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Witch Flounder in NAFO Divisions 2J, 3K and 3L

by

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Abstract

Canadian autumn surveys since the late 1970's indicated that witch flounder were widely distributed throughout the shelf area in deeper channels around the fishing banks primarily in Div. 3K. By the mid 1980's they were rapidly disappearing and by the early 1990's had virtually disappeared from the area entirely except for some very small catches along the slope in Division 3L. In several years from 1991-2003, more of the survey stock was found in Div. 3L. In recent surveys, Div. 3K estimates were higher once again than those in Div. 3L. For the three divisions combined, the biomass index declined from about 65,000 tons in 1984 to 1100 tons in 1995, by far the lowest in the time series. Mean weight per tow decreased from a maximum of near 6 kg/tow in 1984 to a low of 0.23 kg/tow in 1995. The small increase in biomass index and mean weight per tow observed between 1995 and 1996 was almost exclusively a result of inclusion of the deeper strata surveyed in Division 3L. Although estimates of biomass and abundance have increased steadily in recent years, the stock size remains extremely low.

Fisheries and management

The fishery for witch in NAFO Divs. 2J3KL began in the early 1960's and increased steadily from about 1,000 t in 1963 to a peak of over 24,000 t in 1973 (Table 1; Fig. 1). Catches declined rapidly to 2,800 t by 1980 and subsequently fluctuated between 3,000 and 4,500 t to 1991. The catch in 1992 declined to about 2,700 t, the lowest since 1964, and further declined to around 400 t by 1993 (Table 1). Until the late 1980's, the fishery was conducted by Poland, USSR and Canada (Table 1) mainly in Div. 3K (Fig. 1). The regulated fishery (beginning in 1974) was conducted mainly by Canada, although EU (Portugal and Spain) took increased catches in the NAFO Regulatory area of Div. 3L from the mid-1980's. Although only 12 t were reported for 1994, a catch of 491 t was indicated for Spain in the Spanish Research Report (SCS Doc. 95/15) for the Regulatory Area of Div. 3L. In 1995 and 1996 total catches (as by-catch) were estimated to be about 780 and 1370 tons, respectively. However, it is believed that these catches could be overestimated by 15-20% because of misreported Greenland halibut. The catches in 1997 and 1998 were estimated to be about 850 and 1100 tons, respectively most of which was reported from the NAFO Regulatory Area of Div. 3L. From 1999 to 2005 catches ranged from 160 to 830 t and in 2007 was the lowest in the time series at 53 t. Catches have remained low in recent years, averaging about 200 t in recent years.

During 1988-92, the Canadian fishery was particularly successful by fishing on pre-spawning concentrations in the deep slopes of Div. 3K, especially in depths beyond 700 m. Between 1988 and 1993, however, the area fished had become increasingly smaller and substantially deeper as the resource became depleted. The fishery during the winter of 1993 was very poor with the best catch rates occurring in depths greater than 1400 m. No directed fishing by Canada has been permitted since 1994 due to the poor state of the stock.

The stock has been regulated by TAC since 1974 (first introduced by ICNAF) and managed by Canada within its zone since the introduction of the 200 mile national limit and has been under moratorium from 1995 to the present (Fig. 1). Because of the poor state of the stock, the NAFO Fisheries Commission agreed to extend the moratorium to the NAFO Regulatory Area in 1998 and it has continued to 2013.

Canadian Research Vessel Surveys

Distribution

Changes in spatial distribution patterns of witch flounder over the 20 year history of the surveys from 1978-97 were presented in a previous assessment as graphical distribution maps (SCR Doc. 98/64) and were updated for 1984-2010 in Maddock Parsons (2011). Survey distribution data from the late 1970's and early 1980's indicated that witch flounder were widely distributed throughout the shelf area in deeper channels around the fishing banks primarily in Div. 3K. By the mid 1980's, however, they were rapidly disappearing and by the early 1990's had virtually disappeared from the area entirely except for some very small catches along the slope and more to the southern area. Since 1998, surveys caught witch flounder mostly along the deep continental slope area, both inside and outside the Canadian 200-mile fishery zone. From 1991-2003, several years had survey estimates of biomass that were higher in Div. 3L than in Div. 3K (where historically, most of the stock was located) (Fig. 2). As the biomass estimates have increased in the last several years, however, more of the stock is once again found in Div. 3K. The distribution of witch flounder in the 2011 and 2012 Canadian autumn survey is shown in Fig. 3.

Biomass and Abundance Indices

Stratified-random research vessel surveys have been conducted in the autumn in Div. 2J, 3K and 3L since 1977, 1978 and 1981 respectively. Until 1994, the surveys were conducted using an *Engel* 145' high-rise groundfish trawl whereas the 1995-2009 surveys were carried out with a much more efficient *Campelen 1800* shrimp trawl. All data presented here are now in *Campelen 1800* trawl catch equivalents for 1977-94 with the actual data for 1995-2012.

For Div. 2J, biomass estimates ranged from as high as 5 900 t in 1986 to a low of less than 200 t in 2003 and increased every year to nearly 2 000 t in 2008. From 2008-2012 biomass estimates have shown a declining trend although confidence limits are wide as the majority of the biomass estimate in some years results from one or few stratum (Tables 2, 3 and 26; Fig. 4a). Mean weight per tow peaked at 1.8 kg in 1986 and declined to 0.1 kg in 2003 (Tables 20, 21 and 27; Fig. 4b). Since then values have increased steadily to 2008 (0.6 kg/tow) but have since declined to 0.64 kg/tow in 2012.

In Div. 3K, during 1979-85, there was a period of relative stability where most annual biomass estimates were near 50 000 t (Tables 4, 5 and 26; Fig. 4a). Estimates declined considerably to around 400 t in 1995, the lowest in the time series. Estimates increased slightly after 1995 ranging from 500-1400 tons from 1996-2003. Estimates of biomass increased to 2600t in 2004 and continued to increase to 5600 t in 2009. In 2011 and 2012, estimates were 3800 t and 4400 t respectively. In several of the recent surveys the majority of the estimate has been the result of high catches in one or a few strata (Table 5). Corresponding to the period of higher biomass estimates (1979-85), the mean weights per tow in Division 3K ranged from 8 to 13 kg (Tables 22, 23 and 27; Fig. 4b) and declined to a low of less than 1 kg/tow in 1995. Mean weights per tow have remained low since then and in 2002 were below 1 kg/tow. Since then estimates have increased to 4 kg/tow in 2007, and have been less since, at about 2.5 kg/tow in the recent two surveys, still much lower than the maximum observed.

For Div. 3L, biomass estimates varied generally between 7 000 and 13 000 t from 1984 to 1990 but then declined rapidly to a low of around 400 t in 1995 (Tables 6, 7 and 26; Fig. 4a). In 1996, the Canadian autumn survey expanded to included deeper water strata (depths of 732-1097). Surveys prior to 1996 covered only a part of the stock area and biomass estimates from the early part of the survey series are most likely underestimated. Using the strata surveyed in 1984 as index strata (the first year of the combined Div. 2J, 3K and 3L series and also the highest estimate in the series), it was estimated that survey estimates prior to 1996, may have been underestimated by about 48% (Maddock Parsons, 2010). In 2004, difficulties with the Canadian autumn survey resulted in incomplete coverage, particularly in the deeper strata of Div. 3L (SCR Doc. 05/34) and the biomass estimate was the lowest in the time series at 451 t. Coverage in strata greater than 731m was very limited in the 2005 survey as well,

but the biomass estimate increased to 1,000 t. Biomass estimates in Div. 3L increased from 1 000 t in 2005 to 3600 t in 2012. Mean weight per tow in Division 3L (Tables 24, 25 and 27; Fig 4b) ranged from 2 to 2.5 kg/tow in the early part of the survey series (1984-1990). A rapid decline in mean weight per tow then resulted in the lowest observed at 0.1 kg in 1995. The inclusion of deep water strata in 1996 explains the over three-fold increase in mean weight per tow to 0.3 kg. Mean weight per tow has shown the same general trend as the biomass index in the survey, and has from 2003-2012. In 2009, a decrease in mean weight per tow from 2008 was explained by more small fish in the survey, and less large witch. In 2011 and 2012, deepwater strata were not surveyed due to problems with the survey vessel. Nevertheless biomass estimates increased slightly in Div. 3L.

The abundance indices followed similar trends as the biomass indices and are shown in Tables 8-13 for Divisions 2J, 3K and 3L, respectively and illustrated in Fig. 4a by Division and in Fig. 5 and Table 16 for the divisions combined. The mean numbers per tow by Division are given in Tables 14-19 and Table 29, and are shown in Fig. 4b. In general, abundance indices have increased in trend since 2003, but in 2006 and 2008, the increase in biomass in the survey was not seen in the abundance estimates. In these years, there were fewer small fish in the survey than in the other recent surveys (Fig. 7).

For the three divisions combined, there was a very steady and rather systematic decline in the biomass index from about 65,000 tons (nearly 6 kg/tow) in 1984 to 1100 tons (0.23 kg/tow) in 1995, the lowest in the time series (Fig. 5; Table 14). There has been a very slight increasing trend in recent years, however current stock size remains extremely low.

Length frequencies

Population numbers at length from the 1996-2012 Canadian autumn surveys are given in Figures 6 and 7. The proportion of fish small fish (<23cm) were higher than the average (1996-2012) in surveys from 2000-2003 but have been lower than average in most years following.

Assessment Results

Precautionary limit reference points

In a previous assessment for this stock, a proxy for B_{lim} was calculated as 15% of the highest observed survey biomass estimate because no analytical assessment was available (B_{lim} = 9 800 t; Maddock Parsons, 2007). Since the highest observed biomass estimate is in the early part of the time series when the survey did not cover the entire stock area, B_{lim} was likely underestimated using this method. An analysis of the amount of biomass in index strata (those strata covered in 1984, the highest biomass estimate in the series) concluded that the survey biomass estimates in the early part of the time series may have been underestimated by about 48% -the average of the biomass outside of the index strata in 1996-2009. The proxy for B_{lim}, adjusted for less extensive coverage in the survey, was calculated to be 14 500 t (B_{lim} =15% of B1984*1.48; Maddock Parsons, 2011). The survey biomass estimates have been below this reference point since 1991 (Figures 9 and 10).

Current Status

The stock remains at an extremely low level with current indices of stock size based on survey trends at most 5% of the average of the early 1980's when the stock was considered at a reasonably healthy level.

References

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Table 1. Catch statistics by country of witch flounder in Divisions 2J, 3K and 3L during 1963-2012. In 1998-2001, and 2005 small portions of the "Others" catch are from Division 3M.

Year	Canada	Fed. Rep. Germany	German Dem. Rep.	Poland	USSR/ Russia	UK	Others	Total	TAC
1963	17	3	0	259	89	7	570	945	
1964	103	0	0	752	164	24	1	1044	
1965	128	29	0	1876	2056	58	0	4147	
1966	187	9	1045	559	1868	29	0	3697	
1967	901	0	332	926	1933	9	0	4101	
1968	446	0	358	1990	7834	33	5	10666	
1969	1355	0	546	957	9726	1	0	12585	
1970	4020	0	508	3566	9934	0	2	18030	
1971	8030	75	508	5404	2018	9	9	16053	
1972	5520	6	648	4013	7016	225	0	17428	
1973	3761	1348	2327	11802	2834	258	2031	24361	
1974	1868	1082	272	5302	6917	29	493	15963	22000
1975	1352	446	374	4583	4763	0	687	12205	17000
1976	2081	606	110	3828	3022	3	975	10625	17000
1977	4371	300	203	3052	392	0	0	8318	17000
1978	1979	23	58	3490	1345	1	8	6904	17000
1979	1392	0	22	1855	150	22	656	4097	17000
1980	1459	0	16	1235	45	0	68	2823	17000
1981	2661	0	32	1385	85	0	31	4194	8000
1982	1206	0	4	1151	552	0	68	2981	8000
1983	1483	0	50	1005	516	0	34	3088	8000
1984	2077	0	27	1617	1000	2	85	4808	8000
1985	1305	26	33	565	1006	-	68	3003	8000
1986	1199	2	7	3	21	-	2684[a]	3916	8000
1987	854	-	56	765	1057	-	1743	4475	6000
1988	3270	-	10	760	4	-	110	4154	5000
1989	4059	-	4	691	5	-	147	4906	5000
1990	3271	-	-	-	-	-	696	3967	4000
1991	2805	-	-	-	-	1	1208	4014	4000
1992	1736	5	-	-	-	2	954	2697	4000
1993	343	-	-	-	-	-	59	402	3500
1994	12	-	-	-	-	-	491[b]	503	1000
1995	7	-	-	-	-	-	777	784	0
1996	11	-	-	-	-	-	1371	1382	0
1997	8	-	-	-	-	-	847	855	0
1998	-	-	-	-	2	-	1113	1115	0
1999	2	-	-	-	20	-	278	300	0
2000	85	-	-	-	6	-	578	669	0
2001	161	-	-	-	31	-	605	797	0
2002	166	-	-	-	15	-	258	439	0
2003	110	-	-	-	7	-	630	747	0
2004	26	-	-	-	16	-	787	829	0
2005	42	-	-	-	2	-	115	159	0
2006	53	-	-	-	3	-	28	84	0
2007	23	-	-	-	2	-	28	53	0
2008	7	-	-	-	9	-	68	84	0
2009	42	-	-	-	-	-	58	100	0
2010	158	-	-	-	2	-	77	237	0
2011	140	-	-	-	2	-	78	220	0
2012	93	-	-	-	19		83	195	0

[a]Since 1985 the "Others" category is mainly comprised of EU catches

[b]Spain (SCS Doc. 95/15)

Table 2. Estimated Biomass (tons) of Witch Flounder (M+F) in each stratum from surveys in Div. 2J during fall of 1977-1994. (Engel 145 data converted to Campelen Units).

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94
	1427	633	201	0	0	0	0	0	0	0	61	0	0	0	0	0	0	0	0	0	0
	1823	1594	205	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0
101 -	2582	1870	206	114	0	0	0	0	37	0	0	0	0	0	0	0	0	0	0	0	0
200	2246	2264	207	0	0	0	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0
	.	733	237																	0	0
	.	778	238																		0
	440	621	202	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
	1608	680	209	103	14	48	122	0	83	123	19	152	0	0	0	0	14	0	0	0	0
201 -	774	1035	210	133	45	121	338	24	129	0	286	0	0	38	0	22	0	0	0	0	0
300	1725	1583	213	265	249	160	298	280	371	197	118	102	130	98	21	56	0	0	0	0	0
	1171	1341	214	193	54	0	58	65	122	74	21	106	71	0	16	14	19	0	0	0	0
	1270	1302	215	193	33	11	0	82	67	0	45	0	0	0	0	0	0	0	0	0	0
	1428	2196	228	508	134	301	543	183	678	264	467	79	728	93	123	151	76	0	44	35	0
	508	530	234	0	35	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	480	487	203	0	0	0	0	0	54	112	0	0	19	0	0	20	0	0	0	0	0
	448	588	208	178	36	75	367	91	638	80	95	608	91	0	0	27	0	0	0	0	0
301 -	330	251	211	447	198	100	289	70	242	12	99	72	27	38	0	34	0	0	0	0	0
400	384	360	216	0	0	27	42	56	63	85	0	0	54	13	10	16	0	0	0	0	0
	441	450	222	197	99	29	103	155	285	69	26	45	0	0	173	46	0	10	0	0	0
	567	536	229	183	177	118	215	127	139	155	103	52	857	70	145	596	32	31	28	15	13
	354	288	204	57	0	37		85	125	13	91	0	71	14	42	58	14	0	0	0	0
	268	241	217	0	0	15	0	0	0	0		0	54	64	44	72	6	0	0	0	13
401 -	180	158	223	13	0	0	0	37	0	0	31	0	139	116	59	64	18	18	8	8	14
500	686	598	227	161	123	44	482	180	358	211	85	147	329	411	203	228	1837	207	125	132	0
	420	414	235	813	0	456	430	502	371	908	517	399	121	168	0	62	149	37	20	0	41
	.	133	240																	36	19
	664	557	212	1564	105	640	193	630	1116	1390	822	1253	3139	834	392	588	639	111	272	44	52
501 -	420	362	218	0	0		0	0	0	0		15	0	44	114	79	58	13	0	8	19
750	270	228	224	0	0	0	0	0	0	0	0	0	32	48	120	125	17	49	32	0	23
	237	185	230	0	0		15	0	0	0	17	0	57	15	101	396	771	1711	346	85	105
	.	120	239																	0	0
751 -	213	283	219					0		0		0	0	0	0	0	0	0	0	15	8
1000	182	186	231	0	0		0		0	0	0	0	0	0	0		0	457	176	197	118
	122	193	236	0				14	0	0	0	0	0	0	9		23	25	51	51	37
1001 -	324	303	220		0																
1250	177	195	225	0																	
	236	228	232	0	0																
1251 -	286	330	221																		
1500	180	201	226		0																
	180	237	233																		
Grand Total				5123	1302	2218	3494	2581	4909	3693	2903	3030	5920	2063	1571	2653	3672	2669	1102	627	462
Biomass >1000m				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent >1000m				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biomass in Index strata											2903	3015	5866	1956	1413	2502	3608	2656	1102	568	403
Fraction of biomass in Index Strata											1.00	1.00	0.99	0.95	0.90	0.94	0.98	1.00	1.00	0.90	0.87

Table 3. Estimated Biomass (tons) of Witch Flounder (M+F) in each stratum from surveys in Div. 2J during fall of 1995-2012.

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12
	1427	633	201		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1823	1594	205		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101 -	2582	1870	206	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	0
200	2246	2264	207	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	.	733	237	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
	.	778	238		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	440	621	202	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1608	680	209	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
201 -	774	1035	210	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	1725	1583	213	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	49	0
	1171	1341	214	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0
	1270	1302	215	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1428	2196	228	0	0	0	0	0	0	0	3	0	0	30	0	0	12	0	105	150	77
	508	530	234		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	480	487	203	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	448	588	208	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	80	0	92
301 -	330	251	211	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	107
400	384	360	216	0	2	0	0	0	0	0	3	0	0	0	5	5	0	0	0	4	50
	441	450	222	0	6	0	17	10	0	0	0	0	0	0	11	0	0	4	9	23	11
	567	536	229	0	0	0	0	0	6	4	0	11	4	55	22	81	0	74	14	66	135
	354	288	204	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	19
	268	241	217	0	7	8	6	0	0	0	0	2	14	8	4	0	0	6	0	25	0
401 -	180	158	223	0	7	5	5	0		4	1	3	0	9	13	13	10	4	6	0	0
500	686	598	227	0	0	86	84	125	0	26	4	0	41	32	68	105	80	107	132	50	189
	420	414	235	0	16	3	22	0	0	0	46	0	63	20	16	28	118	10	341	658	208
	.	133	240	0	17	16	11	24	11	9	0	3	14	31	43	62	18	102	48	6	29
	664	557	212	71	96	90	184	261	125	8	38	52	193	341	599	983	1568	758	467	74	75
501 -	420	362	218	1	17	10	12	9	4	0	0	3	20	12	6	14	9	65	0	0	0
750	270	228	224	1	18	23	16	1	15	13	1	0	0	3	32	15	29	16	0	0	0
	237	185	230	69	126	176	26	161	36	21	2	48	60	108	137	55	88	199	13	0	25
	.	120	239	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	13	3	12
751 -	213	283	219	3	13	9	14	0	3	4	6	12	11	0	0	0		0	0	0	0
1000	182	186	231	115	6	36	228	143	283	59	257	12	43	35	0	7	9	0	0	10	0
	122	193	236	3	28	3	11	16	13	38	27	29	0	0	6	0		0	0	0	0
1001 -	324	303	220		10	0	0		0	0	6	0	0	0	0	0		0	0	0	0
1250	177	195	225		0	0	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0
	236	228	232		0	0	0	0	0	23	0	4	0	0	0	0	0	0	0	0	0
1251 -	286	330	221		0	0	0	0	0	0	3	0	0	0	0	0		0	0	0	0
1500	180	201	226		0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0
	180	237	233		0	0	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0
Grand Total				263	370	465	649	752	498	209	404	178	476	684	962	1369	1947	1351	1242	1243	1244
Biomass >1000m				0	10	0	6	2	1	24	16	4	0	0	0	0	0	0	0	0	0
Percent >1000m				0.0	2.8	0.0	0.9	0.3	0.3	11.4	3.9	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biomass in Index strata				260	305	423	601	716	478	172	383	154	418	633	909	1293	1913	1178	1180	1118	987
Fraction of biomass in Index Strata				0.99	0.83	0.91	0.93	0.95	0.96	0.82	0.95	0.87	0.88	0.92	0.94	0.94	0.98	0.87	0.95	0.90	0.79

Table 4. Estimated Biomass (tons) of Witch Flounder (M+F) in each stratum from surveys in Div. 3K during fall of 1977-1995. (Engel 145 data converted to Campelen Units).

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
	.	798	608																		
101 -	.	445	612																		
200	.	250	616																		
	1455	1347	618							0	0	0	0	0	0	0	0	0	0	0	0
	1588	1753	619							0	0	0	0	0	0	0	0	0	0	0	1
	.	342	609																		
	.	573	611																		
	.	251	615																		
	2709	2545	620	612	1410	509	152	227	133	126	64	198	0	0	0	0	0	0	0	0	0
201 -	2859	2537	621	1051	3719	498	424	250	788	329	445	26	62	0	63	0	0	0	0	0	0
300	668	1105	624	356	145	105	378	446	121	367	90	66	19	0	0	7	0	0	12	0	0
	447	.	632	395	591	230	524	408	447		210	89	34	38	82	0	3	8			
	1618	1555	634	788	772	1075	536	981	177	860	388	256	209	373	131	0	0	25	4	0	0
	1274	1274	635	1635	1887	1443	1481	833	538	2211	775	15	136	338	166	21	0	31	0	0	1
	1455	1455	636	1482	1680	1845	1166	876	711	2898	848	314	520	824	355	63	0	0	0	0	2
	1132	1132	637	1116	2242	1430	1864	1905	3668	2724	2490	702	841	215	158	0	0	57	17	0	0
	.	256	610																		
	.	263	614																		
	.	593	617																0	0	0
	1027	494	623	500	633	584	551	410	601	343	650	164	199	30	10	0	0	0	0	0	0
301 -	850	888	625	864	2238	988	1580	491	1588	1416	1101	50	165	104	12	0	0	0	0	0	3
400	919	1113	626	3586	5737	5960	1149	4128	3477	1248	1110	57	174	32	56	0	0	22	0	0	0
	1085	1085	628	2454	6077	3512	1379	2431	4882	2070	2324	954	523	39	214	0	0	20	0	0	0
	499	495	629	1722	1617	2520	1745	958	2253	1016	998	225	510	196	63	66	0	10	2	6	4
	544	332	630	1048	730	850	981		727	549	363	168	182	155	28	0	0	11	18	0	0
	2179	2067	633	2190	2876	3722	1402	2399	2661	3092	2072	1599	1105	1931	1186	365	162	117	94	47	3
	2059	2059	638	3316	8711	4695	5840	3430	4381	8608	7033	8275	5506	7317	3393	327	340	91	81	4	4
	1463	1463	639	1415	1092	2077	1716	1127	3637	4062	2121	1744	779	2637	544	487	83	13	0	36	40
	.	30	613																		
	632	691	622	598	1228	1938	1010	600	946	640	1152	263	653	21	20	37	10	28	14	0	5
401 -	1184	1255	627	2887	4140	8083	11621	8635	10560	7849	4541	1598	1378	1341	738	243	6	47	69	23	32
500	1202	1321	631	2274	2264	2534	7736	1009	5887	6448	4570	2929	1553	598	358	73	338	313	63	280	77
	198	69	640	51		177	62	411		436	1074	1669	2280	1347	1145	176	184	18	0	0	0
	204	216	645	12		0	12	341	281	1519	238		3079	571	252	991	99	15	15	8	0
	.	134	650																21	4	2
501 -	584	230	641	0	0	39	82	72	171	0	813		1657			11071	937	0	12	8	9
750	333	325	646	0	0	68	14	25	615	94	108		102			275	173	49	36	79	3
	.	359	651																25	23	19
751 -	931	418	642	0		79	0	36		131	89		83			2496	1213	790	81	65	17
1000	409	360	647	0	0	0	0	0			26					390	724	198	67	108	30
	.	516	652																266	154	52
1001 -	1266	733	643	0	0																66
1250	232	228	648	0																	
	.	531	653																429		66
1251 -	954	474	644	0	0																0
1500	263	212	649	0																	
	.	479	654																		0
Grand Total				30353	49789	44962	43406	32429	49251	49038	35694	21359	21746	18110	8976	17088	4272	1863	1327	846	435
Biomass >1000m				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	429	0	132
Percent >1000m				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.3	0.0	30.4
Biomass in Index strata										49038	35458	21270	21712	18072	8894	16698	3544	1656	519	557	201
Fraction of biomass in Index Strata										1.00	0.99	1.00	1.00	1.00	0.99	0.98	0.83	0.89	0.39	0.66	0.46

Table 5. Estimated Biomass (tons) of Witch Flounder (M+F) in each stratum from surveys in Div. 3K during fall of 1995-2012.

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12
	.	798	608	0	0	0		0	0	0	0	0	0	0				0		
101 -	.	445	612	0	0	0		0	0	0	0	0	0	0				0		
200	.	250	616	0	0	0		0	0	0	0	0		0						
	1455	1347	618	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1588	1753	619	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	.	342	609	0	0	0		0	0	0	0	0	0	0			0	0		
	.	573	611	0	0	0		0	0	0	0	0	0	6				0		
	.	251	615	0	0	0		1	0	0	0	0	0	1				0		
	2709	2545	620	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	43
201 -	2859	2537	621	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	29	50
300	668	1105	624	0	9	0	6	5	24	0	0	9	0	0	0	0	0	0	0	31
	447	.	632																	
	1618	1555	634	0	0	0	0	0	0	0	0	0	3	0	0	0	12	15	0	67
	1274	1274	635	0	46	17	0	6	0	0	0	0	16		0	0	0	0	93	4
	1455	1455	636	2	37	0	0	0	5	0	0	0	1	0	0	78	0	1	28	82
	1132	1132	637	0	3	2	32		1	0	0	0	1	0	0	63	2	9	4	0
	.	256	610	1	0	3		1	1	3	0	0	2	7				2		
	.	263	614	0	0	0		1	1	0	0	0	0	0				0		
	.	593	617	0	4	13	0	0	0	0	0	0	0	0	0	0	18	14	0	38
	1027	494	623	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	122
	850	888	625	4	0	7	2	0	2	0	0	2	9	26	0	4	0	0	201	7
301 - 400	919	1113	626	0	1	0	9	8	5	0	0	2	1	13	119	25	24	21	219	144
	1085	1085	628	0	0	0	5	12	3	0	0	15	0	8	0	35	1	7	210	251
	499	495	629	2	2	8	18	14	1	0	0	24	1	27	4	104	4	0	55	57
	544	332	630	7	1	0	3	5	8	0	0	0	14	2	7	8	8	3	11	16
	2179	2067	633	33	39	74	21	26	13	11	1	3	82	37	108	12	91	200	109	126
	2059	2059	638	5	17	79	60	79	75	14	11	59	39	240	411	725	58	438	192	657
	1463	1463	639	14	4	41	0	0	0	3	0	0	21	0	133	20	42	63	215	56
	.	30	613	0	0	0		3	0	0	0	0	0	0				0		
	632	691	622	1	6	18	0	48	42	0	0	6	7	0	27	0	2	0	98	58
401 -	1184	1255	627	8	48	81	42	98	40	13	2	50	11	73	265	227	96	162	288	373
500	1202	1321	631	7	85	80	16	66	18	17	3	150	165	43	125	102	57	99	48	258
	198	69	640	8	3	10	0	12	14	0	0	30	2	52	22	62	39	170	26	55
	204	216	645	18	15	3	23	7	9	5	0	0	80	79	61	17	309	228	82	234
	.	134	650	9	17	20	25		15	9	9	51	13	162	173	300	105	333	207	179
501 -	584	230	641	45	36	108	114		162	25	61	595	74	476	430	310	1413	740	511	730
750	333	325	646	431	42	40	36	173	118	154	16	72	107	5	631	76	247	184	372	108
	.	359	651	52	202	127	179		447	134	17	1309	809	1596	1637	1162	2244	2689	714	609
751 -	931	418	642	7	0	6	35	208	11	14	141	17	476	32	158	16	115	0	0	0
1000	409	360	647	50	118	103	193	0	280	9	102	232	238	4	0		0	0	2	0
	.	516	652	149	382	408	39	412	112	59	218	14	657	0	360	30	701	29	0	30
1001 -	1266	733	643	0	0	0	12	18	0	0	37	0	7	0	0		0	0	0	0
1250	232	228	648	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0
	.	531	653	0	0	0	12	0	18	0	33	0	8	0	0	0	0	0	0	0
1251 -	954	474	644	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0
1500	263	212	649	0	0	0	0	0	0	0	0	0	0	0	0		0	10	0	0
	.	479	654	0	0	4	0	0	0	0	0	0	0	0	0		52	0	0	0
Grand Total				855	1116	1255	881	1200	1427	471	651	2641	2842	2889	4671	3374	5639	3922	3923	3924
Biomass >1000m				0	0	4	24	18	18	0	70	0	15	0	0	0	52	10	0	0
Percent >1000m				0.0	0.0	0.3	2.7	1.5	1.3	0.0	10.7	0.0	0.5	0.0	0.0	0.0	0.9	0.3	0.0	0.0
Biomass in Index strata				593	394	577	421	765	552	257	235	1035	1107	1113	2500	1882	2519	2340	2883	3528
Fraction of biomass in Index Strata				0.69	0.35	0.46	0.48	0.64	0.39	0.55	0.36	0.39	0.39	0.39	0.54	0.56	0.45	0.60	0.73	0.90

Table 6. Estimated Biomass (tons) of Witch Flounder (M+F) in each stratum from surveys in Div. 3L during fall of 1983-1994. (Engel 145 data converted to Campelen Units).

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	84	85	86	87	88	89	90	91	92	93	94
30-56	.	268	784											
	2071	2071	350	136	0	0	0	0	0	0	0	0	0	0
	1780	1780	363	85	0	50	0	0	0	264	33	41	0	0
57 -	1121	1121	371	46	0	0	0	0	0	0	0	0	0	0
92	2460	2460	372	144	0	0	0	16	0	38	8	0	0	0
	1120	1120	384	98	0	0	0	0	0	0	0	0	0	0
	.	465	785											
	1519	1519	328	45	0	0	0	0	0	0	0	0	0	0
	1574	1574	341	230	0	0	34	34	0	0	0	0	0	0
	585	585	342	0	0	0	0	0	0	0	0	0	0	0
	525	525	343	84	0	0	0	0	0	0	0	0	0	0
	2120	2120	348	334	0	0	0	44	0	0	0	0		0
	2114	2114	349	306	0	155	0	36	0	145	0	0	0	0
	2817	2817	364	202	0	143	0	39	0	27	0	0	0	0
	1041	1041	365	100	0	68	29	18	0	0	36	0	0	0
93 -	1320	1320	370	190	0	0	34	0	0	0	0	0	0	0
183	2356	2356	385	340	0	79	58	27	0	0	0	0	0	0
	1481	1481	390	159	0	0	0	0	0	0	0	0	0	0
	.	84	786											
	.	613	787											
	.	261	788											
	.	89	790											
	.	72	793											
	.	216	794											
	.	98	797											
	.	72	799											
	1494	1582	344	159	37	29	127	0	0	0	0	0	0	0
	983	983	347	467	0	42	0	154	66	0	0	0	0	0
	1394	1394	366	186	355	307	171	110	187	27	0	7	0	0
184 -	961	961	369	374	570	706	320	1061	429	473	162	0	0	0
274	983	983	386	168	519	1082	1518	1750	442	218	307	875	0	0
	821	821	389	196	133	760	250	138	21	79	0	27	0	0
	282	282	391	0	32	0	9	0	0	0	70	22	0	0
	.	164	795											
184 -	.	72	789											
366	.	227	791											
	.	100	798											
	1432	1432	345	4484	1227	617	3693	2099	2358	750	0	61	73	0
	865	865	346	1423	2240	3321	1201	1823	1287	1863	203	40	14	0
	334	334	368	47	29	386	23	64	144	106	39	14	0	0
275 -	718	718	387	169	404	276	572	1775	1546	3668	159	52	32	12
366	361	361	388	1229	48		589	92	126	0	125	173	0	14
	145	145	392	55	13	20	50	13	0	0	0	0	0	4
	.	175	796											
	.	81	800											
	186	186	729	146	127	280				48	274	246	42	131
367 -	216	216	731	498	248					465	178	356	38	79
549	468	468	733	328	1164					1618	2110	610	183	60
	272	272	735	367	34	1714					222	216	40	12
	.	50	792											
	170	170	730	104	16						130	6	140	88
550 -	231	231	732	282	235					29	207	283	41	194
731	228	228	734	30	184					168	100	11	106	49
	175	175	736		268	709				355	913	90	70	20
	.	227	737											
732 -	.	223	741											
914	.	348	745											
	.	159	748											
	.	221	738											
915 -	.	206	742											
1097	.	392	746											
	.	126	749											
	.	254	739											
1098 -	.	211	743											
1280	.	724	747											
	.	556	750											
1281 -	.	264	740											
1463	.	280	744											
	.	229	751											
Grand Total				13210	7881	10743	8679	9294	6606	10341	5274	3131	778	663
Biomass >731m				0	0	0	0	0	0	0	0	0	0	0
Percent >731m				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biomass in Index strata				13210	7613	10034	8679	9294	6606	9986	4361	3041	708	644
Fraction of biomass in Index Strat				1.00	0.97	0.93	1.00	1.00	1.00	0.97	0.83	0.97	0.91	0.97

Table 7. Estimated Biomass (tons) of Witch Flounder (M+F) in each stratum from surveys in Div. 3L during fall of 1995-2012. (Engel 145 data converted to Campelen Units).

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	99	00	01	02	03	04	05	06	7	08	09	10	11	12
30-56	.	268	784		1	0	0	0	0	0							
	2071	2071	350	0	0	0	0	0	0	18	0	0	34	0	0	0	0
	1780	1780	363	0	0	0	0	0	0	0	0	0	0	0	0	30	0
57 -	1121	1121	371	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	2460	2460	372	0	0	0	0	0	0	0	0	0	0	0	0	0	17
	1120	1120	384	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	.	465	785		0	0	0	0	0	0							
	1519	1519	328	0	0	0	0	0	0	0	0	0	0	0	0	13	25
	1574	1574	341	0	0	0	0	0	0	25	393	0	37	0	89	66	1
	585	585	342	0	0	0	1	0	0	0	0	0	0	0	0	0	0
	525	525	343	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2120	2120	348	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	2114	2114	349	0	2	0	0	17	0	117	0	0	82	1	32	37	0
	2817	2817	364	0	0	0	0	0	0	0	0	0	0	0	14	1	36
	1041	1041	365	0		0	0	0		21	0	0	0	0	0	0	0
93 -	1320	1320	370	0	0	0	0	0		0	0	0	0	0	0	1	0
183	2356	2356	385	0	0	0	0	0	0	0	0	0	0	0	5	0	0
	1481	1481	390	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	.	84	786		0	1	0	1	0	1							
	.	613	787		0	0	0	0	0	0	0						
	.	261	788		0	0	0	0	0	0	0				0		
	.	89	790		0	1	0	0	0	0					0		
	.	72	793		0	0	2	0	0	3					0		
	.	216	794			0	0	0	0	0	0				0		
	.	98	797		0	0	0	0	0	0	0				0		
	.	72	799		0	0	0	0	0	0	0				0		
	1494	1582	344	0	1	0	3	3	2	0	0	30	57	3	0	1	0
	983	983	347	0	0	4	0	0	0	0	0	0	1	0	17	51	249
	1394	1394	366	0	0	0	0	6		0	0	6	0	0	19	51	36
184 -	961	961	369	0	0	0	0	0		0	1	0	26	0	0	1	47
274	983	983	386	0	0	0	0	0		1	0	0	0	0	0	42	3
	821	821	389	0	11	0	0	0	0	0	5	0	0	0	0	0	3
	282	282	391	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	.	164	795		0	0	0	0	0	0	0				0		
184 -	.	72	789		0	0	0	0	0	0	0						
366	.	227	791		0	0	1	3	0	5					0		
	.	100	798		3	23	0	0	3	2					0		
	1432	1432	345	3	5	0	8	5	1	36	43	14	255	33	160	78	751
	865	865	346	20	16	8	4	1	0	72	97	75	609	39	12	444	522
	334	334	368	0	6	0	0	0		3	12	0	28	0	0	2	47
275 -	718	718	387	5	38	4	6	0		1	17	35	132	0	101	76	53
366	361	361	388	0	5	17	6	4	0	3	32	11	17	21	6	4	8
	145	145	392	0	0	14	0	0	0	0	0	0	0	0	1	0	0
	.	175	796		0	4	1	0	0	9	2				1		
	.	81	800		6	24	22	1	4	7				10	6		
	186	186	729	0	1	13	33	12	0	3	32	28	74	11	195	80	18
	216	216	731	19	16	4	3	13	22	25	47	10	41	84	92		23
367 -	468	468	733	54	62	50	106	8	248	230	166	370	26	207	226	436	399
549	272	272	735	12	3	3	12	0		61	45	188	334	509	298	539	754
	.	50	792		29	54	49	45	49	79					25		
	170	170	730	10	59	274	113	0	14	0	48	14	4	39	68	47	59
550 -	231	231	732	252	230	207	115	107	106	36	183	120	149	252	336	138	74
731	228	228	734	95	47	17	79	4		0	84	44	19	468	219	653	49
	175	175	736	93	415	185	1196	104		195	758	777	832	932	956	548	387
	.	227	737	151	11	124	502	68		48	11	0		0	80		
732 -	.	223	741	7	0	3	159	15			10	0		15	0		
914	.	348	745	65	0	0	0	7			0	0		0	22		
	.	159	748	40	0	0	0	37			0	0		0	5		
	.	221	738	0	0	7	6	423			0	0		0	0		
915 -	.	206	742	0	0	0	0	117			0	0		0	0		
1097	.	392	746	0	0	0	0	7			0	0		0	0		
	.	126	749		0	0	0	0				0		0	0		
	.	254	739	0	0	0	0	0		0	0	0		0	0		
1098 -	.	211	743	0	0	0	0	0			0	0		0	0		
1280	.	724	747	0	0	0	0	0			0	0		0	0		
	.	556	750	0	0	0	0	0				0		0	0		
1281 -	.	264	740	0	0	0	0	0		0	0	0		0	0		
1463	.	280	744		0	0	0	0			0	0		0	0		
	.	229	751		0	0	0	0				0		0	0		
Grand Total				826	968	1042	2428	1010	451	1003	1987	1723	2759	2625	2986	3339	3562
Biomass >731m				262	12	134	667	674	0	48	21	0	0	15	108	0	0
Percent >731m				31.8	1.2	12.9	27.5	66.8	0.0	4.8	1.1	0.0	0.0	0.6	3.6	0.0	0.0
Biomass in Index strata				471	502	614	489	182	394	653	1205	946	1926	1669	1891	2792	3175
Fraction of biomass in Index Stra				0.57	0.52	0.59	0.20	0.18	0.87	0.65	0.61	0.55	0.70	0.64	0.63	0.84	0.89

Table 8. Abundance (000s) per stratum of Witch Flounder (M+F) from surveys in Div. 2J during fall of 1977-1994. Engel 145 data converted to Campelen Units.

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94
101 - 200	1427	633	201	0	0	0	0	0	0	0	65	0	0	0	0	0	0	0	0	0	0
	1823	1594	205	0	0	0	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0
	2582	1870	206	129	0	0	0	0	59	0	0	0	0	0	0	0	0	0	0	0	0
	2246	2264	207	0	0	0	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0
	.	733	237																	0	0
	.	778	238																		0
201 - 300	440	621	202	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
	1608	680	209	158	37	32	147	0	80	158	32	147	0	0	0	0	37	0	0	0	0
	774	1035	210	142	46	106	405	35	124	0	373	0	0	53	0	53	0	0	0	0	0
	1725	1583	213	386	271	203	326	435	475	308	190	185	185	158	30	53	0	0	0	0	0
	1171	1341	214	268	69	0	97	64	141	101	40	134	81	0	27	54	32	0	0	0	0
	1270	1302	215	218	22	29	0	35	78	0	58	0	0	0	0	0	0	0	0	0	0
	1428	2196	228	565	262	393	746	196	825	295	421	56	1080	112	196	393	229	0	79	101	0
	508	530	234	0	42	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
301 - 400	480	487	203	0	0	0	0	0	66	154	0	0	33	0	0	22	0	0	0	0	0
	448	588	208	339	62	139	508	154	924	123	144	965	123	0	0	123	0	0	0	0	0
	330	251	211	545	306	148	390	91	340	23	136	106	23	45	0	68	0	0	0	0	0
	384	360	216	0	0	40	40	106	106	123	0	0	79	26	26	26	0	0	0	0	0
	441	450	222	303	182	45	152	212	465	101	40	61	0	0	394	61	0	20	0	0	0
	567	536	229	312	292	175	331	117	195	214	130	52	1846	260	364	1664	78	26	130	221	25
401 - 500	354	288	204	73	0	73		97	130	16	122	0	97	24	73	97	24	0	0	0	0
	268	241	217	0	0	18	0	0	0	0		0	74	92	74	92	18	0	0	0	155
	180	158	223	12	0	0	0	37	0	0	50	0	248	161	124	111	37	66	33	76	145
	686	598	227	165	189	47	566	189	396	283	126	212	409	684	220	354	4404	661	330	329	0
	420	414	235	1343	0	664	549	664	578	1358	770	520	376	289	0	202	173	96	19	0	304
	.	133	240																	348	140
501 - 750	664	557	212	2147	183	868	228	731	1461	1705	1127	1621	4658	1302	685	891	1218	411	365	77	281
	420	362	218	0	0		0	0	0	0		29	0	58	173	144	87	29	0	100	199
	270	228	224	0	0	0	0	0	0	0	0	0	56	56	204	186	19	111	74	0	146
	237	185	230	0	0		16	0	0	0	16	0	65	16	147	782	1695	4548	880	471	382
	.	120	239																	0	0
751 - 1000	213	283	219					0		0		0	0	0	0	0	0	0	0	156	58
	182	186	231	0	0		0		0	0	0	0	0	0	0		0	939	401	512	375
	122	193	236	0				25	0	0	0	0	0	0	8		59	34	151	199	159
1001 - 1250	324	303	220		0																
	177	195	225	0																	
	236	228	232	0	0																
1251 - 1500	286	330	221																		
	180	201	226		0																
	180	237	233																		
Grand Total				7106	1962	3016	4503	3190	6486	4963	3840	4089	9432	3337	2746	5377	8110	6941	2463	2588	2369
Abundance >1000m				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent >1000m				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 9. Abundance (000s) per stratum of Witch Flounder (M+F) from surveys in Div. 2J during fall of 1995-2012.

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12
101 - 200	1427	633	201		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1823	1594	205		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2582	1870	206	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51	0
	2246	2264	207	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	.	733	237	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34		0
	.	778	238		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
201 - 300	440	621	202	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1608	680	209	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	774	1035	210	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1725	1583	213	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	131	0
	1171	1341	214	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	0	0
	1270	1302	215	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1428	2196	228	0	0	0	0	0	0	0	38	0	0	38	0	0	49	0	345	352	151
	508	530	234		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
301 - 400	480	487	203	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	448	588	208	0	0	0	0	0	0	0	0	0	81	0	0	0	0	0	162	0	202
	330	251	211	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	234
	384	360	216	0	25	0	0	0	0	0	25	0	0	0	25	25	0	0	0	25	177
	441	450	222	0	58	0	62	62	0	0	0	0	0	0	31	0	0	35	31	62	31
	567	536	229	0	0	0	0	0	37	33	0	37	37	147	111	184	0	295	49	184	406
401 - 500	354	288	204	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	40
	268	241	217	0	33	66	31	0	0	0	0	19	66	50	17	0	0	17	0	66	0
	180	158	223	0	75	43	19	0		43	12	22	0	36	54	54	42	11	12	0	0
	686	598	227	0	0	206	329	535	0	206	47	0	129	165	329	329	219	247	411	123	247
	420	414	235	0	51	28	85	0	0	0	65	0	342	114	57	85	304	28	940	1643	456
	.	133	240	0	146	55	45	137	37	76	0	18	46	82	119	106	49	312	115	27	46
501 - 750	664	557	212	306	217	268	690	536	460	68	115	115	575	996	1396	2271	3317	1724	1120	153	153
	420	362	218	17	199	75	50	47	50	0	0	22	149	50	50	25	25	171	0	0	0
	270	228	224	31	78	141	84	16	94	72	16	0	0	16	110	31	81	31	0	0	0
	237	185	230	827	582	865	102	674	165	130	29	216	153	407	394	153	191	509	27	0	47
	.	120	239	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	41	8	33
751 - 1000	213	283	219	39	58	39	78	0	17	16	62	71	58	0	0	0		0	0	0	0
	182	186	231	563	26	90	832	461	1011	205	951	44	234	154	0	26	26	0	0	51	0
	122	193	236	25	133	13	38	66	80	173	80	133	0	0	27	0		0	0	0	0
1001 - 1250	324	303	220		42	0	0		0	0	19	0	0	0	0	0		0	0	0	0
	177	195	225		0	0	0	13	13	12	0	0	0	0	0	0	0	0	0	0	0
	236	228	232		0	0	0	0	0	63	0	18	0	0	0	0	0	0	0	0	0
1251 - 1500	286	330	221		0	0	0	0	0	0	23	0	0	0	0	0		0	0	0	0
	180	201	226		0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0
	180	237	233		0	0	23	0	0	0	16	0	0	0	0	0	0	0	0	0	0
Grand Total				1808	1724	1890	2505	2548	1964	1096	1497	715	1870	2254	2719	3290	4313	3398	3344	3399	2222
Abundance >1000m				0	42	0	23	13	13	75	58	18	0	0	0	0	0	0	0	0	0
Percent >1000m				0.0	2.4	0.0	0.9	0.5	0.7	6.8	3.8	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 10. Abundance (000s) per stratum of Witch Flounder (M+F) from surveys in Div. 3K during fall of 1978-1994. Engel 145 data converted to Campelen Units.

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94
101 - 200	.	798	608																	
	.	445	612																	
	.	250	616																	
	1455	1347	618							0	0	0	0	0	0	0	0	0	0	0
	1588	1753	619							0	0	0	0	0	0	0	0	0	0	0
201 - 300	.	342	609																	
	.	573	611																	
	.	251	615																	
	2709	2545	620	963	1975	621	149	166	112	115	80	124	0	0	0	0	0	0	0	0
	2859	2537	621	1999	5148	696	286	169	688	253	393	28	66	0	486	0	0	0	0	0
	668	1105	624	525	230	161	597	459	184	368	161	92	31	0	0	23	0	0	22	0
	447	.	632	553	769	261	646	512	492		225	92	31	31	61	0	6	57		
	1618	1555	634	841	835	1272	668	911	223	890	544	267	283	482	254	0	0	240	13	0
	1274	1274	635	1694	1906	1782	1577	876	584	2432	1127	29	146	456	175	29	0	58	0	0
	1455	1455	636	1716	1716	1887	1168	961	634	2927	976	400	486	767	240	29	0	0	0	0
	1132	1132	637	1609	3292	1972	2362	2380	4765	3530	3315	740	960	195	156	0	0	52	52	0
301 - 400	.	256	610																	
	.	263	614																	
	.	593	617																0	0
	1027	494	623	871	989	871	742	480	871	565	918	283	537	311	47	0	0	0	0	0
	850	888	625	1579	3976	1462	2572	585	2222	2081	1684	78	322	292	88	0	0	0	0	0
	919	1113	626	8849	11251	10644	1593	6928	4867	2865	1618	63	582	126	329	0	0	42	0	0
	1085	1085	628	3603	8358	5249	1841	3433	6567	2708	4229	1692	896	269	634	0	0	149	0	0
	499	495	629	3032	3672	4915	2791	1476	3638	1373	2094	526	732	755	412	103	0	46	182	136
	544	332	630	2769	1347	1122	1310		898	798	917	299	274	249	125	0	0	25	30	0
	2179	2067	633	2964	3897	4526	2098	2955	3047	3627	2848	3559	1853	3485	3687	1063	360	552	600	57
	2059	2059	638	6833	15200	9725	9559	5910	6849	14417	12385	11330	7534	11400	5047	535	612	317	368	13
	1463	1463	639	2013	1157	2650	2013	1429	4025	5459	2792	2381	1236	3321	503	489	67	24	0	226
401 - 500	.	30	613																	
	632	691	622	2652	1942	3347	1608	1130	2260	978	1934	696	1478	203	290	130	58	261	238	0
	1184	1255	627	6026	11618	12948	22938	18544	22232	18690	17311	7753	3882	7199	6271	1954	434	271	3625	367
	1202	1321	631	8515	5677	6338	13261	1819	8863	12666	11433	8019	3417	2563	1819	276	2563	2260	727	2453
	198	69	640	109		232	82	463		572	1716	2465	4017	2274	1648	245	245	91	0	0
	204	216	645	14		0	14	412	295	2020	393		5837	1108	463	2357	196	47	188	119
	.	134	650																25	5
501 - 750	584	230	641	0	0	80	161	60	241	0	1004		2437			17031	1366	0	53	74
	333	325	646	0	0	46	23	46	710	92	122		115			527	366	290	209	462
	.	359	651																49	111
751 - 1000	931	418	642	0		64	0	43		128	128		128			4013	2177	1089	383	173
	409	360	647	0	0	0	0	0			38					534	1594	506	281	264
	.	516	652																899	355
1001 - 1250	1266	733	643	0	0															
	232	228	648	0																
	.	531	653																974	
1251 - 1500	954	474	644	0	0															
	263	212	649	0																
	.	479	654																	
Grand Total				59729	84955	72872	70058	52146	75267	79553	70384	40917	37279	35486	22734	29338	10045	6377	8918	4815
Abundance >1000m				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	974	0
Percent >1000m				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.9	0.0

Table 11. Abundance (000s) per stratum of Witch Flounder (M+F) from surveys in Div. 3K during fall of 1995-2012.

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12
101 - 200	.	798	608		0	0	0		0	0	0	0	0	0	0				0		
	.	445	612		0	0	0		31	0	0	0	0	0	0				0		
	.	250	616		0	0	0		0	0	0	0	0		0						
	1455	1347	618	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1588	1753	619	54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
201 - 300	.	342	609		0	0	0		0	0	0	0	0	0	0			0	27		
	.	573	611		0	0	0		0	0	0	0	0	39	39				0		
	.	251	615		0	0	0		17	0	0	0	0	0	35				0		
	2709	2545	620	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	102	35
	2859	2537	621	0	0	0	187	0	0	0	0	0	0	0	0	0	0	0	0	407	44
	668	1105	624	0	0	30	0	57	30	30	0	0	30	0	0	0	0	0	0	0	61
	447	.	632																		
	1618	1555	634	0	0	0	0	0	0	0	0	0	0	61	0	0	0	36	41	0	122
	1274	1274	635	29	0	70	105	0	80	0	0	0	0	52		0	0	0	0	175	40
	1455	1455	636	29	33	67	0	0	0	71	0	0	0	40	0	0	100	0	33	67	214
	1132	1132	637	0	0	31	62	145		31	0	0	0	31	0	0	147	39	62	36	0
301 - 400	.	256	610		104	18	53		35	55	106	16	0	53	65				18		
	.	263	614		36	18	0		163	36	0	0	0	0	0				0		
	.	593	617	41	0	27	51	0	0	0	0	0	0	0	0	0	0	41	31	0	136
	1027	494	623	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	340
	850	888	625	41	24	0	31	31	0	35	0	0	31	31	31	0	54	0	0	525	41
	919	1113	626	0	0	122	0	575	364	306	0	0	38	54	170	1990	531	995	389	697	429
	1085	1085	628	27	0	30	0	179	269	114	0	30	30	0	94	0	203	37	186	533	473
	499	495	629	306	34	34	68	375	280	45	0	0	34	34	511	61	291	34	0	146	136
	544	332	630	0	46	46	23	114	101	15	20	0	0	23	43	46	188	91	78	23	23
	2179	2067	633	67	221	284	348	63	190	135	72	32	63	284	71	352	101	308	691	384	320
	2059	2059	638	78	150	157	661	602	1020	617	252	328	678	552	560	2490	2098	750	1625	649	1711
	1463	1463	639	115	34	101	168	0	0	0	93	0	0	161	0	335	67	140	134	365	134
401 - 500	.	30	613		2	4	14		220	14	9	6	2	10	10				8		
	632	691	622	28	23	32	95	0	63	158	0	0	63	60	0	32	0	36	0	143	190
	1184	1255	627	792	127	1343	2244	660	2012	773	362	134	475	387	1098	2676	1435	1906	3128	1770	1416
	1202	1321	631	537	178	569	485	84	628	314	212	121	500	682	165	575	554	654	575	195	878
	198	69	640	0	38	19	62	5	47	138	9	5	160	14	157	81	194	166	451	90	133
	204	216	645	0	149	45	13	104	74	110	74	0	0	292	253	223	53	852	481	198	461
	.	134	650	37	28	147	313	179		166	99	166	424	57	571	565	951	339	747	553	470
501 - 750	584	230	641	79	253	190	506	378		791	156	301	1946	232	1171	1130	1086	2832	1548	1070	1894
	333	325	646	22	2209	156	156	156	797	536	786	89	313	291	22	1406	250	536	425	854	291
	.	359	651	247	444	771	444	571		1552	1242	222	4864	2796	4889	4157	3185	6675	6748	1506	1411
751 - 1000	931	418	642	86	29	0	29	173	597	33	58	316	29	1294	86	288	29	230	0	0	0
	409	360	647	50	173	198	272	743	0	867	25	347	672	718	25	0		0	0	25	0
	.	516	652	390	745	1207	1526	177	887	238	177	1278	71	1810	0	674	71	1463	106	0	81
1001 - 1250	1266	733	643	235	0	0	0	34	45	0	0	123	0	34	0	0		0	0	0	0
	232	228	648		0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0
	.	531	653	256	0	0	0	37	0	37	0	146	0	37	0	0	0	0	0	0	0
1251 - 1500	954	474	644	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0
	263	212	649		0	0	0	0	0	0	0	0	0	0	0	0		0	15	0	0
	.	479	654	0	0	0	38	0	0	0	0	0	0	0	0	0		33	0	0	0
Grand Total				3546	5081	5716	7955	5441	7952	7220	3752	3659	10424	10129	10065	17080	11589	18194	17547	10541	11482
Abundance >1000m				491	0	0	38	70	45	37	0	269	0	70	0	0	0	33	15	0	0
Percent >1000m				13.8	0.0	0.0	0.5	1.3	0.6	0.5	0.0	7.4	0.0	0.7	0.0	0.0	0.0	0.2	0.1	0.0	0.0

Table 12. Abundance (000s) per stratum of Witch Flounder (M+F) from surveys in Div. 3L during fall of 1984-1998. (Engel 145 data converted to Campelen Units).

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98
30 - 56	.	268	784													0	0	0
	2071	2071	350	166	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1780	1780	363	92	0	35	0	0	0	306	43	39	0	0	0	0	0	0
57 - 92	1121	1121	371	44	0	0	0	0	0	0	0	0	0	0	0	0	44	0
	2460	2460	372	182	0	0	0	26	0	34	13	0	0	0	34	0	0	0
	1120	1120	384	128	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	.	465	785													0	0	0
	1519	1519	328	52	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1574	1574	341	217	0	0	24	27	0	0	0	0	0	0	0	0	0	43
	585	585	342	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	525	525	343	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2120	2120	348	292	0	0	0	58	0	0	0	0		0	0	0	0	49
	2114	2114	349	291	0	162	0	32	0	166	0	0	0	0	0	0	42	0
	2817	2817	364	271	0	155	0	55	0	32	0	0	0	0	0	0	0	43
	1041	1041	365	143	0	57	48	29	0	0	48	0	0	0	0	0	0	0
93 - 183	1320	1320	370	233	0	0	30	0	0	0	0	0	0	0	0	0	0	0
	2356	2356	385	324	0	122	36	25	0	0	0	0	0	0	0	0	0	0
	1481	1481	390	136	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	.	84	786													90	36	23
	.	613	787													0	0	0
	.	261	788													0	0	18
	.	89	790													6	18	55
	.	72	793													0	0	0
	.	216	794													0	0	0
	.	98	797													7	0	0
	.	72	799													0	0	0
	1494	1582	344	206	46	117	154	0	0	0	0	0	0	0	0	0	0	0
	983	983	347	586	0	34	0	135	108	0	0	0	0	0	0	0	0	0
	1394	1394	366	157	362	431	219	110	164	32	0	8	0	0	0	0	38	0
184 - 274	961	961	369	359	507	661	330	1348	529	463	162	0	0	0	39	0	0	0
	983	983	386	186	568	1082	1792	1974	352	237	270	1262	0	0	0	0	0	0
	821	821	389	169	158	875	226	169	28	75	0	38	0	0	33	0	0	0
	282	282	391	0	39	0	19	0	0	0	91	26	0	0	34	0	19	0
	.	164	795													0	0	0
184 - 366	.	72	789													0	5	5
	.	227	791													42	62	0
	.	100	798													7	7	172
	1432	1432	345	6895	1488	739	4531	2589	3180	2088	0	345	394	0	113	70	223	439
	865	865	346	2380	3498	3927	1487	2427	1606	2340	389	170	76	0	0	35	317	178
	334	334	368	46	46	459	23	69	207	115	69	14	0	0	23	0	23	0
275 - 366	718	718	387	165	444	247	691	2025	1679	4971	198	66	33	77	99	49	44	0
	361	361	388	1440	50		819	149	149	0	116	199	0	14	0	0	0	149
	145	145	392	80	20	20	70	20	0	0	0	0	0	7	0	0	0	0
	.	175	796													0	107	24
	.	81	800														156	178
	186	186	729	217	192	409				64	341	422	51	290	34	375	115	0
367 - 549	216	216	731	877	371					520	248	604	99	200	45		0	74
	468	468	733	338	1609					2221	2983	665	258	136	32	19	0	114
	272	272	735	661	37	2320					349	249	37	14	75	58	75	168
	.	50	792													901	423	279
	170	170	730	105	23						117	12	195	171	108	0	47	19
550 - 731	231	231	732	365	302					32	270	397	48	339	78	280	413	969
	228	228	734	21	267					251	110	16	141	146	44	467	70	380
	175	175	736		373	987				506	1613	217	241	34	75	782	277	1037
	.	227	737												78	468	297	1109
732 - 914	.	223	741													291	460	892
	.	348	745													311	479	168
	.	159	748													186	0	0
	.	221	738												61	532	347	56
915 - 1097	.	206	742													43	14	14
	.	392	746													216	168	0
	.	126	749													61	43	0
	.	254	739													0	0	0
1098 - 1280	.	211	743													0	0	0
	.	724	747													0	0	100
	.	556	750													0	0	0
1281 - 1463	.	264	740													0	0	0
	.	280	744													0	0	0
	.	229	751													0	14	0
Grand Total				17914	10401	12839	10500	11269	8002	14453	7428	4748	1572	1428	1004	5297	4383	6755
Biomass >731m				0	0	0	0	0	0	0	0	0	0	0	139	2108	1821	2337
Percent >731m				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.8	39.8	41.6	34.6

Table 13. Abundance (000s) per stratum of Witch Flounder (M+F) from surveys in Div. 3L during fall of 1999-2012.

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	99	00	01	02	03	04	05	06	07	08	09	10	11	12
30 - 56	.	268	784		74	0	0	0	0	0							
57 - 92	2071	2071	350	0	0	0	0	0	0	41	0	47	47	0	0	0	41
	1780	1780	363	0	0	0	0	0	0	0	0	0	0	0	0	49	0
	1121	1121	371	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2460	2460	372	0	0	0	0	0	0	0	0	0	0	0	0	0	80
	1120	1120	384	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	.	465	785		0	32	0	0	0	37							
93 - 183	1519	1519	328	0	0	0	0	0	0	0	0	0	0	0	42	37	42
	1574	1574	341	0	0	0	0	0	0	49	606	0	99	38	173	130	130
	585	585	342	40	0	0	40	0	0	0	0	0	0	0	0	0	0
	525	525	343	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2120	2120	348	0	73	0	0	0	48	42	42	0	0	0	0	0	48
	2114	2114	349	0	42	0	0	125	42	148	0	42	97	43	42	83	0
	2817	2817	364	43	0	43	0	0	0	0	0	0	0	0	344	166	437
	1041	1041	365	0		0	0	0		48	0	0	0	0	0	0	0
	1320	1320	370	0	0	0	0	0		0	0	0	0	0	0	61	0
	2356	2356	385	0	0	0	0	0	0	0	0	0	0	0	41	0	0
	1481	1481	390	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	.	84	786		40	164	29	64	40	204							
	.	613	787		0	0	0	0	0	0	0						
	.	261	788		18	0	0	0	0	0	0				41		
	.	89	790		0	37	6	0	0	0					0		
	.	72	793		0	0	50	0	7	6					8		
	.	216	794			0	0	0	0	0	0				0		
	.	98	797		0	0	0	0	0	0	0				0		
	.	72	799		0	0	6	0	0	0	0				0		
184 - 274	1494	1582	344	0	64	0	87	131	50	0	44	381	169	54	0	218	0
	983	983	347	0	0	45	0	0	0	0	0	0	45	0	81	90	496
	1394	1394	366	38	0	0	0	77		34	0	38	0	0	31	48	78
	961	961	369	0	0	0	0	0		32	39	0	44	0	0	132	166
	983	983	386	0	0	0	80	0		52	0	0	0	0	0	135	97
	821	821	389	0	301	0	0	0	38	0	151	0	0	0	0	0	113
	282	282	391	0	0	0	0	0	0	0	0	0	0	0	0	0	19
	.	164	795		56	0	0	0	0	0	10				0		
184 - 366	.	72	789		22	5	24	5	20	12	25						
	.	227	791		0	28	10	16	0	45					0		
	.	100	798		135	530	21	0	123	41					9		
275 - 366	1432	1432	345	149	117	79	468	184	105	569	214	197	919	621	1791	396	1525
	865	865	346	282	119	278	326	59	40	357	326	472	1503	282	299	984	982
	334	334	368	20	23	0	0	23		138	20	0	163	0	0	23	152
	718	718	387	44	593	44	93	0		56	176	395	582	0	296	691	646
	361	361	388	0	124	309	44	94	0	174	50	265	132	110	22	206	50
	145	145	392	0	0	16	0	0	0	27	0	0	0	0	30	0	9
	.	175	796		21	638	96	0	0	385	120				84		
	.	81	800		136	953	574	28	166	195				1088	376		
367 - 549	186	186	729	0	34	13	80	26	0	23	102	181	239	61	534	256	102
	216	216	731	56	59	15	40	116	187	94	178	40	238	431	322		89
	468	468	733	129	170	109	433	61	1506	869	526	1470	57	765	916	1642	1343
	272	272	735	50	17	19	17	0		151	133	401	872	1478	871	1291	1954
	.	50	792		915	1829	2887	2298	1331	2368					1032		
550 - 731	170	170	730	21	58	509	222	10	42	0	79	21	10	82	114	79	147
	231	231	732	508	524	565	233	229	249	89	381	222	254	427	681	313	182
	228	228	734	173	125	28	265	25		0	200	92	32	876	471	1689	105
	175	175	736	433	1432	681	3295	631		614	1637	1601	2035	2022	2077	1276	923
732 - 914	.	227	737	390	16	281	1028	390		125	16	0		0	203		
	.	223	741	14	0	31	291	70			15	0		31	0		
	.	348	745	202	24	24	0	48			0	0		0	48		
	.	159	748	50	0	0	0	55			0	0		0	11		
915 - 1097	.	221	738	0	0	14	30	1049			0	0		0	0		
	.	206	742	13	0	0	0	264			0	0		0	0		
	.	392	746	0	27	0	0	13			0	0		0	0		
	.	126	749		0	0	0	0				0		0	0		
1098 - 1280	.	254	739	0	0	0	0	0		0	0	0		0	0		
	.	211	743	0	0	0	0	0			0	0		0	0		
	.	724	747	0	0	0	0	0			0	0		0	0		
	.	556	750	0	0	0	0	0				0		0	0		
1281 - 1463	.	264	740	0	0	0	0	0		0	0	0		0	0		
	.	280	744		0	0	0	0			0	0		0	0		
	.	229	751		0	0	0	0				0		0	0		
Grand Total				2655	5361	7316	10776	6090	3990	7023	5091	5865	7538	8410	10991	9994	9954
Biomass >731m				669	67	349	1350	1890	0	125	31	0	0	31	262	0	0
Percent >731m				25.2	1.2	4.8	12.5	31.0	0.0	1.8	0.6	0.0	0.0	0.4	2.4	0.0	0.0

Table 14. Mean Numbers per Tow of Witch Flounder (M+F) in each stratum from surveys in Div. 2J during fall of 1977-1994.
Engel 145 data converted to Campelen Units.

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94
101 - 200	1427	633	201	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1823	1594	205	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2582	1870	206	0.4	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2246	2264	207	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	.	733	237																	0.0	0.0
	.	778	238																		0.0
201 - 300	440	621	202	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	1608	680	209	0.7	0.2	0.1	0.7	0.0	0.4	0.7	0.1	0.7	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
	774	1035	210	1.3	0.4	1.0	3.8	0.3	1.2	0.0	3.5	0.0	0.0	0.5	0.0	0.5	0.0	0.0	0.0	0.0	0.0
	1725	1583	213	1.6	1.1	0.9	1.4	1.8	2.0	1.3	0.8	0.8	0.8	0.7	0.1	0.2	0.0	0.0	0.0	0.0	0.0
	1171	1341	214	1.7	0.4	0.0	0.6	0.4	0.9	0.6	0.3	0.8	0.5	0.0	0.2	0.3	0.2	0.0	0.0	0.0	0.0
	1270	1302	215	1.3	0.1	0.2	0.0	0.2	0.4	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1428	2196	228	2.9	1.3	2.0	3.8	1.0	4.2	1.5	2.1	0.3	5.5	0.6	1.0	2.0	1.2	0.0	0.4	0.3	0.0
	508	530	234	0.0	0.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
301 - 400	480	487	203	0.0	0.0	0.0	0.0	0.0	1.0	2.3	0.0	0.0	0.5	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
	448	588	208	5.5	1.0	2.3	8.3	2.5	15.0	2.0	2.3	15.7	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
	330	251	211	12.0	6.8	3.3	8.6	2.0	7.5	0.5	3.0	2.3	0.5	1.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0
	384	360	216	0.0	0.0	0.8	0.8	2.0	2.0	2.3	0.0	0.0	1.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0
	441	450	222	5.0	3.0	0.8	2.5	3.5	7.7	1.7	0.7	1.0	0.0	0.0	6.5	1.0	0.0	0.3	0.0	0.0	0.0
	567	536	229	4.0	3.8	2.3	4.3	1.5	2.5	2.8	1.7	0.7	23.7	3.3	4.7	21.3	1.0	0.3	1.7	3.0	0.3
401 - 500	354	288	204	1.5	0.0	1.5		2.0	2.7	0.3	2.5	0.0	2.0	0.5	1.5	2.0	0.5	0.0	0.0	0.0	0.0
	268	241	217	0.0	0.0	0.5	0.0	0.0	0.0	0.0		0.0	2.0	2.5	2.0	2.5	0.5	0.0	0.0	0.0	4.7
	180	158	223	0.5	0.0	0.0	0.0	1.5	0.0	0.0	2.0	0.0	10.0	6.5	5.0	4.5	1.5	2.7	1.3	3.5	6.7
	686	598	227	1.8	2.0	0.5	6.0	2.0	4.2	3.0	1.3	2.3	4.3	7.3	2.3	3.8	46.7	7.0	3.5	4.0	0.0
	420	414	235	23.3	0.0	11.5	9.5	11.5	10.0	23.5	13.3	9.0	6.5	5.0	0.0	3.5	3.0	1.7	0.3	0.0	5.3
	.	133	240																	19.0	7.7
501 - 750	664	557	212	23.5	2.0	9.5	2.5	8.0	16.0	18.7	12.3	17.8	51.0	14.3	7.5	9.8	13.3	4.5	4.0	1.0	3.7
	420	362	218	0.0	0.0		0.0	0.0	0.0	0.0		0.5	0.0	1.0	3.0	2.5	1.5	0.5	0.0	2.0	4.0
	270	228	224	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5	5.5	5.0	0.5	3.0	2.0	0.0	4.7
	237	185	230	0.0	0.0		0.5	0.0	0.0	0.0	0.5	0.0	2.0	0.5	4.5	24.0	52.0	139.5	27.0	18.5	15.0
	.	120	239																	0.0	0.0
751 - 1000	213	283	219					0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	1.5
	182	186	231	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	37.5	16.0	20.0	14.7
	122	193	236	0.0				1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5		3.5	2.0	9.0	7.5	6.0
1001 - 1250	324	303	220		0.0																
	177	195	225	0.0																	
	236	228	232	0.0	0.0																
1251 - 1500	286	330	221																		
	180	201	226		0.0																
	180	237	233																		
All strata				2.2	0.6	1.0	1.4	1.0	2.0	1.5	1.2	1.3	2.9	1.0	0.9	1.7	2.5	2.1	0.8	0.8	0.7

Table 15. Mean Numbers per Tow of Witch Flounder (M+F) in each stratum from surveys in Div. 2J during fall of 1995-2012.

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12
101 - 200	1427	633	201		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1823	1594	205		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2582	1870	206	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
	2246	2264	207	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	.	733	237	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3		0.0
	.	778	238		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
201 - 300	440	621	202	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1608	680	209	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	774	1035	210	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1725	1583	213	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
	1171	1341	214	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
	1270	1302	215	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1428	2196	228	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.0	1.1	1.2	0.5
	508	530	234		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
301 - 400	480	487	203	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	448	588	208	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.5
	330	251	211	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	6.8
	384	360	216	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.0	0.5	3.6
	441	450	222	0.0	0.9	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.6	0.5	1.0	0.5
	567	536	229	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.0	0.5	0.5	2.0	1.5	2.5	0.0	4.0	0.7	2.5	5.5
401 - 500	354	288	204	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	1.0
	268	241	217	0.0	1.0	2.0	0.9	0.0	0.0	0.0	0.0	0.6	2.0	1.5	0.5	0.0	0.0	0.5	0.0	2.0	0.0
	180	158	223	0.0	3.4	2.0	0.9	0.0		2.0	0.6	1.0	0.0	1.6	2.5	2.5	1.9	0.5	0.6	0.0	0.0
	686	598	227	0.0	0.0	2.5	4.0	6.5	0.0	2.5	0.6	0.0	1.6	2.0	4.0	4.0	2.7	3.0	5.0	1.5	3.0
	420	414	235	0.0	0.9	0.5	1.5	0.0	0.0	0.0	1.1	0.0	6.0	2.0	1.0	1.5	5.3	0.5	16.5	28.9	8.0
	.	133	240	0.0	8.0	3.0	2.5	7.5	2.0	4.2	0.0	1.0	2.5	4.5	6.5	5.8	2.7	17.1	6.3	1.5	2.5
501 - 750	664	557	212	4.0	2.8	3.5	9.0	7.0	6.0	0.9	1.5	1.5	7.5	13.0	18.2	29.6	43.3	22.5	14.6	2.0	2.0
	420	362	218	0.3	4.0	1.5	1.0	0.9	1.0	0.0	0.0	0.4	3.0	1.0	1.0	0.5	0.5	3.4	0.0	0.0	0.0
	270	228	224	1.0	2.5	4.5	2.7	0.5	3.0	2.3	0.5	0.0	0.0	0.5	3.5	1.0	2.6	1.0	0.0	0.0	0.0
	237	185	230	32.5	22.9	34.0	4.0	26.5	6.5	5.1	1.1	8.5	6.0	16.0	15.5	6.0	7.5	20.0	1.1	0.0	1.8
	.	120	239	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	2.5	0.5	2.0
751 - 1000	213	283	219	1.0	1.5	1.0	2.0	0.0	0.4	0.4	1.6	1.8	1.5	0.0	0.0	0.0		0.0	0.0	0.0	0.0
	182	186	231	22.0	1.0	3.5	32.5	18.0	39.5	8.0	37.2	1.7	9.1	6.0	0.0	1.0	1.0	0.0	0.0	2.0	0.0
	122	193	236	0.9	5.0	0.5	1.4	2.5	3.0	6.5	3.0	5.0	0.0	0.0	1.0	0.0		0.0	0.0	0.0	0.0
1001 - 1250	324	303	220		1.0	0.0	0.0		0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
	177	195	225		0.0	0.0	0.0	0.5	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	236	228	232		0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1251 - 1500	286	330	221		0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
	180	201	226		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
	180	237	233		0.0	0.0	0.7	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All strata				0.6	0.5	0.5	0.7	0.7	0.6	0.3	0.4	0.2	0.5	0.6	0.8	0.9	1.3	1.0	1.0	0.9	0.6

Table 16. Mean Numbers per Tow of Witch Flounder (M+F) in each stratum from surveys in Div. 3K during fall of 1978-1994.
Engel 145 data converted to Campelen Units.

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94
101 - 200	.	798	608																	
	.	445	612																	
	.	250	616																	
	1455	1347	618							0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1588	1753	619							0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
201 - 300	.	342	609																	
	.	573	611																	
	.	251	615																	
	2709	2545	620	2.6	5.3	1.7	0.4	0.4	0.3	0.3	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2859	2537	621	5.1	13.1	1.8	0.7	0.4	1.8	0.6	1.0	0.1	0.2	0.0	1.2	0.0	0.0	0.0	0.0	0.0
	668	1105	624	5.7	2.5	1.8	6.5	5.0	2.0	4.0	1.8	1.0	0.3	0.0	0.0	0.3	0.0	0.0	0.1	0.0
	447	.	632	9.0	12.5	4.3	10.5	8.3	8.0		3.7	1.5	0.5	0.5	1.0	0.0	0.1	0.9		
	1618	1555	634	3.8	3.8	5.7	3.0	4.1	1.0	4.0	2.4	1.2	1.3	2.2	1.1	0.0	0.0	1.1	0.1	0.0
	1274	1274	635	9.7	10.9	10.2	9.0	5.0	3.3	13.9	6.4	0.2	0.8	2.6	1.0	0.2	0.0	0.3	0.0	0.0
	1455	1455	636	8.6	8.6	9.4	5.8	4.8	3.2	14.6	4.9	2.0	2.4	3.8	1.2	0.1	0.0	0.0	0.0	0.0
	1132	1132	637	10.3	21.1	12.7	15.2	15.3	30.6	22.7	21.3	4.8	6.2	1.3	1.0	0.0	0.0	0.3	0.3	0.0
301 - 400	.	256	610																	
	.	263	614																	
	.	593	617																0.0	0.0
	1027	494	623	6.2	7.0	6.2	5.3	3.4	6.2	4.0	6.5	2.0	3.8	2.2	0.3	0.0	0.0	0.0	0.0	0.0
	850	888	625	13.5	34.0	12.5	22.0	5.0	19.0	17.8	14.4	0.7	2.8	2.5	0.8	0.0	0.0	0.0	0.0	0.0
	919	1113	626	70.0	89.0	84.2	12.6	54.8	38.5	22.7	12.8	0.5	4.6	1.0	2.6	0.0	0.0	0.3	0.0	0.0
	1085	1085	628	24.1	56.0	35.2	12.3	23.0	44.0	18.1	28.3	11.3	6.0	1.8	4.3	0.0	0.0	1.0	0.0	0.0
	499	495	629	44.2	53.5	71.6	40.7	21.5	53.0	20.0	30.5	7.7	10.7	11.0	6.0	1.5	0.0	0.7	2.7	2.0
	544	332	630	37.0	18.0	15.0	17.5		12.0	10.7	12.3	4.0	3.7	3.3	1.7	0.0	0.0	0.3	0.7	0.0
	2179	2067	633	9.9	13.0	15.1	7.0	9.9	10.2	12.1	9.5	11.9	6.2	11.6	12.3	3.5	1.2	1.8	2.1	0.2
	2059	2059	638	24.1	53.7	34.3	33.8	20.9	24.2	50.9	43.7	40.0	26.6	40.3	17.8	1.9	2.2	1.1	1.3	0.0
	1463	1463	639	10.0	5.8	13.2	10.0	7.1	20.0	27.1	13.9	11.8	6.1	16.5	2.5	2.4	0.3	0.1	0.0	1.1
401 - 500	.	30	613																	
	632	691	622	30.5	22.3	38.5	18.5	13.0	26.0	11.3	22.3	8.0	17.0	2.3	3.3	1.5	0.7	3.0	2.5	0.0
	1184	1255	627	37.0	71.3	79.5	140.8	113.9	136.5	114.8	106.3	47.6	23.8	44.2	38.5	12.0	2.7	1.7	21.0	2.1
	1202	1321	631	51.5	34.3	38.3	80.2	11.0	53.6	76.6	69.1	48.5	20.7	15.5	11.0	1.7	15.5	13.7	4.0	13.5
	198	69	640	4.0		8.5	3.0	17.0		21.0	63.0	90.5	147.5	83.5	60.5	9.0	9.0	3.3	0.0	0.0
	204	216	645	0.5		0.0	0.5	14.7	10.5	72.0	14.0		208.0	39.5	16.5	84.0	7.0	1.7	6.3	4.0
	.	134	650																1.3	0.3
501 - 750	584	230	641	0.0	0.0	1.0	2.0	0.8	3.0	0.0	12.5		30.3			212.0	17.0	0.0	1.7	2.3
	333	325	646	0.0	0.0	1.0	0.5	1.0	15.5	2.0	2.7		2.5			11.5	8.0	6.3	4.7	10.3
	.	359	651																1.0	2.3
751 - 1000	931	418	642	0.0		0.5	0.0	0.3		1.0	1.0		1.0			31.3	17.0	8.5	6.7	3.0
	409	360	647	0.0	0.0	0.0	0.0	0.0			0.7					9.5	28.3	9.0	5.7	5.3
	.	516	652																12.7	5.0
1001 - 1250	1266	733	643	0.0	0.0															
	232	228	648	0.0																
	.	531	653																13.3	
1251 - 1500	954	474	644	0.0	0.0															
	263	212	649	0.0																
	.	479	654																	
All strata				13.9	21.0	18.6	17.9	13.6	20.3	18.9	16.2	10.2	8.7	8.8	5.7	6.8	2.3	1.5	2.0	1.1

Table 17. Mean Numbers per Tow of Witch Flounder (M+F) in each stratum from surveys in Div. 3K during fall of 1995-2012.

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12
101 - 200	.	798	608		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0		
	.	445	612		0.0	0.0	0.0		0.5	0.0	0.0	0.0	0.0	0.0	0.0				0.0		
	.	250	616		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0						
	1455	1347	618	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1588	1753	619	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
201 - 300	.	342	609		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.6		
	.	573	611		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.5	0.5				0.0		
	.	251	615		0.0	0.0	0.0		0.5	0.0	0.0	0.0	0.0	0.0	1.0				0.0		
	2709	2545	620	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1
	2859	2537	621	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.1
	668	1105	624	0.0	0.0	0.2	0.0	0.4	0.2	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
	447	.	632																		
	1618	1555	634	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.2	0.2	0.0	0.6
	1274	1274	635	0.2	0.0	0.4	0.6	0.0	0.5	0.0	0.0	0.0	0.0	0.3		0.0	0.0	0.0	0.0	1.0	0.2
	1455	1455	636	0.1	0.2	0.3	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.2	0.0	0.0	0.5	0.0	0.2	0.3	1.1
	1132	1132	637	0.0	0.0	0.2	0.4	0.9		0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.9	0.3	0.4	0.2	0.0
301 - 400	.	256	610		2.9	0.5	1.5		1.0	1.6	3.0	0.4	0.0	1.5	1.8				0.5		
	.	263	614		1.0	0.5	0.0		4.5	1.0	0.0	0.0	0.0	0.0	0.0				0.0		
	.	593	617	0.5	0.0	0.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.0	1.7
	1027	494	623	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	5.0
	850	888	625	0.3	0.2	0.0	0.3	0.3	0.0	0.3	0.0	0.0	0.3	0.3	0.3	0.0	0.4	0.0	0.0	4.3	0.3
	919	1113	626	0.0	0.0	0.8	0.0	3.8	2.4	2.0	0.0	0.0	0.3	0.4	1.1	13.0	3.5	6.5	2.5	4.6	2.8
	1085	1085	628	0.2	0.0	0.2	0.0	1.2	1.8	0.8	0.0	0.2	0.2	0.0	0.6	0.0	1.4	0.3	1.2	3.6	3.2
	499	495	629	4.5	0.5	0.5	1.0	5.5	4.1	0.7	0.0	0.0	0.5	0.5	7.5	0.9	4.3	0.5	0.0	2.1	2.0
	544	332	630	0.0	1.0	1.0	0.5	2.5	2.2	0.3	0.4	0.0	0.0	0.5	0.9	1.0	4.1	2.0	1.7	0.5	0.5
	2179	2067	633	0.2	0.8	1.0	1.2	0.2	0.7	0.5	0.3	0.1	0.2	1.0	0.3	1.2	0.4	1.1	2.4	1.3	1.1
	2059	2059	638	0.3	0.5	0.6	2.3	2.1	3.6	2.2	0.9	1.2	2.4	2.0	2.0	8.8	7.4	2.6	5.7	2.3	6.0
	1463	1463	639	0.6	0.2	0.5	0.8	0.0	0.0	0.0	0.5	0.0	0.0	0.8	0.0	1.7	0.3	0.7	0.7	1.8	0.7
401 - 500	.	30	613		0.6	1.0	3.5		53.2	3.4	2.3	1.4	0.6	2.4	2.4				2.0		
	632	691	622	0.3	0.2	0.3	1.0	0.0	0.7	1.7	0.0	0.0	0.7	0.6	0.0	0.3	0.0	0.4	0.0	1.5	2.0
	1184	1255	627	4.6	0.7	7.8	13.0	3.8	11.7	4.5	2.1	0.8	2.8	2.2	6.4	15.5	8.3	11.0	18.1	10.3	8.2
	1202	1321	631	3.0	1.0	3.1	2.7	0.5	3.5	1.7	1.2	0.7	2.8	3.8	0.9	3.2	3.0	3.6	3.2	1.1	4.8
	198	69	640	0.0	4.1	2.0	6.5	0.5	5.0	14.5	1.0	0.5	16.9	1.5	16.5	8.5	20.4	17.5	47.5	9.5	14.0
	204	216	645	0.0	5.0	1.5	0.4	3.5	2.5	3.7	2.5	0.0	0.0	9.8	8.5	7.5	1.8	28.7	16.2	6.7	15.5
	.	134	650	2.0	1.5	8.0	17.0	9.7		9.0	5.4	9.0	23.0	3.1	31.0	30.7	51.6	18.4	40.5	30.0	25.5
501 - 750	584	230	641	2.5	8.0	6.0	16.0	11.9		25.0	4.9	9.5	61.5	7.3	37.0	35.7	34.3	89.5	48.9	33.8	59.9
	333	325	646	0.5	49.4	3.5	3.5	3.5	17.8	12.0	17.6	2.0	7.0	6.5	0.5	31.4	5.6	12.0	9.5	19.1	6.5
	.	359	651	5.0	9.0	15.6	9.0	11.6		31.4	25.1	4.5	98.5	56.6	99.0	84.2	64.5	135.2	136.6	30.5	28.6
751 - 1000	931	418	642	1.5	0.5	0.0	0.5	3.0	10.4	0.6	1.0	5.5	0.5	22.5	1.5	5.0	0.5	4.0	0.0	0.0	0.0
	409	360	647	1.0	3.5	4.0	5.5	15.0	0.0	17.5	0.5	7.0	13.6	14.5	0.5	0.0		0.0	0.0	0.5	0.0
	.	516	652	5.5	10.5	17.0	21.5	2.5	12.5	3.4	2.5	18.0	1.0	25.5	0.0	9.5	1.0	20.6	1.5	0.0	1.1
1001 - 1250	1266	733	643	2.3	0.0	0.0	0.0	0.3	0.4	0.0	0.0	1.2	0.0	0.3	0.0	0.0		0.0	0.0	0.0	0.0
	232	228	648		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
	.	531	653	3.5	0.0	0.0	0.0	0.5	0.0	0.5	0.0	2.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1251 - 1500	954	474	644	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
	263	212	649		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.5	0.0	0.0
	.	479	654	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.5	0.0	0.0	0.0
All strata				0.8	1.0	1.1	1.6	1.2	1.6	1.4	0.7	0.7	2.0	2.0	2.0	3.7	2.7	3.9	3.5	2.3	2.5

Table 18. Mean Numbers per Tow of Witch Flounder (M+F) in each stratum from surveys in Div. 3L during fall of 1984-1998. (Engel 145 data converted to Campelen Units).

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98
30 - 56	.	268	784													0.0	0.0	0.0
57 - 92	2071	2071	350	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1780	1780	363	0.4	0.0	0.1	0.0	0.0	0.0	1.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	1121	1121	371	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
	2460	2460	372	0.5	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
	1120	1120	384	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	.	465	785													0.0	0.0	0.0
93 - 183	1519	1519	328	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1574	1574	341	1.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
	585	585	342	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	525	525	343	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2120	2120	348	1.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.2
	2114	2114	349	1.0	0.0	0.6	0.0	0.1	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
	2817	2817	364	0.7	0.0	0.4	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	1041	1041	365	1.0	0.0	0.4	0.3	0.2	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1320	1320	370	1.3	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2356	2356	385	1.0	0.0	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1481	1481	390	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	.	84	786													7.8	3.1	2.0
	.	613	787													0.0	0.0	0.0
	.	261	788													0.0	0.0	0.5
	.	89	790													0.5	1.5	4.5
	.	72	793													0.0	0.0	0.0
	.	216	794													0.0	0.0	0.0
	.	98	797													0.5	0.0	0.0
	.	72	799													0.0	0.0	0.0
184 - 274	1494	1582	344	1.0	0.2	0.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	983	983	347	4.3	0.0	0.3	0.0	1.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1394	1394	366	0.8	1.9	2.3	1.1	0.6	0.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
	961	961	369	2.7	3.8	5.0	2.5	10.2	4.0	3.5	1.2	0.0	0.0	0.0	0.3	0.0	0.0	0.0
	983	983	386	1.4	4.2	8.0	13.3	14.6	2.6	1.8	2.0	9.3	0.0	0.0	0.0	0.0	0.0	0.0
	821	821	389	1.5	1.4	7.8	2.0	1.5	0.3	0.7	0.0	0.3	0.0	0.0	0.3	0.0	0.0	0.0
	282	282	391	0.0	1.0	0.0	0.5	0.0	0.0	0.0	2.3	0.7	0.0	0.0	0.9	0.0	0.5	0.0
	.	164	795													0.0	0.0	0.0
184 - 366	.	72	789													0.0	0.5	0.5
	.	227	791													1.0	2.0	0.0
	.	100	798													0.5	0.5	12.5
275 - 366	1432	1432	345	35.0	7.6	3.8	23.0	13.1	16.1	10.6	0.0	1.8	2.0	0.0	0.6	0.4	1.1	2.2
	865	865	346	20.0	29.4	33.0	12.5	20.4	13.5	19.7	3.3	1.4	0.6	0.0	0.0	0.3	2.7	1.5
	334	334	368	1.0	1.0	10.0	0.5	1.5	4.5	2.5	1.5	0.3	0.0	0.0	0.5	0.0	0.5	0.0
	718	718	387	1.7	4.5	2.5	7.0	20.5	17.0	50.3	2.0	0.7	0.3	0.8	1.0	0.5	0.4	0.0
	361	361	388	29.0	1.0		16.5	3.0	3.0	0.0	2.3	4.0	0.0	0.3	0.0	0.0	0.0	3.0
	145	145	392	4.0	1.0	1.0	3.5	1.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
	.	175	796													0.0	4.4	1.0
	.	81	800														14.0	16.0
367 - 549	186	186	729	8.5	7.5	16.0				2.5	13.3	16.5	2.0	11.3	1.3	14.7	4.5	0.0
	216	216	731	29.5	12.5					17.5	8.3	20.3	3.3	6.7	1.5		0.0	2.5
	468	468	733	5.3	25.0					34.5	46.3	10.3	4.0	2.1	0.5	0.3	0.0	1.8
	272	272	735	17.7	1.0	62.0					9.3	6.7	1.0	0.4	2.0	1.5	2.0	4.5
	.	50	792													131.0	61.5	40.5
550 - 731	170	170	730	4.5	1.0						5.0	0.5	8.3	7.3	4.6	0.0	2.0	0.8
	231	231	732	11.5	9.5					1.0	8.5	12.5	1.5	10.7	2.4	8.8	13.0	30.5
	228	228	734	0.7	8.5					8.0	3.5	0.5	4.5	4.7	1.4	14.9	2.2	12.1
	175	175	736		15.5	41.0				21.0	67.0	9.0	10.0	1.4	3.1	32.5	11.5	43.1
732 - 914	.	227	737												2.5	15.0	9.5	35.5
	.	223	741													9.5	15.0	29.1
	.	348	745													6.5	10.0	3.5
	.	159	748													8.5	0.0	0.0
915 - 1097	.	221	738												2.0	17.5	11.4	1.8
	.	206	742													1.5	0.5	0.5
	.	392	746													4.0	3.1	0.0
	.	126	749													3.5	2.5	0.0
1098 - 1280	.	254	739													0.0	0.0	0.0
	.	211	743													0.0	0.0	0.0
	.	724	747													0.0	0.0	1.0
	.	556	750													0.0	0.0	0.0
1281 - 1463	.	264	740													0.0	0.0	0.0
	.	280	744													0.0	0.0	0.0
	.	229	751													0.0	0.4	0.0
All strata				3.4	2.0	2.5	2.1	2.2	1.6	2.7	1.4	0.9	0.3	0.3	0.2	0.8	0.7	1.1

Table 19. Mean Numbers per Tow of Witch Flounder (M+F) in each stratum from surveys in Div. 3L during fall of 1999-2012.

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	99	00	01	02	03	04	05	06	07	08	09	10	11	12
30 - 56	.	268	784		2.0	0.0	0.0	0.0	0.0	0.0							
	2071	2071	350	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.2	0.0	0.0	0.0	0.1
	1780	1780	363	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
57 - 92	1121	1121	371	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2460	2460	372	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
	1120	1120	384	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	.	465	785		0.0	0.5	0.0	0.0	0.0	0.6							
	1519	1519	328	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
	1574	1574	341	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.8	0.0	0.5	0.2	0.8	0.6	0.6
	585	585	342	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	525	525	343	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2120	2120	348	0.0	0.3	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2
	2114	2114	349	0.0	0.1	0.0	0.0	0.4	0.1	0.5	0.0	0.1	0.3	0.1	0.1	0.3	0.0
	2817	2817	364	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.4	1.1
	1041	1041	365	0.0		0.0	0.0	0.0		0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1320	1320	370	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
93 - 183	2356	2356	385	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
	1481	1481	390	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	.	84	786		3.5	14.2	2.5	5.5	3.4	17.6							
	.	613	787		0.0	0.0	0.0	0.0	0.0	0.0	0.0						
	.	261	788		0.5	0.0	0.0	0.0	0.0	0.0	0.0				1.1		
	.	89	790		0.0	3.0	0.5	0.0	0.0	0.0					0.0		
	.	72	793		0.0	0.0	5.0	0.0	0.7	0.6					0.8		
	.	216	794			0.0	0.0	0.0	0.0	0.0	0.0				0.0		
	.	98	797		0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0		
	.	72	799		0.0	0.0	0.6	0.0	0.0	0.0	0.0				0.0		
	1494	1582	344	0.0	0.3	0.0	0.4	0.6	0.2	0.0	0.2	1.8	0.8	0.3	0.0	1.0	0.0
	983	983	347	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.6	0.7	3.7
	1394	1394	366	0.2	0.0	0.0	0.0	0.4		0.2	0.0	0.2	0.0	0.0	0.2	0.3	0.4
184 - 274	961	961	369	0.0	0.0	0.0	0.0	0.0		0.2	0.3	0.0	0.3	0.0	0.0	1.0	1.3
	983	983	386	0.0	0.0	0.0	0.6	0.0		0.4	0.0	0.0	0.0	0.0	0.0	1.0	0.7
	821	821	389	0.0	2.7	0.0	0.0	0.0	0.3	0.0	1.3	0.0	0.0	0.0	0.0	0.0	1.0
	282	282	391	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
	.	164	795		2.5	0.0	0.0	0.0	0.0	0.0	0.4				0.0		
184 - 366	.	72	789		2.2	0.5	2.4	0.5	2.0	1.2	2.5						
	.	227	791		0.0	0.9	0.3	0.5	0.0	1.4					0.0		
	.	100	798		9.8	38.5	1.5	0.0	8.9	3.0					0.7		
	1432	1432	345	0.8	0.6	0.4	2.4	0.9	0.5	2.9	1.1	1.0	4.7	3.2	9.1	2.0	7.7
	865	865	346	2.4	1.0	2.3	2.7	0.5	0.3	3.0	2.7	4.0	12.6	2.4	2.5	8.3	8.3
	334	334	368	0.4	0.5	0.0	0.0	0.5		3.0	0.4	0.0	3.6	0.0	0.0	0.5	3.3
275 - 366	718	718	387	0.4	6.0	0.4	0.9	0.0		0.6	1.8	4.0	5.9	0.0	3.0	7.0	6.5
	361	361	388	0.0	2.5	6.2	0.9	1.9	0.0	3.5	1.0	5.3	2.7	2.2	0.4	4.1	1.0
	145	145	392	0.0	0.0	0.8	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	1.5	0.0	0.4
	.	175	796		0.9	26.5	4.0	0.0	0.0	16.0	5.0				3.5		
	.	81	800		12.2	85.5	51.6	2.5	14.9	17.5				97.7	33.7		
	186	186	729	0.0	1.3	0.5	3.1	1.0	0.0	0.9	4.0	7.1	9.3	2.4	20.9	10.0	4.0
367 - 549	216	216	731	1.9	2.0	0.5	1.3	3.9	6.3	3.2	6.0	1.3	8.0	14.5	10.8		3.0
	468	468	733	2.0	2.6	1.7	6.7	0.9	23.4	13.5	8.2	22.8	0.9	11.9	14.2	25.5	20.9
	272	272	735	1.3	0.4	0.5	0.4	0.0		4.0	3.6	10.7	23.3	39.5	23.3	34.5	52.2
	.	50	792		133.1	265.9	419.7	334.1	193.5	344.3					150.0		
	170	170	730	0.9	2.5	21.8	9.5	0.4	1.8	0.0	3.4	0.9	0.4	3.5	4.9	3.4	6.3
550 - 731	231	231	732	16.0	16.5	17.8	7.3	7.2	7.8	2.8	12.0	7.0	8.0	13.4	21.4	9.9	5.7
	228	228	734	5.5	4.0	0.9	8.4	0.8		0.0	6.4	2.9	1.0	27.9	15.0	53.9	3.4
	175	175	736	18.0	59.5	28.3	136.9	26.2		25.5	68.0	66.5	84.5	84.0	86.3	53.0	38.3
	.	227	737	12.5	0.5	9.0	32.9	12.5		4.0	0.5	0.0		0.0	6.5		
732 - 914	.	223	741	0.4	0.0	1.0	9.5	2.3			0.5	0.0		1.0	0.0		
	.	348	745	4.2	0.5	0.5	0.0	1.0			0.0	0.0		0.0	1.0		
	.	159	748	2.3	0.0	0.0	0.0	2.5			0.0	0.0		0.0	0.5		
	.	221	738	0.0	0.0	0.4	1.0	34.5			0.0	0.0		0.0	0.0		
915 - 1097	.	206	742	0.4	0.0	0.0	0.0	9.3			0.0	0.0		0.0	0.0		
	.	392	746	0.0	0.5	0.0	0.0	0.3			0.0	0.0		0.0	0.0		
	.	126	749		0.0	0.0	0.0	0.0				0.0		0.0	0.0		
	.	254	739	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0		
1098 - 1280	.	211	743	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0		
	.	724	747	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0		
	.	556	750	0.0	0.0	0.0	0.0	0.0				0.0		0.0	0.0		
1281 - 1463	.	264	740	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0		
	.	280	744		0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0		
	.	229	751		0.0	0.0	0.0	0.0				0.0		0.0	0.0		
All strata				0.5	0.9	1.1	1.7	1.0	0.8	1.2	0.8	1.0	1.4	1.4	1.8	1.9	1.9

Table 20. Mean Weight (kg) per Tow of Witch Flounder (M+F) in each stratum from surveys in Div. 2J during fall of 1977-1994.
Engel 145 data converted to Campelen Units.

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94
101 - 200	1427	633	201	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1823	1594	205	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2582	1870	206	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2246	2264	207	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	.	733	237																	0.0	0.0
	.	778	238																		0.0
201 - 300	440	621	202	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	1608	680	209	0.5	0.1	0.2	0.6	0.0	0.4	0.6	0.1	0.7	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
	774	1035	210	1.2	0.4	1.1	3.2	0.2	1.2	0.0	2.7	0.0	0.0	0.4	0.0	0.2	0.0	0.0	0.0	0.0	0.0
	1725	1583	213	1.1	1.1	0.7	1.3	1.2	1.6	0.8	0.5	0.4	0.5	0.4	0.1	0.2	0.0	0.0	0.0	0.0	0.0
	1171	1341	214	1.2	0.3	0.0	0.4	0.4	0.8	0.5	0.1	0.7	0.4	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	1270	1302	215	1.1	0.2	0.1	0.0	0.5	0.4	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1428	2196	228	2.6	0.7	1.5	2.8	0.9	3.4	1.3	2.4	0.4	3.7	0.5	0.6	0.8	0.4	0.0	0.2	0.1	0.0
	508	530	234	0.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
301 - 400	480	487	203	0.0	0.0	0.0	0.0	0.0	0.8	1.7	0.0	0.0	0.3	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
	448	588	208	2.9	0.6	1.2	6.0	1.5	10.4	1.3	1.5	9.9	1.5	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
	330	251	211	9.8	4.4	2.2	6.4	1.5	5.3	0.3	2.2	1.6	0.6	0.8	0.0	0.7	0.0	0.0	0.0	0.0	0.0
	384	360	216	0.0	0.0	0.5	0.8	1.1	1.2	1.6	0.0	0.0	1.0	0.3	0.2	0.3	0.0	0.0	0.0	0.0	0.0
	441	450	222	3.3	1.6	0.5	1.7	2.6	4.7	1.1	0.4	0.8	0.0	0.0	2.8	0.8	0.0	0.2	0.0	0.0	0.0
	567	536	229	2.4	2.3	1.5	2.8	1.6	1.8	2.0	1.3	0.7	11.0	0.9	1.9	7.6	0.4	0.4	0.4	0.2	0.2
401 - 500	354	288	204	1.2	0.0	0.8		1.7	2.6	0.3	1.9	0.0	1.5	0.3	0.9	1.2	0.3	0.0	0.0	0.0	0.0
	268	241	217	0.0	0.0	0.4	0.0	0.0	0.0	0.0		0.0	1.5	1.7	1.2	2.0	0.2	0.0	0.0	0.0	0.4
	180	158	223	0.5	0.0	0.0	0.0	1.5	0.0	0.0	1.3	0.0	5.6	4.7	2.4	2.6	0.7	0.7	0.3	0.4	0.6
	686	598	227	1.7	1.3	0.5	5.1	1.9	3.8	2.2	0.9	1.6	3.5	4.4	2.2	2.4	19.5	2.2	1.3	1.6	0.0
	420	414	235	14.1	0.0	7.9	7.4	8.7	6.4	15.7	9.0	6.9	2.1	2.9	0.0	1.1	2.6	0.6	0.4	0.0	0.7
	.	133	240																	2.0	1.0
501 - 750	664	557	212	17.1	1.2	7.0	2.1	6.9	12.2	15.2	9.0	13.7	34.4	9.1	4.3	6.4	7.0	1.2	3.0	0.6	0.7
	420	362	218	0.0	0.0		0.0	0.0	0.0	0.0		0.3	0.0	0.8	2.0	1.4	1.0	0.2	0.0	0.2	0.4
	270	228	224	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.3	3.2	3.4	0.4	1.3	0.9	0.0	0.7
	237	185	230	0.0	0.0		0.5	0.0	0.0	0.0	0.5	0.0	1.7	0.5	3.1	12.1	23.7	52.5	10.6	3.3	4.1
	.	120	239																	0.0	0.0
751 - 1000	213	283	219					0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2
	182	186	231	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	18.2	7.0	7.7	4.6
	122	193	236	0.0				0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.5		1.4	1.5	3.1	1.9	1.4
1001 - 1250	324	303	220		0.0																
	177	195	225	0.0																	
	236	228	232	0.0	0.0																
1251 - 1500	286	330	221																		
	180	201	226		0.0																
	180	237	233																		
All strata				1.6	0.4	0.7	1.1	0.8	1.5	1.1	0.9	0.9	1.8	0.6	0.5	0.8	1.1	0.8	0.3	0.2	0.1

Table 21. Mean Weight (kg) per Tow of Witch Flounder (M+F) in each stratum from surveys in Div. 2J during fall of 1995-2012.

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12
101 - 200	1427	633	201		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1823	1594	205		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2582	1870	206	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
	2246	2264	207	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	.	733	237	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3		0.0
	.	778	238		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
201 - 300	440	621	202	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1608	680	209	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	774	1035	210	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1725	1583	213	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
	1171	1341	214	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
	1270	1302	215	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1428	2196	228	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.0	1.1	1.2	0.5
	508	530	234		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
301 - 400	480	487	203	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	448	588	208	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.5
	330	251	211	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	6.8
	384	360	216	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.0	0.5	3.6
	441	450	222	0.0	0.9	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.6	0.5	1.0	0.5
	567	536	229	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.0	0.5	0.5	2.0	1.5	2.5	0.0	4.0	0.7	2.5	5.5
401 - 500	354	288	204	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	1.0
	268	241	217	0.0	1.0	2.0	0.9	0.0	0.0	0.0	0.0	0.6	2.0	1.5	0.5	0.0	0.0	0.5	0.0	2.0	0.0
	180	158	223	0.0	3.4	2.0	0.9	0.0		2.0	0.6	1.0	0.0	1.6	2.5	2.5	1.9	0.5	0.6	0.0	0.0
	686	598	227	0.0	0.0	2.5	4.0	6.5	0.0	2.5	0.6	0.0	1.6	2.0	4.0	4.0	2.7	3.0	5.0	1.5	3.0
	420	414	235	0.0	0.9	0.5	1.5	0.0	0.0	0.0	1.1	0.0	6.0	2.0	1.0	1.5	5.3	0.5	16.5	28.9	8.0
	.	133	240	0.0	8.0	3.0	2.5	7.5	2.0	4.2	0.0	1.0	2.5	4.5	6.5	5.8	2.7	17.1	6.3	1.5	2.5
501 - 750	664	557	212	4.0	2.8	3.5	9.0	7.0	6.0	0.9	1.5	1.5	7.5	13.0	18.2	29.6	43.3	22.5	14.6	2.0	2.0
	420	362	218	0.3	4.0	1.5	1.0	0.9	1.0	0.0	0.0	0.4	3.0	1.0	1.0	0.5	0.5	3.4	0.0	0.0	0.0
	270	228	224	1.0	2.5	4.5	2.7	0.5	3.0	2.3	0.5	0.0	0.0	0.5	3.5	1.0	2.6	1.0	0.0	0.0	0.0
	237	185	230	32.5	22.9	34.0	4.0	26.5	6.5	5.1	1.1	8.5	6.0	16.0	15.5	6.0	7.5	20.0	1.1	0.0	1.8
	.	120	239	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	2.5	0.5	2.0
751 - 1000	213	283	219	1.0	1.5	1.0	2.0	0.0	0.4	0.4	1.6	1.8	1.5	0.0	0.0	0.0		0.0	0.0	0.0	0.0
	182	186	231	22.0	1.0	3.5	32.5	18.0	39.5	8.0	37.2	1.7	9.1	6.0	0.0	1.0	1.0	0.0	0.0	2.0	0.0
	122	193	236	0.9	5.0	0.5	1.4	2.5	3.0	6.5	3.0	5.0	0.0	0.0	1.0	0.0		0.0	0.0	0.0	0.0
1001 - 1250	324	303	220		1.0	0.0	0.0		0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
	177	195	225		0.0	0.0	0.0	0.5	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	236	228	232		0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1251 - 1500	286	330	221		0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
	180	201	226		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
	180	237	233		0.0	0.0	0.7	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All strata				0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.6	0.4	0.4	0.3	0.3

Table 22. Mean Weight (kg) per Tow of Witch Flounder (M+F) in each stratum from surveys in Div. 3K during fall of 1978-1994. Engel 145 data converted to Campelen Units.

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94
101 - 200	.	798	608																	
	.	445	612																	
	.	250	616																	
	1455	1347	618							0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1588	1753	619							0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
201 - 300	.	342	609																	
	.	573	611																	
	.	251	615																	
	2709	2545	620	1.6	3.8	1.4	0.4	0.6	0.4	0.3	0.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2859	2537	621	2.7	9.5	1.3	1.1	0.6	2.0	0.8	1.1	0.1	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0
	668	1105	624	3.9	1.6	1.1	4.1	4.9	1.3	4.0	1.0	0.7	0.2	0.0	0.0	0.1	0.0	0.0	0.1	0.0
	447	.	632	6.4	9.6	3.7	8.5	6.6	7.3		3.4	1.5	0.5	0.6	1.3	0.0	0.1	0.1		
	1618	1555	634	3.5	3.5	4.8	2.4	4.4	0.8	3.9	1.7	1.1	0.9	1.7	0.6	0.0	0.0	0.1	0.0	0.0
	1274	1274	635	9.3	10.8	8.2	8.5	4.8	3.1	12.6	4.4	0.1	0.8	1.9	0.9	0.1	0.0	0.2	0.0	0.0
	1455	1455	636	7.4	8.4	9.2	5.8	4.4	3.6	14.5	4.2	1.6	2.6	4.1	1.8	0.3	0.0	0.0	0.0	0.0
	1132	1132	637	7.2	14.4	9.2	12.0	12.2	23.6	17.5	16.0	4.5	5.4	1.4	1.0	0.0	0.0	0.4	0.1	0.0
301 - 400	.	256	610																	
	.	263	614																	
	.	593	617																0.0	0.0
	1027	494	623	3.5	4.5	4.1	3.9	2.9	4.3	2.4	4.6	1.2	1.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0
	850	888	625	7.4	19.1	8.4	13.5	4.2	13.6	12.1	9.4	0.4	1.4	0.9	0.1	0.0	0.0	0.0	0.0	0.0
	919	1113	626	28.4	45.4	47.1	9.1	32.7	27.5	9.9	8.8	0.4	1.4	0.3	0.4	0.0	0.0	0.2	0.0	0.0
	1085	1085	628	16.4	40.7	23.5	9.2	16.3	32.7	13.9	15.6	6.4	3.5	0.3	1.4	0.0	0.0	0.1	0.0	0.0
	499	495	629	25.1	23.6	36.7	25.4	14.0	32.8	14.8	14.5	3.3	7.4	2.9	0.9	1.0	0.0	0.1	0.0	0.1
	544	332	630	14.0	9.8	11.4	13.1		9.7	7.3	4.9	2.2	2.4	2.1	0.4	0.0	0.0	0.2	0.4	0.0
	2179	2067	633	7.3	9.6	12.4	4.7	8.0	8.9	10.3	6.9	5.3	3.7	6.4	4.0	1.2	0.5	0.4	0.3	0.2
	2059	2059	638	11.7	30.8	16.6	20.6	12.1	15.5	30.4	24.8	29.2	19.4	25.8	12.0	1.2	1.2	0.3	0.3	0.0
	1463	1463	639	7.0	5.4	10.3	8.5	5.6	18.1	20.2	10.5	8.7	3.9	13.1	2.7	2.4	0.4	0.1	0.0	0.2
401 - 500	.	30	613																	
	632	691	622	6.9	14.1	22.3	11.6	6.9	10.9	7.4	13.2	3.0	7.5	0.2	0.2	0.4	0.1	0.3	0.1	0.0
	1184	1255	627	17.7	25.4	49.6	71.4	53.0	64.8	48.2	27.9	9.8	8.5	8.2	4.5	1.5	0.0	0.3	0.4	0.1
	1202	1321	631	13.8	13.7	15.3	46.8	6.1	35.6	39.0	27.6	17.7	9.4	3.6	2.2	0.4	2.0	1.9	0.3	1.5
	198	69	640	1.9		6.5	2.3	15.1		16.0	39.4	61.3	83.7	49.5	42.1	6.5	6.8	0.7	0.0	0.0
	204	216	645	0.4		0.0	0.4	12.2	10.0	54.1	8.5		109.7	20.4	9.0	35.3	3.5	0.5	0.5	0.3
	.	134	650																1.1	0.2
501 - 750	584	230	641	0.0	0.0	0.5	1.0	0.9	2.1	0.0	10.1		20.6			137.8	11.7	0.0	0.4	0.2
	333	325	646	0.0	0.0	1.5	0.3	0.5	13.4	2.1	2.4		2.2			6.0	3.8	1.1	0.8	1.8
	.	359	651																0.5	0.5
751 - 1000	931	418	642	0.0		0.6	0.0	0.3		1.0	0.7		0.6			19.5	9.5	6.2	1.4	1.1
	409	360	647	0.0	0.0	0.0	0.0	0.0			0.5					6.9	12.9	3.5	1.4	2.2
	.	516	652																3.7	2.2
1001 - 1250	1266	733	643	0.0	0.0															
	232	228	648	0.0																
	.	531	653																5.9	
1251 - 1500	954	474	644	0.0	0.0															
	263	212	649	0.0																
	.	479	654																	
All strata				7.1	12.3	11.5	11.1	8.4	13.3	11.6	8.2	5.3	5.1	4.5	2.2	3.9	1.0	0.4	0.3	0.2

Table 23. Mean Weight (kg) per Tow of Witch Flounder (M+F) in each stratum from surveys in Div. 3K during fall of 1995-2012.

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12
101 - 200	.	798	608		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0		
	.	445	612		0.0	0.0	0.0		0.5	0.0	0.0	0.0	0.0	0.0	0.0				0.0		
	.	250	616		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0						
	1455	1347	618	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1588	1753	619	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
201 - 300	.	342	609		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.6		
	.	573	611		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.5	0.5				0.0		
	.	251	615		0.0	0.0	0.0		0.5	0.0	0.0	0.0	0.0	0.0	1.0				0.0		
	2709	2545	620	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1
	2859	2537	621	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.1
	668	1105	624	0.0	0.0	0.2	0.0	0.4	0.2	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
	447	.	632																		
	1618	1555	634	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.2	0.2	0.0	0.6
	1274	1274	635	0.2	0.0	0.4	0.6	0.0	0.5	0.0	0.0	0.0	0.0	0.3		0.0	0.0	0.0	0.0	1.0	0.2
	1455	1455	636	0.1	0.2	0.3	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.2	0.0	0.0	0.5	0.0	0.2	0.3	1.1
	1132	1132	637	0.0	0.0	0.2	0.4	0.9		0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.9	0.3	0.4	0.2	0.0
301 - 400	.	256	610		2.9	0.5	1.5		1.0	1.6	3.0	0.4	0.0	1.5	1.8				0.5		
	.	263	614		1.0	0.5	0.0		4.5	1.0	0.0	0.0	0.0	0.0	0.0				0.0		
	.	593	617	0.5	0.0	0.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.0	1.7
	1027	494	623	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	5.0
	850	888	625	0.3	0.2	0.0	0.3	0.3	0.0	0.3	0.0	0.0	0.3	0.3	0.3	0.0	0.4	0.0	0.0	4.3	0.3
	919	1113	626	0.0	0.0	0.8	0.0	3.8	2.4	2.0	0.0	0.0	0.3	0.4	1.1	13.0	3.5	6.5	2.5	4.6	2.8
	1085	1085	628	0.2	0.0	0.2	0.0	1.2	1.8	0.8	0.0	0.2	0.2	0.0	0.6	0.0	1.4	0.3	1.2	3.6	3.2
	499	495	629	4.5	0.5	0.5	1.0	5.5	4.1	0.7	0.0	0.0	0.5	0.5	7.5	0.9	4.3	0.5	0.0	2.1	2.0
	544	332	630	0.0	1.0	1.0	0.5	2.5	2.2	0.3	0.4	0.0	0.0	0.5	0.9	1.0	4.1	2.0	1.7	0.5	0.5
	2179	2067	633	0.2	0.8	1.0	1.2	0.2	0.7	0.5	0.3	0.1	0.2	1.0	0.3	1.2	0.4	1.1	2.4	1.3	1.1
	2059	2059	638	0.3	0.5	0.6	2.3	2.1	3.6	2.2	0.9	1.2	2.4	2.0	2.0	8.8	7.4	2.6	5.7	2.3	6.0
	1463	1463	639	0.6	0.2	0.5	0.8	0.0	0.0	0.0	0.5	0.0	0.0	0.8	0.0	1.7	0.3	0.7	0.7	1.8	0.7
401 - 500	.	30	613		0.6	1.0	3.5		53.2	3.4	2.3	1.4	0.6	2.4	2.4				2.0		
	632	691	622	0.3	0.2	0.3	1.0	0.0	0.7	1.7	0.0	0.0	0.7	0.6	0.0	0.3	0.0	0.4	0.0	1.5	2.0
	1184	1255	627	4.6	0.7	7.8	13.0	3.8	11.7	4.5	2.1	0.8	2.8	2.2	6.4	15.5	8.3	11.0	18.1	10.3	8.2
	1202	1321	631	3.0	1.0	3.1	2.7	0.5	3.5	1.7	1.2	0.7	2.8	3.8	0.9	3.2	3.0	3.6	3.2	1.1	4.8
	198	69	640	0.0	4.1	2.0	6.5	0.5	5.0	14.5	1.0	0.5	16.9	1.5	16.5	8.5	20.4	17.5	47.5	9.5	14.0
	204	216	645	0.0	5.0	1.5	0.4	3.5	2.5	3.7	2.5	0.0	0.0	9.8	8.5	7.5	1.8	28.7	16.2	6.7	15.5
	.	134	650	2.0	1.5	8.0	17.0	9.7		9.0	5.4	9.0	23.0	3.1	31.0	30.7	51.6	18.4	40.5	30.0	25.5
501 - 750	584	230	641	2.5	8.0	6.0	16.0	11.9		25.0	4.9	9.5	61.5	7.3	37.0	35.7	34.3	89.5	48.9	33.8	59.9
	333	325	646	0.5	49.4	3.5	3.5	3.5	17.8	12.0	17.6	2.0	7.0	6.5	0.5	31.4	5.6	12.0	9.5	19.1	6.5
	.	359	651	5.0	9.0	15.6	9.0	11.6		31.4	25.1	4.5	98.5	56.6	99.0	84.2	64.5	135.2	136.6	30.5	28.6
751 - 1000	931	418	642	1.5	0.5	0.0	0.5	3.0	10.4	0.6	1.0	5.5	0.5	22.5	1.5	5.0	0.5	4.0	0.0	0.0	0.0
	409	360	647	1.0	3.5	4.0	5.5	15.0	0.0	17.5	0.5	7.0	13.6	14.5	0.5	0.0		0.0	0.0	0.5	0.0
	.	516	652	5.5	10.5	17.0	21.5	2.5	12.5	3.4	2.5	18.0	1.0	25.5	0.0	9.5	1.0	20.6	1.5	0.0	1.1
1001 - 1250	1266	733	643	2.3	0.0	0.0	0.0	0.3	0.4	0.0	0.0	1.2	0.0	0.3	0.0	0.0		0.0	0.0	0.0	0.0
	232	228	648		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
	.	531	653	3.5	0.0	0.0	0.0	0.5	0.0	0.5	0.0	2.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1251 - 1500	954	474	644	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
	263	212	649		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.5	0.0	0.0
	.	479	654	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.5	0.0	0.0	0.0
All strata				0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.1	0.1	0.5	0.6	0.6	1.0	0.8	1.2	1.1	0.8	0.9

Table 24. Mean Weight (kg) per Tow of Witch Flounder (M+F) in each stratum from surveys in Div. 3L during fall of 1984-1998. (Engel 145 data converted to Campelen Units).

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98
30 - 56	.	268	784													0.0	0.0	0.0
57 - 92	2071	2071	350	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1780	1780	363	0.3	0.0	0.2	0.0	0.0	0.0	1.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	1121	1121	371	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2460	2460	372	0.4	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
	1120	1120	384	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	.	465	785													0.0	0.0	0.0
93 - 183	1519	1519	328	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1574	1574	341	1.1	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	585	585	342	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	525	525	343	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2120	2120	348	1.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	2114	2114	349	1.1	0.0	0.5	0.0	0.1	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2817	2817	364	0.5	0.0	0.4	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1041	1041	365	0.7	0.0	0.5	0.2	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1320	1320	370	1.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2356	2356	385	1.0	0.0	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1481	1481	390	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	.	84	786													0.1	0.0	0.0
	.	613	787													0.0	0.0	0.0
	.	261	788													0.0	0.0	0.0
	.	89	790													0.0	0.0	0.1
	.	72	793													0.0	0.0	0.0
	.	216	794													0.0	0.0	0.0
	.	98	797													0.0	0.0	0.0
	.	72	799													0.0	0.0	0.0
184 - 274	1494	1582	344	0.8	0.2	0.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	983	983	347	3.5	0.0	0.3	0.0	1.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1394	1394	366	1.0	1.9	1.6	0.9	0.6	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	961	961	369	2.8	4.3	5.3	2.4	8.0	3.2	3.6	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	983	983	386	1.2	3.8	8.0	11.2	12.9	3.3	1.6	2.3	6.5	0.0	0.0	0.0	0.0	0.0	0.0
	821	821	389	1.7	1.2	6.7	2.2	1.2	0.2	0.7	0.0	0.2	0.0	0.0	0.3	0.0	0.0	0.0
	282	282	391	0.0	0.8	0.0	0.2	0.0	0.0	0.0	1.8	0.6	0.0	0.0	0.9	0.0	0.7	0.0
	.	164	795													0.0	0.0	0.0
184 - 366	.	72	789													0.0	0.0	0.0
	.	227	791													0.1	0.0	0.0
	.	100	798													0.0	0.1	1.6
275 - 366	1432	1432	345	22.8	6.2	3.1	18.7	10.7	12.0	3.8	0.0	0.3	0.4	0.0	0.0	0.0	0.0	0.2
	865	865	346	12.0	18.8	27.9	10.1	15.3	10.8	15.7	1.7	0.3	0.1	0.0	0.0	0.1	0.0	0.0
	334	334	368	1.0	0.6	8.4	0.5	1.4	3.1	2.3	0.8	0.3	0.0	0.0	0.5	0.0	0.0	0.0
	718	718	387	1.7	4.1	2.8	5.8	18.0	15.7	37.1	1.6	0.5	0.3	0.1	0.6	0.1	0.0	0.0
	361	361	388	24.7	1.0		11.9	1.8	2.5	0.0	2.5	3.5	0.0	0.3	0.0	0.0	0.0	0.3
	145	145	392	2.7	0.6	1.0	2.5	0.6	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
	.	175	796													0.0	0.0	0.1
	.	81	800														0.7	0.2
367 - 549	186	186	729	5.7	5.0	10.9				1.9	10.7	9.6	1.6	5.1	0.1	5.9	0.9	0.0
	216	216	731	16.8	8.3					15.7	6.0	12.0	1.3	2.7	0.6		0.0	0.3
	468	468	733	5.1	18.1					25.1	32.8	9.5	2.8	0.9	0.4	0.2	0.0	0.6
	272	272	735	9.8	0.9	45.8					5.9	5.8	1.1	0.3	0.1	0.5	0.6	0.5
	.	50	792													8.1	5.4	1.7
550 - 731	170	170	730	4.4	0.7						5.5	0.3	6.0	3.8	3.5	0.0	0.9	0.5
	231	231	732	8.9	7.4					0.9	6.5	8.9	1.3	6.1	0.5	4.6	3.8	13.9
	228	228	734	1.0	5.9					5.4	3.2	0.4	3.4	1.6	1.2	4.0	0.5	4.8
	175	175	736		11.2	29.4				14.7	37.9	3.7	2.9	0.8	0.4	10.9	1.7	5.6
732 - 914	.	227	737												0.6	4.2	3.3	14.0
	.	223	741													3.8	5.4	10.2
	.	348	745													3.2	4.4	2.6
	.	159	748													4.0	0.0	0.0
915 - 1097	.	221	738												0.3	10.9	4.2	0.8
	.	206	742													1.1	0.1	0.3
	.	392	746													2.2	2.3	0.0
	.	126	749													1.9	1.7	0.0
1098 - 1280	.	254	739													0.0	0.0	0.0
	.	211	743													0.0	0.0	0.0
	.	724	747													0.0	0.0	1.1
	.	556	750													0.0	0.0	0.0
1281 - 1463	.	264	740													0.0	0.0	0.0
	.	280	744													0.0	0.0	0.0
	.	229	751													0.0	0.0	0.0
All strata				2.5	1.5	2.1	1.7	1.8	1.3	2.0	1.0	0.6	0.2	0.1	0.1	0.3	0.2	0.3

Table 25. Mean Weight (kg) per Tow of Witch Flounder (M+F) in each stratum from surveys in Div. 3L during fall of 1999-2012.

Depth Range (m)	Old Stratum Area	New Stratum Area	Stratum	99	00	01	02	03	04	05	06	07	08	09	10	11	12
30 - 56	.	268	784		0.0	0.0	0.0	0.0	0.0	0.0							
57 - 92	2071	2071	350	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0
	1780	1780	363	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
	1121	1121	371	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2460	2460	372	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	1120	1120	384	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	.	465	785		0.0	0.0	0.0	0.0	0.0	0.0							
93 - 183	1519	1519	328	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	1574	1574	341	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.8	0.0	0.2	0.0	0.4	0.3	0.0
	585	585	342	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	525	525	343	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2120	2120	348	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2114	2114	349	0.0	0.0	0.0	0.0	0.1	0.0	0.4	0.0	0.0	0.3	0.0	0.1	0.1	0.0
	2817	2817	364	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	1041	1041	365	0.0		0.0	0.0	0.0		0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1320	1320	370	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2356	2356	385	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1481	1481	390	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	.	84	786		0.0	0.1	0.0	0.1	0.0	0.1							
	.	613	787		0.0	0.0	0.0	0.0	0.0	0.0	0.0						
	.	261	788		0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0		
	.	89	790		0.0	0.1	0.0	0.0	0.0	0.0					0.0		
	.	72	793		0.0	0.0	0.2	0.0	0.0	0.3					0.0		
	.	216	794			0.0	0.0	0.0	0.0	0.0	0.0				0.0		
	.	98	797		0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0		
	.	72	799		0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0		
184 - 274	1494	1582	344	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0
	983	983	347	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.8
	1394	1394	366	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2
	961	961	369	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.4
	983	983	386	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
	821	821	389	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	282	282	391	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	.	164	795		0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0		
184 - 366	.	72	789		0.0	0.0	0.0	0.0	0.0	0.0	0.0						
	.	227	791		0.0	0.0	0.0	0.1	0.0	0.1					0.0		
	.	100	798		0.2	1.7	0.0	0.0	0.2	0.1					0.0		
275 - 366	1432	1432	345	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	1.3	0.2	0.8	0.4	3.8
	865	865	346	0.2	0.1	0.1	0.0	0.0	0.0	0.6	0.8	0.6	5.1	0.3	0.1	3.7	4.4
	334	334	368	0.0	0.1	0.0	0.0	0.0		0.1	0.3	0.0	0.6	0.0	0.0	0.0	1.0
	718	718	387	0.0	0.4	0.0	0.1	0.0		0.0	0.2	0.4	1.3	0.0	1.0	0.8	0.5
	361	361	388	0.0	0.1	0.3	0.1	0.1	0.0	0.1	0.7	0.2	0.3	0.4	0.1	0.1	0.2
	145	145	392	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	.	175	796		0.0	0.2	0.0	0.0	0.0	0.4	0.1				0.0		
	.	81	800		0.6	2.2	2.0	0.1	0.3	0.7				0.9	0.5		
367 - 549	186	186	729	0.0	0.0	0.5	1.3	0.5	0.0	0.1	1.3	1.1	2.9	0.4	7.6	3.1	0.7
	216	216	731	0.6	0.6	0.1	0.1	0.5	0.7	0.8	1.6	0.4	1.4	2.8	3.1		0.8
	468	468	733	0.8	1.0	0.8	1.6	0.1	3.9	3.6	2.6	5.8	0.4	3.2	3.5	6.8	6.2
	272	272	735	0.3	0.1	0.1	0.3	0.0		1.6	1.2	5.0	8.9	13.6	8.0	14.4	20.2
	.	50	792		4.2	7.8	7.1	6.6	7.2	11.5					3.6		
550 - 731	170	170	730	0.4	2.5	11.7	4.9	0.0	0.6	0.0	2.1	0.6	0.2	1.7	2.9	2.0	2.5
	231	231	732	7.9	7.2	6.5	3.6	3.4	3.3	1.1	5.8	3.8	4.7	7.9	10.6	4.4	2.3
	228	228	734	3.0	1.5	0.5	2.5	0.1		0.0	2.7	1.4	0.6	14.9	7.0	20.8	1.6
	175	175	736	3.9	17.2	7.7	49.7	4.3		8.1	31.5	32.3	34.6	38.7	39.7	22.7	16.1
732 - 914	.	227	737	4.8	0.4	4.0	16.1	2.2		1.6	0.4	0.0		0.0	2.6		
	.	223	741	0.2	0.0	0.1	5.2	0.5			0.3	0.0		0.5	0.0		
	.	348	745	1.4	0.0	0.0	0.0	0.2			0.0	0.0		0.0	0.5		
	.	159	748	1.8	0.0	0.0	0.0	1.7			0.0	0.0		0.0	0.2		
915 - 1097	.	221	738	0.0	0.0	0.2	0.2	13.9			0.0	0.0		0.0	0.0		
	.	206	742	0.0	0.0	0.0	0.0	4.1			0.0	0.0		0.0	0.0		
	.	392	746	0.0	0.0	0.0	0.0	0.1			0.0	0.0		0.0	0.0		
	.	126	749		0.0	0.0	0.0	0.0				0.0		0.0	0.0		
1098 - 1280	.	254	739	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0		
	.	211	743	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0		
	.	724	747	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0		
	.	556	750	0.0	0.0	0.0	0.0	0.0				0.0		0.0	0.0		
1281 - 1463	.	264	740	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0		
	.	280	744		0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0		
	.	229	751		0.0	0.0	0.0	0.0				0.0		0.0	0.0		
All strata				0.1	0.2	0.2	0.4	0.2	0.1	0.2	0.3	0.3	0.5	0.4	0.5	0.6	0.7

Table 26. Estimates of biomass (tons) of witch flounder from Canadian fall surveys in Div. 2J, 3K and 3L during 1977-2012.

	2J	3K	3L	2J3KL
1977	5123			
1978	1302	30353	0	31655
1979	2218	49789	0	52008
1980	3494	44962	0	48456
1981	2581	43406	0	37338
1982	4909	32429	0	37338
1983	3693	49251	9082	62026
1984	2903	49038	13210	65151
1985	3030	35694	7881	46605
1986	5920	21359	10743	38022
1987	2063	21746	8679	32488
1988	1571	18110	9294	28975
1989	2653	8976	6606	18234
1990	3672	17088	10341	31101
1991	2669	4272	5274	12215
1992	1102	1863	3131	6095
1993	627	1327	778	2733
1994	462	846	663	1971
1995	263	435	418	1117
1996	370	855	1806	3031
1997	465	1116	1095	2676
1998	649	1255	1906	3810
1999	752	881	826	2460
2000	498	1200	968	2667
2001	209	1427	1042	2678
2002	404	471	2428	3303
2003	178	651	1010	1839
2004	476	2641	451	3568
2005	684	2842	1003	4529
2006	962	2889	1987	5838
2007	1369	4671	1723	7762
2008	1947	3374	2759	8080
2009	1351	5639	2625	9616
2010	1242	5417	2986	9645
2011	1151	3806	3339	8297
2012	1028	4384	3562	8975

Table 27. Mean weights (kg) of witch flounder per tow from Canadian fall surveys in Div. 2J, 3K and 3L during 1977-2012.

	2J	3K	3L	2J3KL
1977	1.56			
1978	0.39	7.077	0.00	4.16
1979	0.72	12.332	0.00	7.29
1980	1.11	11.483	0.00	6.85
1981	0.80	11.086	0.00	5.28
1982	1.52	8.443	0.00	5.28
1983	1.13	13.297	2.05	5.44
1984	0.93	11.630	2.49	5.15
1985	0.93	8.235	1.48	3.61
1986	1.82	5.346	2.11	3.08
1987	0.63	5.083	1.72	2.58
1988	0.49	4.501	1.84	2.36
1989	0.83	2.231	1.31	1.48
1990	1.13	3.943	1.96	2.42
1991	0.82	0.986	0.99	0.95
1992	0.34	0.430	0.59	0.47
1993	0.20	0.302	0.15	0.22
1994	0.14	0.196	0.12	0.15
1995	0.09	0.094	0.08	0.09
1996	0.11	0.168	0.28	0.20
1997	0.13	0.219	0.17	0.18
1998	0.19	0.246	0.30	0.25
1999	0.22	0.189	0.14	0.18
2000	0.14	0.248	0.16	0.18
2001	0.06	0.280	0.16	0.18
2002	0.12	0.092	0.38	0.22
2003	0.05	0.128	0.16	0.12
2004	0.14	0.518	0.10	0.27
2005	0.20	0.561	0.17	0.31
2006	0.28	0.587	0.33	0.40
2007	0.39	1.003	0.29	0.55
2008	0.59	0.782	0.52	0.62
2009	0.39	1.20	0.44	0.68
2010	0.36	1.07	0.48	0.66
2011	0.34	0.82	0.63	0.62
2012	0.30	0.94	0.67	0.67

Table 28. Estimates of abundance (000s) of witch flounder from Canadian fall surveys in Div. 2J, 3K and 3L during 1977-2012.

	2J	3K	3L	Total
1977	7106			
1978	1962	59729	0	61691
1979	3016	84955	0	87971
1980	4503	72872	0	77374
1981	3190	70058	0	58631
1982	6486	52146	0	58631
1983	4963	75267	12033	92262
1984	3840	79553	17914	101307
1985	4089	70384	10401	84874
1986	9432	40917	12839	63188
1987	3337	37279	10500	51117
1988	2746	35486	11269	49501
1989	5377	22734	8002	36114
1990	8110	29338	14453	51901
1991	6941	10045	7428	24414
1992	2463	6377	4748	13588
1993	2588	8918	1572	13078
1994	2369	4815	1428	8612
1995	1808	3546	1004	6358
1996	1724	5081	5297	12102
1997	1890	5716	4383	11989
1998	2505	7955	6755	17214
1999	2548	5441	2655	10644
2000	1964	7952	5361	15276
2001	1096	7220	7316	15631
2002	1497	3752	10776	16025
2003	715	3659	6090	10464
2004	1870	10424	3990	16284
2005	2254	10129	7023	19406
2006	2719	10065	5091	17875
2007	3290	17080	5865	26235
2008	4313	11589	7538	23441
2009	3398	18194	8410	30001
2010	3344	17547	10991	31882
2011	2879	10541	9994	23414
2012	2222	11482	9954	23658

Table 29. Mean numbers of witch flounder per tow from Canadian fall surveys in Div. 2J, 3K and 3L during 1977-2012.

	2J	3K	3L	2J3KL
1977	2.16			
1978	0.59	13.93	0.00	8.12
1979	0.97	21.04	0.00	12.33
1980	1.42	18.61	0.00	10.93
1981	0.99	17.89	0.00	8.30
1982	2.01	13.58	0.00	8.30
1983	1.52	20.32	2.72	8.10
1984	1.23	18.87	3.38	8.01
1985	1.26	16.24	1.95	6.57
1986	2.90	10.24	2.52	5.12
1987	1.03	8.71	2.08	4.06
1988	0.86	8.82	2.23	4.03
1989	1.67	5.65	1.58	2.94
1990	2.49	6.77	2.74	4.04
1991	2.13	2.32	1.39	1.89
1992	0.76	1.47	0.89	1.05
1993	0.82	2.03	0.31	1.04
1994	0.72	1.12	0.27	0.67
1995	0.65	0.77	0.19	0.50
1996	0.50	1.00	0.83	0.81
1997	0.54	1.12	0.69	0.80
1998	0.72	1.56	1.06	1.15
1999	0.74	1.17	0.45	0.76
2000	0.57	1.64	0.86	1.05
2001	0.32	1.42	1.15	1.05
2002	0.43	0.74	1.69	1.07
2003	0.21	0.72	0.96	0.70
2004	0.54	2.05	0.84	1.22
2005	0.65	2.00	1.20	1.35
2006	0.78	2.05	0.84	1.24
2007	0.95	3.67	0.99	1.86
2008	1.31	2.69	1.41	1.81
2009	0.98	3.87	1.41	2.12
2010	0.96	3.47	1.78	2.17
2011	0.85	2.26	1.88	1.76
2012	0.64	2.47	1.86	1.76

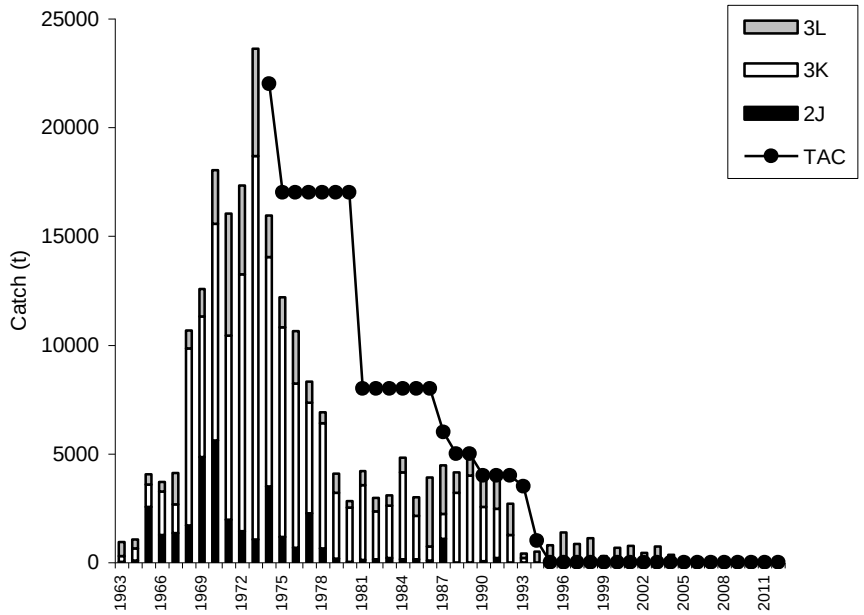

Fig. 1. Commercial carches and TACs of witch flounder in Divisions 2J, 3K and 3L during 1963-2012. Catches in Div. 3M are included for 1998-2000. Although not included, the estimated catches in Div 3M from 2001-2004 averaged 360 tons.

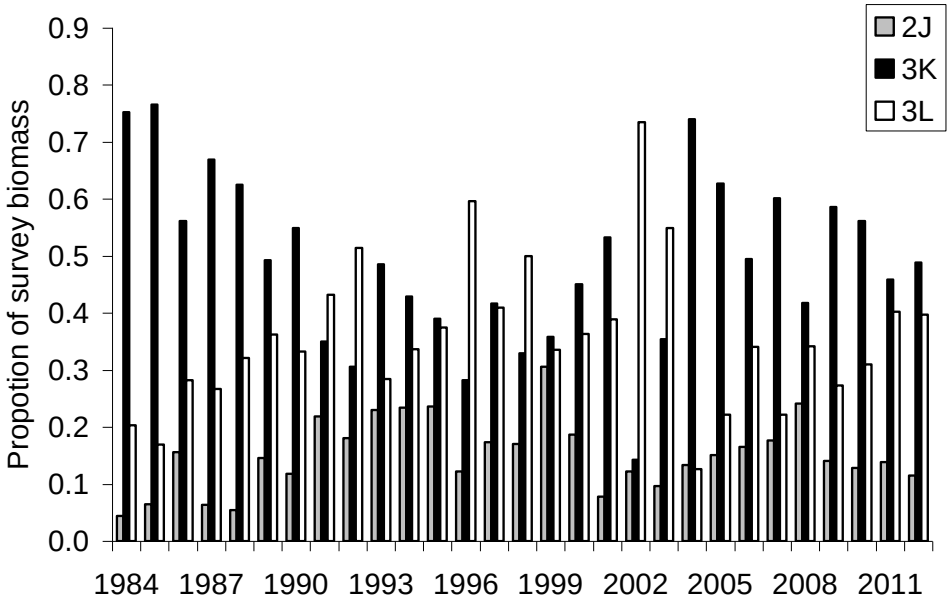

Figure 2. Proportion of witch flounder in Div, 2J, 3K and 3L from Canadian autumn surveys 1984-2012.

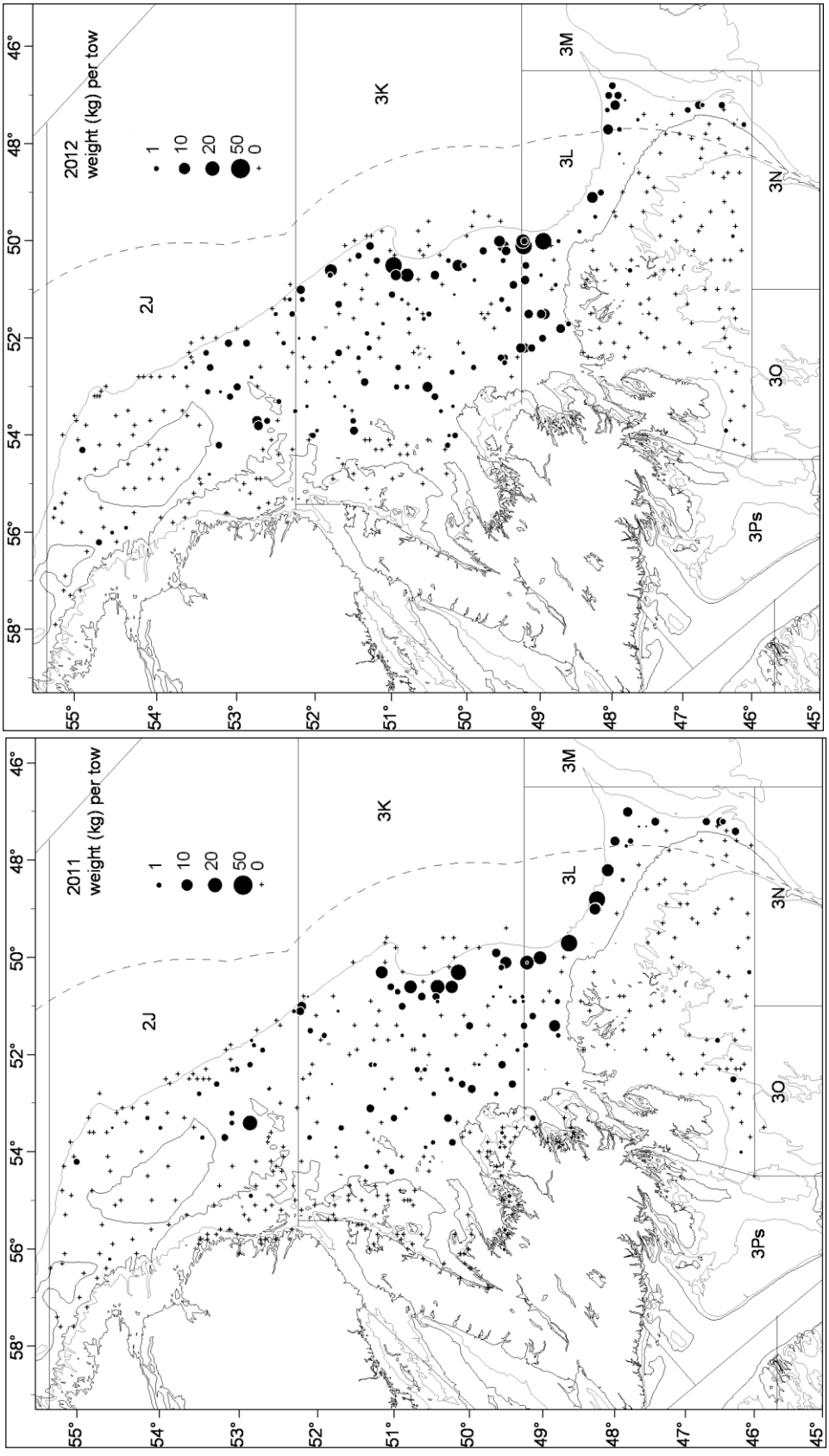

Fig. 3. Weight (kg) per set of witch flounder from Canadian surveys in NAFO divisions 2J, 3K, and 3L during autumn 2011 and 2012.

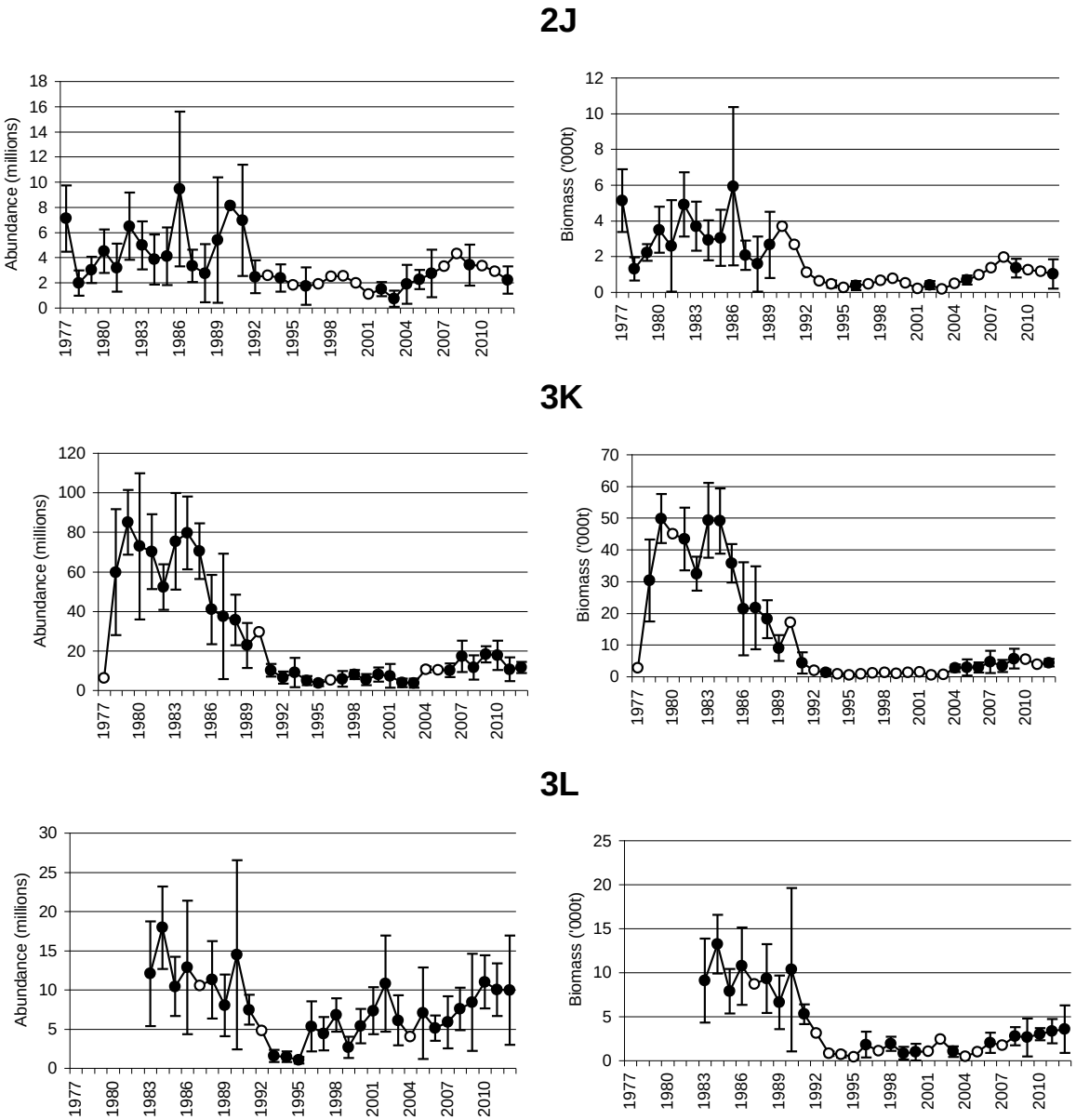

Figure 4a. Biomass (000 t) and abundance (000s) for Div. 2J, 3K, and 3L Canadian autumn surveys. Where lower confidence limits were negative, error bars were omitted (hollow symbols).

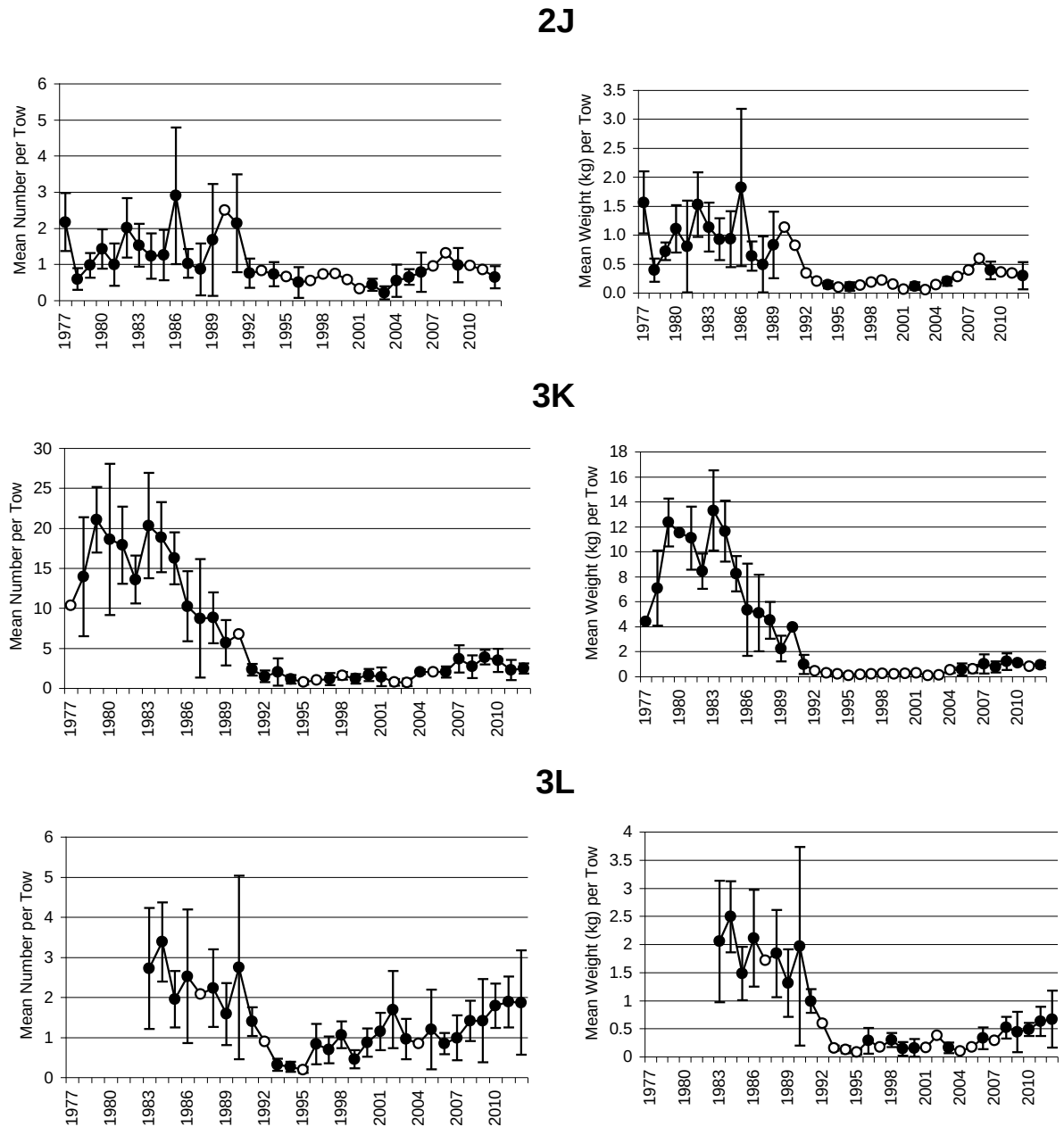

Figure 4b. Mean number and weight (kg) per tow for Div. 2J, 3K and 3L Canadian autumn surveys. Where lower confidence limits were negative, error bars were omitted (hollow symbols).

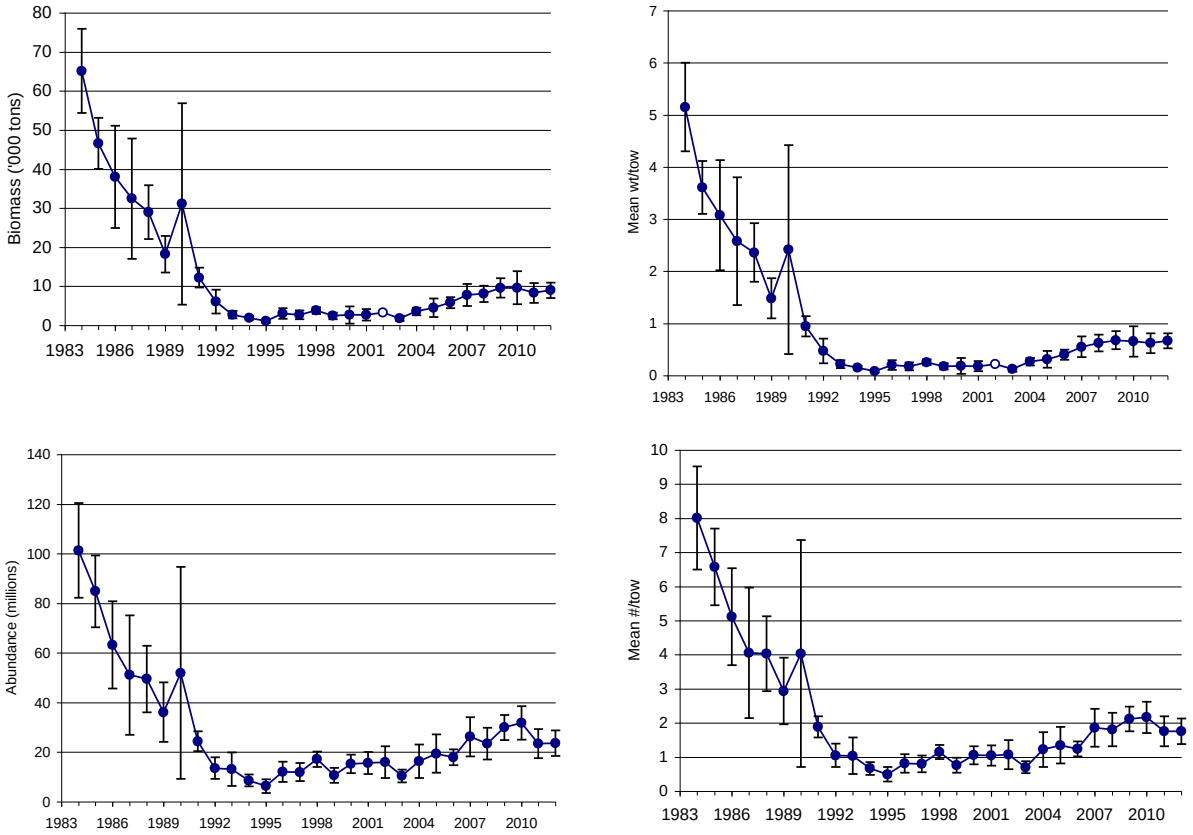

Figure 5. Biomass (000 t) and abundance (000s) estimates, mean number and weight (kg) per tow, of witch flounder from Canadian autumn surveys in Div. 2J, 3K and 3L combined. Where lower confidence limits were negative, error bars were omitted (hollow symbols).

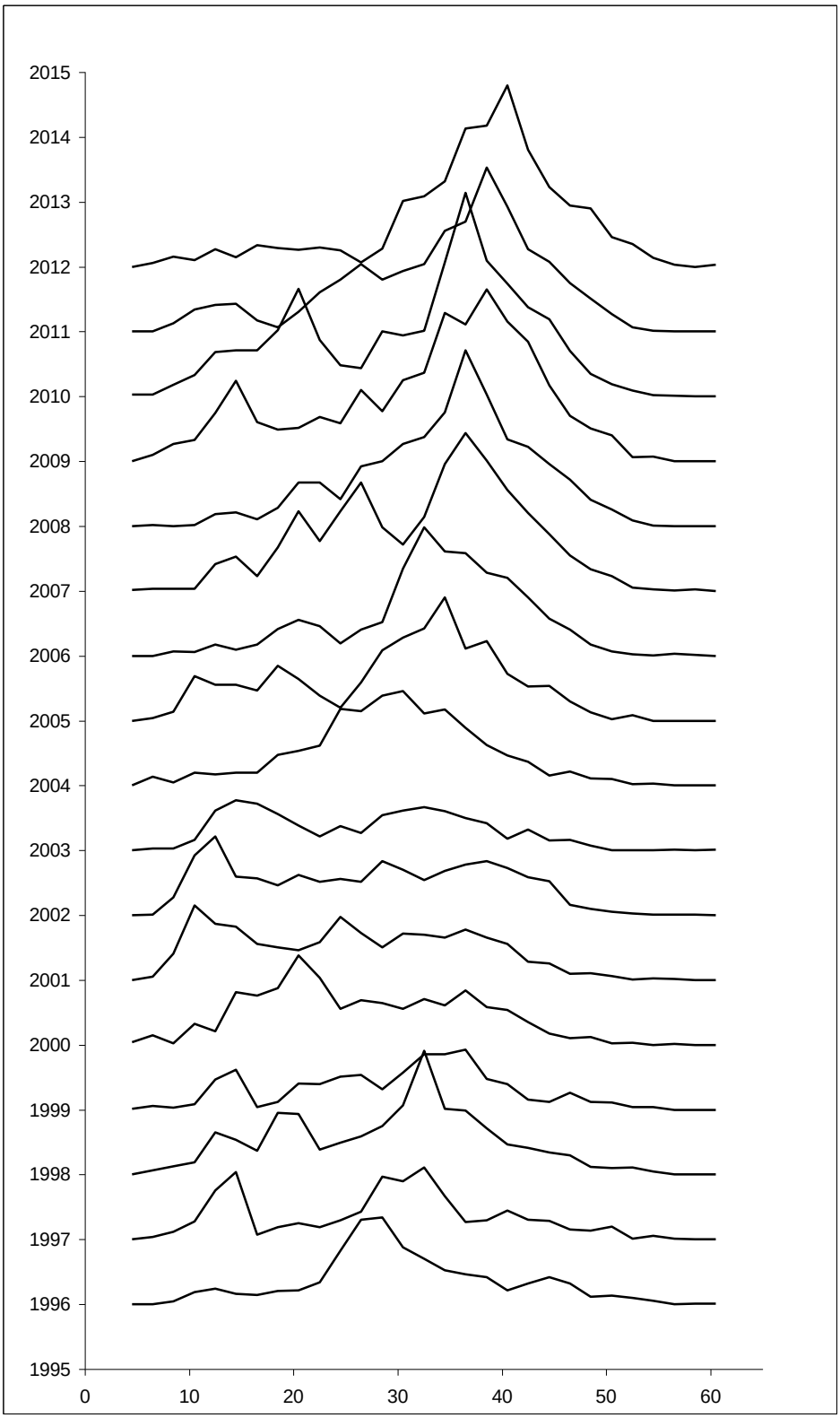

Figure 6. Witch flounder in 2J3KL: population numbers at length from Canadian autumn surveys (1996-2012).

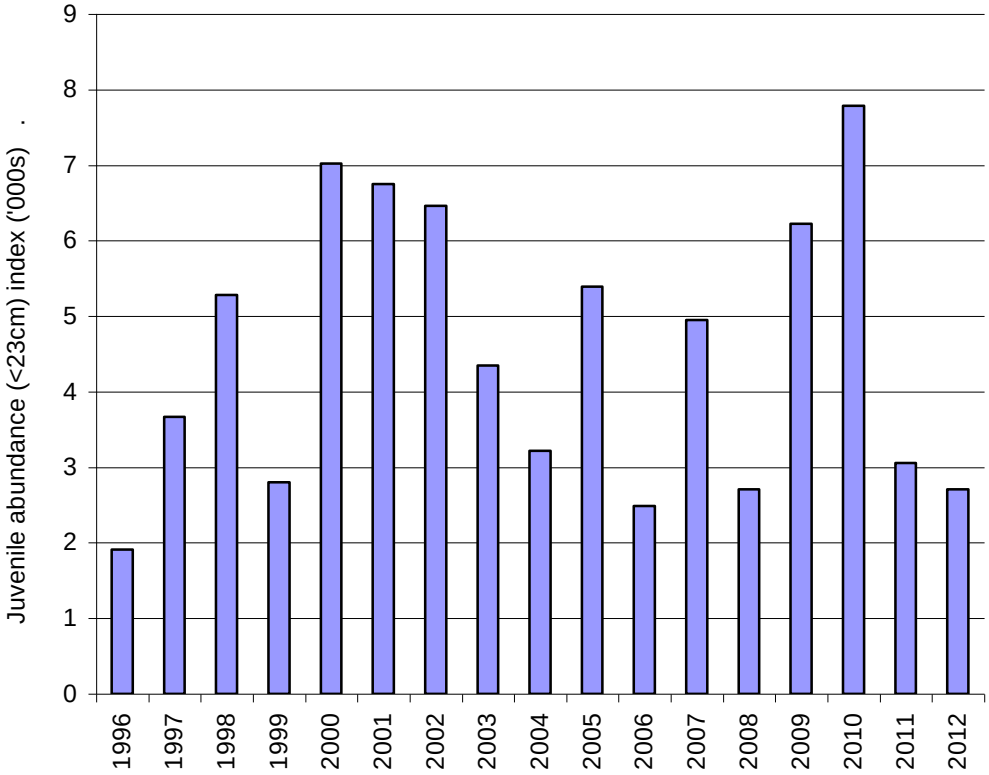

Figure 7. Abundance of yellowtail flounder less than 23 cm from autumn surveys 1996-2012.

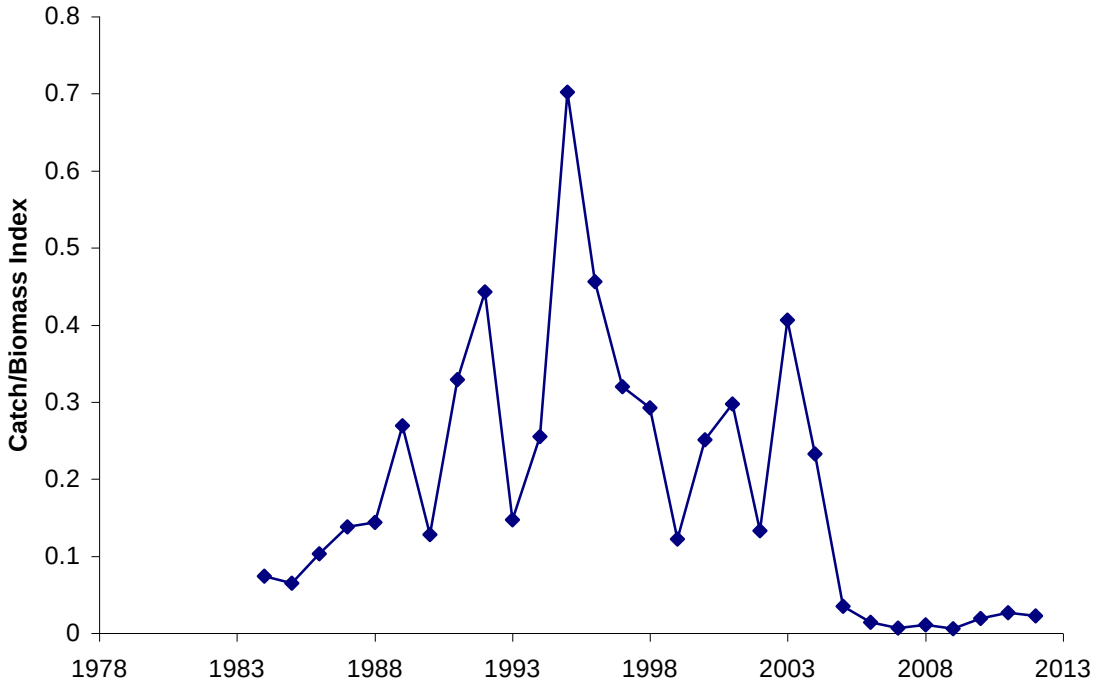

Figure 8. Catch to survey biomass ratio for witch flounder in NAFO Divs. 2J, 3K, and 3L.

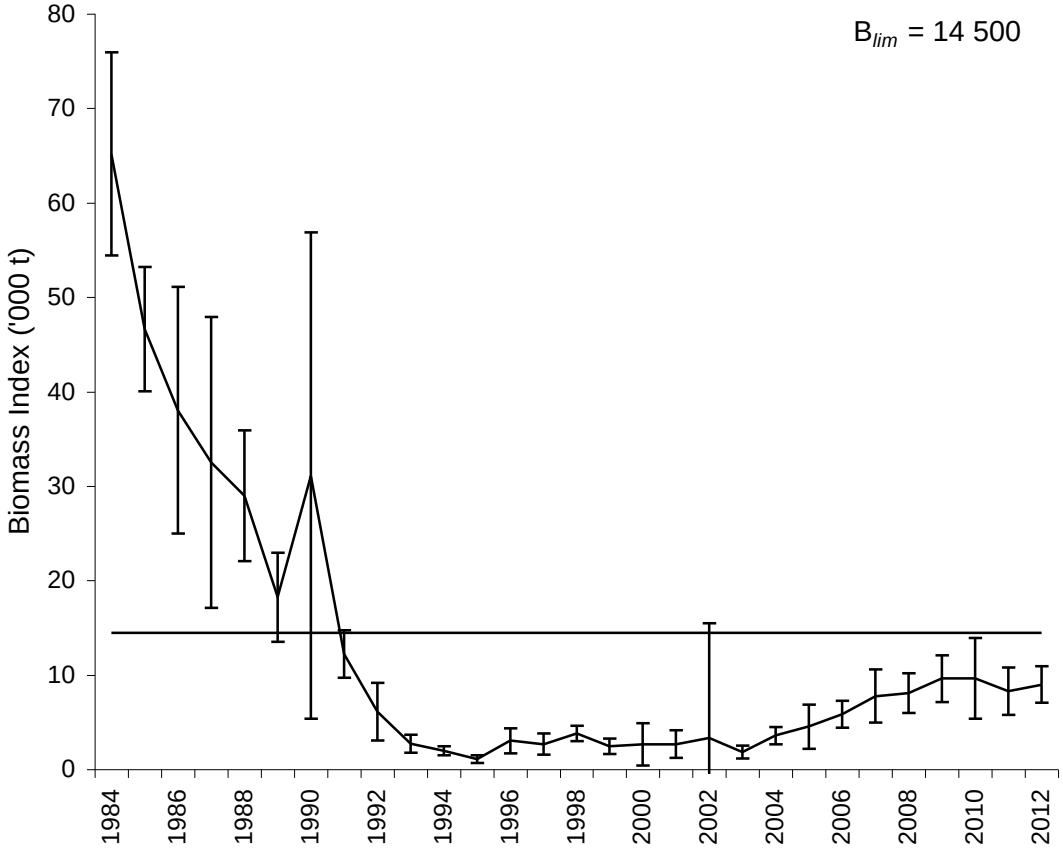

Figure 9. Biomass estimates of witch flounder in Div. 2J, 3K, and 3L from the Canadian autumn survey. Surveys prior to 1996 covered fewer strata and biomass estimates likely represent less of the total stock. B_{lim}=14 500 t is 15% of B_{1984} adjusted for less extensive survey coverage (x 1.48).

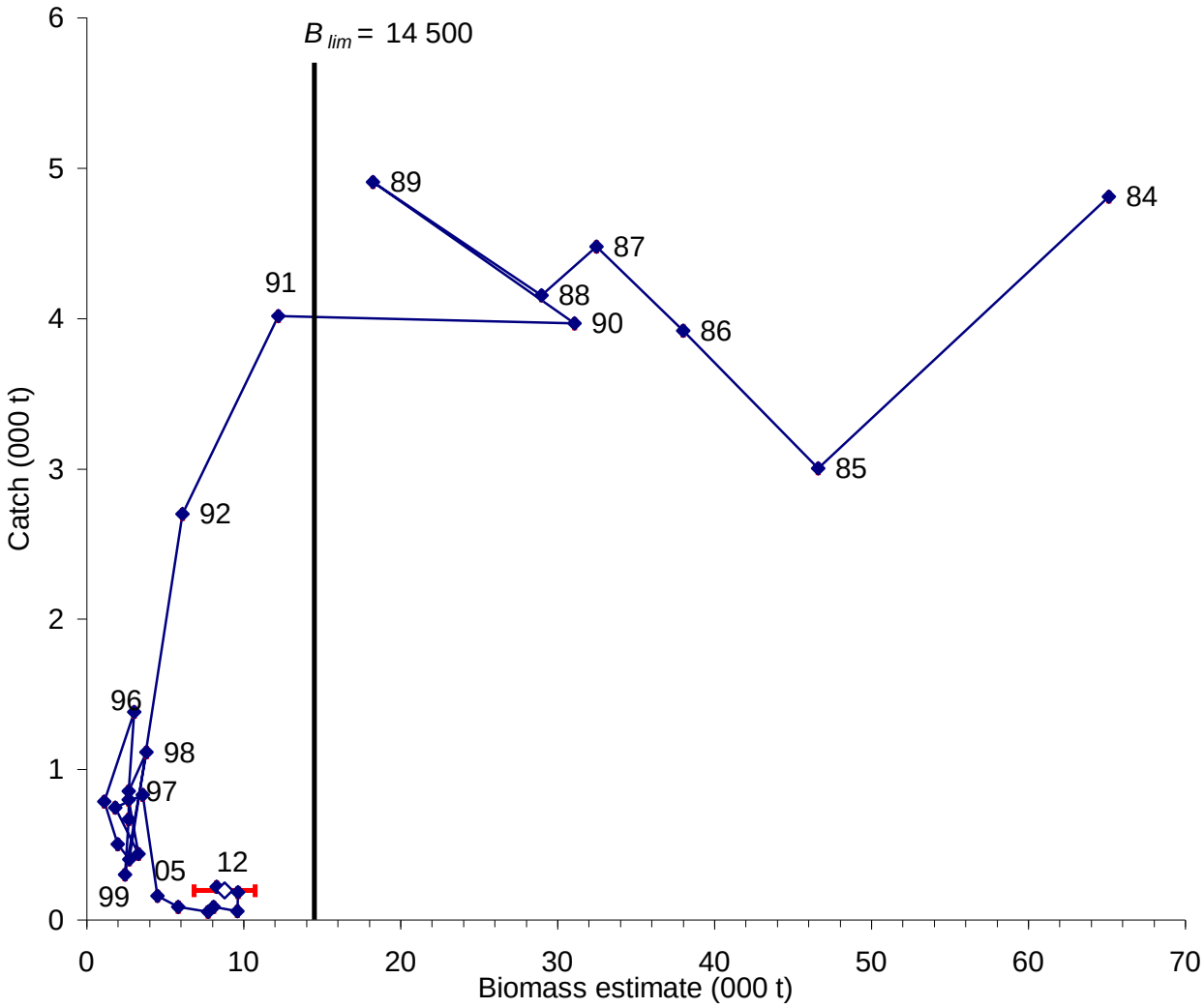

Figure 10.Catch (000 t) of witch flounder plotted against survey biomass index (000 t) for autumn surveys 1996-2012. Blim is shown as 15% of the highest observed biomass level (adjusted for less survey coverage in 1984).