Status and Future Prospects for the Darkblotched Rockfish Resource in Waters off Washington, Oregon, and California as Assessed in 2007

by

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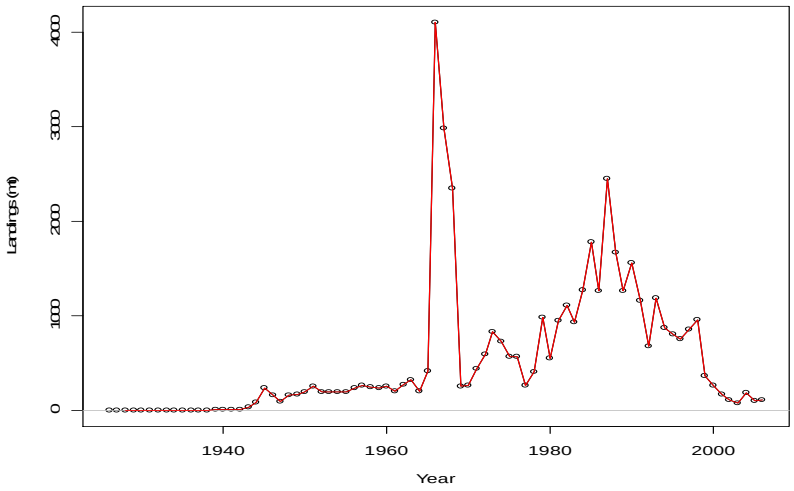
This assessment applies to the darkblotched rockfish (*Sebastes crameri*) for the combined US Vancouver, Columbia, Eureka and Monterey INPFC areas. The largest landings (removals between 2,300 and 4,200 metric tons (mt)) of darkblotched were taken from 1966-1968, primarily by foreign vessels. From 1969 to 1981, the fishery proceeded with more moderate landings of between 200 and 1000 mt per year, with the foreign fishery ending in 1977. A second peak in landings occurred between 1982 and 1993, with landings exceeding 1,100 mt in 10 of 12 years, reaching over 2,400 mt in 1987. Management measures reduced landings to below 950 mt since 1994, below 400 mt since 1999, and below 200 mt in recent years.

Landings history from 1928-2006



Landings estimates for the past 10 years

Year	*Landings(mt)*
1997	824
1998	944
1999	362
2000	262
2001	173
2002	113
2003	80
2004	189
2005	105
2006	113

This assessment used the SS2 model, version 2.00f. New data and changes to the data used in the previous assessment were applied to this new assessment. They are as follows:

Landings data for 1981-2004 were updated, and new landings data were added for 2005 and 2006. Fishery length compositions for 1977-2004 were updated, with new 2005 and 2006 length compositions added. Discard estimates were updated for 2003 and 2004, and a new estimate from 2005 was added. Trawl fishery discard length compositions for 2002-2006 were used for the first time. The 1999-2004 NWFSC Slope Survey biomass indices and length compositions were recalculated based upon changes in stratum area estimates and updates in the database, and the 2005 and 2006 NWFSC Slope Survey biomass indices and length compositions were added. The POP Survey was not used in this assessment, and the NWFSC Shelf Survey (30-100fm, 55-183m, 2003-2006) was included for the first time. The "super years" from the AFSC Slope Survey were excluded, as was the 1977 Triennial Shelf Survey. New GLMM-based biomass indices and CVs were calculated for all four surveys used in this assessment. Conditional age-at-length data were included for the first time in this assessment, using only recently produced age data (otoliths read 2004–present). These recent reads included fishery otoliths from 1991, 1998, and 2003-2006,

AFSC Slope Survey otoliths from 2001, NWFSC slope and shelf otoliths from 2003-2006, and fishery discard otoliths from 2004 and 2005.

A number of sources of uncertainty were explicitly included in this assessment. For example, allowance was made for uncertainty in natural mortality and the parameters of the stock-recruitment relationship. There were also other sources of uncertainty that were not included in the current model, including the degree of connection between the stocks of darkblotched rockfish off British Columbia and those in PFMC waters; the effect of the PDO, ENSO and other climatic variables on recruitment, growth and survival of darkblotched rockfish; and gender-based differences in survival.

A reference case was selected based on extensive model testing and an attempt was made to balance the sources of uncertainty.

Summary of past 10 years

Year	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*
Catch (mt)	860	1007	393	430	283	184	109	254	139	149	
Discards(mt)	36	63	31	168	110	71	29	65	34	36	
Landings(mt)	824	944	362	262	173	113	80	189	105	113	
ABC	256	256	256	256	302-349	187	205	240	269	294	456
OY					130	168	172	240	269	200	290
F	0.168	0.221	0.086	0.085	0.050	0.029	0.015	0.031	0.015	0.015	
Expl. Rate	0.134	0.161	0.065	0.066	0.040	0.024	0.013	0.027	0.014	0.014	
1+ Biomass	6416	6251	6002	6456	6993	7770	8638	9470	10030	10605	11094
Sp. Output	4415	3906	3272	3176	3230	3567	4071	4660	5231	6013	6853
Sp. Out. sd	410	416	424	439	472	533	610	695	791		
Sp. Out. cv	0.093	0.107	0.129	0.138	0.146	0.149	0.150	0.149	0.151		
Recruits(10^3)	2271	576	5188	4728	547	570	1761	1903	2005	1958	
Rec. sd	389	166	771	714	119	111	320	408	622	1577	
Rec. cv	0.171	0.288	0.149	0.151	0.218	0.196	0.182	0.215	0.310	0.805	
Depletion	0.144	0.127	0.107	0.104	0.105	0.116	0.133	0.152	0.171	0.196	0.224
Depl. sd											0.030
Depl. cv											0.135

The point estimate for the depletion of the spawning output at the start of 2007 is 22.4%. The ABC (using the F50% MSY proxy) and OY (from the rebuilding plan) for 2007 in the above table reflect current management based on the 2005 assessment. Under the current model the ABC for 2007 would be somewhat lower (421 mt). For West Coast rockfish, a stock is considered overfished when it is below 25% of virgin spawning biomass, and recovered when it reaches 40% of virgin spawning biomass. Overfishing is considered to be occurring when catch exceeds the ABC specified for a particular year. Based on this assessment, darkblotched rockfish on the West

Coast remain below the overfished threshold, but the spawning biomass appears to have increased steadily over the past 5 or 6 years. Since 2001, overfishing occurred only once, with estimated catch exceeding the ABC by 14 mt (5.8%) in 2004.

With the stock extending northwards into Canadian waters, management and assessment of stock status might be improved through greater cooperation with British Columbia.

Major quantities from assessment

	Value	*sd*	*cv*
$SpOut_0$ (10^8 eggs)	30,640	708	0.023
B_0 (mt)	34,509		
R_0 (10^3 fish)	3,295	89	0.027
$SpOut_{msy}$	12,256		
F_{msy}	0.041		
Basis for above	$F_{50\%SPR}$		
Exploitation rate at MSY	0.038		
MSY	621		

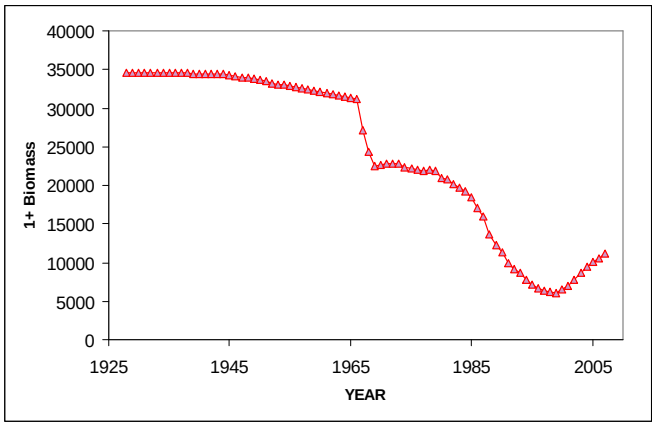
Reference points

	F_{msy}=F_{spr} (0.5)	**F_{msy} = F_{Btarg}(B_{40})**	**Calculated F_{msy}**
SPR	**0.5**	**0.5**	**0.422**
F	**0.041**	**0.041**	**0.054**
Exploitation Rate	**0.038**	**0.038**	**0.048**
MSY (mt)	**621**	**621**	**644**
Sp. Out. $_{msy}$	**12,256**	**12,256**	**9,376**
B/B_0 (Sp. Out.)	**0.40**	**0.40**	**0.306**
1+ Biomass	**16,528**	**16,528**	**13,331**

*Note that when steepness (h) = 0.6, the reference F_{spr} = 0.5 will result in an equilibrium biomass of B_{40}; therefore, the first two columns in the above table are identical (since when h = 0.6 and biomass = B_{40}, expected recruitment = $0.8R_0$)

The point estimates of summary (age 1+) biomass show an upward trend over the past ten years, increasing by nearly 50% in that time.

1+ Biomass Levels from 1928 to 2007

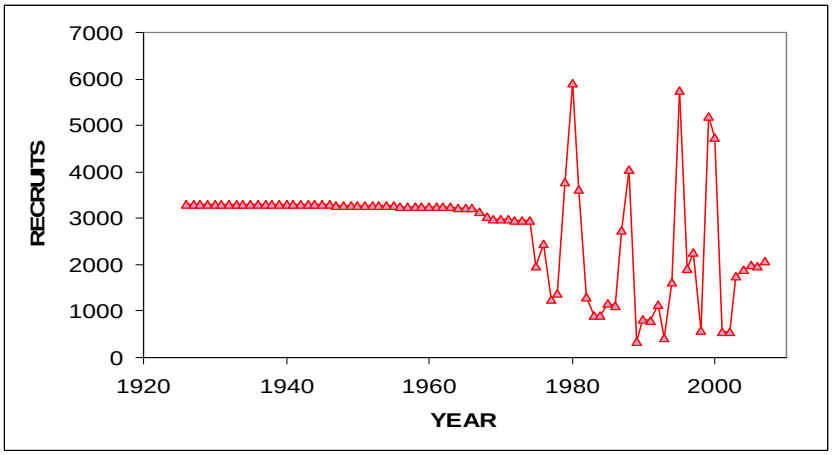


Biomass estimates for the past 10 years

Year	*Total 1+ biomass(mt)*
1998	6,251
1999	6,002
2000	6,456
2001	6,993
2002	7,770
2003	8,638
2004	9,470
2005	10,030
2006	10,605
2007	11,094

The first year for which recruitment appears to be reliably estimated is 1975. The recruitment pattern for darkblotched rockfish is similar to that of many rockfish species, with highly variable recruitment from year to year. With a few exceptions, the 1980s and 1990s provided rather poor year-classes compared with average historical recruitment levels, although the 1999 and 2000 year-classes appear to be two of the four largest year-classes since 1975.

Recruitment estimates (1928-2006)

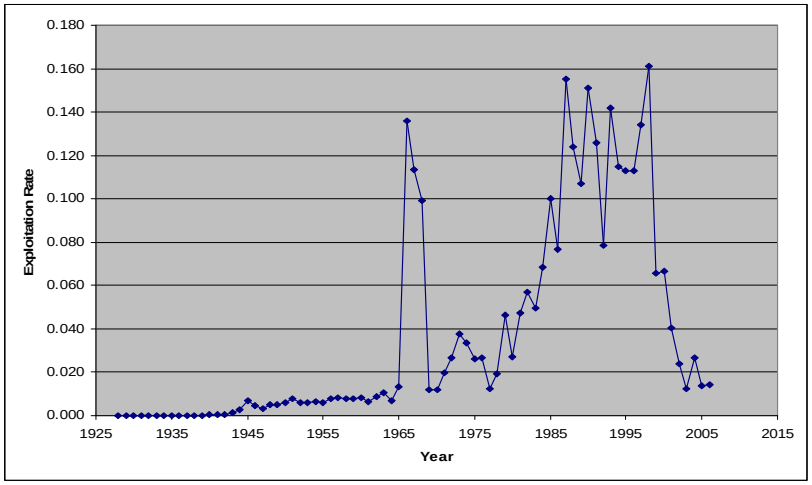


Recruitment estimates for the past 10 years (Thousands of age-0 recruits)

Year	*Recruitment*
1997	2,271
1998	576
1999	5,188
2000	4,728
2001	547
2002	570
2003	1,761
2004	1,903
2005	2,005
2006	1,958

The exploitation rate (percent of biomass taken) on fully-selected animals peaked near 14% in the mid-1960's when foreign fishing was intensive. The exploitation rate dropped by the late 1960's, but increased slowly and steadily from the late 1970's to 1987 at near 15% and stayed high until 1998 with the continuing decline in exploitable biomass. Over the past 10 years the exploitation rate has fallen from over 13% (with a peak of 16% in 1998) to under 2%.

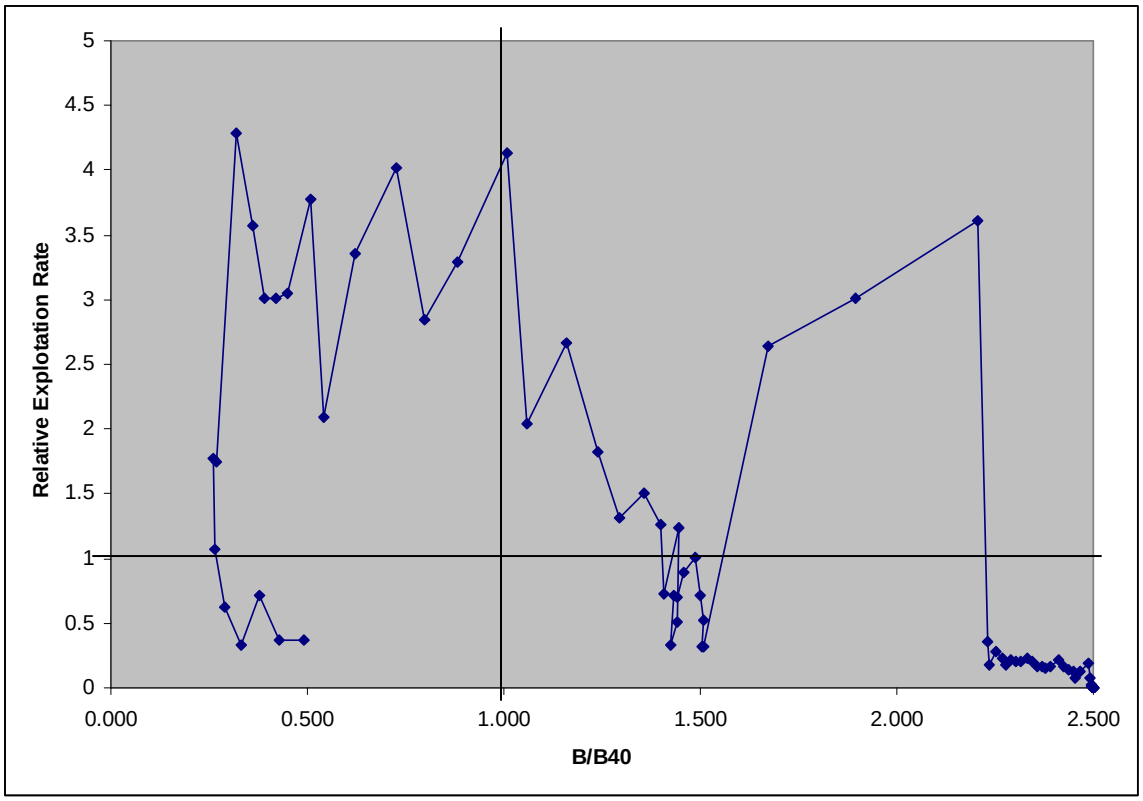
Exploitation rate estimates (1928-2007)



Exploitation rate for the past 10 years

Year	*Exploitation rate*
1997	0.1340
1998	0.1611
1999	0.0654
2000	0.0666
2001	0.0404
2002	0.0237
2003	0.0126
2004	0.0268
2005	0.0138
2006	0.0141

Relative Exploitation rate versus B/Bmsy for 1928-2006



The major axes of uncertainty are steepness and natural mortality. The decision table below uses natural mortality (M) as the major axis of uncertainty. The three landings series are based upon 2006 fishing mortality rate (F_{2006}; "Low Landings"), 40:10 rule catches (with 2007 and 2008 landings to meet catch OYs; "Medium Landings"), and 2005 rebuilding plan F (F = 0.0463, with 2007-8 OYs; "High Landings"). Discard, and thus total catch, is estimated within the model.

			LOW STATE M = 0.05			MEDIUM STATE M = 0.07			HIGH STATE M = 0.09		
	Year	Landings	Catch	Sp. Out.	Depl.	Catch	Sp. Out.	Depl.	Catch	Sp. Out.	Depl.
Low Landings	2007	119	156	2891	9.2%	156	6853	22.4%	156	15092	45.8%
	2008	123	161	3176	10.1%	161	7597	24.8%	162	16608	50.4%
	2009	127	167	3392	10.8%	167	8186	26.7%	167	17769	53.9%
	2010	130	171	3551	11.3%	172	8658	28.3%	171	18670	56.6%
	2011	134	176	3672	11.7%	177	9061	29.6%	176	19432	58.9%
	2012	138	182	3769	12.0%	182	9425	30.8%	181	20103	61.0%
	2013	142	187	3856	12.3%	187	9766	31.9%	186	20683	62.7%
	2014	146	192	3943	12.6%	193	10094	32.9%	191	21179	64.2%
	2015	151	199	4037	12.9%	198	10418	34.0%	198	21606	65.5%
	2016	155	204	4137	13.2%	204	10744	35.1%	203	21983	66.7%
Medium Landings	2007	220	288	2891	9.2%	289	6853	22.4%	289	15092	45.8%
	2008	251	329	3078	9.8%	330	7497	24.5%	330	16509	50.1%
	2009	272	357	3153	10.0%	358	7946	25.9%	357	17532	53.2%
	2010	282	371	3142	10.0%	371	8252	26.9%	370	18272	55.4%
	2011	290	382	3080	9.8%	383	8477	27.7%	381	18864	57.2%
	2012	298	394	2987	9.5%	393	8657	28.3%	391	19360	58.7%
	2013	305	403	2880	9.2%	402	8811	28.8%	400	19766	59.9%
	2014	313	414	2770	8.8%	412	8951	29.2%	411	20088	60.9%
	2015	320	424	2662	8.5%	422	9088	29.7%	420	20346	61.7%
	2016	327	433	2555	8.1%	432	9226	30.1%	429	20557	62.3%
High Landings	2007	220	288	2891	9.2%	289	6853	22.4%	289	15092	45.8%
	2008	251	329	3078	9.8%	330	7497	24.5%	330	16509	50.1%
	2009	371	487	3153	10.0%	488	7946	25.9%	488	17532	53.2%
	2010	372	490	3039	9.7%	490	8147	26.6%	489	18169	55.1%
	2011	373	492	2875	9.2%	491	8272	27.0%	490	18661	56.6%
	2012	375	496	2684	8.6%	494	8356	27.3%	492	19065	57.8%
	2013	377	500	2486	7.9%	497	8419	27.5%	495	19384	58.8%
	2014	380	504	2291	7.3%	502	8476	27.7%	499	19628	59.5%
	2015	384	510	2104	6.7%	506	8535	27.9%	504	19816	60.1%
	2016	388	516	1922	6.1%	512	8602	28.1%	509	19965	60.5%

As this stock remains overfished, a rebuilding analysis will be conducted and further exploration of catch series' will be performed for that analysis.

Future research needs include:

- A thorough review of species composition in historical rockfish landings and a tabulation of estimated landings by species to be used in assessments.

- Investigation into the best available methods and data for constructing and using conditional age at length compositions from data taken across space and time within years.

- A thorough investigation of historical darkblotched rockfish mortality in the shrimp fishery.

- Mapping of “trawlable” and “untrawlable” habitat and construction of a prior on survey q.

1. Introduction

The assessment utilized combined data from the International North Pacific Fisheries Commission (INPFC) U.S. Vancouver, Columbia, Eureka and Monterey areas. The darkblotched rockfish (*Sebastes crameri*) population in these areas was modeled as a single stock.

Darkblotched rockfish (*Sebastes crameri*) are found from the Bering Sea to near Santa Catalina I., California at depths of 29-549 m (16-300 fm; Eschmeyer et al.1983). Commercially important concentrations are found from Northern CA through the Canadian border, on or near the bottom, in depths of approximately 183-366 m (100-200 fm) (Figure 1). This species co-occurs with an assemblage of slope rockfish, including Pacific ocean perch (*Sebastes alutus*), splitnose rockfish (*Sebastes diploproa*), yellowmouth rockfish (*Sebastes reedi*), and sharpchin rockfish (*Sebastes zacentrus)*. Pacific ocean perch and darkblotched rockfish are the most abundant members of that assemblage off the coasts of Oregon and Washington, but splitnose rockfish and darkblotched rockfish dominate off the northern coast of California. In the early years of the fishery, darkblotched rockfish were designated as part of the "Pacific ocean perch" market category for red-colored northern slope rockfish.

There are no clear stock delineations for darkblotched rockfish in U.S. waters. No distinct breaks are seen in the fishery landings and catch distributions (Figure 1). Survey catches imply a continuous distribution over most of the range, with the largest catches occurring over a swath of latitude and depth. Recent analyses indicate some genetic changes in the stock along the coast, but no distinct stock breaks. Genetic and geographic distance was correlated, with mean average dispersal distances of 1-100 km (Gomez-Uchida and Banks, 2005). Genetic structure between northern California and Washington samples are somewhat different, but overall the level of genetic differentiation is small. For the purpose of this assessment, the species is treated as a unit stock from the Mexican border to the U.S.-Canadian border. However, management actions on a coast-wide stock should account for problems in effort concentration because areas of high concentration do exist.

Darkblotched rockfish display sexually dimorphic growth. As with many other *Sebastes* species, females grow faster than and reach larger sizes than males (Nichol 1990, Rogers et al 2000, Rogers 2003). In National Marine Fisheries Service (NMFS) survey data, 80% of fish over 40 cm fork length (fl) were females. Darkblotched rockfish mate from August to December, eggs are fertilized from October through March, and larvae are released from November through April (Love et al. 2002). Fecundity increases with fish size and can reach 610,000 eggs, with all larvae released in one batch. Late-stage larvae and pelagic juvenile darkblotched rockfish are found closer to the surface than many other rockfishes.

Darkblotched rockfish migrate to deeper waters with increasing size and age (Lenarz 1993, Nichol 1990, Rogers 2003). In NMFS surveys tows, they averaged 21 cm fl in less than 100 fm, 29 cm in 100-200 fm, and 35 cm in 200-300 fm. Although aging is uncertain, analysis of 2003-2004 NWFSC Shelf-Slope Survey data indicates depth migration is either more dependent upon length than age, or that the rate of growth changes with depth. There is some evidence of diurnal vertical migration in darkblotched rockfish. Hannah et al. (2005) determined that catch was reduced at night using a conventional bottom trawl.

The fishery targeting the slope rockfish assemblage has always used bottom trawl gear. Although Eschmeyer et al. (1983) indicated darkblotched rockfish are found on soft bottoms, submersible observations indicate darkblotched rockfish are associated with rocks or other bottom structures (Waldo Wakefield, NMFS, Newport, OR 97365, pers. comm.).

Prior to 1965, darkblotched rockfish off of the U. S. West Coast were harvested almost entirely by Canadian and U. S. vessels. Most of the vessels were of multi-purpose design and used in other fisheries, such as salmon and herring, when not engaged in the groundfish fishery (Forrester et al. 1978). Generally under 200 gross tons and less than 33 meters (m) in length, these vessels had very little at-sea processing capabilities. These characteristics, for the most part, restricted the distance these vessels could fish from home ports, and limited the size of their landings. Estimated landings from 1956 to 1965 average around 270 mt with a somewhat lower average catch level over the preceding 12 years, and minimal catches prior to 1944. Catches increased dramatically after 1965 with the introduction of large distant-water fishing fleets from the Soviet Union and Japan. Both nations employed large factory stern trawlers as their primary method for harvesting. These vessels generally operated independently by processing and freezing their own catches. Support vessels, such as refrigerated transports, oil tankers, and supply ships permitted the large stern trawlers to operate at sea for extended periods of time. Peak removals by all nations combined are estimated at over 4,000 mt in 1966 and over 3,000 mt in 1967. These numbers are based upon a re-analysis of the foreign catch data (Rogers, 2003). Catches declined rapidly following these peak years, and the fishery proceeded with more moderate landings of between 200 and 1000 mt per year from 1969 through 1981, with the foreign fishery ending in 1977. A second peak in catches occurred between 1982 and 1993 with landings exceeding 1,100 mt in 10 of 12 years, reaching a high of over 2,400 mt in 1987. Management measures and a declining stock reduced landings to below 900 mt by 1994, below 400 mt in 1999, and below 200 mt in recent years.

Prior to 1977, darkblotched rockfish stocks in the northeast Pacific were managed by the Canadian Government within its waters, and by the individual states in waters (out to three miles) off of the United States. With implementation of the Magnuson Fishery Conservation and Management Act (MFCMA) in 1977, primary responsibility for management of the groundfish stocks off Washington, Oregon and California shifted from the states to the Pacific Fishery Management Council (PFMC).

Limits on domestic rockfish catch were first instituted in 1983, with darkblotched rockfish managed as part of a group of around 50 species (designated as the Sebastes complex) (Rogers et al. 2000). Observer data collected off Oregon in 1986 and 1987 indicated that slope rockfish were caught primarily in 134 - 282 fm (Rogers 1994). The fishery targeting those rockfish used bottom trawl gear utilizing rollers (roller gear) with 3.5 inch codend mesh, reduced from the mesh size used in the mid-1970's. About five percent of the catch was discarded due to small size. Nichol (1990) stated that fishermen were not harvesting the largest darkblotched rockfish in 1986-1987 because they were mainly fishing in less than 200 fm. Several changes occurred in the 1990's. Minimum codend mesh size was increased from 3 to 4.5 inches through regulatory changes in 1992 and 1995. Beginning in 1994, the Sebastes complex was divided into northern and southern areas, for purposes of setting annual specifications and trip limits. An assessment of the major species in the Sebastes complex (Rogers et al. 1996) led to a species-specific Allowable Biological Catch in 1997.

In recent years, managers have acted to reduce the catch of darkblotched rockfish (Table 1). The species was fully assessed in 2000 (Rogers et al 2000) and as a result of that assessment, was declared overfished. Since that time, it has been managed as part of a group of eight other slope rockfishes, including Pacific ocean perch for the areas south of $40^{0}10'$ and splitnose rockfish for the area north of that boundary. In 2001, darkblotched rockfish was given an individual Optimum Yield (OY) (Methot and Rogers 2001). However, landings of darkblotched rockfish continue to be governed by trip limits established for the Northern and Southern minor slope rockfish complexes. Since September 2002, managers have used Rockfish Conservation Areas

(RCA's) in addition to landings limits to control darkblotched rockfish fishing mortality. RCA's are large closed areas intended to protect overfished rockfish species. The boundaries of the RCA's and landings limits outside them have varied by year, gear type, and season. The seaward boundary of the trawl RCA has ranged from 150 to 250 fm, while the shoreward boundary has ranged from 100 fm to the shore. Trawl gear that is used shoreward of the RCA is required to have small footropes (<8" diameter), which increases the risk of gear loss in rocky areas. Reductions in landings limits for shelf rockfish species have also reduced incentives to fish in rocky areas shoreward of the RCA. Since 2005, vessels using trawl gear shoreward of the RCA north of 40°10' have also been required to use nets that are designed to be more selective for flatfish.

Management targets were exceeded from the time they were first implemented in 1997 through 2002 (Table 2). Landings goals were not met in 1997-2001 and the assumed discard rate was underestimated in 2002. The estimated darkblotched discard rate fell by roughly one-third from 2002 to 2003, with slighter decreases in 2004 and 2005 (Table 3). This trend is most likely attributable to combined changes in trip limits and the extent of closed areas. Although northern slope rockfish trip limits did not increase from 2002 to 2003, the area between 100 and 200 fm was closed throughout the year, with the shoreward boundary set no deeper than 50 fm during six months in 2003. The RCA areas in 2003 appeared to effectively change the distribution of the catch. In 2002, distribution of the catch was similar to that in the survey catches. In 2003, most of the landings and catch were from outside those areas. In 2004, trip limits were set 2-4 times higher than in 2003 during January-September, in conjunction with a seaward RCA boundary of 150 fm between May and September. This combination produced a sharp increase in catch that exceeded the ABC in 2004, but the larger retention allowances yielded a discard rate similar to that in the 2003 fishery. During 2005 and 2006, trip limits were roughly twice as high as in 2003, but unlike 2004, the area between 100 and 200 fm was closed throughout the year. In both 2004 and 2005, the entire area shoreward of 250 fm was closed for the last three months of the year.

Research surveys have been undertaken to provide fishery-independent information about the abundance, distribution, and biological characteristics of darkblotched rockfish. A coast–wide Shelf Survey of the rockfish resource was conducted in 1977 (Gunderson and Sample 1980) and was repeated every three years (thus referred to as the "Triennial" survey) through 2004. The National Marine Fisheries Service (NMFS) coordinated a cooperative research survey of the Pacific ocean perch stocks off Washington and Oregon with the Washington Department of Fisheries (WDF) and the Oregon Department of Fish and Wildlife (ODFW) in March-May 1979 (Wilkins and Golden 1983). This survey was repeated in 1985. Two slope surveys have been conducted on the West Coast in recent years. The first, conducted by the research vessel Miller Freeman, was discontinued after 2001. The second is an ongoing cooperative survey conducted by commercial fishing vessels, which started in 1998 and expanded to cover the shelf beginning in 2003.

2. Data

2.1. Removals and regulations

Darkblotched landings were estimated for the fishery off the West Coast of the continental United States from 1928 through 2006 (Figure 2; Tables 4-5). In this assessment estimates of landings for 1928-1980 are unchanged from the previous assessment. For the period 1928-1962, darkblotched landings were estimated by apportioning combined rockfish landings using the earliest available species proportions in a given area. Since the fleet fished shallower than 100 fm

in years before 1945-1948, the available darkblotched proportions were reduced for those years. Landings from 1963-1977 were mainly available in the literature, but some estimation was required. 1978-1980 landings were taken from CalCom and Tagart (1985). Landings from 1981-2006 were extracted from PacFIN on June 14, 2007, with auxiliary data from Tagart (pers. comm.) for 1981 and 1982, and from the At-Sea-Hake Observer Program (Vanessa Tuttle, pers. comm.) for 1991-2006. At-sea hake catch was also estimated for the years 1981-1990. Darkblotched rockfish has been sorted since 2000. Previous estimates were based on applying port-sampling species ratios to mixed rockfish landings.

Discards

The discard rate in 1986 was estimated using 1985-1987 observed darkblotched rockfish catch and discard in the Oregon and Washington bottom trawl fisheries (Rogers 1993). Fishermen attributed those discards to small sizes rather than management limits or other market considerations (Rogers 1994). Five percent of the 1985-1987 observed catch was discarded.

Data from another set of fishery observations conducted during 1995-1998 off Oregon and Washington were not used in this assessment. Due to time constraints, the observers only recorded discarded catch for darkblotched rockfish. At that time, darkblotched rockfish landings were recorded in the logbooks and landings tickets as part of a mixed group of rockfish.

Annual discard rates for 2000 through 2002 were computed using a combination of fish ticket, species composition, logbook, and observer data from that period. Fish ticket landed catch, as adjusted by species composition sampling of rockfish market categories, was used as the measure of landed tonnage in each area. Area discards of darkblotched rockfish were estimated by multiplying area- and depth-specific observed ratios of discarded darkblotched rockfish per metric ton of target species by retained amounts of target species (derived from logbooks and expanded to match area fish-ticket amounts). Discard estimates for 2000 and 2001 were computed using pooled observer data from September 2001 through August 2004. For 2002 observer data from only that year were used. Discard rates for each year were calculated by dividing the estimated discard by the sum of discard plus landed catch. The discard rates for 2003-2005 were calculated using the amounts of retained and discarded darkblotched rockfish reported by the observer program for those years (Table 3).

Fishery Length compositions

Fishery length compositions (Table 6; Figures 3-6) were estimated from PacFIN for the years 1977-1978 and 1981-2006. Fishery length compositions were not taken from the previous assessment for the years 1979-1980 as those compositions looked substantially different from the ones derived from PacFIN for adjoining years, and therefore did not appear to be consistent with the rest of the data.

Fishery length compositions were constructed using BDS data retrieved from PacFIN on 5/31/2007. Length, age and sex data were acquired at the trip level, and then aggregated to the state level as was done in the 2005 assessment. For each trip, the length composition of the sampled individuals was scaled up to represent the length composition of the trip landings through use of an expansion factor. In this assessment, the expansion factor was calculated as:

$$\text{Expansion Factor} = (WT_{total}/WT_{sampled})^{0.9},$$

with total weight divided by sample weight being the equivalent of total estimated number over sampled number. The exponent 0.9 was used rather than capping the expansion factor at a specific value (such as 500), in acknowledgment of the reduced information that occurs with any expansion to the trip level. In practice this reduced the largest expansion factor from 739 to 382, which is less than the cap of 500 that is frequently applied. The initial effective N value (input N) for each state was calculated via Stewart's Method (Ian Stewart, pers. Comm.), which for fisheries is:

$$N_{effective} = N_{trips} + 0.138 N_{fish} \quad \text{if } N_{fish}/N_{trips} < 44$$
$$N_{effective} = 7.06 N_{trips} \quad \text{if } N_{fish}/N_{trips} \geq 44$$

Ideally the relative effective sample size for each state would be equal to the relative landings for each state. In order to account for lack of proportional sampling in each state, the effective N for each state was down weighted using the geometric mean of the product of the ratio of individual state landings to total (3 State) landings and the ratio of individual state effective N to the sum of the effective Ns for all 3 states as follows:

$$W_s = \sqrt{\left(\left(\frac{Land_s}{Land_T}\right)\left(\frac{EffN_s}{EffN_T}\right)\right)}$$

where *Land* represents landings, *s* indexes the states, *T* represents total or sum of individual states, and *EffN* is initial effective sample size (input N). These W_s were used as weighting factors in summing the normalized length compositions L_s of the states before renormalizing:

$$\vec{L}_T = \frac{\sum_{s=1}^{3} W_s \vec{L}_s}{\sum_{s=1}^{3} W_s}$$

Total input N was calculated by summing the individual state estimated initial effective N values and then multiplying this sum by a down weighting factor equal to the sum of the W_s (which is always ≤ 1) (Table 7A). This was done in order to down weight the input N in cases where sampling was unbalanced. This down weighting factor has varied between 0.49 and 0.98, and has been above 0.9 in all years since 1995.

The length composition of discarded darkblotched rockfish in 1986 was estimated using data from observed groundfish trawls in that year (Rogers, 2005). The length compositions of discards in more recent years (2002-2006) were calculated with observer data from boats using bottom trawl gear. Individual lengths were scaled up by a straight expansion factor to the total discard for each observed tow. Due to significant missing sex data across the full range of length bins, all discard length-, age- and conditional age-at-length compositions were developed as combined-sex length compositions (Figures 7-8). Input N values for discard length compositions were calculated via Stewart's Method (Table 7B).

Fishery conditional age-at-length compositions

Conditional age-at-length compositions were constructed from age and length data available from PacFIN for the years 2003-2006. These years were used because all of the ages in PacFIN for those years were from otoliths aged between 2004 and 2007, a period in which ageing methods

have been invariant, with three agers doing all of the ageing. Double read analysis indicates minimal or no bias between agers and relatively good precision. In constructing conditional age-at-length compositions, instead of expanding samples up to trips, as with the length data, each age-at-length data point was considered independent for the purposes of creating each composition, although total input N (across all length bins) was still based on Stewart's method as described above. This total input N was spread among the length bins according to the number of fish contributing to data in that bin.

Since rockfish grow significantly in a single year and fishing occurs throughout the year, length bins were pooled according to estimated growth for each age. The bins were 0-10 cm, 11-15 cm, 16-20 cm, 21-24 cm, 25-27 cm, and 28-30 cm, with two centimeter bins for length from 31 cm to 50 cm, and a plus group at 51 cm and above.

2003 was the only year with ages available from all three states, and differences by data sources were noted. However, the majority of darkblotched rockfish landings (~70-80%) have been made in Oregon in recent years, and therefore the fact that age data from Oregon have dominated in recent years is appropriate.

A number of new ages (from otoliths read in 2006 and 2007) were available from the cooperative ageing lab for fish caught in the California fishery between 1986 and 1998. These data were not available in PacFIN, as the ager and date-aged columns were empty for age data from California for those years. Although these data were limited to California, they are the only age data available from those years. Rather than use all the years, including those with relatively few samples, only data from the years 1991 and 1998, with around 350 new ages apiece (Table 8), were used in the assessment. The remaining years had half that many new ages or fewer. The compositions (e.g. Figures 9-10 (2006)) and input sample sizes (Table 8) were developed by the same method as described above for the PacFIN data.

2.2. Surveys

NMFS Cruises

The results from four fishery-independent surveys are used in this assessment:

1. The NWFS Triennial Shelf Survey that was conducted every third year from 1980-2004
2. The AFSC Slope Survey for the years 1997 and 1999-2001.
3. The NWFSC Slope Survey for the years 1999-2006.
4. The shelf portion of the NWFSC survey for the years 2003-2006.

Neither the 1977 Triennial Shelf Survey, due to concerns about the first year of the survey's implementation, nor the AFSC Slope Survey "super years", consisting of combined data from multiple years of partial coastal coverage, were used in this assessment. The "POP" survey from 1979 and 1985 was not used as selectivity likely changed between the two years which used separate methods, and the previous solution of mirroring the AFSC Slope Survey was unlikely to produce realistic selectivities for the POP survey. The two years of data were also relatively insignificant given all the other data available.

Indices

Indices of abundance were derived from each of the above surveys and years using a generalized linear mixed model (GLMM) for each survey. (Helser et al., 2004; Table 9). The GLMM models

occurrence of darkblotched rockfish in a survey haul as a binomial process and the size of the non-zero catches with a lognormal model. Coefficients of variation (CVs) about the indices were produced from the GLMM as well. In the last assessment, the GLMM approach was used for the NWFSC and AFSC slope surveys but not for the Triennial Survey (or the POP Survey). In this assessment, the GLMM approach was used for all four surveys, utilizing two latitudinal strata, the combined U.S. Vancouver and Columbia INPFC areas, and the combined Eureka and Monterey INPFC areas. While darkblotched rockfish are occasionally seen in the Conception INPFC area, the numbers there are negligible compared to those further north. Depth ranges were limited to those which were covered in all years of each survey. For three of the four surveys two depth strata were used. For both slope surveys, depth strata of 100-164 fm (183-300 m) and 164-310 fm (300-567 m) were used. For the Triennial Survey, depth strata of 30-100 fm (55-183 m) and 100-200 fm (183-366 m) were used. Since the shelf portion of the NWFSC Survey covers only depths from 30-100 fm (55-183 m), this survey was modeled using a single depth stratum.

Length compositions

Length compositions (Table 6) were derived for each survey, except for the 1999 NWFSC Slope Survey, for which length data were not available and the 2004 Triennial Survey where age compositions, instead of length compositions, were used (Figures 11-26).

Length, age, and sex data were acquired at the tow level, and then aggregated within INPFC areas and depth strata. For each trip, the length composition of the sampled individuals was scaled up to represent the length composition of the trip landings through use of an expansion factor. In this assessment, the expansion factor was calculated as:

$$\text{Expansion Factor} = (WT_{total}/WT_{sampled})$$

with total weight divided by sample weight being the equivalent of total estimated number over sampled number. No down weighting exponent was used, as the survey data are taken at the tow level rather than the trip level. The initial effective N (input N) was calculated via Stewart's Method (Ian Stewart, pers. Comm.), which for surveys is

$$N_{effective} = N_{trips} + 0.0707 N_{fish} \quad \text{if } N_{fish}/N_{trips} < 55$$
$$N_{effective} = 4.89 N_{trips} \quad \text{if } N_{fish}/N_{trips} \geq 55$$

where N_{fish} is the total number of fish sampled across all trips (Table 7C).

Age compositions

The 2004 Triennial Survey age composition is included in this assessment as derived in the 2005 assessment (figures 27-28).

Conditional-age-at length compositions

Conditional age-at-length compositions were constructed from age and length data using the same methods as for survey length compositions. These compositions were constructed for the 2001 AFSC Slope Survey and the 2003-2006 NWFSC Slope and Shelf Surveys (e.g. Figures 29-32) (2006). These years and surveys were used because all of the ages in PacFIN for those years were from otoliths aged between 2004 and 2007, a period in which ageing methods have been invariant, with three agers doing all of the ageing. Double read analysis indicates minimal or no bias between agers and relatively good precision. Total input N for each year was based on

Stewart's method as described above (Table 8). This total input N was spread among the length bins according to the number of fish contributing to data in that bin.

A summary of data sources and years included in the base model is given in Table 10.

2.3. Biology and life history

Natural mortality

In the 2000 and 2003 assessments, M = 0.05 was selected based on fit to the data (Rogers et al. 2000). Lenarz (1993) suggested a range of natural morality estimates (0.025-0.05) based on a maximum age range of 60-105 years, using Hoenig's method. In 2005, indirect estimates of M for darkblotched rockfish from Gunderson et al. (2003) were considered in selecting a value for M. Gunderson estimated M based on a meta-analysis of the relationship of the Gonadosomatic Index or GSI (ovary weight/somatic body weight). This method produced a value of M = 0.107 for darkblotched rockfish with a 95% confidence interval of 0.07-0.14. The 2005 assessment used 0.07 based on balancing the estimates using GSI and Hoenig's method.

However, the correct interval to use when conducting meta-analyses and predicting an unobserved point is a prediction interval, not a confidence interval. The prediction interval for both Hoenig's method and the GSI method are quite large ((0.005 - 0.375) for Hoenig's (using log-log regression), and either (-0.186 - 0.323) (untransformed) or (0.062-0.205) (log-log) for Gunderson's method). In addition, the values of both maximum age and GSI for darkblotched are towards the edge of the data used in constructing the meta-analyses, so assuming a linear relationship in either space is somewhat suspect. Therefore it is hard to define what the correct prediction interval is for either method. However, observation error in the data used in the meta-analysis can cause prediction intervals to be too wide, and therefore the situation may not be quite as dire. In any case, M continues to be a very difficult parameter to pin down. In this assessment, M was not changed from the value used in the last assessment. In so far as this value does balance the point estimates well, there is support for using this value. A profile over M was conducted as part of the sensitivity analysis.

Sex ratio, maturation and fecundity

In this assessment, the sex ratio at birth is assumed to be 1:1. Maturity-at-length for females was based on the work of Nichol (1990) with 50% maturity occurring at 34.5 cm (Figure 33):

$$P_{Mat} = \frac{1}{-e^{(-0.6449L+22.2)}}$$

Fecundity-at-weight was derived by converting Nichol's (1990) fecundity-at-length equation (Figure 34) using his length-weight relationship:

$$Eggs = 14{,}580W + 132{,}500W^2,$$

where W = weight in kg.

Length-weight relationship

The length-weight relationship was estimated by Rogers (2005) using available survey data. Sexes were combined because means did not differ substantially. The equation was fit to mean weight at length from 6374 fish measured in West Coast surveys:

$$W = 0.000021L^{2.96142}$$

where W is weight (kg) and L is fork length (cm). This equation differs slightly from Nichol's (1990) equation, but this difference in the weight-length relationship results in quite minimal changes to the resultant weight and fecundity-at-age estimates.

Length at age

Length at age was estimated within the assessment model. No latitudinal or temporal changes in length at age were assumed, although male and female growth rate and L_{∞} were estimated separately. The CV of length at age was also estimated and allowed to change linearly with mean length at age (Figure 35).

Ageing error

Aging error was derived using the 2005 double reads of otoliths by ager 1, and double reads between agers 4 and 5, who are the current readers of darkblotched rockfish otoliths. The standard deviation in age given the initial age (first reading) for ages 2-75 was estimated using a linear relationship:

SD_{age} =0.138+.07 * initial age (actual std used for ages less than 10)

Actual estimated SDs were used for ages 2-9 because they were based on a large number of fish and varied slightly from the values predicted by the relationship. The standard deviation for ages 0 and 1 were assumed to be one-third and two thirds of that for age 2.

2.4 Changes in data from the 2005 assessment

Changes in data for this assessment included updated landings data for 1980-2004 (minor changes) and new 2005 and 2006 landings data; updated 2003 and 2004 discard rate estimates, and a new 2005 discard rate estimate; new 2005 and 2006 NWFSC Slope Survey data; addition of the 2003-2006 NWFSC Shelf Survey data; and new GLMM estimates for all surveys. Conditional age-at-length data are used for the first time in this assessment from the fishery for 1991, 1998 and 2003-2006; from observer data for 2004 and 2005, from the AFSC Slope Survey for 2001; and from both the shelf and slope portions of the NWFSC Survey for 2003-2006.

Data from the two years of the POP Survey are no longer used in this assessment. Mean weight data from the discard fishery and mean size-at-age data are no longer used as the conditional-age at-length data encompasses the same data sources and provide similar information.

3. Assessment model

3.1 History of Modeling approaches

There have been six previous assessments of darkblotched rockfish off of the U. S. West Coast (Lenarz 1993, Rogers et al. 1996, Rogers et al. 2000, Methot and Rogers 2001, Rogers 2003 and Rogers 2005). These assessments began with life-history based analyses of sustainable catch rates and have progressed to statistical age-based modeling. The first full assessment of the darkblotched rockfish stock was conducted in 2000. That assessment was updated twice in 2001 and 2003. This current assessment represents the third full assessment for this species.

Lenarz (1993) reviewed the available life-history and fishery information on the species. Based on Hoenig's (1983) method and a maximum age of 60-105 years, the rate of natural mortality was estimated to be between 0.025 and 0.05. From these values, the target fishing mortality rate ($F_{35\%}$) was estimated to be between 0.04 and 0.06, and the overfishing level ($F_{20\%}$) was estimated to be between 0.07 and 0.11. ABC was not estimated. All of the length frequency data available at that time indicated that average size had decreased from 1983 to 1993 which was consistent with estimated fishing impacts.

Rogers et al. (1996) considered 13 commercially-important rockfish species using an F = M approach, modified in an attempt to derive ABC's given the target fishing mortality of $F_{35\%}$. The AFSC Shelf Survey biomass index was averaged over 1980-1995 for several species, and a proxy adjustment factor was developed based on the ABC's from available stock assessments for West Coast rockfish and the particulars of each species. For darkblotched rockfish the proxy was 0.8. The ABC was determined assuming natural mortality rate of 0.05. Darkblotched rockfish was the only species that was also assessed using a simple stock synthesis model (Methot 1990), primarily to confirm the F = M approach. That two-sex model covered the period from 1980-1995, and included two indices: the Triennial Shelf Survey and a Pacific ocean perch bycatch effort index, as well as length and age composition data from the survey and fishery. The model was structured to have northern and southern fisheries, and the population was assumed to be in equilibrium in 1979, with a previous equilibrium catch of 300 mt. The model produced estimates of age-one recruitment for 1980-1993, dome-shaped selectivity for the Shelf Survey and southern fishery asymptotic selectivity for the northern fishery and bycatch index with catchability for the Shelf Survey fixed at 1.0. The $F_{35\%}$ fishing mortality rate was estimated to be 0.04 for the northern fishery and 0.02 for the southern fishery.

Rogers et al. 2000 expanded the 1996 model to provide the first full assessment of the darkblotched rockfish stock. The model covered the period from 1963 to 1999, with an equilibrium catch of 200 mt. Five abundance indices were used: the AFSC Slope Survey, POP Survey (Wilkins and Golden 1983) and a commercial trawl fishery logbook CPUE index (Ralston 1999) were added to the AFSC shelf and POP bycatch indices used in the 1996 assessment. Length composition data included all years of the slope, shelf, and POP surveys. A single fishery was assumed and discard was included only in a sensitivity run, because it complicated the model without substantially changing the results. Fishery selectivity was assumed to be asymptotic, but survey selectivity was allowed to be dome-shaped. Age-one recruitments were estimated for 1963-1998, with the 1999 recruitment fixed at an assumed value.

Two models were presented in the 2000 assessment: a STAT team model and a STAR panel model. Both models had similar results, but their assumptions were quite different. The STAT model included subjective weights on the log-likelihood components and informative prior

distributions on some of the fitted parameters and assumed a Beverton-Holt type stock-recruitment relationship. The STAR panel model assumed all weights on the likelihood components were either 1 or 0, assumed no prior knowledge about the fitted parameters, and placed no bounds on the estimated recruitments. The logbook and bycatch indices were considered less reliable than the other indices, and the STAT model considered the Shelf Survey more reliable than the slope or POP surveys. The STAT model estimated similarly dome-shaped selectivities for all three surveys. The steepness parameter prior had a mean = 0.8, with CV of 0.1, and the estimated value was 0.83.

Uncertainty in the 2000 assessment was expressed both through choice of the two models and through assumptions regarding the amount of foreign catch of darkblotched rockfish relative to that estimated for Pacific ocean perch. The target fishing mortality ($F_{50\%}$), was about 0.032, regardless of model or foreign catch assumption. Given the range of foreign catch, spawning depletion in 1999 was estimated to be between 0.17 and 0.28 in the STAT model, and 0.13 and 0.26 in the STAR model. The projected ABC yields averaged over the years 2000-2002 ranged from 272 mt to 330 mt, given uncertainty in both the model and the amount of foreign catch.

In the 2001 update selectivities and survey catchabilities were fixed at the values estimated in the 2000 assessment. Only the age-one recruitments were re-estimated, with 2000 and 2001 recruitments fixed at an assumed level. The fishing mortality rate at $F_{50\%}$ was estimated to be 0.032, the spawning depletion at the beginning of 2002 was 14%, and the 2002 ABC was 187 mt.

The 2003 assessment was a comprehensive update of the 2000 assessment: the data were extended though 2002 and all the fitted parameters were estimated, but the model structure and values assumed for fixed parameters were not changed. Newly available age compositions were not included in the model because they were not compatible with the growth curve and the aging error parameters that were fixed in the 2000 model. (See the data section in this document for more information). Management-related discard was added to the 2001 and 2002 landings, using rates assumed by the Pacific Fishery Management Council (16% in 2001 and 20% in 2002. Revised foreign catch estimates for 1966-1976 were taken from Rogers (2003). The estimated fishing mortality rate at $F_{50\%}$ was 0.032, the spawning depletion was 11% in 2004, and the 2004 ABC was 240 mt.

The 2005 assessment (Rogers, 2005) used Stock Synthesis 2 (SS2 v1.) and a Beverton-Holt stock recruitment relationship was assumed. The landings history was extended back to 1928, with the 1927 population assumed to be in unfished equilibrium. The AFSC slope and POP surveys were assumed to have the same length selectivity in order to be able to include length data from the AFSC Slope Survey for 1985. Only age compositions based upon ages read in 2004 were included in the model due to the difficulty of age assignment of darkblotched rockfish and the variability in ages by readers over time. Discard data for 1986 and 2000-2004 were added and discard rates and retention curves were estimated within the model. The AFSC Slope Survey indices were re-estimated using a GLM model, and the NWFSC Slope Survey index (1999-2004) and length compositions (2000-2004) were added to the model. Also, elements of the growth curve were estimated within the assessment model. All of these features are carried forward into the current assessment model, except that the POP Survey is no longer used and age and conditional age-at-length data are based upon age reading conducted during the years 2004-2007.

3.2 Current Model

Model

This assessment uses SS2 version 2.00 f , released by Dr. Richard Methot on June 20, 2007. The parameters, both those that were estimated and those that were fixed, for the base model are given in Table 11.

Length and age bins

The length frequency bins were the same as in the 2005 assessment. The first bin contained all fish less than 7 cm, followed 1 cm length bins up to 32 cm, and then 2 cm bins from 33-34 cm to 49-50 cm, and a maximum bin of all fish ≥ 51cm in length.

As there are relatively few old fish in recent survey and fishery data, the number of age bins was reduced in this assessment, with single year bins from 0 to 29 and a plus group at 30 years of age and older. This is a reduction from the previous plus group at 44 years of age. However, given the uncertainty in the ageing seen both in double reads and in bomb-radiocarbon validation work using darkblotched rockfish with estimated ages in the 30s and 40s (Figure 36), it is unlikely that substantial information has been lost.

Growth

Growth parameters were estimated within the model, including the size at age 1.7, the size at age 29, the von Bertalanffy growth rate parameter (K) and the CV of length at age 1.7. Exponential offsets were also estimated for the CV at age 29, for male size at age 29 and for von Bertalanffy K. Table 12 gives the estimates of these values for the current model and those arrived at in the previous two assessments.

Recruitment, stock-recruitment steepness and natural mortality

R_0 is estimated in the model, along with recruitment deviations from 1975 through 2005, with σ_r = 0.8. Natural mortality is set at 0.07 which is the value used in the 2005 assessment and which balances the estimates from various meta-analyses. The model is able to estimate both natural mortality (M) and stock recruitment steepness (h) independently or together. However, some caution should be exercised in accepting these values, especially that for steepness. In the previous assessment, steepness was estimated to be 1, so it was set in the final model at 0.95. The current assessment estimates h to be 0.35 when both h and M are estimated within the model (M estimated at 0.098) and 0.595 when M is set at 0.07. This latter steepness value is within the range of steepness estimated (0.55-0.65) in the 2003, 2005 and 2007 assessments of Pacific ocean, which is a related species. In the base model, therefore, h is set at 0.6 and M at 0.07. There is one extra caveat in dealing with steepness in this model, in that the spawning output is assumed to be quadratic function of individual female weight (or biomass), so the interpretation of steepness is somewhat different than in other assessments which assume a linear function.

Selectivity and Retention

In initial runs, all 6 parameters of the double normal selectivity function were estimated for the fishery and each survey, along with the inflection point and slope of the logistic retention function. Various blocking schemes on fishery selectivity were tested in an effort to account for

changes in depth of fishing and codend mesh size. However, these blocks resulted either in unrealistic selectivity patterns, due to the sparseness or vagaries of the data, or almost no change at all. Therefore a single selectivity pattern was assumed for all years of the fishery. Retention was blocked to reflect changes in recent years. The length at the inflection point was allowed to change in 2000 and the asymptotic retention was allowed to change in both 2000 and 2003.

Although fishery selectivity was initially allowed to be domed shaped, in practice it was asymptotic in these initial runs. Similarly, the NWFSC Slope Survey was essentially asymptotic, with only the last length showing a drop in selectivity. However under certain combinations of h and M, fishery selectivity was estimated to be noticeably domed shape whereas the NWFSC Slope Survey remains asymptotic except for the last bin. While a hypothesis could be constructed to explain a pattern such as this, it seems counterintuitive that the survey would be less domed shape than the fishery. To avoid this issue, in all final runs for both the fishery and the NWFSC Slope Survey selectivities were forced to be asymptotic, while the others are allowed to be domed shaped (Figures 37-42). The pattern of retention changed in recent years due to regulations (Table 1; Figure 38). Modeled and observed discards are shown in Figures 43-45.

Weighting

Iterative re-weighting was applied to the base model, and the sensitivities used the same final weights as the base model. Length, age, and conditional age-at-length composition data were downweighted when necessary but not upweighted. The recruitment deviation RMSE was close to the input value (0.77 vs. 0.8) and was not reweighted. Similarly, since the RMSE for each of the surveys was no more than 1.13 times the input CV (NWFSC slope), and in two cases far less than the input CV (AFSC slope and NWFSC shelf – both with only 4 points), these were not reweighted either.

Likelihood contributions

The objective function, which was minimized to obtain the point estimates of the model parameters, included contributions by the data (survey biomass indices, fishery and survey length, age and conditional age-at-length composition data) and well as priors (essentially non-informative except for the prior on h in sensitivity runs which is that provided by Dorn's recent meta-analysis).

4. Results

4.1. Reference model results

Figures 46-50 show the time trajectories of the estimates of summary biomass, fishery exploitation rate, recruitment, and depletion in spawning output (see Tables 13-14 as well). The fit to the stock-recruitment relationship (Figure 48) indicates a substantial amount of variability. The exploitation rate first peaked at around 9-13% in 1966-1968 due to fishing by foreign fleets. The maximum exploitation rate of around 15% was attained in both 1987 and 1998, averaging around 11% in the intervening years. The fishing mortality rate has been less than 3% over the past 5 years, and less than 1.3 % in 2005 and 2006. Figures 51 and 52 provide a comparison of the time trajectories of spawning biomass, depletion and summary (1+) biomass for the current and the 2005 assessments.

The fits of the base model to the various indices are summarized in Figures 53-54 (survey biomass indices), and Figures 3-8 and 11-28 (composition data). The estimated growth parameters are given in Table 12.

While many other specifications have similar overall likelihoods, the base model appears to fit the overall pattern of the Triennial Survey index (Figure 53) better and that of the NWFSC Slope Survey indices as well as those other specifications. This does not necessarily show up in the likelihoods, as the issue is the strength of patterns of residuals in fits to the two long time series. Both of these series have anomalous low 2001 indices (Figures 53 and 54).

The major quantities and likelihoods from the assessment are given in Table 15. Values for the original, pre-reweighting run is given there as well ("Norewt").

4.2. Retrospective analysis

Retrospective analyses were conducted as if the assessment were carried out in the years from 2002 to 2006. (without the last 1-5 years of data). Estimates (or projections) of depletion in 2007 from these analyses range from 13.7% to 29.2% (Table 15). No consistent retrospective pattern was seen (Figure 55).

4.3 Sensitivity Analysis and profiles

One strict sensitivity run was done for the final model (Table 15):

1) "Fec=WT" Fecundity is set to female spawner biomass as is done in most West Coast groundfish assessments.

A number of profiles over natural mortality and steepness were performed as well (Tables 16-19):

1) h = 0.3, 0.4, 0.5, 0.7, 0.8 and 0.95 (this last as in 2005 model).
2) M = 0.04, 0.05, 0.06, 0.08, 0.09, 0.10.
3) h estimated within the model (using Dorn's prior for steepness).
4) h and M both estimated within the model (using Dorn's prior).
5) h fixed at 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9; M estimated.
6) M fixed at 0.04, 0.05, 0.06, 0.08, 0.09, 0.10; h estimated (using Dorn's prior).

The results from profiling over h with M estimated or over M with h estimated, and estimating both h and M, indicate that the likelihood surface is relatively flat and that a variety of combinations of steepness and natural mortality fit the data relatively well. The profiles show the conflict between the Triennial Survey, which favors somewhat lower values for M or h (i.e. productivity) and the rest of the likelihood, which favors somewhat higher M or h.

5. STAR panel summary

Several requests were made during the STAR panel (July 16-20) to check the input data or model, to make changes to the data or model, and to conduct sensitivity analyses

Checks:

A. Compare absolute scale and trends of GLMM and area swept biomass indices. The GLMM indices had similar trends but were at different scales than the area swept indices. However, differences in scale are absorbed into the catchability parameters.
B. Compare GLMM indices. They had consistent trends.
C. Compare number of trips/hauls, number of fish, and input Ns.
D. Compare input and output effective Ns for last iteration. This showed adequate tuning for length frequencies.
E. Tabulate the standard deviation of standardized residuals for each time series. These showed adequate tuning.
F. Compare age data across states. These did not show contrary trends, so any issues with unbalanced and changing sampling over time would not greatly affect the assessment.
G. Perform likelihood profiles over R0. This showed some tension between data sets, and also that the use of continuous F rather than Pope's equation for F resulted in estimating the catch (request J).
H. Conduct sensitivity runs across σ_r to see if starting point matters. For the range 0.6 to 1.0, output regresses towards 0.8. for input of 1.5, expands to 1.7. Appears to be stable within a reasonable range of σ_r.
I. Sensitivity with no fishery conditional age-at-length data. This resulted in a much lower depletion level in 2007 (13% vs. 23%).
J. See G.
K. See (2) below.
L. see D.
M. see E,F.
N. Recalculate input N values for conditional age-at-length data (see 3. below).

Q. Plot raw catches within strata for Triennial Survey to compare spatial distribution across years. Data was very noisy but no clear pattern to indicate shift in population.

Requested Changes:

1. Use Pope's equation for F, rather than continuous F. This changed the likelihoods a little bit, but not the overall result. (Request J. above).
2. Use expanded length bins for fishery conditional age-at-length data. Instead of using 1-cm bins for fish through 32 cm, used 5 cm down to 2 cm bins to account for growth throughout the year. (request K. above)
3. Use effective N from Stewart's formula for entire composition for a single year and fleet for conditional age-at-length data, and rescale number of fish in each length bin to get input N's for each length bin. This avoids counting each trip again in each length bin.
4. Use Dorn's prior for h to find steepness for this species. The STAR panel preferred to use the median value of the prior (h = 0.5) while I chose to have the model calculate steepness using the prior (h = 0.6) (see Table 17 for comparison).

Sensitivities:

O. Run four sensitivities with high and low h and M to see range of uncertainty. The resulting range of depletion was 4% to 50%.
P. Do retrospective analysis to look for retrospective patterns. None were found.

6. Future research

Future research needs include:

- A thorough review of species composition in historical rockfish landings and a tabulation of estimated landings by species to be used in assessments.

- Investigation into the best available methods and data for constructing and using conditional age at length compositions from data taken across space and time within years.

- A thorough investigation of historical darkblotched rockfish mortality in the shrimp fishery.

- Mapping of “trawlable” and “untrawlable” habitat and construction of a prior on survey q.

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Table 1. Recent management regulations affecting darkblotched rockfish landings.

Area	Year	Period	Bimonthly Landings (lbs)	RCA Depth (fm)		Small footrope required
				min	max	
N of 40° 10’	2000	Jan-June	3000			for shelf rockfish
		Jul-Oct	5000			for shelf rockfish
		Nov-Dec	3000			for shelf rockfish
	2001	Jan-Jun	1500			for shelf rockfish
		Jul-Oct1	2000			for shelf rockfish
		Oct2-Dec	0			for shelf rockfish
	2002	Jan-Aug	1800			
		Sep	600	0	250	
		Oct	600	100	250	shoreward of RCA
		Nov-Dec	1800	100	250	shoreward of RCA
	2003	Jan-Dec	1800	0-100	200-250	shoreward of RCA
	2004	Jan-Apr	4000	60-75	200	shoreward of RCA
		May-Sep	8000	60-75	150	shoreward of RCA
		Oct	8000	0	250	shoreward of RCA
		Nov-Dec	1800	0	250	shoreward of RCA
	2005	Jan-Feb	4000	75	200	shoreward of RCA
		Mar-Oct	4000	100	200	shoreward of RCA
		Nov-Dec	4000	75	200	shoreward of RCA
	2006	Jan-Feb	4000	75	200	shoreward of RCA
		Mar-Oct	4000	100	200	shoreward of RCA
		Nov-Dec	4000	75	200	shoreward of RCA
S of 40° 10’	2000	Jan-Jun	3000			
		Jul-Aug	7000			
		Sep-Dec	20000			
	2001	Jan-Jun	14000			
		Jul-Dec	25000			
40° 10’ to 36°	2002	Jan-Apr	50000			
		May-Aug	5000			
		Sep	600	0	250	
		Oct	600			
		Nov-Dec	1800			
40 °10’ to 38°	2003	Jan-Dec	1800	0-60	200-250	shoreward of RCA
	2004	Jan-Apr	7000	75	150	shoreward of RCA
		May-Sep	50000	75-100	150	shoreward of RCA
		Oct	50000	75	150	shoreward of RCA
		Nov-Dec	10000	0	200	shoreward of RCA
	2005	Jan-Feb	4000	75	200	shoreward of RCA
		Mar-Oct	4000	100	200	shoreward of RCA
		Nov-Dec	4000	75	200	shoreward of RCA
	2006	Jan-Feb	4000	75	200	shoreward of RCA
		Mar-Oct	4000	100	200	shoreward of RCA
		Nov-Dec	4000	75	200	shoreward of RCA

Table 2. Management performance (Bold indicates overfishing).

Year	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*
ABC	256	256	256	256	302-349	187	205	240	269	294
OY					130	168	172	240	269	200
Landings(mt)	824	944	362	262	173	113	80	189	105	113
Modeled Discards(mt)	36	63	31	168	110	71	29	65	34	36
Estimated Catch (mt)	**860**	**1007**	**393**	**430**	283	184	109	**254**	139	149

Table 3. Input discard rates used in the assessment.

Year	Discard %	CV
1986	5	0.3
2000	32	0.2
2001	41	0.2
2002	47	0.1
2003	33	0.1
2004	21	0.1
2005	24	0.1

Table 4. Estimates of darkblotched rockfish landings from 1928-1977 for domestic and foreign fleets (Rogers 2005).

Year	California	Oregon	Washington	Foreign	Total
1928	1	0	0		1
1929	2	0	0		3
1930	2	0	0		3
1931	1	0	0		1
1932	1	0	0		1
1933	1	0	0		1
1934	1	0	0		2
1935	2	0	0		2
1936	2	0	0		2
1937	1	1	0		2
1938	5	1	0		5
1939	7	0	0		7
1940	5	2	0		8
1941	4	5	0		9
1942	2	7	0		10
1943	12	26	0		39
1944	48	43	0		91
1945	101	133	2		236
1946	76	83	1		160
1947	48	52	1		100
1948	122	35	3		160
1949	98	72	1		171
1950	119	80	2		201
1951	158	101	2		261
1952	86	107	2		195
1953	106	86	2		194
1954	99	100	2		201
1955	95	100	2		197
1956	102	136	7		244
1957	130	135	4		269
1958	126	114	6		246
1959	108	130	5		243
1960	100	151	7		258
1961	53	142	8		203
1962	55	213	7		276
1963	107	208	8		323
1964	50	150	8		208
1965	67	340	8		415
1966	55	259	8	3807	4129
1967	45	242	8	2706	3001
1968	55	7	8	2288	2358
1969	65	27	11	153	256
1970	77	33	6	149	265
1971	91	63	9	278	441
1972	111	107	3	374	595
1973	1	58	9	768	836
1974	253	110	24	346	733
1975	66	99	109	293	567
1976	136	248	72	118	574
1977	120	98	45		263

Table 5. Estimated landings for 1978-2006. State values from PacFIN (extracted June14, 2007) except for 1978-1980 California from CalCom, and 1978-1982 Oregon and 1978-1980 Washington from Tagart (1985 and pers. comm.). At-Sea Hake "landings" (including discards) from Vanessa Tuttle, At-Sea Hake Observer Program (pers. comm.) for 1991-2006, and extended back to 1981 using a ratio estimator from years with data.

Year	California	Oregon	Washington	Other	At Sea Hake	Total
1978	78	163	189	0	-	410
1979	159	752	81	0	-	992
1980	164	244	98	0	-	557
1981	522	352	37	0	46	957
1982	170	920	24	0	3	1116
1983	510	407	22	0	0	940
1984	596	585	82	0	11	1274
1985	802	838	111	0	36	1787
1986	417	623	215	0	10	1265
1987	1647	686	68	0	19	2420
1988	750	789	108	0	8	1655
1989	441	737	91	0	6	1275
1990	870	764	16	0	0	1651
1991	333	776	54	0	45	1208
1992	187	451	20	0	29	687
1993	285	892	9	0	8	1194
1994	292	549	9	0	15	864
1995	367	339	28	0	49	783
1996	408	296	19	0	6	730
1997	452	346	22	0	4	824
1998	498	413	20	0	14	944
1999	113	228	10	0	11	362
2000	114	132	9	0	8	262
2001	87	66	8	0	12	173
2002	51	52	7	0	3	113
2003	12	62	2	0	4	80
2004	39	136	7	0	7	189
2005	18	68	1	7	11	105
2006	24	72	2	5	11	113

Table 6. Percentage of annual fishery and survey length samples in each length bin.

Year	Fleet	Sex	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1977	Fish	F	0.0	0.0	0.0	0.0	0.0	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	2.3
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	1.3
1978	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1981	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1982	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		M	0.0	0.0	0.0	0.0	0.0	0.0	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
1983	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
1984	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
1985	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1986	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	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
		M	0.0	0.0	0.0	0.0	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	0.0
1987	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1988	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	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
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1989	Fish	F	0.0	0.0	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	0.0	0.0	0.0	0.0
		M	0.0	0.0	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	0.0	0.0	0.0	0.0
1990	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.4
		M	0.0	0.0	0.0	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	0.0	0.0	0.5
1992	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
1993	Fish	F	0.0	0.0	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	0.1	0.1	0.1	0.5
		M	0.0	0.0	0.0	0.0	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	0.0	0.1
1994	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	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
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
1995	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1996	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
1997	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
		M	0.0	0.0	0.0	0.0	0.0	0.0	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
1998	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.4
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.4
1999	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.7
		M	0.0	0.0	0.0	0.0	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	0.5	0.9
2000	Fish	F	0.0	0.0	0.0	0.0	0.0	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	0.1
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.6
2001	Fish	F	0.0	0.0	0.0	0.0	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	0.0	0.1
		M	0.0	0.0	0.0	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	0.0	0.0	0.1
2002	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.5
		M	0.0	0.0	0.0	0.0	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	0.3	0.4
2003	Fish	F	0.0	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	0.1	0.0	0.2	0.1	0.6
		M	0.0	0.0	0.0	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	0.2	0.3	0.3
2004	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
		M	0.0	0.0	0.0	0.0	0.0	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	0.1
2006	Fish	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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 6(cont.) Percentage of fishery and survey length samples in each length bin.

Year	Fleet	Sex	25	26	27	28	29	30	31	32	33	35	37	39	41	43	45	47	49	51
1977	Fish	F	1.6	3.0	7.9	6.6	7.2	8.2	4.6	4.6	7.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		M	1.6	3.3	6.3	7.9	8.6	4.9	3.6	3.3	2.0	0.0	0.0	0.3	0.0	0.0	0.0	0.3	0.0	0.0
1978	Fish	F	1.0	1.5	2.5	4.0	4.5	6.0	6.5	9.0	12.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		M	0.0	2.0	4.0	5.5	8.0	14.5	6.5	5.0	5.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1981	Fish	F	0.9	0.0	0.1	1.0	0.0	1.7	1.0	0.2	0.4	3.0	7.9	16.4	20.1	7.8	4.5	0.7	0.0	0.0
		M	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.4	0.7	4.7	18.4	8.7	0.9	0.0	0.0	0.0	0.0	0.0
1982	Fish	F	0.1	0.0	0.6	0.7	1.0	0.7	1.9	3.6	3.6	9.7	10.6	15.1	10.7	5.0	1.7	0.3	1.8	0.4
		M	0.5	0.3	0.2	0.6	0.4	1.1	0.9	1.6	4.9	12.6	6.5	1.6	0.4	0.5	0.1	0.1	0.1	0.0
1983	Fish	F	0.1	0.2	0.2	0.3	0.2	0.6	0.7	0.5	2.5	4.3	12.9	10.7	15.9	6.6	3.4	0.6	0.5	0.2
		M	0.0	0.1	0.1	0.1	0.5	0.5	1.1	1.3	4.8	10.8	11.4	6.3	1.8	0.1	0.2	0.0	0.2	0.2
1984	Fish	F	0.0	0.1	0.1	0.7	1.2	1.2	0.8	1.9	3.2	6.3	11.8	10.0	10.7	8.2	3.6	0.8	0.2	0.0
		M	0.2	0.1	0.1	0.3	0.9	0.8	0.8	1.7	6.5	12.4	8.7	5.6	0.6	0.1	0.1	0.0	0.0	0.0
1985	Fish	F	0.1	0.1	0.5	0.4	0.7	1.8	2.4	3.5	5.7	7.0	7.9	8.5	7.1	4.2	2.9	0.3	0.1	0.0
		M	0.2	0.2	0.6	0.4	1.4	1.6	2.4	4.1	8.5	12.0	8.0	4.2	1.8	0.6	0.2	0.1	0.1	0.0
1986	Fish	F	0.0	0.1	0.2	0.2	0.7	1.2	1.6	4.6	12.3	8.2	9.8	8.6	7.5	2.8	1.2	0.2	0.0	0.0
		M	0.0	0.2	0.3	0.5	0.8	1.7	2.7	3.6	8.9	11.4	7.2	2.5	0.4	0.0	0.0	0.0	0.0	0.0
1987	Fish	F	0.1	0.0	0.0	0.0	0.2	0.4	0.7	1.7	7.1	12.0	13.0	8.3	3.8	1.3	0.1	0.1	0.0	0.0
		M	0.0	0.0	0.0	0.2	0.4	1.3	1.8	4.5	13.8	17.0	9.3	2.0	0.4	0.2	0.0	0.1	0.0	0.0
1988	Fish	F	0.0	0.2	0.2	0.1	0.4	0.2	0.3	1.1	9.0	13.1	10.8	11.4	4.9	1.1	0.3	0.2	0.0	0.0
		M	0.1	0.1	0.2	0.1	0.3	0.7	0.8	3.4	11.6	16.1	9.5	3.0	0.5	0.0	0.0	0.0	0.0	0.0
1989	Fish	F	0.1	0.4	0.6	0.8	1.1	0.6	2.0	2.1	6.8	15.2	7.0	7.1	4.0	2.5	1.1	0.0	0.0	0.0
		M	0.1	0.6	0.8	0.4	0.7	1.5	1.4	3.9	15.0	15.3	5.7	2.4	0.4	0.0	0.0	0.0	0.0	0.0
1990	Fish	F	0.0	0.4	0.7	1.2	0.5	1.0	1.8	2.7	6.6	7.9	10.2	8.2	4.8	5.2	2.2	0.7	0.5	0.0
		M	0.0	0.2	0.1	0.4	1.3	2.2	2.1	2.7	11.5	11.4	7.2	4.6	1.5	0.2	0.0	0.0	0.0	0.0
1991	Fish	F	1.2	0.9	0.6	0.9	1.3	1.0	2.0	1.5	3.7	7.7	9.3	10.1	7.2	9.3	3.9	1.4	0.1	0.0
		M	0.4	1.1	0.9	0.6	1.0	1.0	0.7	1.5	7.4	10.4	5.7	4.1	0.9	0.4	0.0	0.0	0.0	0.0
1992	Fish	F	0.0	0.5	0.2	0.3	1.0	0.7	2.2	3.0	4.4	7.5	9.8	12.4	8.1	5.8	1.4	0.2	0.0	0.0
		M	0.0	0.0	0.1	1.3	1.0	2.6	0.9	2.1	5.5	12.3	10.5	4.6	0.7	0.3	0.0	0.3	0.0	0.0
1993	Fish	F	0.2	0.0	0.4	0.9	1.2	1.9	3.2	2.5	3.5	8.5	8.7	5.8	3.6	1.0	0.7	0.3	0.1	0.0
		M	0.1	0.2	0.1	2.6	1.1	3.1	3.3	3.5	13.4	16.8	7.7	2.6	1.4	0.3	0.0	0.0	0.0	0.0
1994	Fish	F	0.2	0.0	0.0	0.4	0.4	1.6	1.7	3.1	6.9	8.3	7.2	9.5	5.7	4.5	1.7	0.4	0.0	0.0
		M	0.0	0.1	0.0	0.3	0.5	1.9	1.8	4.4	11.7	11.6	9.5	4.8	0.9	0.1	0.0	0.2	0.0	0.0
1995	Fish	F	0.1	0.4	0.0	0.0	0.3	0.4	1.5	3.0	6.7	8.7	11.1	9.0	8.9	4.3	1.2	0.2	0.0	0.0
		M	0.0	0.3	0.1	0.3	0.3	0.6	3.9	5.6	10.1	13.7	6.4	1.8	0.4	0.0	0.2	0.0	0.0	0.0
1996	Fish	F	0.2	0.3	0.4	0.8	0.5	1.0	1.1	1.5	6.8	7.2	7.8	7.2	5.9	3.3	1.9	0.5	0.1	0.0
		M	0.2	0.4	0.4	0.6	0.8	1.9	3.8	6.3	14.6	15.6	5.2	2.2	0.6	0.2	0.1	0.1	0.1	0.0
1997	Fish	F	0.5	0.8	0.4	1.1	1.4	2.0	1.7	3.5	6.3	7.5	7.2	7.6	6.2	3.6	2.8	0.4	0.2	0.0
		M	0.3	0.8	0.4	0.8	1.7	3.2	3.0	5.1	10.5	10.9	5.4	2.9	0.9	0.3	0.1	0.0	0.0	0.0
1998	Fish	F	0.5	0.6	1.1	1.3	1.5	1.1	2.2	2.0	6.0	6.7	9.6	7.3	7.3	5.0	1.7	0.4	0.0	0.0
		M	0.7	1.7	1.4	1.6	1.4	1.7	1.8	3.2	11.3	9.6	5.7	2.6	0.9	0.1	0.0	0.2	0.1	0.0
1999	Fish	F	1.8	3.2	4.0	3.7	3.3	4.2	2.0	1.8	4.0	7.6	7.7	4.3	3.1	2.1	1.3	0.4	0.1	0.0
		M	1.6	4.3	2.7	3.4	3.1	3.2	2.5	2.4	7.0	6.4	3.5	2.1	0.3	0.0	0.0	0.0	0.0	0.0
2000	Fish	F	0.6	1.1	1.5	4.5	4.2	4.1	4.4	5.0	4.9	4.5	5.0	5.5	4.9	2.6	1.5	0.2	0.0	0.0
		M	0.1	1.8	2.1	3.9	5.1	5.1	2.6	3.9	6.9	6.0	4.0	2.0	0.5	0.1	0.1	0.0	0.0	0.0
2001	Fish	F	0.4	0.7	0.9	2.3	2.1	5.2	6.6	7.0	9.3	5.1	2.9	3.0	1.8	1.5	1.1	0.4	0.0	0.0
		M	0.2	0.5	1.4	3.2	4.0	6.7	7.4	6.8	7.6	5.6	2.7	1.8	0.7	0.2	0.1	0.1	0.0	0.0
2002	Fish	F	0.4	0.5	0.6	1.1	1.0	1.8	2.6	4.3	12.4	7.0	4.5	4.4	5.6	5.7	1.6	0.6	0.1	0.0
		M	0.4	0.6	0.9	1.3	1.8	2.8	4.8	6.6	10.0	9.9	2.6	1.5	0.5	0.0	0.0	0.0	0.0	0.0
2003	Fish	F	0.2	0.2	0.5	0.6	0.5	0.8	1.0	1.1	8.7	13.4	9.0	6.0	4.7	4.5	2.0	0.5	0.2	0.0
		M	0.2	0.2	0.5	1.1	1.0	1.5	2.0	4.1	14.3	9.7	6.2	1.7	0.8	0.3	0.3	0.0	0.0	0.0
2004	Fish	F	0.1	0.6	0.7	0.8	1.5	1.6	1.8	2.7	4.5	8.8	6.1	7.6	7.1	3.5	2.2	1.1	0.1	0.1
		M	0.5	0.2	0.8	1.1	2.5	3.1	4.6	4.1	12.8	11.1	5.7	1.8	0.4	0.2	0.1	0.0	0.0	0.0
2005	Fish	F	0.2	0.4	0.8	1.1	1.6	2.5	3.4	4.7	7.7	8.8	9.4	6.3	4.1	2.1	0.6	0.5	0.1	0.1
		M	0.2	0.6	1.2	1.3	1.5	3.9	5.2	4.6	10.3	9.9	4.1	1.9	0.5	0.1	0.0	0.0	0.0	0.0
2006	Fish	F	0.1	0.1	0.3	0.7	0.3	1.8	3.2	6.9	9.2	6.8	8.4	4.6	3.1	2.4	1.0	0.2	0.0	0.1
		M	0.1	0.1	0.1	1.0	1.3	3.5	6.8	6.2	14.1	10.0	5.2	2.1	0.3	0.2	0.1	0.0	0.0	0.0

Table 6. (cont) Percentage of fishery and survey length samples in each length bin.

Year	Fleet	Sex	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1986	Disc		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	0.6	0.7	1.5	1.0	1.3	2.2	2.6	6.7	9.8
2002	Disc		0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.6	0.5	0.4	0.3	1.2	1.4	0.6	0.9	0.9	0.9	1.9	2.4
2003	Disc		0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.9	0.6	1.0	0.2	0.4	0.9	1.8	0.2	0.2	0.5	2.7	3.7
2004	Disc		0.0	0.1	0.0	0.0	0.0	0.4	0.8	1.4	1.5	1.2	1.3	3.3	3.5	2.0	1.6	1.3	2.3	0.9	0.3
2005	Disc		0.0	0.1	0.0	0.2	0.0	0.5	0.8	2.2	2.8	1.5	1.8	3.7	5.4	2.9	1.4	1.3	2.1	1.6	1.1
2006	Disc		0.0	0.0	0.0	0.1	0.0	0.2	1.6	1.1	1.1	1.4	1.2	3.1	5.5	4.1	3.2	7.4	6.1	3.9	2.1
1980	Tri	F	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.0	0.1	0.2	0.4	0.6	1.4	0.1	0.7	0.8	1.0	3.1
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.3	0.2	0.8	0.9	1.5	0.7	0.6	0.6	0.8	0.7
1983	Tri	F	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.2	0.4	2.1	3.8	2.2	2.9	3.1	4.4	4.0	3.5
		M	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.4	0.2	0.2	0.6	2.1	3.2	3.2	2.6	3.8	6.6	5.5	4.0
1986	Tri	F	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.4	1.3	0.9	0.6	0.3	0.8	1.7	1.5	0.7	0.6	1.1	1.7
		M	0.1	0.0	0.0	0.0	0.1	0.0	0.3	0.5	1.0	0.8	0.5	0.3	0.3	1.1	1.6	0.7	0.6	1.5	1.5
1989	Tri	F	0.0	0.0	0.0	0.0	0.0	0.1	0.6	3.8	6.6	2.9	0.5	1.5	3.3	6.2	3.2	3.7	1.4	2.0	2.1
		M	0.0	0.0	0.0	0.1	0.0	0.2	0.8	3.8	6.5	4.5	0.8	1.4	4.2	5.7	3.3	2.5	1.6	1.8	1.3
1992	Tri	F	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.2	0.4	0.1	0.0	0.2	1.9	4.0	2.5	0.6	1.1	1.6
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.5	0.3	0.1	0.4	1.8	2.9	2.9	1.1	0.7	3.1
1995	Tri	F	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.8	2.3	1.2	0.2	0.1	0.6	1.3	0.9	0.9	1.0	2.6	4.5
		M	0.0	0.0	0.0	0.0	0.0	0.1	0.3	1.1	2.4	1.2	0.2	0.2	0.5	1.1	2.0	1.2	1.1	2.9	4.7
1998	Tri	F	0.0	0.0	0.0	0.0	0.0	0.2	0.9	0.8	0.3	0.1	0.7	1.2	0.8	1.6	2.5	4.7	7.7	8.2	3.6
		M	0.0	0.0	0.0	0.0	0.0	0.7	1.3	1.1	0.1	0.2	0.6	1.4	1.1	1.1	3.3	5.4	8.2	7.5	5.3
2001	Tri	F	0.0	0.0	0.1	0.2	0.1	0.2	1.4	3.6	2.3	0.6	0.3	1.2	3.9	8.7	8.4	2.3	0.2	0.4	0.4
		M	0.0	0.0	0.1	0.2	0.0	0.2	1.1	3.1	2.0	0.8	0.3	1.1	4.2	7.7	7.6	2.8	0.4	0.2	0.5
2004	Tri	F	0.0	0.1	0.0	0.0	0.0	0.1	0.8	1.3	1.4	0.2	0.2	0.3	0.7	0.8	0.3	0.3	0.6	1.0	1.9
		M	0.0	0.1	0.0	0.0	0.0	0.3	1.0	2.7	1.5	0.3	0.3	0.4	0.7	0.8	0.6	0.4	0.7	0.7	2.3
1997	AFSC	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	4.0	5.6	5.5	4.8	3.9	3.7	8.5
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	2.0	5.6	12.4	5.7	1.8	3.2	5.3
1999	AFSC	F	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.1	0.1	0.1	0.2	0.1	0.3	1.9
		M	0.0	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	1.5	0.0	0.0	0.2	0.3
2000	AFSC	F	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	0.1	1.0	1.0	3.7	6.8	8.2
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.0	0.0	3.0	5.3	11.1	16.3
2001	AFSC	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.6	1.4	1.2	0.7	0.1
		M	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	0.4	1.1	1.4	0.5	0.3	0.4
2000	NWSL	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.1	0.1	0.3	0.0	0.1	1.4	1.3	1.7
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.7	0.3	0.0	0.1	0.1	0.0	0.1	0.2	0.8
2001	NWSL	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.7	0.9	2.7	6.1	1.9	1.0	0.3	0.7
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.2	0.8	0.5	2.3	4.9	3.2	1.6	0.5	0.3
2002	NWSL	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.4	1.9	1.1	1.0	0.3	2.5	7.1	9.7
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.9	1.5	0.5	0.3	2.0	5.6	8.8
2003	NWSL	F	0.0	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	0.0	0.3	0.6	1.4	1.9
		M	0.0	0.0	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	0.2	0.7	1.6	1.8
2004	NWSL	F	0.0	0.0	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	3.6	0.9	1.3	3.0
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	1.9	6.0	6.7
2005	NWSL	F	0.0	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	0.1	0.1	0.2	0.1	0.1
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.3
2006	NWSL	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.7	0.2	1.0	1.2	1.7	1.3	0.7
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.5	1.0	0.9	1.9	1.3	1.1
2003	NWSH	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.1	0.3	0.3	0.4	0.8	2.4	6.7	8.2	11.0
		M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	0.6	0.7	1.5	1.0	1.3	2.2	2.6	6.7	9.8
2004	NWSH	F	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.6	0.5	0.4	0.3	1.2	1.4	0.6	0.9	0.9	0.9	1.9	2.4
		M	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.9	0.6	1.0	0.2	0.4	0.9	1.8	0.2	0.2	0.5	2.7	3.7
2005	NWSH	F	0.0	0.1	0.0	0.0	0.0	0.4	0.8	1.4	1.5	1.2	1.3	3.3	3.5	2.0	1.6	1.3	2.3	0.9	0.3
		M	0.0	0.1	0.0	0.2	0.0	0.5	0.8	2.2	2.8	1.5	1.8	3.7	5.4	2.9	1.4	1.3	2.1	1.6	1.1
2006	NWSH	F	0.0	0.0	0.0	0.1	0.0	0.2	1.6	1.1	1.1	1.4	1.2	3.1	5.5	4.1	3.2	7.4	6.1	3.9	2.1
		M	0.0	0.0	0.0	0.1	0.1	0.4	1.3	1.3	2.1	1.1	1.1	2.0	5.3	4.3	3.1	5.9	6.4	4.1	1.9

Table 6. (cont) Percentage of fishery and survey length samples in each length bin.

Year	Fleet	Sex	25	26	27	28	29	30	31	32	33	35	37	39	41	43	45	47	49	51
1986	Disc		8.1	10.1	7.4	10.8	19.6	19.6	7.4	6.8	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2002	Disc		8.0	5.0	2.1	2.5	2.0	2.6	2.3	4.7	14.1	13.0	6.4	1.4	1.2	0.6	0.2	0.0	0.0	0.0
2003	Disc		0.8	0.4	2.5	2.7	3.8	2.7	3.4	8.6	24.9	18.7	10.1	5.3	2.9	0.5	0.9	0.4	0.0	0.0
2004	Disc		2.3	1.9	1.9	2.5	1.2	2.4	3.7	9.1	18.6	22.5	10.9	10.4	3.2	5.1	1.0	0.0	0.0	0.0
2005	Disc		0.6	4.0	5.9	5.2	5.6	6.2	7.7	6.3	17.8	16.9	8.5	2.4	1.1	0.2	0.2	0.0	0.1	0.0
2006	Disc		0.6	0.5	0.8	0.6	1.5	4.6	6.6	7.0	17.4	12.1	9.6	2.1	4.0	2.5	0.6	0.2	0.0	0.3
1980	Tri	F	3.4	4.0	4.4	4.3	1.7	1.5	3.5	3.8	6.9	3.3	3.7	2.3	1.0	0.9	0.6	0.0	0.0	0.0
		M	1.3	2.3	1.7	3.7	2.7	4.2	5.4	3.6	4.1	5.1	3.7	0.0	0.4	0.0	0.0	0.0	0.0	0.0
1983	Tri	F	3.4	4.0	2.3	1.5	0.5	0.6	0.6	0.4	0.7	0.8	0.9	2.1	2.1	1.1	0.4	0.1	0.0	0.0
		M	3.7	3.7	2.6	1.1	0.5	0.7	0.4	0.4	0.6	2.2	2.0	0.9	0.2	0.1	0.0	0.0	0.0	0.0
1986	Tri	F	2.0	3.3	3.3	2.6	4.6	4.2	3.8	3.0	4.9	2.3	1.2	0.9	1.0	0.7	0.4	0.2	0.1	0.0
		M	2.0	4.2	3.8	3.8	6.4	4.1	4.6	3.4	2.8	1.8	0.5	1.0	0.6	0.2	0.0	0.0	0.0	0.0
1989	Tri	F	1.8	1.7	1.4	1.0	0.9	0.9	1.0	0.3	1.0	0.9	0.7	0.6	0.5	0.0	0.1	0.0	0.0	0.0
		M	1.7	1.1	1.5	1.1	1.1	1.2	0.5	0.7	1.1	0.4	0.3	0.3	0.1	0.1	0.0	0.0	0.0	0.0
1992	Tri	F	2.9	2.5	4.7	9.6	7.1	4.5	2.6	0.8	0.8	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0
		M	2.6	1.9	9.3	11.1	7.7	3.1	0.9	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1995	Tri	F	3.9	2.4	2.4	1.7	1.3	1.6	0.9	0.8	2.2	3.3	3.4	3.0	3.7	2.6	1.0	0.4	0.0	0.0
		M	4.0	2.4	1.6	1.4	1.1	0.9	1.5	1.5	5.3	6.0	3.5	0.6	0.1	0.1	0.0	0.0	0.0	0.0
1998	Tri	F	3.2	2.9	2.7	1.9	1.1	0.6	0.4	0.3	0.6	0.5	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0
		M	3.4	2.9	2.8	1.8	0.8	0.8	0.8	0.6	0.9	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0
2001	Tri	F	0.8	0.9	0.9	0.5	1.1	0.5	2.5	3.0	10.6	0.7	0.4	0.6	0.2	0.2	0.0	0.1	0.0	0.0
		M	0.6	0.7	0.8	0.4	0.6	0.7	2.2	1.5	2.3	0.4	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2004	Tri	F	2.6	4.2	5.3	4.1	3.4	4.4	3.3	2.4	3.4	0.7	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0
		M	3.2	8.1	7.3	4.6	4.9	5.5	4.0	2.0	2.3	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1997	AFSC	F	12.9	3.0	2.3	0.1	0.1	0.0	0.0	0.1	0.8	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
		M	2.3	1.4	1.6	0.0	0.3	0.1	0.3	0.2	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1999	AFSC	F	0.0	1.0	7.7	11.6	11.3	7.3	6.2	2.0	1.9	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		M	0.7	2.8	13.4	14.5	7.4	4.7	0.9	0.6	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000	AFSC	F	7.6	1.3	2.6	2.8	2.1	3.9	4.5	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		M	6.2	2.4	0.4	4.2	1.7	1.7	0.8	0.0	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2001	AFSC	F	1.0	0.7	1.3	1.6	2.1	2.4	3.7	11.1	16.3	7.5	0.8	0.1	0.6	0.1	0.4	0.0	0.0	0.0
		M	1.0	1.3	2.6	1.9	1.0	1.6	10.5	13.0	6.4	0.5	0.1	0.6	0.4	0.0	0.0	0.0	0.0	0.0
2000	NWSL	F	0.0	1.1	2.2	7.4	6.1	10.3	2.4	1.2	0.4	0.0	2.0	3.9	5.9	4.0	3.3	0.0	0.0	0.0
		M	1.3	0.2	2.6	4.9	6.3	3.5	2.1	0.2	3.4	12.0	2.7	1.3	0.7	0.7	0.0	0.0	0.0	0.0
2001	NWSL	F	0.6	0.8	1.2	0.6	1.4	1.2	1.6	5.8	6.1	1.7	2.7	4.8	1.5	0.5	0.0	0.0	0.0	0.0
		M	0.3	1.8	1.8	0.4	1.2	2.5	3.5	5.3	6.0	10.0	6.6	0.8	0.0	0.1	0.0	0.0	0.0	0.0
2002	NWSL	F	8.0	5.6	1.2	1.6	2.3	1.8	1.6	1.4	1.9	0.7	0.6	0.1	0.2	0.0	0.3	0.1	0.0	0.0
		M	6.6	6.6	2.1	1.9	2.4	1.9	1.3	1.4	1.8	0.6	0.9	0.5	0.2	0.0	0.0	0.0	0.0	0.0
2003	NWSL	F	1.3	1.1	2.4	2.6	1.7	0.6	0.8	2.6	8.0	14.1	7.6	4.2	2.5	3.1	3.0	0.8	0.2	0.0
		M	1.2	2.0	2.4	1.9	1.6	0.6	0.9	1.8	10.6	8.3	1.8	1.2	0.3	0.0	0.0	0.0	0.0	0.0
2004	NWSL	F	3.3	3.5	4.8	5.2	4.1	3.5	2.5	2.4	2.1	1.4	0.7	0.5	0.4	0.1	0.3	0.0	0.0	0.0
		M	3.6	3.1	5.3	6.3	5.4	3.6	1.6	2.2	1.8	3.0	2.7	0.6	0.3	0.2	0.0	0.0	0.0	0.0
2005	NWSL	F	0.2	0.3	0.8	1.1	0.7	1.6	2.8	3.5	5.8	12.7	11.7	4.4	0.4	0.6	0.2	0.6	0.0	0.0
		M	0.4	0.6	1.0	1.7	2.0	2.2	2.8	8.1	19.4	8.1	3.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0
2006	NWSL	F	1.4	0.7	1.1	1.8	1.2	5.0	3.8	3.8	7.0	5.2	5.2	4.2	1.7	1.5	0.6	0.0	0.0	0.0
		M	0.5	0.8	1.8	2.2	3.3	4.5	4.7	3.9	9.9	5.5	3.6	0.5	0.1	0.0	0.0	0.0	0.0	0.0
2003	NWSH	F	5.9	2.7	2.2	2.5	2.6	1.7	0.3	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		M	7.8	4.6	2.4	2.8	3.6	1.5	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	NWSH	F	9.2	10.0	7.2	3.0	1.6	2.2	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		M	9.8	15.8	6.1	2.3	3.2	2.0	0.3	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	NWSH	F	0.9	0.9	4.5	4.9	5.6	4.2	0.5	0.7	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		M	1.1	2.1	7.6	7.0	4.7	2.2	1.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2006	NWSH	F	1.2	1.5	0.6	0.9	0.7	2.0	1.3	0.8	0.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
		M	1.2	0.7	0.9	0.2	1.5	1.0	1.6	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 7. A. Raw numbers of fish and trips sampled and input Ns used for fisheries length compositions.

Year	WA fish	OR fish	CA fish	WA trips	OR trips	CA trips	Total Fish	Total Trips	Input N	ReWt N
1977	0	304	0	0	5	0	304	5	22	16
1978	0	200	0	0	2	0	200	2	9	7
1981	0	0	199	0	0	31	199	31	44	34
1982	0	300	459	0	2	57	759	59	89	68
1983	0	0	792	0	0	115	792	115	165	126
1984	0	70	1925	0	1	161	1995	162	333	253
1985	0	201	2966	0	2	206	3167	208	486	370
1986	0	0	2437	0	0	145	2437	145	278	211
1987	0	0	2704	0	0	124	2704	124	412	313
1988	0	0	1337	0	0	92	1337	92	187	142
1989	0	0	1107	0	0	92	1107	92	144	110
1990	0	100	873	0	1	91	973	92	183	139
1991	0	200	764	0	2	75	964	77	143	109
1992	0	0	429	0	0	49	429	49	58	44
1993	0	0	566	0	0	56	566	56	66	50
1994	0	200	595	0	2	51	795	53	119	90
1995	0	188	793	0	7	55	981	62	182	138
1996	370	833	1044	28	23	81	2247	132	425	323
1997	586	802	947	32	22	58	2335	112	405	308
1998	456	541	1353	28	13	80	2350	121	413	314
1999	342	611	770	26	13	40	1723	79	283	215
2000	653	507	906	20	15	53	2066	88	338	257
2001	892	1406	897	25	43	60	3195	128	538	409
2002	1129	681	994	48	22	48	2804	118	455	346
2003	580	1567	590	28	64	38	2737	130	479	364
2004	616	1678	562	20	72	33	2856	125	499	379
2005	117	1416	571	9	59	34	2104	102	386	293
2006	505	1252	0	10	55	0	1757	65	244	185

Table 7. B. Raw numbers of fish and hauls sampled and input Ns used for discard length composition data

Year	Fish	Hauls	Input N	ReWt N
1986			100	38
2002	674	34	127	48
2003	856	41	159	60
2004	797	72	182	69
2005	1529	108	319	121
2006	1123	114	269	102

Table 7. C. Raw numbers of fish and hauls sampled and input Ns used for survey length composition data.

Survey	Year	Fish	Hauls	Input N	ReWt N
Triennial	1980	656	11	54	38
	1983	4438	43	210	149
	1986	1834	38	168	119
	1989	6054	85	416	295
	1992	1445	33	135	96
	1995	2389	106	275	195
	1998	2943	110	318	226
	2001	2980	184	395	280
	2004	3578	152	405	288
AFSC slope	1997	313	20	42	27
	1999	228	26	42	27
	2000	223	20	36	23
	2001	324	14	37	24
NW slope	2000	25	296	46	32
	2001	44	491	79	54
	2002	51	1023	123	85
	2003	60	1736	183	126
	2004	45	527	82	57
	2005	45	1017	117	81
	2006	64	1130	144	99
NW shelf	2003	35	632	80	80
	2004	36	488	71	71
	2005	61	960	129	129
	2006	64	792	120	120

Table 8. Number of trips (fishery) or hauls, number of fish, and total input Ns for conditional age-at-length and age compositions used in the assessment.

Fleet	Year	Trips/Hauls	Fish	Total input N	ReWT N
Fishery	1991	38	360	88	88
	1998	16	341	63	63
	2003	88	1996	363	363
	2004	48	1443	247	247
	2005	26	662	117	117
	2006	16	370	67	67
Discard					
	2004	47	246	81	81
	2005	80	504	150	150
Triennial	(Age composition)				
	2004	134	1121	213	151
AFSC slope					
	2001	18	191	32	32
NWFSC slope	2003	57	406	87	87
	2004	45	281	65	65
	2005	45	362	71	71
	2006	64	479	99	99
NWFSC shelf	2003	34	253	52	52
	2004	36	202	51	51
	2005	61	357	87	87
	2006	64	455	97	97

Table 9. GLMM-based biomass indices used in the assessment model.

A. Triennial Shelf Survey

	Vancouver-Columbia				Eureka-Monterey				Total	
	55-183 m		183-366 m		55-183 m		183-366 m		Biomass	
Year	Median	CV	Median	CV	Median	CV	Median	CV	Median	CV
1980	103.75	0.307	244.82	0.358	36.37	0.801	763.81	0.538	1189.48	0.377
1983	354.01	0.240	723.88	0.259	113.63	0.477	583.36	0.379	1824.50	0.206
1986	163.89	0.247	755.76	0.336	42.58	0.553	616.24	0.668	1640.63	0.325
1989	327.39	0.247	374.04	0.365	61.15	0.418	381.94	0.410	1178.75	0.234
1992	249.36	0.283	662.51	0.362	21.55	0.638	169.85	0.465	1128.75	0.265
1995	96.28	0.310	398.74	0.371	16.76	0.633	185.18	0.396	717.89	0.261
1998	236.01	0.321	447.25	0.328	13.43	0.624	104.67	0.381	818.37	0.236
2001	128.29	0.310	322.64	0.317	50.48	0.431	88.14	0.359	601.20	0.225
2004	125.65	0.318	721.36	0.352	78.09	0.581	447.48	0.376	1396.86	0.258

B. AFSC Slope Survey

	Vancouver-Columbia				Eureka-Monterey				Total	
	183-299 m		300-567 m		183-299 m		300-567 m		Biomass	
Year	Median	CV	Median	CV	Median	CV	Median	CV	Median	CV
1997	406.35	1.13	77.27	0.61	47.99	0.73	20.22	1.38	577.95	0.81
1999	148.17	0.85	135.19	0.53	44.83	0.85	44.93	0.95	407.40	0.41
2000	267.21	0.87	155.37	0.72	14.14	0.63	40.35	1.17	520.12	0.53
2001	534.69	1.00	46.49	1.45	60.59	0.81	36.07	1.09	723.91	0.76

C. NWFSC Slope Survey

	Vancouver-Columbia				Eureka-Monterey				Total	
	183-299 m		300-567 m		183-299 m		300-567 m		Biomass	
Year	Median	CV	Median	CV	Median	CV	Median	CV	Median	CV
1999	314.72	0.601	196.19	1.077	130.61	0.559	80.57	0.673	789.87	0.430
2000	613.94	0.504	241.01	1.298	75.74	0.518	84.98	0.834	1098.18	0.456
2001	186.64	0.662	178.36	0.673	60.52	0.553	38.40	0.969	495.34	0.416
2002	403.79	0.648	88.82	1.415	220.63	0.465	60.86	0.614	827.17	0.410
2003	2816.52	0.589	626.37	0.651	182.25	0.478	162.40	0.700	3885.43	0.467
2004	321.93	0.523	231.89	0.761	340.01	0.726	239.14	1.339	1253.52	0.431
2005	882.72	0.613	205.35	0.753	394.49	0.555	194.65	1.064	1788.60	0.405
2006	546.36	0.458	513.89	0.617	104.83	0.839	222.19	0.617	1486.74	0.352

D. NWFSC Shelf Survey

	Vancouver-Columbia		Eureka-Monterey		Total	
	55-183 m		55-183 m		Biomass	
Year	Median	CV	Median	CV	Median	CV
2003	240.74	1.790	161.21	1.188	421.99	1.391
2004	220.86	1.073	39.69	1.369	264.88	1.011
2005	189.52	0.629	48.87	0.796	243.67	0.590
2006	141.27	0.579	74.96	0.802	227.60	0.526

Table 10. Data sources and years included in the Base Model.

Indices	Years
Triennial Shelf	1980 1983 1986 19891992 1995 1998 2001 2004
AFSC Slope	1997 1999-2001
NWFSC Slope	2000-2006
NWFSC Shelf	2003-2006
Discard	1986, 2000-2005
Length Comps	
Fishery landings	1977-1978, 1981-2006
Fishery discard	1986, 2002-2006
Triennial Shelf	1980 1983 1986 19891992 1995 1998 2001
AFSC Slope	1997 1999-2001
NWFSC Slope	2000-2006
NWFSC Shelf	2003-2006
Age Comps	
Triennial Shelf	2004
Age-at-length	
Fishery landings	1991, 1998, 2003-2006
Fishery discard	2004 2005
AFSC Slope	2001
NWFSC Slope	2003-2006
NWFSC Shelf	2003-2006

Table 11. Parameters in the base model.

Mortality and growth				
1	0.07	Fixed	Natural mortality (M)	
2	0	Fixed	Old offset	
3	14.8923	Estimated	Size at age 1.7 (in cm)	
4	42.174	Estimated	Size at age 29 (females)	
5	0.214137	Estimated	Von-Bertalanffy K (females)	
6	0.0620961	Estimated	cv of size at age (young)	
7	0.0244513	Estimated	cv of size at age offset (old)	
8	0	Fixed	M offset Male	
9	0	Fixed	M offset old male	
10	0	Fixed	Male offset for size at age 1.7	
11	-0.12589	Estimated	Male offset for size at age 29	At age 29: 37.19cm
12	0.261982	Estimated	Male offset for K	Male K = 0.28
13	0	Fixed	offsest for cv of size	
14	0	Fixed	offset for cv of size	
biology_parms				
15	2.10E-05	Fixed	scalar for weight at length	
16	2.96142	Fixed	Exponent for weight at length	
17	34.59	Fixed	size at 50% maturity	
18	-0.6429	Fixed	logistic parameter for maturity ogive	
19	0.1458	Fixed	eggs/kg intercept	
20	1.325	Fixed	Fec.slope	
21	2.10E-05	Fixed	scalar for weight at length	
22	2.96142	Fixed	Exponent for weight at length	
#_size_sel:	Fishery		Fishery selectivity	
1	34.9749	Estimated	Peak	
2	0.414884	Estimated	Width of peak	
3	3.90223	Estimated	VarAscend	
4	5.5315	Estimated	Var Descending	
5	-2.17195	Estimated	Initial	
6	9	Fixed	Final	
#_retention	Fishery			
7	26.6126	Estimated	size at 50% selectivity through 1999	
8	2.00004	Estimated	logarithmic slope	
9	1	Fixed	final	
10	0	Fixed	intial	
#_size_sel:	Triennial			
11	21.5886	Estimated	Peak	
12	-5.99999	Estimated	Width of peak ***(at bound)***	
13	3.54535	Estimated	VarAscend	
14	4.05594	Estimated	Var Descending	
15	-1.60493	Estimated	Initial	
16	-2.50929	Estimated	Final	
#_size_sel:	AFSC sl			
17	23.1085	Estimated	Peak	
18	-1.02227	Estimated	Width of peak	
19	2.36933	Estimated	VarAscend	
20	2.30353	Estimated	Var Descending	
21	-5	Fixed	Initial	
22	-3.64927	Estimated	Final	
#_size_sel:	NWFSC sl			
23	24.3454	Estimated	Peak	
24	1.26326	Estimated	Width of peak	
25	3.1702	Estimated	VarAscend	
26	4.02345	Estimated	Var Descending	
27	-5	Fixed	Initial	
28	9	Fixed	Final	
#_size_sel:	NWFSC sh			
29	16.4491	Estimated	Peak	
30	-1.24981	Estimated	Width of peak	
31	0.184223	Estimated	VarAscend	
32	2.85191	Estimated	Var Descending	
33	-1.18676	Estimated	Initial	
34	-5	Fixed	Final	
sel_parm_blockparms				
35	26.0001	Estimated	size at 50% selectivity 2000 –	
36	0.64867	Estimated	final retention 2000 -	
37	0.781212	Estimated	final retention 2003 -	

Table 12. Growth parameters estimated in the model

Assessment model year	2000	2005	2007
Female Length at age 1.7	14.92	11.79	14.89
Female length at age 40	41.70	42.93	42.25
Female VBK	0.16	0.20	0.21
CV of length at age at age 1.7	0.10	0.06	0.062
CV of length at age at age 40	0.04	0.06	0.064
Male Length at age 1.7	14.92	11.79	14.89
Male length at age 40	37.40	37.88	37.20
Male VBK	0.21	0.25	0.28
CV of length at age at age 1.7	0.08	0.06	0.062
CV of length at age at age 40	0.04	0.06	0.064

Table 13. Time series of total and summary biomass, spawning output, depletion, recruitment and F.

Year	Total Biom.	Sum. Biom.	Sp. Out.	Depletion	Recruit	F
1928	34527	34509	30641	1.000	3295	0.0000
1929	34527	34509	30640	1.000	3295	0.0001
1930	34524	34506	30638	1.000	3295	0.0001
1931	34521	34503	30635	1.000	3295	0.0000
1932	34521	34503	30634	1.000	3295	0.0000
1933	34520	34502	30634	1.000	3295	0.0000
1934	34520	34502	30633	1.000	3295	0.0001
1935	34518	34501	30632	1.000	3295	0.0001
1936	34517	34499	30630	1.000	3295	0.0001
1937	34516	34498	30629	1.000	3295	0.0001
1938	34514	34497	30628	1.000	3295	0.0002
1939	34510	34492	30624	0.999	3295	0.0002
1940	34504	34486	30617	0.999	3295	0.0003
1941	34497	34480	30611	0.999	3295	0.0003
1942	34490	34472	30603	0.999	3294	0.0003
1943	34482	34464	30594	0.998	3294	0.0012
1944	34445	34427	30558	0.997	3294	0.0029
1945	34358	34340	30472	0.994	3292	0.0075
1946	34128	34111	30246	0.987	3288	0.0052
1947	33984	33966	30097	0.982	3285	0.0032
1948	33905	33887	30009	0.979	3284	0.0052
1949	33771	33753	29866	0.975	3281	0.0056
1950	33631	33614	29718	0.970	3278	0.0066
1951	33468	33450	29546	0.964	3275	0.0086
1952	33252	33234	29322	0.957	3271	0.0065
1953	33111	33093	29167	0.952	3268	0.0064
1954	32978	32960	29020	0.947	3265	0.0067
1955	32844	32826	28873	0.942	3262	0.0066
1956	32720	32703	28737	0.938	3259	0.0082
1957	32556	32538	28562	0.932	3256	0.0091
1958	32373	32356	28369	0.926	3252	0.0084
1959	32222	32204	28205	0.921	3248	0.0083
1960	32080	32062	28050	0.915	3245	0.0089
1961	31929	31912	27888	0.910	3242	0.0070
1962	31841	31823	27785	0.907	3240	0.0096
1963	31684	31667	27619	0.901	3236	0.0112
1964	31487	31469	27413	0.895	3232	0.0073
1965	31413	31395	27325	0.892	3230	0.0146
1966	31135	31118	27044	0.883	3224	0.1464
1967	27150	27133	23219	0.758	3128	0.1229
1968	24415	24399	20513	0.669	3045	0.1081
1969	22421	22405	18470	0.603	2969	0.0129
1970	22621	22605	18450	0.602	2968	0.0132
1971	22828	22812	18480	0.603	2969	0.0217
1972	22862	22846	18407	0.601	2966	0.0292
1973	22742	22726	18240	0.595	2960	0.0412
1974	22380	22364	17886	0.584	2945	0.0368
1975	22125	22114	17640	0.576	1978	0.0288
1976	22025	22012	17553	0.573	2453	0.0292
1977	21875	21868	17466	0.570	1240	0.0134
1978	21967	21959	17665	0.577	1389	0.0207
1979	21820	21800	17738	0.579	3786	0.0501
1980	21030	20998	17276	0.564	5921	0.0291
1981	20736	20716	17170	0.560	3626	0.0509
1982	20197	20189	16636	0.543	1315	0.0621
1983	19639	19634	15862	0.518	909	0.0551
1984	19271	19266	15172	0.495	913	0.0766
1985	18460	18454	14204	0.464	1163	0.1101
1986	16993	16987	12966	0.423	1121	0.0826
1987	15941	15926	12376	0.404	2729	0.1655
1988	13670	13648	10816	0.353	4054	0.1320
1989	12219	12218	9777	0.319	342	0.1155
1990	11257	11252	8917	0.291	820	0.1672
1991	9966	9962	7598	0.248	798	0.1425
1992	9101	9095	6644	0.217	1140	0.0886
1993	8721	8719	6221	0.203	439	0.1559
1994	7776	7768	5508	0.180	1625	0.1244
1995	7155	7124	5133	0.168	5748	0.1226
1996	6678	6668	4787	0.156	1923	0.1251
1997	6428	6416	4415	0.144	2271	0.1555
1998	6254	6251	3906	0.127	576	0.1992
1999	6031	6002	3272	0.107	5188	0.0830
2000	6482	6456	3176	0.104	4728	0.0819
2001	6996	6993	3230	0.105	547	0.0489
2002	7773	7770	3567	0.116	570	0.0288
2003	8648	8638	4071	0.133	1761	0.0152
2004	9480	9470	4660	0.152	1903	0.0311
2005	10041	10030	5231	0.171	2005	0.0154
2006	10615	10605	6013	0.196	1958	0.0154
2007	11105	11094	6853	0.224	2087	

Table 14. Female numbers at age (1000s) for 1928 and 1955-2007.

Females	Age																														
Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30+
1928	1648	1536	1432	1335	1245	1161	1083	1009	941	877	818	763	711	663	618	577	538	501	467	436	406	379	353	329	307	286	267	249	232	216	2982
1955	1631	1522	1419	1324	1234	1149	1067	990	918	851	789	732	679	631	585	543	505	470	438	408	380	354	330	308	287	268	250	233	217	202	2789
1956	1630	1521	1418	1322	1233	1148	1066	990	918	850	788	731	678	629	584	542	503	468	435	405	378	352	328	306	285	266	248	231	216	201	2771
1957	1628	1519	1417	1321	1231	1146	1065	987	916	849	787	729	676	627	582	540	501	465	432	402	375	349	326	303	283	264	246	229	214	199	2748
1958	1626	1518	1415	1320	1230	1144	1062	985	913	846	784	727	674	625	579	538	499	463	430	400	372	346	323	301	280	261	244	227	212	198	2723
1959	1624	1516	1414	1318	1228	1143	1061	983	911	844	782	725	672	623	578	536	497	461	428	398	369	344	320	298	278	259	242	225	210	196	2700
1960	1623	1514	1412	1317	1227	1142	1060	982	909	843	781	723	671	621	576	534	495	460	427	396	368	342	318	296	276	257	240	223	208	194	2678
1961	1621	1513	1411	1315	1226	1140	1058	981	908	841	779	721	669	620	574	532	494	458	425	394	366	340	316	294	274	255	238	222	207	193	2654
1962	1620	1511	1410	1314	1225	1140	1058	981	908	841	778	721	668	619	574	532	493	457	424	393	365	339	314	292	272	253	236	220	205	191	2636
1963	1618	1510	1408	1313	1223	1138	1056	979	906	839	777	719	666	617	572	530	491	455	422	391	363	337	313	290	270	251	234	218	203	189	2611
1964	1616	1509	1407	1311	1222	1136	1053	975	903	836	774	716	663	614	569	527	488	453	420	389	361	335	311	288	268	249	232	216	201	187	2581
1965	1615	1507	1406	1310	1221	1136	1054	976	903	836	774	716	663	613	568	526	488	452	419	388	360	334	310	288	267	248	230	214	200	186	2563
1966	1612	1506	1403	1308	1219	1132	1049	970	897	830	768	711	658	609	564	522	484	448	415	385	357	331	307	285	264	245	228	212	197	183	2526
1967	1564	1503	1383	1287	1187	1071	954	857	780	717	662	612	566	524	485	449	416	385	357	331	306	284	263	244	227	210	195	181	168	157	2156
1968	1522	1458	1384	1272	1173	1054	918	797	706	640	587	542	501	463	428	396	367	340	315	292	270	251	232	215	200	185	172	160	148	138	1892
1969	1484	1419	1345	1275	1162	1047	913	777	667	589	533	489	451	416	385	356	330	305	283	262	243	225	208	193	179	166	154	143	133	123	1688
1970	1484	1384	1322	1252	1186	1078	968	842	716	614	542	491	450	415	383	354	328	303	281	260	241	223	207	192	178	165	153	142	132	122	1667
1971	1485	1384	1289	1231	1165	1100	997	892	775	659	565	499	451	414	382	353	326	302	279	258	239	222	206	190	176	164	152	141	131	121	1646
1972	1483	1384	1287	1199	1143	1077	1011	912	815	707	601	516	455	412	378	348	322	298	275	255	236	218	202	187	174	161	149	138	128	119	1612
1973	1480	1383	1287	1196	1112	1053	985	919	827	738	640	544	467	412	373	342	315	291	269	249	231	213	198	183	170	157	146	135	125	116	1567
1974	1473	1380	1284	1194	1107	1020	955	886	824	740	660	573	487	417	368	333	305	282	260	241	223	206	191	177	164	152	141	130	121	112	1505
1975	989	1373	1282	1192	1106	1017	928	863	797	740	665	593	514	437	375	331	299	274	253	234	216	200	185	171	159	147	136	126	117	108	1452
1976	1227	922	1276	1191	1106	1020	931	844	783	723	671	602	537	466	396	339	300	271	248	229	212	196	181	168	155	144	133	123	114	106	1413
1977	620	1144	857	1186	1105	1019	933	846	765	709	654	607	545	486	422	358	307	271	245	225	207	192	177	164	152	140	130	120	112	103	1375
1978	694	578	1065	798	1103	1025	942	860	779	704	652	602	559	502	447	388	330	283	249	226	207	191	176	163	151	140	129	120	111	103	1360
1979	1893	647	538	991	741	1020	942	863	786	712	643	596	550	510	458	408	354	301	258	228	206	189	174	161	149	138	127	118	109	101	1335
1980	2960	1765	601	499	915	678	920	841	767	697	631	570	528	487	452	406	362	314	267	229	202	182	167	154	143	132	122	113	104	97	1272
1981	1813	2760	1641	558	462	844	620	837	763	694	631	571	516	478	441	409	367	327	284	241	207	183	165	151	140	129	119	110	102	95	1239
1982	657	1691	2560	1521	516	423	760	553	743	676	615	559	505	457	423	390	362	325	290	251	214	183	162	146	134	124	114	106	98	90	1180
1983	454	613	1566	2371	1402	469	378	672	485	651	592	538	489	442	399	370	341	316	284	253	220	187	160	141	128	117	108	100	92	85	1111
1984	456	424	568	1451	2188	1279	421	336	594	428	573	521	474	430	389	352	326	300	279	250	223	194	165	141	124	113	103	95	88	81	1054
1985	582	425	392	525	1334	1979	1133	367	291	512	369	494	449	408	371	335	303	280	259	240	216	192	167	142	121	107	97	89	82	76	978
1986	560	542	392	361	480	1190	1712	957	307	242	425	306	410	373	339	308	278	251	233	215	199	179	159	138	118	101	89	80	74	68	874
1987	1364	522	501	362	331	433	1050	1484	823	263	207	364	262	351	319	290	263	238	215	199	184	170	153	136	118	101	86	76	69	63	806
1988	2027	1272	479	459	328	289	360	841	1168	644	205	161	283	204	273	248	225	205	185	167	155	143	133	119	106	92	78	67	59	54	676
1989	171	1890	1170	440	418	290	246	298	687	949	522	166	131	229	165	221	201	182	166	150	135	125	116	107	96	86	74	63	54	48	591
1990	410	159	1741	1077	401	372	250	207	248	568	784	431	137	108	189	136	182	166	150	137	124	112	103	95	88	79	71	61	52	45	527
1991	399	382	146	1594	973	350	309	200	163	193	442	609	334	107	84	147	106	141	129	117	106	96	87	80	74	69	62	55	48	41	444
1992	570	372	351	134	1447	857	296	253	161	131	155	354	487	267	85	67	117	85	113	103	93	85	77	69	64	59	55	49	44	38	387
1993	219	532	344	324	123	1302	752	255	216	137	111	132	301	414	227	72	57	100	72	96	87	79	72	65	59	55	50	47	42	37	361
1994	813	205	488	315	294	108	1090	609	203	171	108	87	104	237	326	179	57	45	79	57	76	69	62	57	51	46	43	40	37	33	314
1995	2874	758	188	448	287	260	92	909	501	166	140	88	71	85	193	266	146	47	37	64	46	62	56	51	46	42	38	35	32	30	283
1996	962	2679	698	173	409	255	223	77	750	411	136	114	72	58	69	158	218	120	38	30	52	38	51	46	42	38	34	31	29	26	256
1997	1135	897	2466	642	158	362	218	186	63	614	336	111	93	59	48	56	129	178	97	31	24	43	31	41	37	34	31	28	25	23	231
1998	288	1059	823	2260	581	138	303	176	148	50	484	265	88	73	47	38	44	102	140	77	24	19	34	24	32	29	27	24	22	20	200
1999	2594	268	967	750	2030	499	112	235	134	111	37	362	198	65	55	35	28	33	76	104	57	18	14	25	18	24	22	20	18	16	164
2000	2364	2419	248	893	689	1831	440	97	202	115	95	32	310	169	56	47	30	24	28	65	89	49	16	12	22	15	21	19	17	16	154
2001	273	2204	2236	229	820	622	1616	382	84	173	98	82	27	265	145	48	40	25	21	24	56	76	42	13	10	18	13	18	16	15	145
2002	285	255	2045	2074	212	750	561	1444	340	74	154	87	72	24	235	128	42	36	23	18	22	49	68	37	12	9	16	12	16	14	142
2003	880	266	237	1901	1923	195	686	510	1310	308	67	139	79	65	22	213	116	38	32	20	16	20	45	61	34	11	8	15	11	14	142
2004	951	821	247	221	1767	1783	180	632	469	1203	283	62	128	72	60	20	195	107	35	30	19	15	18	41	56	31	10	8	14	10	143
2005	1002	887	763	230	204	1628	1628	164	572	424	1087	256	56	116	65	54	18	177	97	32	27	17	14	16	37	51	28	9	7	12	138
2006	979	935	826	710	214	189	1502	1498	150	525	389	998	235	51	106	60	50	17	162	89	29	25	16	13	15	34	47	26	8	6	138
2007	1044	913	870	769	660	198	175	1383	1377	138	482	357	917	215	47	97	55	46	15	149	81	27	23	14	12	14	31	43	24	8	133

Table 15. Model results from retrospective and sensitivity analyses.

Derived Quantities of Interest	Base	Norewt	Fec=WT	Retro 06	Retro 05	Retro 04	Retro 03	Retro 02
Depletion in 2007	22.4%	22.6%	27.2%	26.7%	29.2%	26.8%	13.7%	14.6%
2007 spawning output	6,853	6,894	4,407	8,195	8,955	8,307	4,112	4,331
Unfished spawning output	30,641	30,557	16,225	30,742	30,720	30,995	30,083	29,662
SO_{MSY}	12,256	12,223	6,490	12,297	12,288	12,398	12,033	11,865
MSY_{B40} (landings+discard)	621	623	648	629	636	644	620	620
F_{MSY}	0.041	0.042	0.045	0.042	0.042	0.041	0.040	0.040
Exploitation rate at MSY	0.038	0.038	0.041	0.038	0.038	0.038	0.038	0.038
F_{2006}/F_{MY}	0.370	0.377	0.323	0.317	0.298	0.369	0.582	0.571
Likelihoods								
Objective function	2217.05	*2684.42*	2217.02	*1940.29*	*1566.90*	*1207.24*	*857.23*	*789.64*
Triennial Survey index	4.93	5.01	5.25	6.08	6.88	5.47	2.23	2.07
AFSC Slope Survey index	0.49	0.52	0.50	0.55	0.59	0.61	0.48	0.66
NWFSC Slope Survey index	4.67	4.72	4.65	4.71	4.67	4.86	1.03	1.04
NWFSC Shelf Survey index	0.03	0.02	0.03	0.04	0.00	0.00	0.00	0.00
Discard	7.61	10.50	7.62	7.44	8.35	2.98	3.73	2.72
Fishery and discard length	531.91	770.74	531.52	500.60	467.63	411.13	346.57	313.59
Triennial Survey length	246.83	331.45	247.00	239.42	232.09	225.30	213.15	211.14
AFSC Slope Survey length	55.56	85.29	55.54	54.68	54.94	54.32	55.95	52.85
NWFSC slope length	150.11	215.85	150.05	139.74	122.64	90.56	52.38	22.40
NWFSC shelf length	55.84	55.79	55.77	38.33	17.89	7.74	0.00	0.00
Fishery and discard age	571.20	591.78	571.36	527.58	388.74	248.15	123.39	124.74
Triennial Survey age	16.10	24.87	16.13	18.41	18.96	0.00	0.00	0.00
AFSC Survey age	45.02	44.73	45.05	42.73	41.61	42.30	42.91	43.35
NWFSC slope age	283.17	291.27	283.18	205.13	119.24	67.49	0.00	0.00
NWFSC shelf age	227.86	233.73	227.83	139.22	66.60	31.00	0.00	0.00
Catch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Recruitment	15.62	18.05	15.46	15.53	15.98	15.24	15.32	14.97
Parameter priors	0.10	0.11	0.10	0.10	0.10	0.10	0.09	0.10
Parameters								
Natural mortality	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Steepness	0.6	0.95	0.6	0.6	0.6	0.6	0.6	0.6

Table 16. Model results from profiling over natural mortality rate values.

Derived Quantities of Interest	Base	M.04	M.05	M.06	M.08	M.09	M.10
Depletion in 2007	22.4%	5.9%	9.2%	14.5%	32.9%	45.8%	60.2%
2007 spawning output	6,853	1,876	2,891	4,467	10,281	15,092	22,055
Unfished spawning output	30,641	32,070	31,393	30,791	31,237	32,981	36,644
SO_{MSY}	12,256	12,828	12,557	12,316	12,495	13,192	14,658
MSY_{B40} (landings+discard)	621	399	471	541	721	859	1,068
F_{MSY}	0.041	0.028	0.033	0.037	0.046	0.050	0.054
Exploitation rate at MSY	0.038	0.027	0.031	0.034	0.041	0.043	0.046
F_{2006}/F_{MY}	0.370	1.897	1.082	0.627	0.226	0.142	0.090
Likelihoods							
Objective function	2217.05	2254.46	2231.75	2220.83	2216.80	2217.96	2219.46
Triennial Survey index	4.93	7.99	4.90	3.83	7.68	11.16	14.59
AFSC Slope Survey index	0.49	0.38	0.39	0.44	0.54	0.58	0.61
NWFSC Slope Survey index	4.67	5.38	4.97	4.76	4.65	4.67	4.71
NWFSC Shelf Survey index	0.03	0.06	0.04	0.03	0.03	0.03	0.03
Discard	7.61	8.41	8.02	7.76	7.54	7.50	7.49
Fishery and discard length	531.91	550.42	543.01	536.86	528.28	525.86	524.40
Triennial Survey length	246.83	243.35	244.45	245.88	246.91	246.27	245.25
AFSC Slope Survey length	55.56	56.15	55.98	55.78	55.36	55.19	55.07
NWFSC slope length	150.11	152.79	151.57	150.67	149.79	149.63	149.54
NWFSC shelf length	55.84	58.12	57.22	56.46	55.41	55.12	54.92
Fishery and discard age	571.20	574.22	570.34	569.86	572.79	574.03	574.88
Triennial Survey age	16.10	15.40	15.62	15.85	16.34	16.52	16.64
AFSC Survey age	45.02	44.22	44.46	44.76	45.20	45.31	45.36
NWFSC slope age	283.17	285.09	284.06	283.45	283.03	282.90	282.76
NWFSC shelf age	227.86	229.59	228.89	228.30	227.53	227.28	227.09
Catch	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Recruitment	15.62	22.79	17.70	16.05	15.63	15.81	16.04
Parameter priors	0.10	0.11	0.10	0.10	0.10	0.10	0.10
Parameters							
Natural mortality	0.07	0.04	0.05	0.06	0.08	0.09	0.10
Steepness	0.6	0.6	0.6	0.6	0.6	0.6	0.6

Table 17. Model results from profiling over stock-recruitment steepness values.

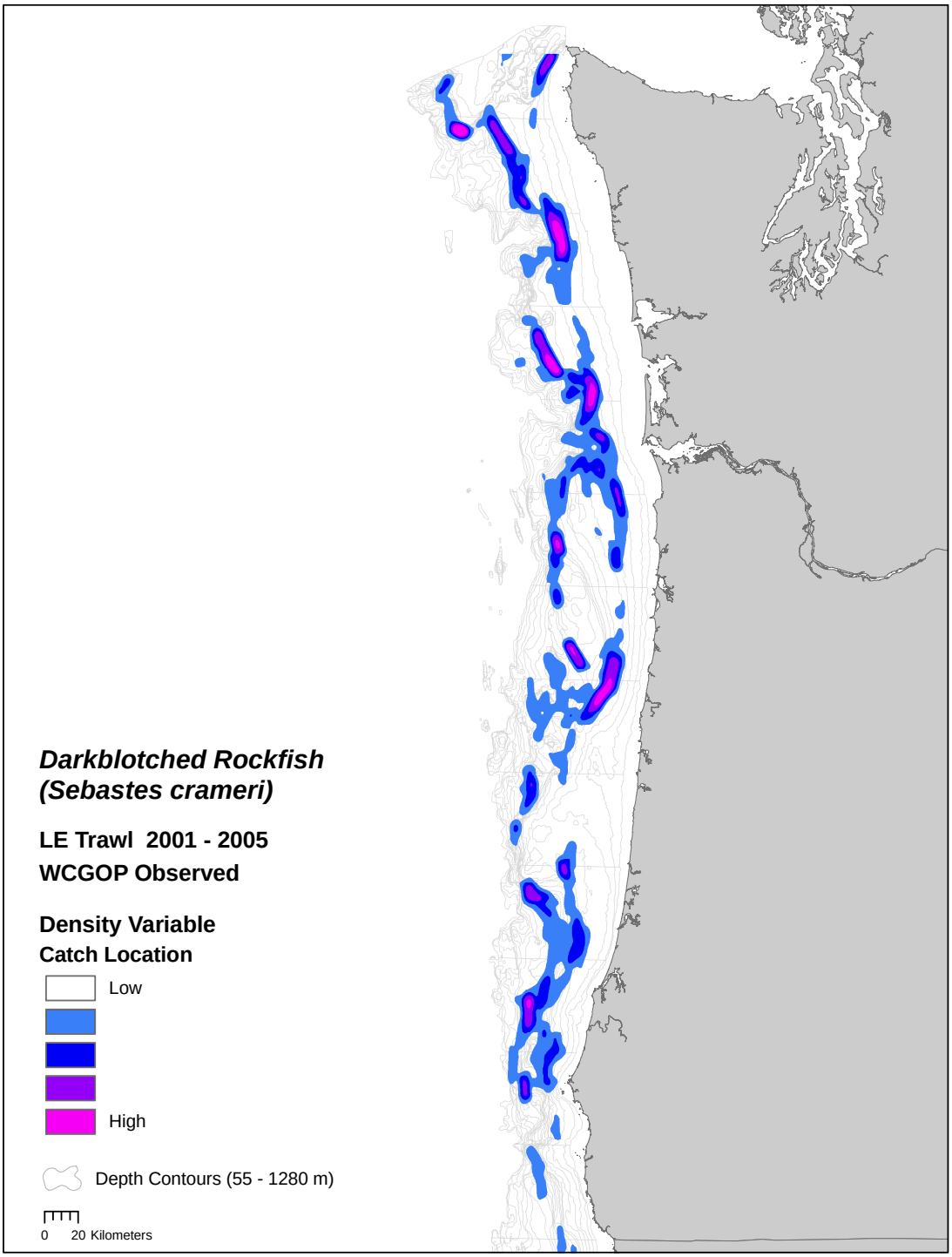
Derived Quantities of Interest	Base	h.3	h.4	h.5	h.7	h.8	h.95	hest
Depletion in 2007	22.4%	6.9%	10.8%	16.0%	29.2%	35.4%	43.1%	22.0%
2007 spawning output	6,853	2,356	3,504	5,000	8,843	10,704	13,017	6,749
Unfished spawning output	30,641	34,085	32,414	31,289	30,336	30,218	30,178	30,665
SO_{MSY}	12,256	13,634	12,966	12,515	12,134	12,087	12,071	12,266
MSY_{B40} (landings+discard)	621	245	408	526	703	776	870	616
F_{MSY}	0.041	0.016	0.027	0.035	0.047	0.051	0.056	0.041
Exploitation rate at MSY	0.038	0.014	0.024	0.032	0.042	0.046	0.050	0.037
F_{2006}/F_{MY}	0.370	2.733	1.101	0.597	0.256	0.195	0.146	0.379
Likelihoods								
Objective function	2217.05	2244.18	2225.64	2218.67	2217.45	2218.39	2219.79	2217.25
Triennial Survey index	4.93	7.85	4.83	4.03	6.72	8.64	11.07	4.85
AFSC Slope Survey index	0.49	0.41	0.42	0.45	0.53	0.56	0.58	0.49
NWFSC Slope Survey index	4.67	5.58	5.08	4.81	4.61	4.58	4.56	4.68
NWFSC Shelf Survey index	0.03	0.08	0.05	0.04	0.03	0.02	0.02	0.03
Discard	7.61	8.10	7.84	7.69	7.57	7.55	7.52	7.62
Fishery and discard length	531.91	543.66	538.33	534.57	530.25	529.27	528.49	532.03
Triennial Survey length	246.83	241.51	243.57	245.50	247.47	247.67	247.66	246.77
AFSC Slope Survey length	55.56	55.62	55.66	55.63	55.47	55.39	55.32	55.56
NWFSC slope length	150.11	152.64	151.32	150.53	149.90	149.80	149.72	150.12
NWFSC shelf length	55.84	58.09	57.03	56.29	55.62	55.52	55.46	55.86
Fishery and discard age	571.20	571.81	569.75	570.18	571.88	572.19	572.32	571.15
Triennial Survey age	16.10	15.62	15.75	15.92	16.26	16.39	16.51	16.10
AFSC Survey age	45.02	44.40	44.59	44.84	45.13	45.18	45.20	45.02
NWFSC slope age	283.17	284.46	283.64	283.29	283.12	283.08	283.03	283.18
NWFSC shelf age	227.86	229.23	228.56	228.13	227.68	227.57	227.45	227.87
Catch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Recruitment	15.62	25.02	19.12	16.69	15.12	14.90	14.77	15.65
Parameter priors	0.10	0.11	0.10	0.10	0.10	0.10	0.10	0.29
Parameters								
Natural mortality	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Steepness	0.6	0.3	0.4	0.5	0.7	0.8	0.95	0.595

Table 18. Model results from profiling over stock-recruitment steepness (h) and estimating natural mortality (M).

Derived Quantities of Interest	Base	h.3Mest	hMest	h.4Mest	h.5Mest	h.6Mest	h.7Mest	h.8Mest	h.9Mest
Depletion in 2007	22.4%	26.5%	26.7%	26.8%	27.2%	28.1%	29.5%	31.6%	34.5%
2007 spawning output	6,853	9,782	9,250	8,969	8,659	8,677	8,950	9,500	10,317
Unfished spawning output	30,641	36,850	34,685	33,458	31,784	30,871	30,350	30,053	29,889
SO_{MSY}	12,256	14,740	13,874	13,383	12,713	12,348	12,140	12,021	11,955
MSY_{B40} (landings+discard)	621	392	492	549	629	675	707	735	766
F_{MSY}	0.041	0.021	0.028	0.033	0.040	0.044	0.047	0.049	0.052
Exploitation rate at MSY	0.038	0.019	0.025	0.029	0.035	0.039	0.042	0.045	0.047
F_{2006}/F_{MY}	0.370	0.503	0.401	0.358	0.308	0.278	0.253	0.227	0.200
Likelihoods									
Objective function	2217.05	2214.78	2215.24	2215.26	2215.89	2216.64	2217.44	2218.31	2219.18
Triennial Survey index	4.93	6.12	6.06	6.05	6.11	6.36	6.82	7.54	8.54
AFSC Slope Survey index	0.49	0.53	0.53	0.52	0.52	0.52	0.53	0.54	0.55
NWFSC Slope Survey index	4.67	4.96	4.87	4.81	4.72	4.65	4.61	4.57	4.55
NWFSC Shelf Survey index	0.03	0.04	0.04	0.03	0.03	0.03	0.03	0.02	0.02
Discard	7.61	7.51	7.53	7.54	7.55	7.56	7.57	7.57	7.56
Fishery and discard length	531.91	526.73	527.45	527.98	528.96	529.67	530.14	530.34	530.28
Triennial Survey length	246.83	244.50	245.14	245.58	246.37	246.98	247.46	247.82	248.04
AFSC Slope Survey length	55.56	55.17	55.24	55.30	55.38	55.44	55.46	55.46	55.43
NWFSC slope length	150.11	149.83	149.86	149.87	149.90	149.90	149.89	149.87	149.83
NWFSC shelf length	55.84	55.35	55.41	55.45	55.52	55.57	55.61	55.62	55.63
Fishery and discard age	571.20	573.91	573.38	573.04	572.48	572.14	571.91	571.80	571.76
Triennial Survey age	16.10	16.27	16.25	16.24	16.23	16.24	16.27	16.32	16.38
AFSC Survey age	45.02	45.17	45.16	45.16	45.14	45.14	45.13	45.13	45.14
NWFSC slope age	283.17	282.86	282.92	282.96	283.03	283.08	283.11	283.13	283.13
NWFSC shelf age	227.86	227.37	227.46	227.51	227.60	227.65	227.67	227.66	227.62
Catch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Recruitment	15.62	18.37	17.63	17.12	16.24	15.59	15.13	14.81	14.62
Parameter priors	0.10	0.11	0.34	0.10	0.10	0.10	0.10	0.10	0.10
Parameters									
Natural mortality	0.07	0.106	0.098	0.093	0.083	0.076	0.070	0.067	0.064
Steepness	0.6	0.3	0.35	0.4	0.5	0.6	0.7	0.8	0.9

Table 19. Model results from profiling over estimating natural mortality (M) and estimating stock recruitment steepness (h) using Dorn's prior.

Derived Quantities of Interest	Base	M.04 h est	M.05 h est	M.06 h est	M.07 h est	M.08 h est	M.09 h est	hMest	M.10 h est
Depletion in 2007	22.4%	12.3%	16.5%	19.7%	22.0%	23.8%	25.4%	26.7%	26.9%
2007 spawning output	6,853	3,779	5,001	5,958	6,749	7,517	8,372	9,250	9,439
Unfished spawning output	30,641	30,774	30,307	30,255	30,665	31,561	32,992	34,685	35,053
SO_{MSY}	12,256	12,309	12,123	12,102	12,266	12,624	13,197	13,874	14,021
MSY_{B40} (landings+discard)	621	507	571	608	616	597	550	492	479
F_{MSY}	0.041	0.037	0.041	0.042	0.041	0.038	0.033	0.028	0.027
Exploitation rate at MSY	0.038	0.035	0.038	0.039	0.037	0.034	0.030	0.025	0.024
F_{2006}/F_{MY}	0.370	0.747	0.516	0.420	0.379	0.367	0.376	0.401	0.408
Likelihoods									
Objective function	2217.05	2232.19	2223.79	2219.54	2217.25	2216.01	2215.39	2215.24	2215.25
Triennial Survey index	4.93	3.51	3.77	4.34	4.85	5.29	5.70	6.06	6.13
AFSC Slope Survey index	0.49	0.41	0.44	0.47	0.49	0.50	0.52	0.53	0.53
NWFSC Slope Survey index	4.67	4.66	4.62	4.63	4.68	4.73	4.81	4.87	4.89
NWFSC Shelf Survey index	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04
Discard	7.61	7.99	7.78	7.68	7.62	7.58	7.55	7.53	7.52
Fishery and discard length	531.91	542.79	537.72	534.39	532.03	530.18	528.63	527.45	527.24
Triennial Survey length	246.83	246.96	247.34	247.19	246.77	246.25	245.66	245.14	245.04
AFSC Slope Survey length	55.56	56.07	55.85	55.69	55.56	55.44	55.33	55.24	55.23
NWFSC slope length	150.11	150.80	150.45	150.25	150.12	150.02	149.93	149.86	149.84
NWFSC shelf length	55.84	56.67	56.32	56.06	55.86	55.69	55.53	55.41	55.38
Fishery and discard age	571.20	570.51	570.16	570.54	571.15	571.86	572.64	573.38	573.53
Triennial Survey age	16.10	15.72	15.91	16.02	16.10	16.15	16.20	16.25	16.26
AFSC Survey age	45.02	44.61	44.80	44.93	45.02	45.08	45.12	45.16	45.17
NWFSC slope age	283.17	283.85	283.51	283.31	283.18	283.08	282.98	282.92	282.91
NWFSC shelf age	227.86	228.59	228.26	228.04	227.87	227.72	227.58	227.46	227.44
Catch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Recruitment	15.62	15.46	14.93	15.13	15.65	16.32	17.03	17.63	17.74
Parameter priors	0.10	3.58	1.92	0.84	0.29	0.09	0.14	0.34	0.38
Parameters									
Natural mortality	0.07	0.04	0.05	0.06	0.07	0.08	0.09	0.098	0.10
Steepness	0.6	0.88	0.81	0.70	0.595	0.50	0.41	0.35	0.35


Darkblotched Rockfish
(Sebastes crameri)
LE Trawl 2001 - 2005
WCGOP Observed
Density Variable
Catch Location
Low
High
Depth Contours (55 - 1280 m)
0 20 Kilometers

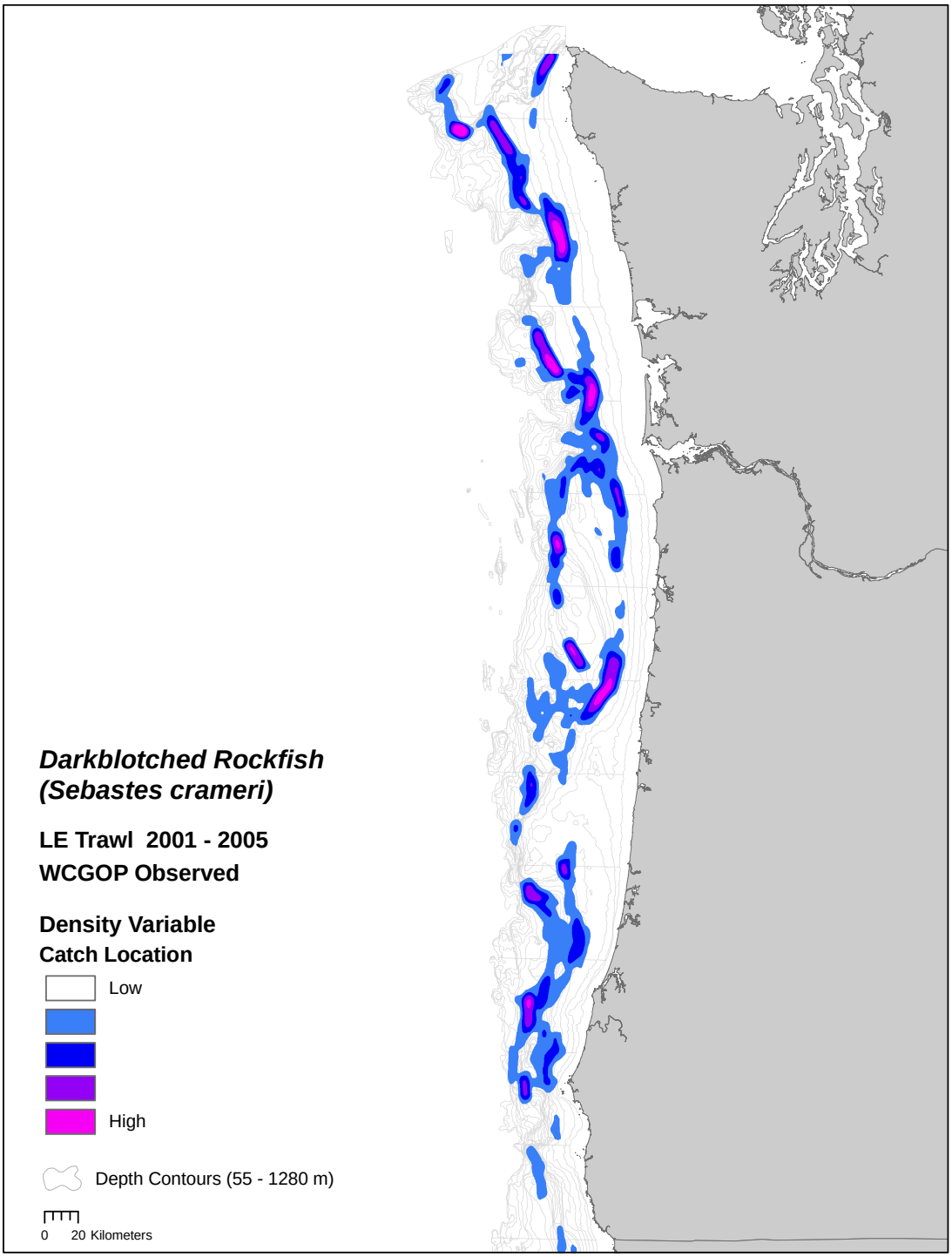


Figure 1. Map of density of occurrence of darkblotched rockfish off of (A) Washington and Oregon and (B) Northern and Central California (next page).

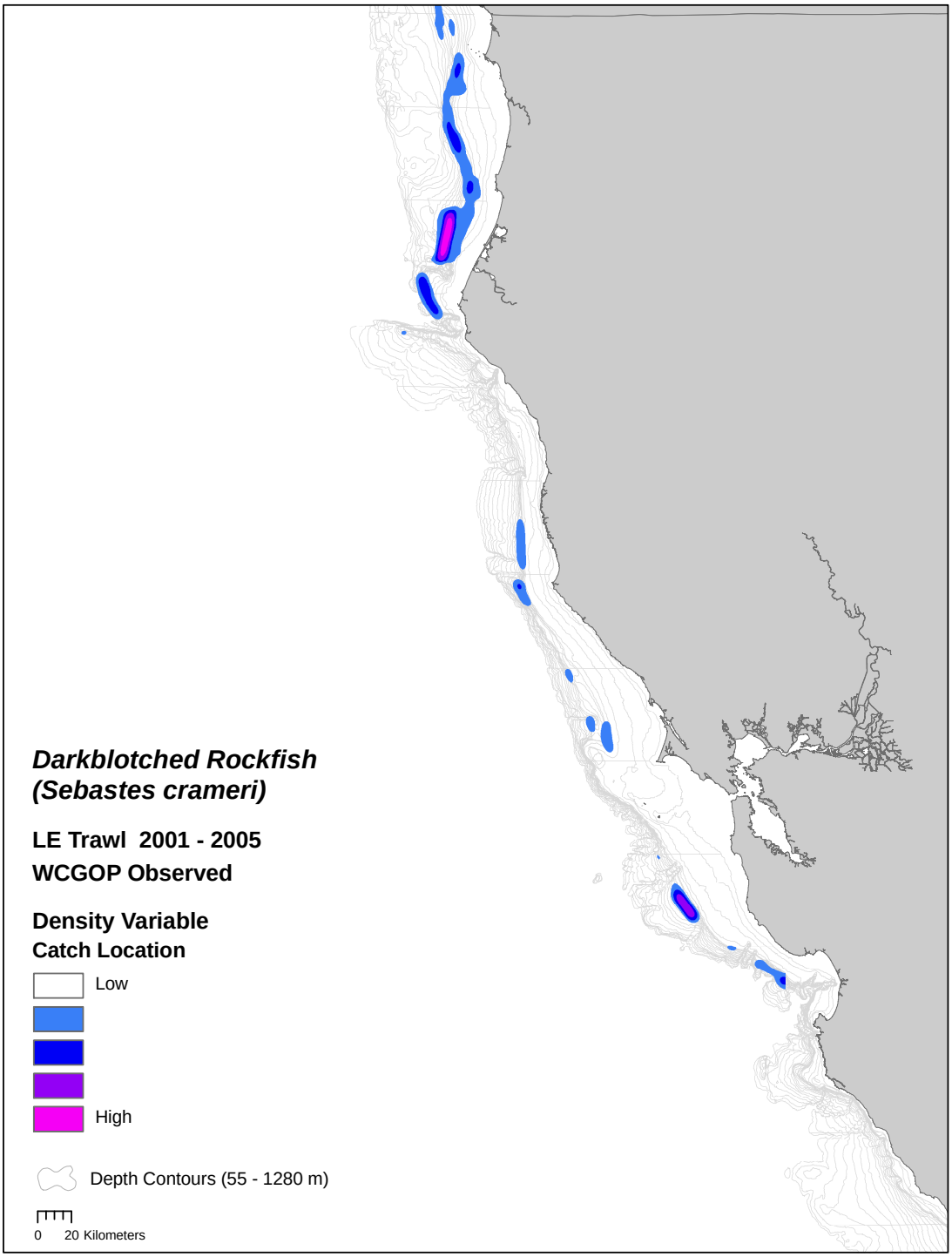


Figure 1 (cont.)

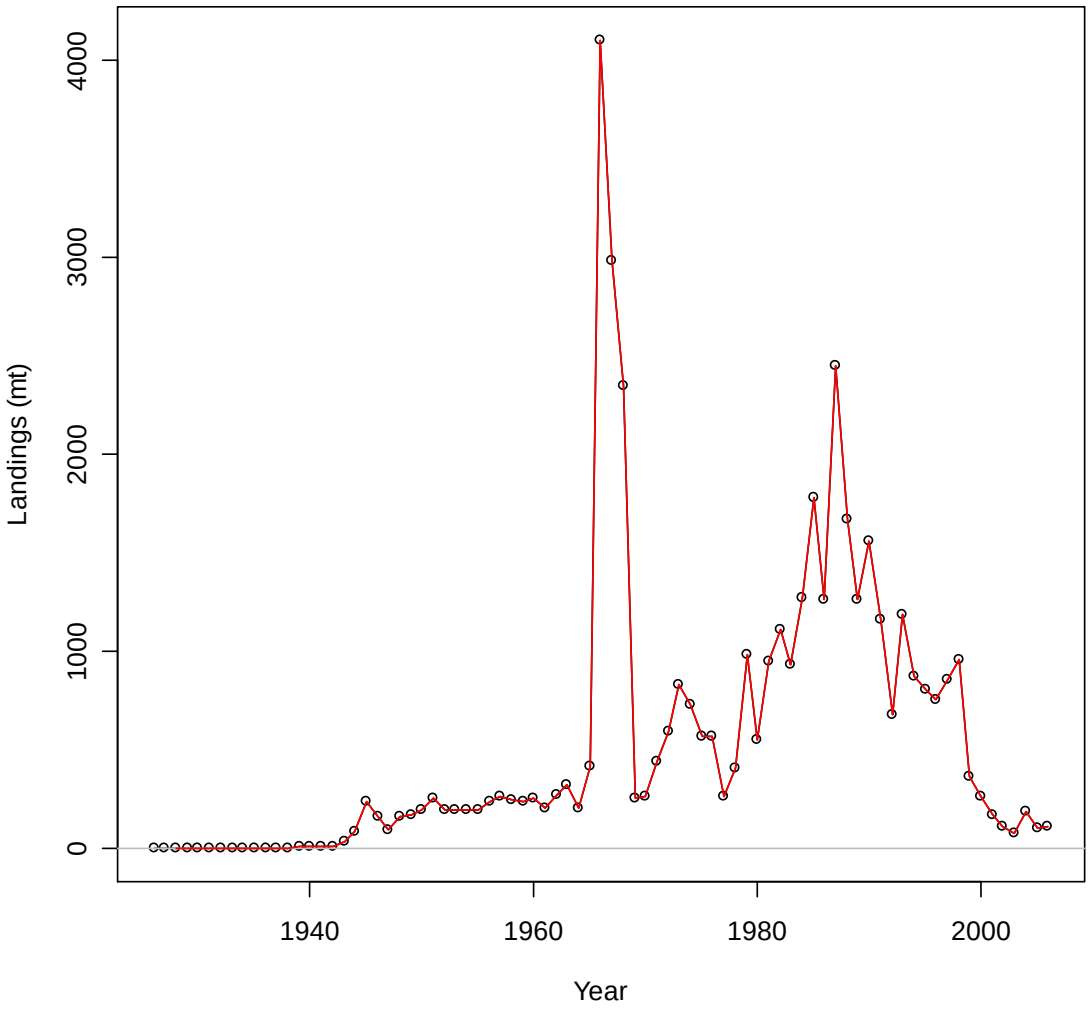


Figure 2. Time series of estimated fishery landings.

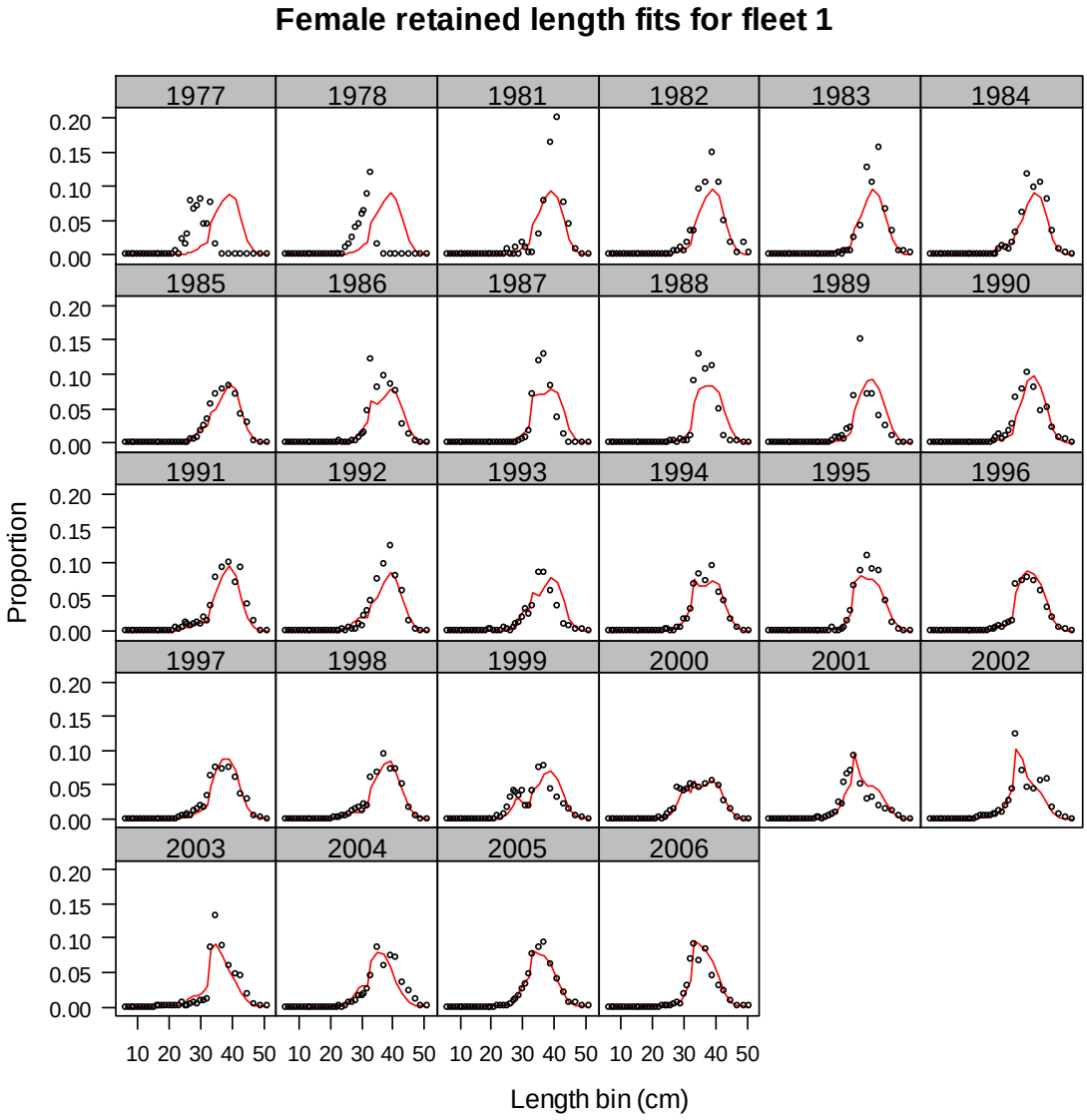


Figure 3. Female fishery length compositions and model fits.

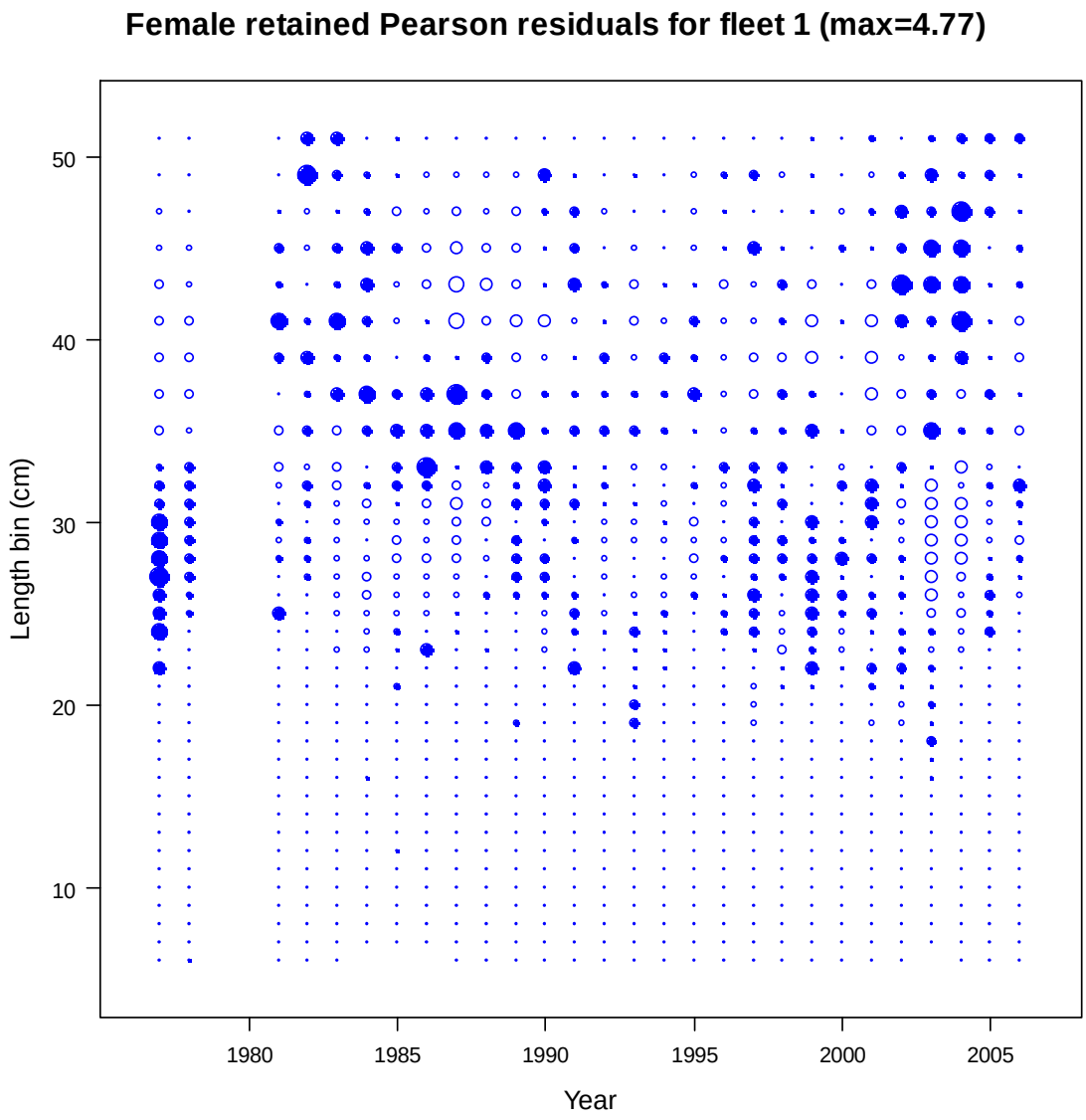


Figure 4. Pearson residuals for female length composition fits to fishery data.

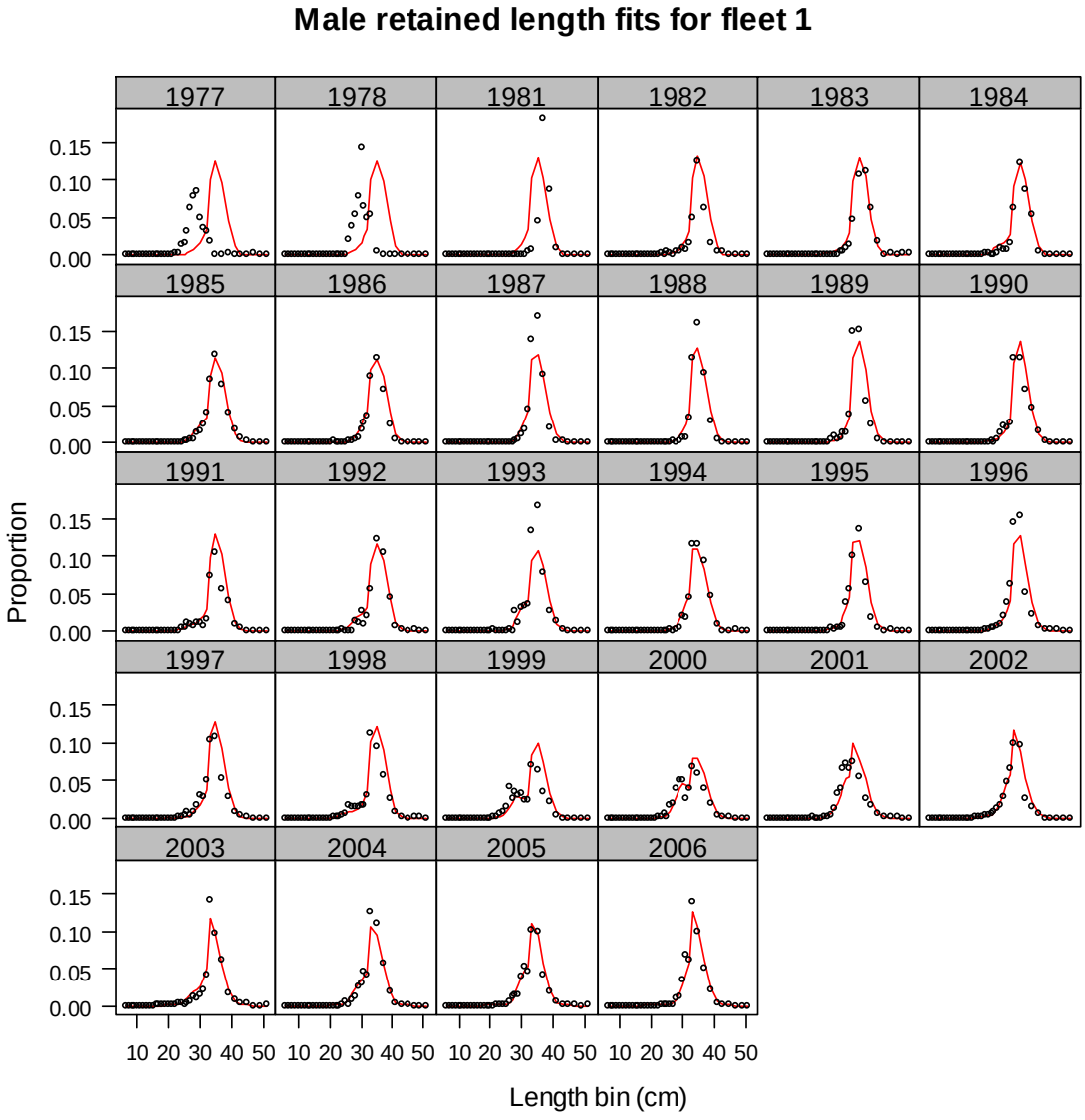


Figure 5. Male fishery lengths compositions and model fits

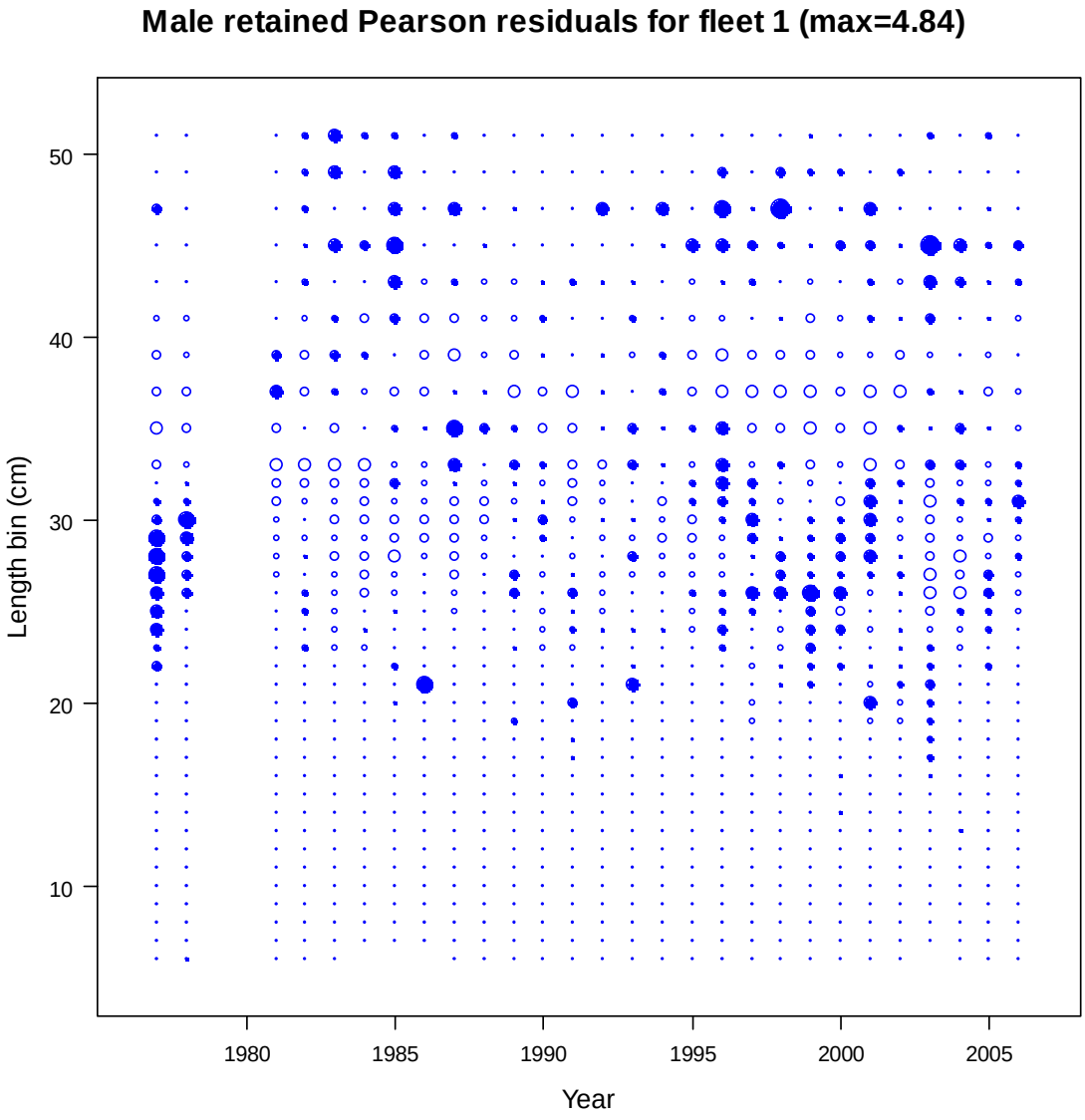


Figure 6. Pearson residuals for male length composition fits to fishery data.

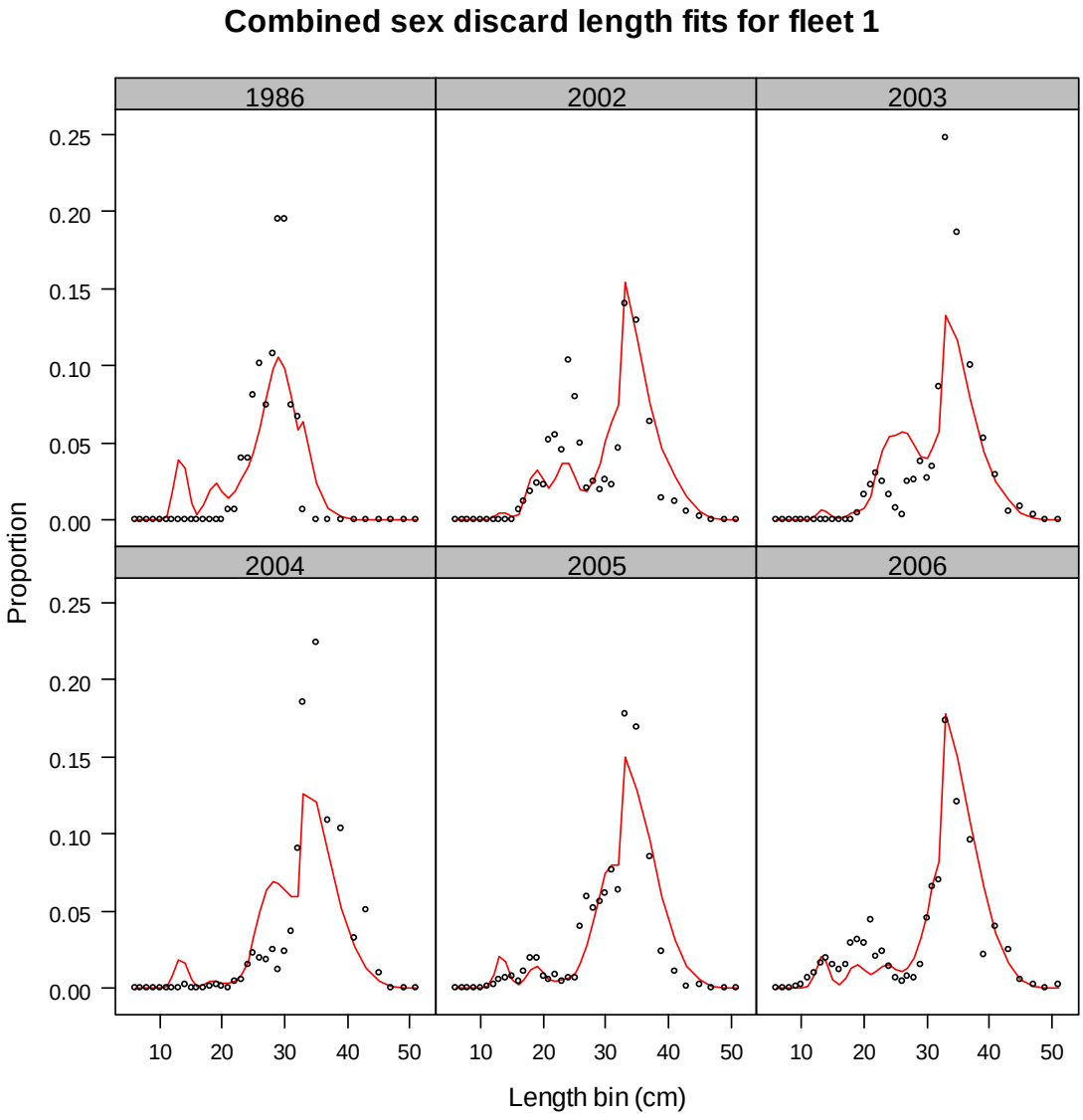


Figure 7. Fishery discard length compositions and model fits.

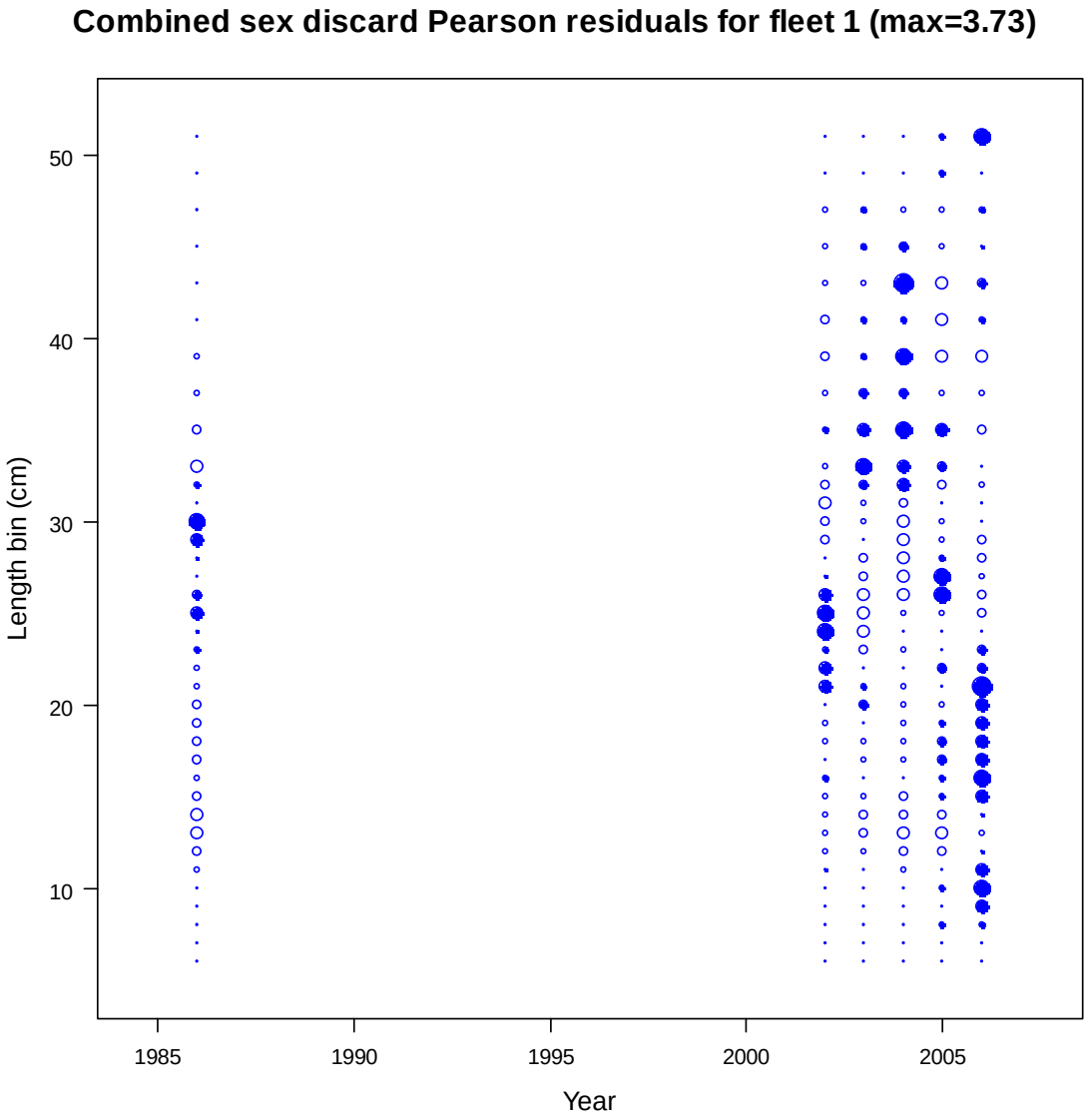


Figure 8. Pearson residuals for length composition fits to fishery discard data.

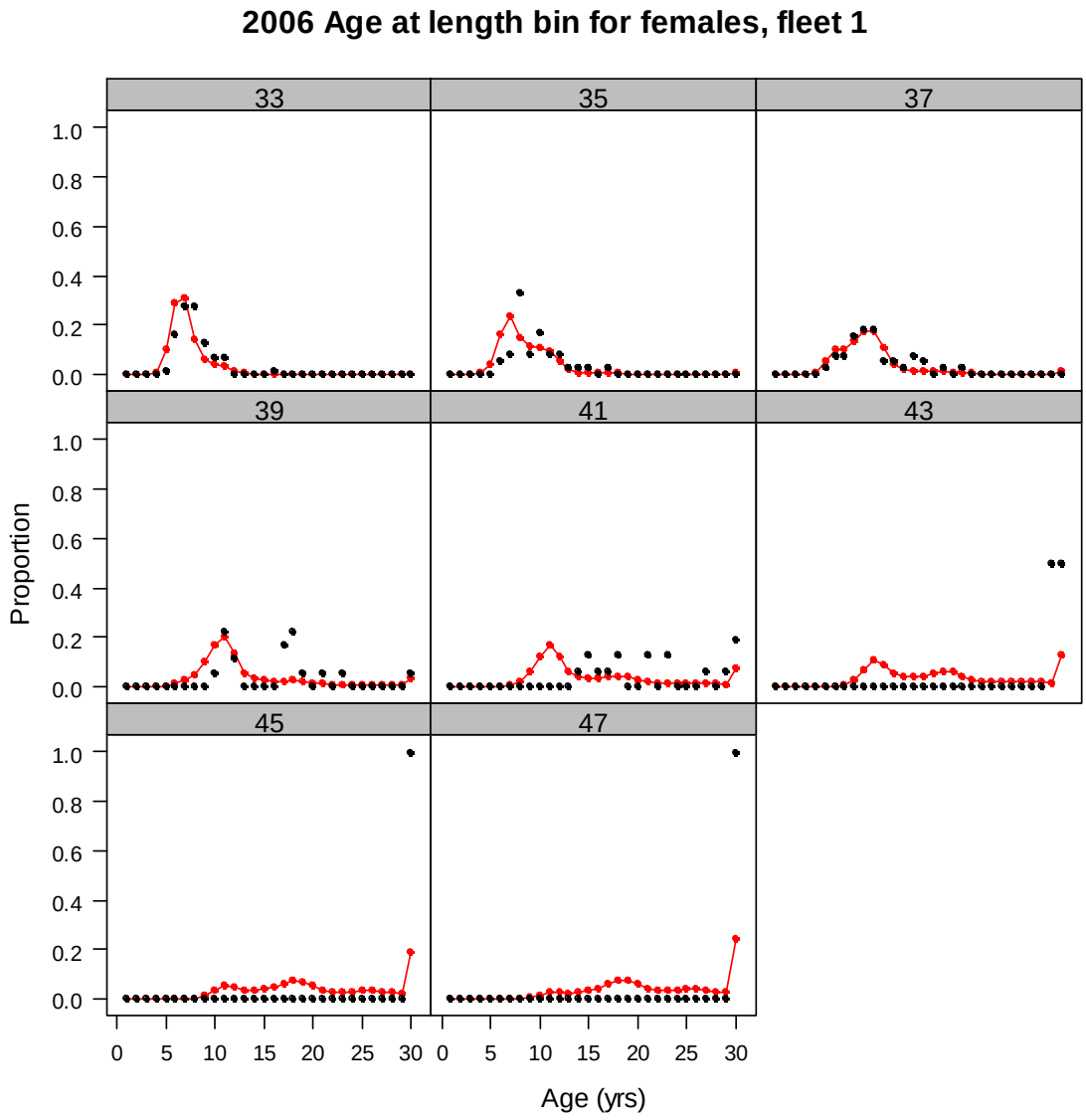


Figure 9. Fishery female 2006 conditional age-at-length data and model fits.

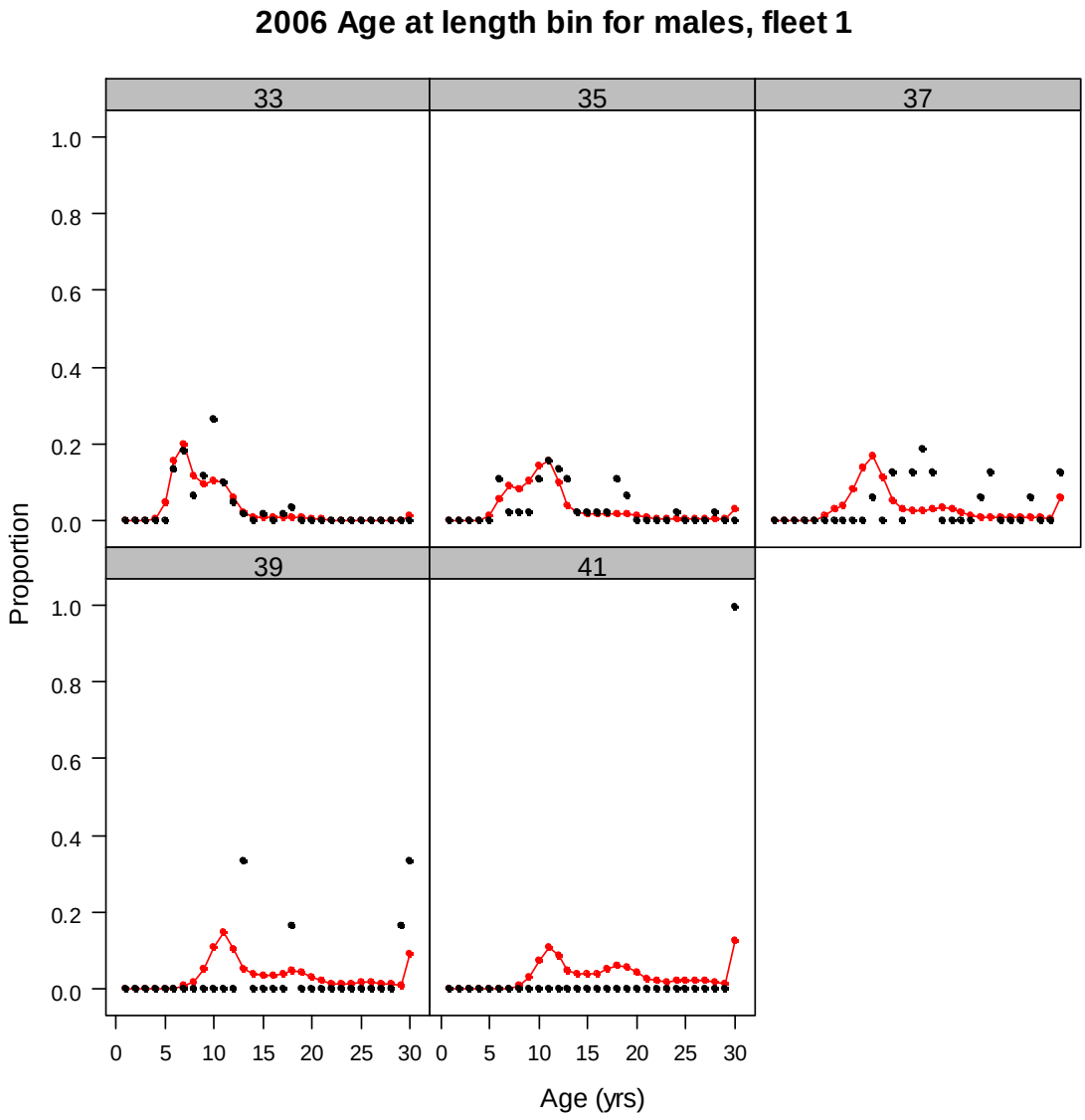


Figure 10. Fishery male 2006 conditional age-at-length data and model fits.

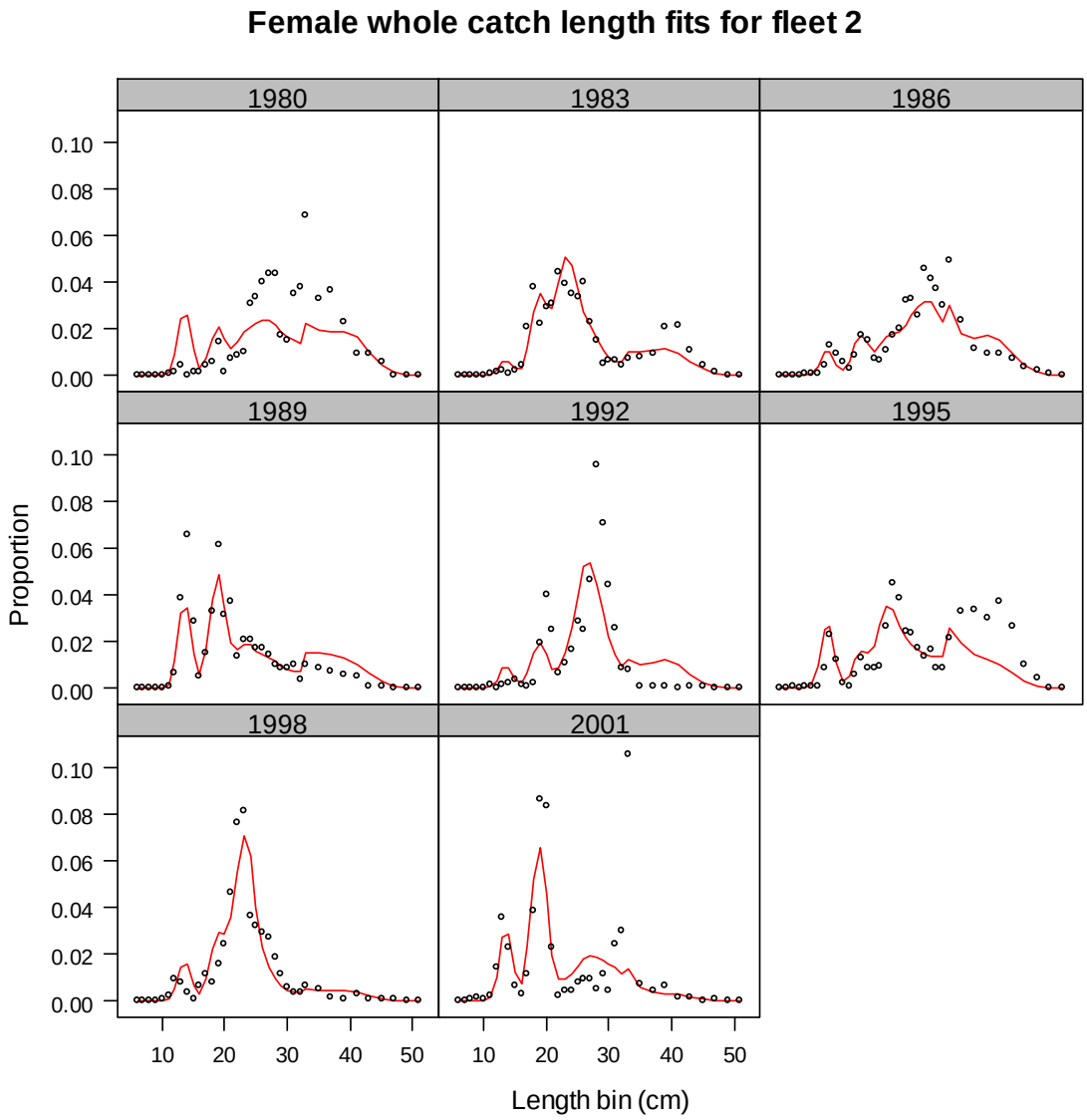


Figure 11. Triennial Shelf Survey female length compositions and model fits.

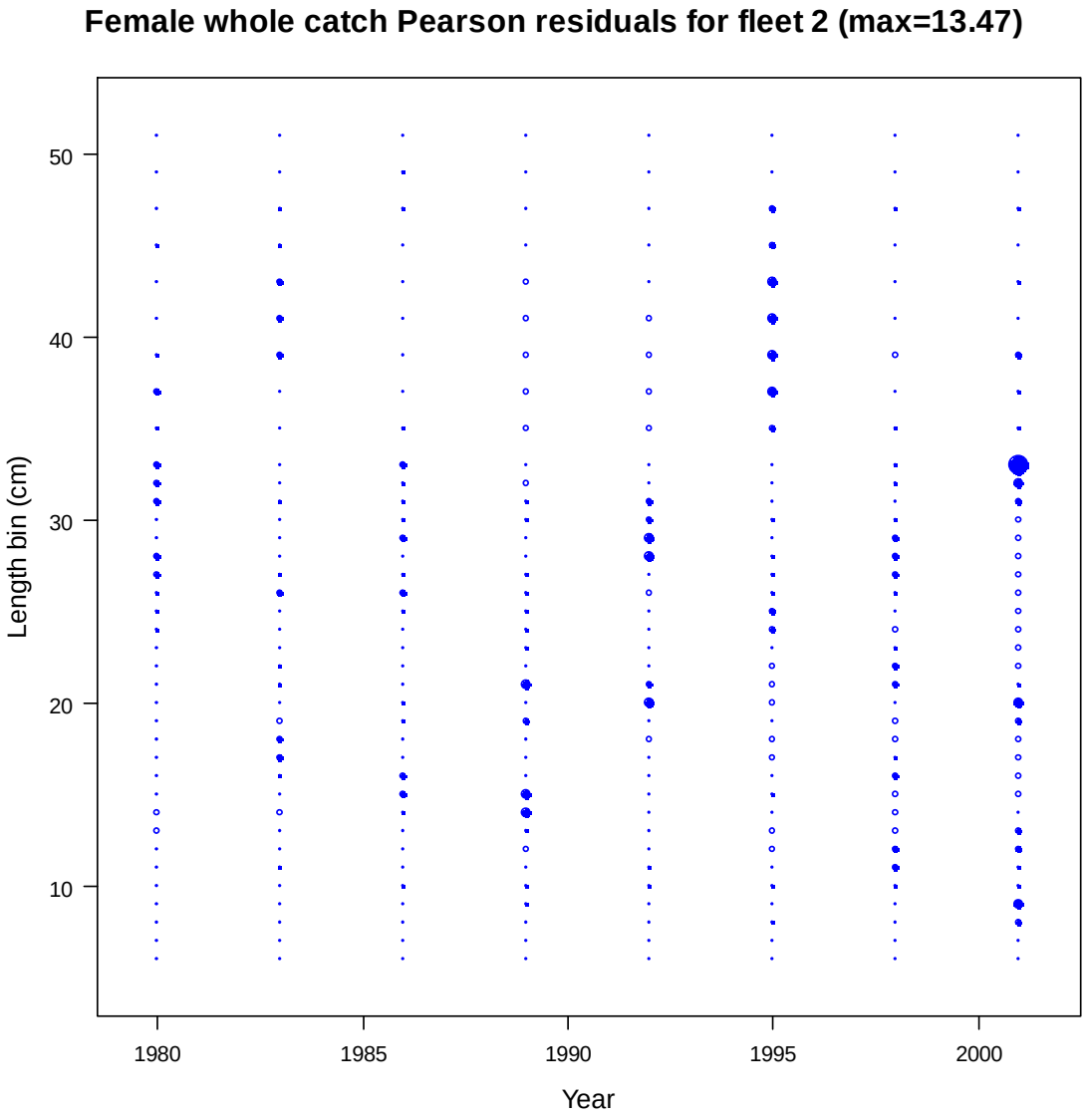


Figure 12. Pearson residuals for female length composition fits to Triennial Survey data.

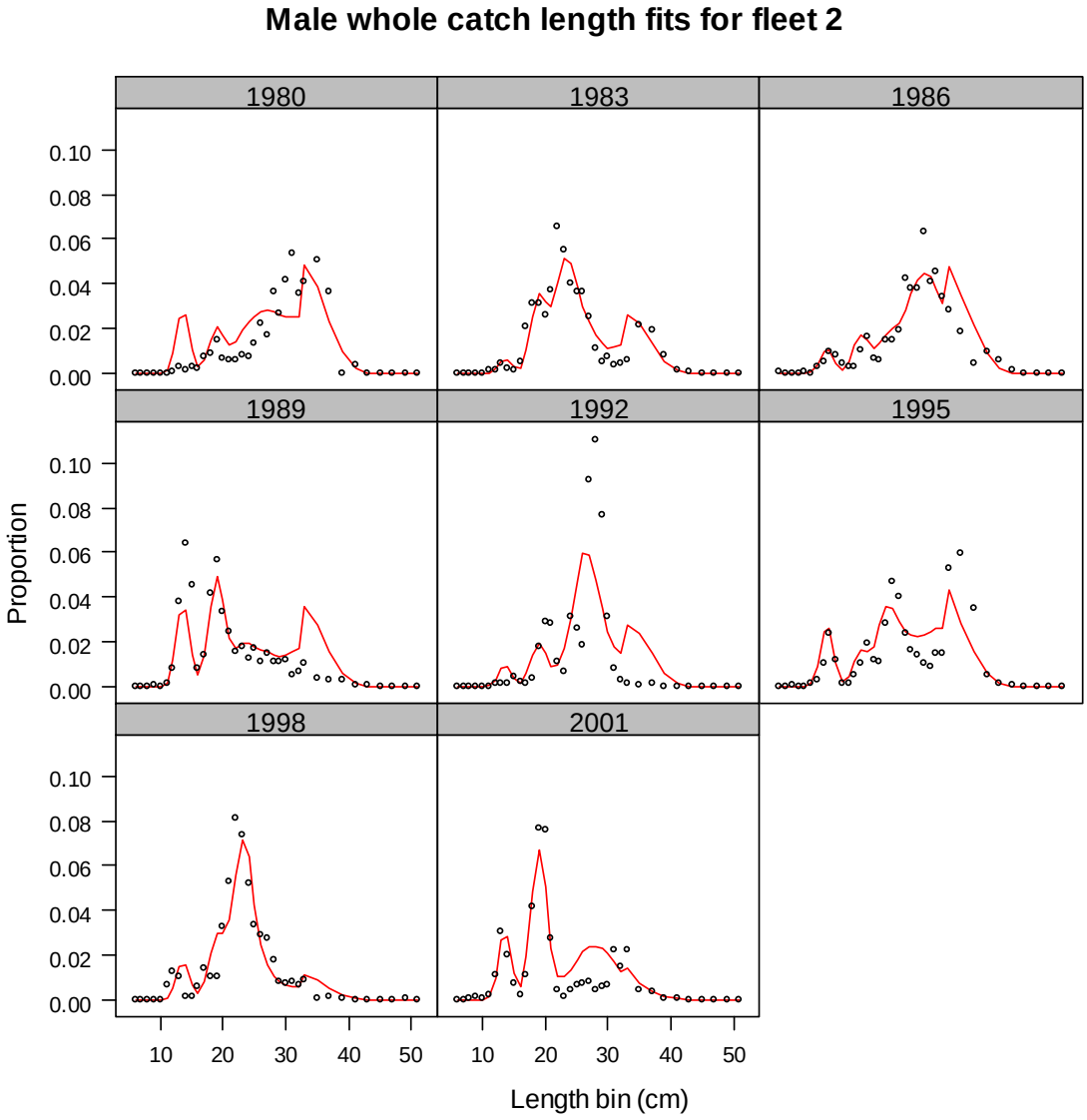


Figure 13. Triennial Shelf Survey male length compositions and model fits

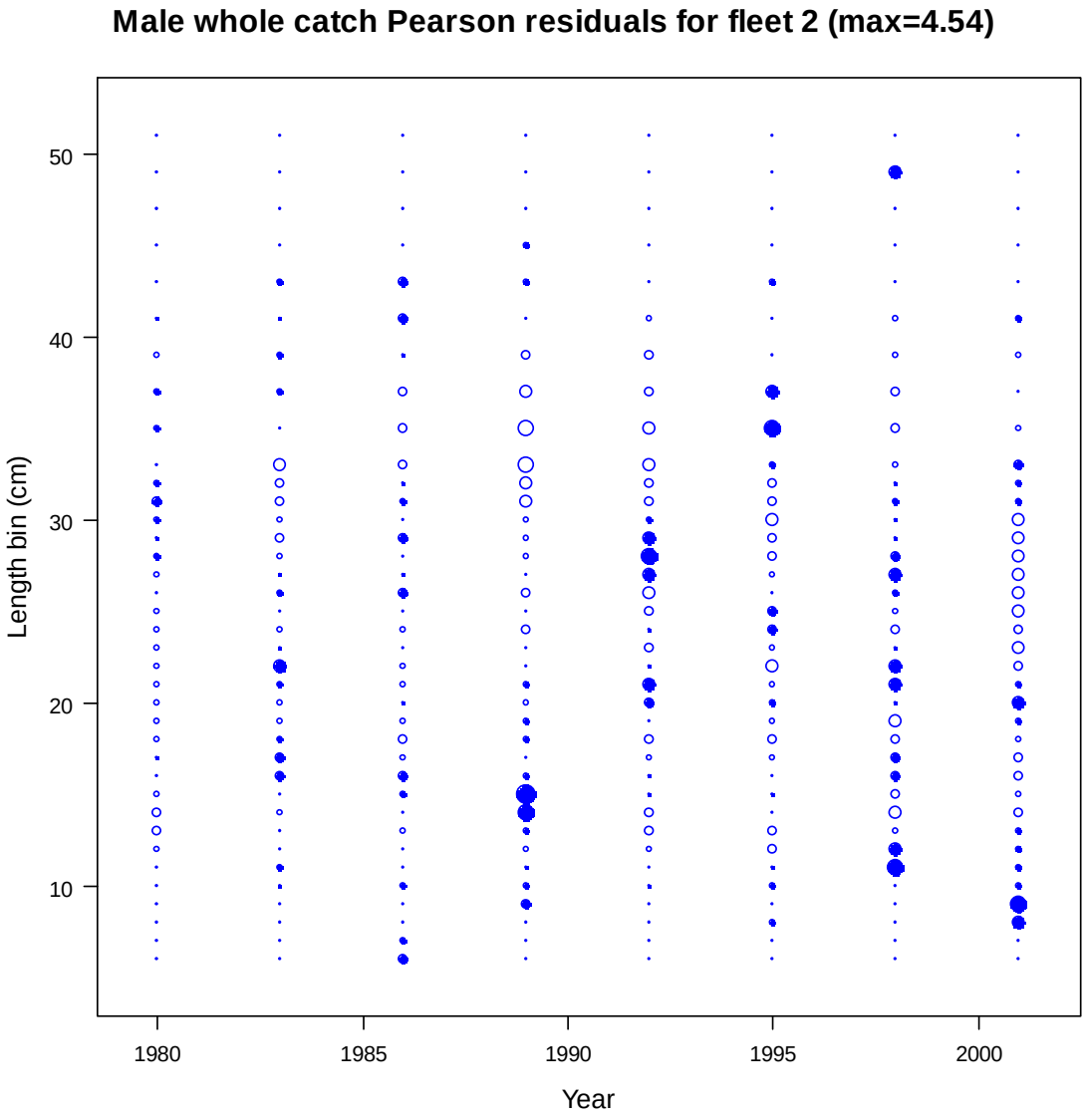


Figure 14. Pearson residuals for male length composition fits to Triennial Survey data.

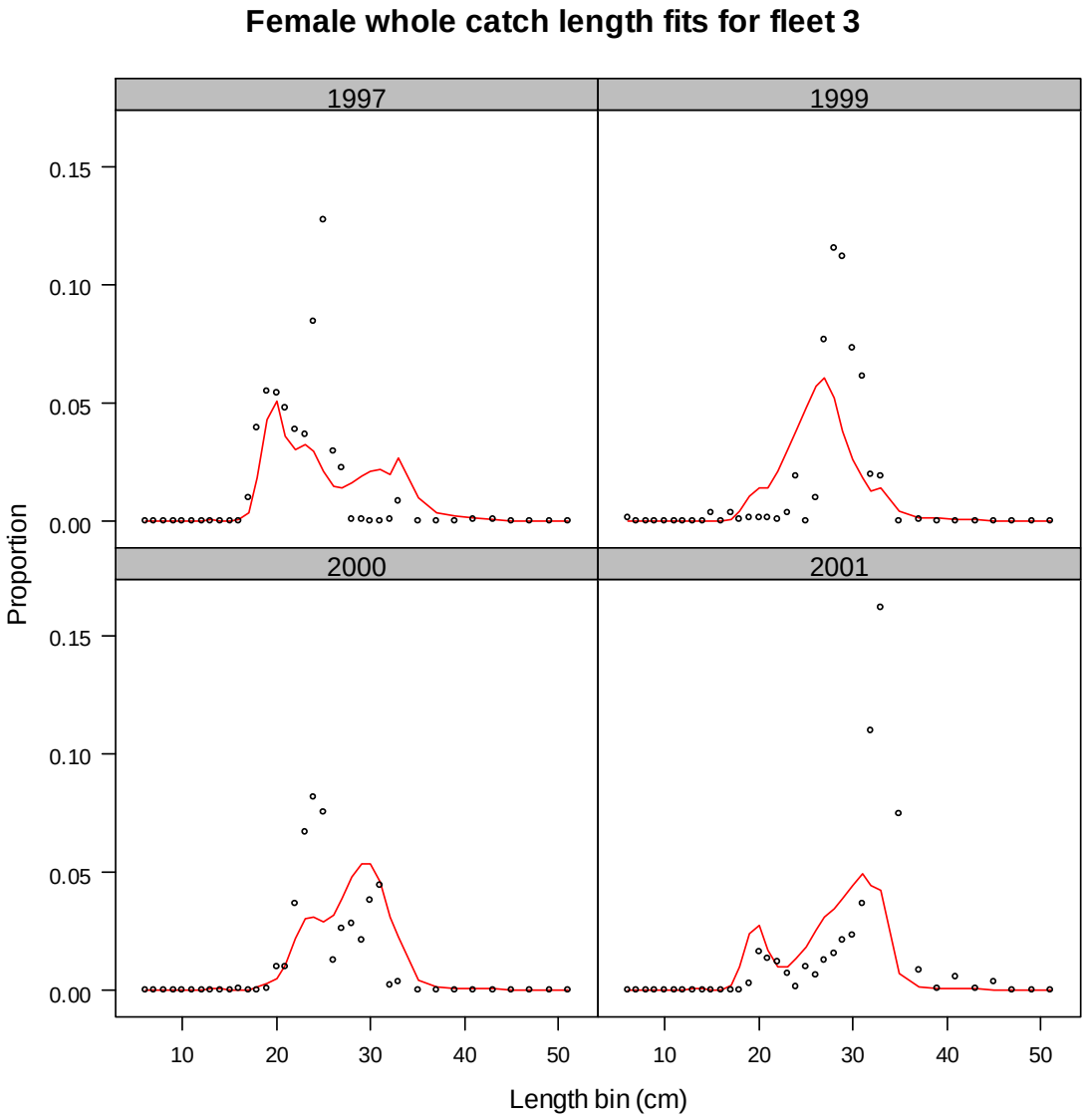


Figure 15. AFSC Slope Survey female length compositions and model fits

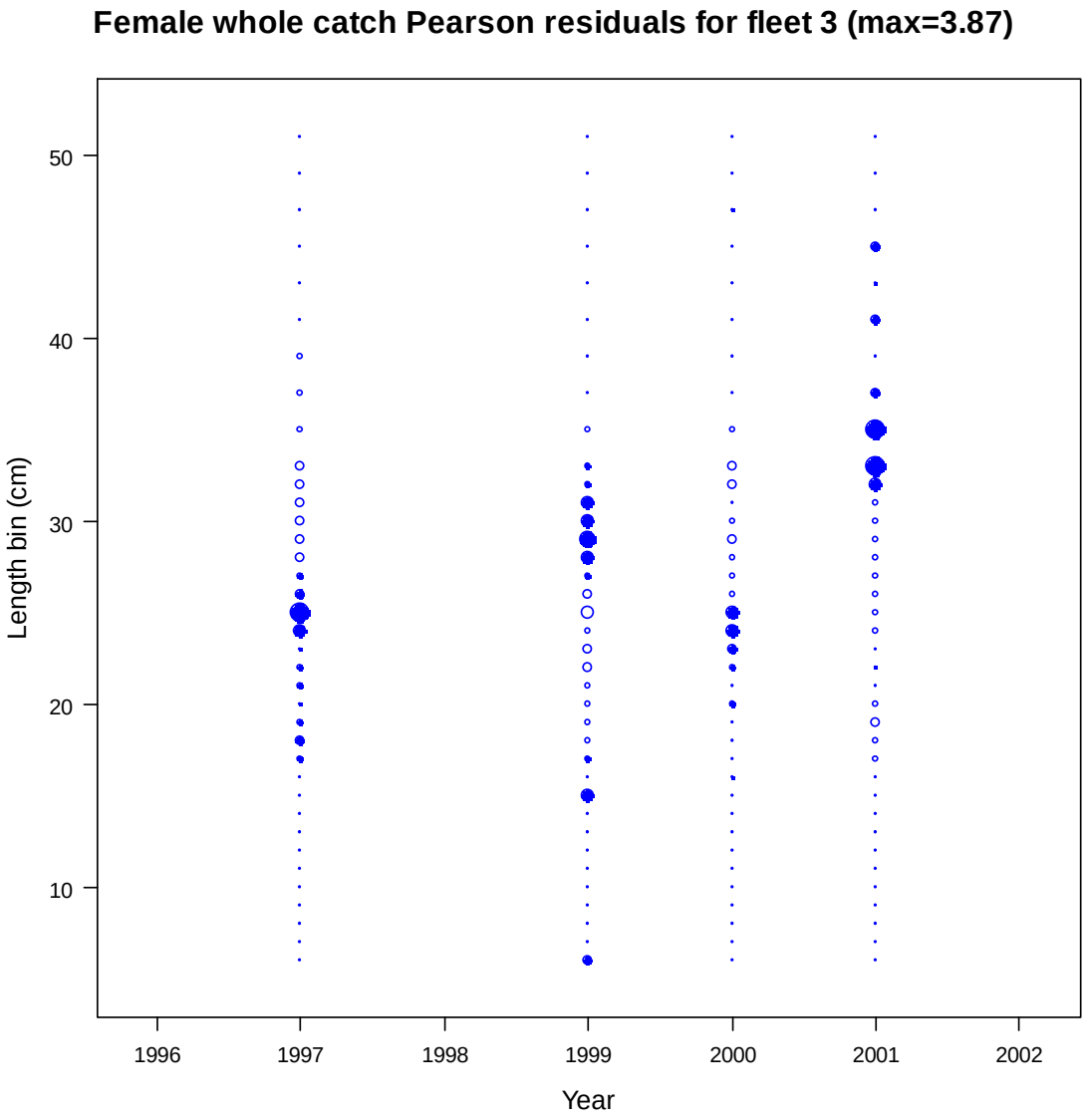


Figure 16. Pearson residuals for female length composition fits to AFSC Slope Survey data.

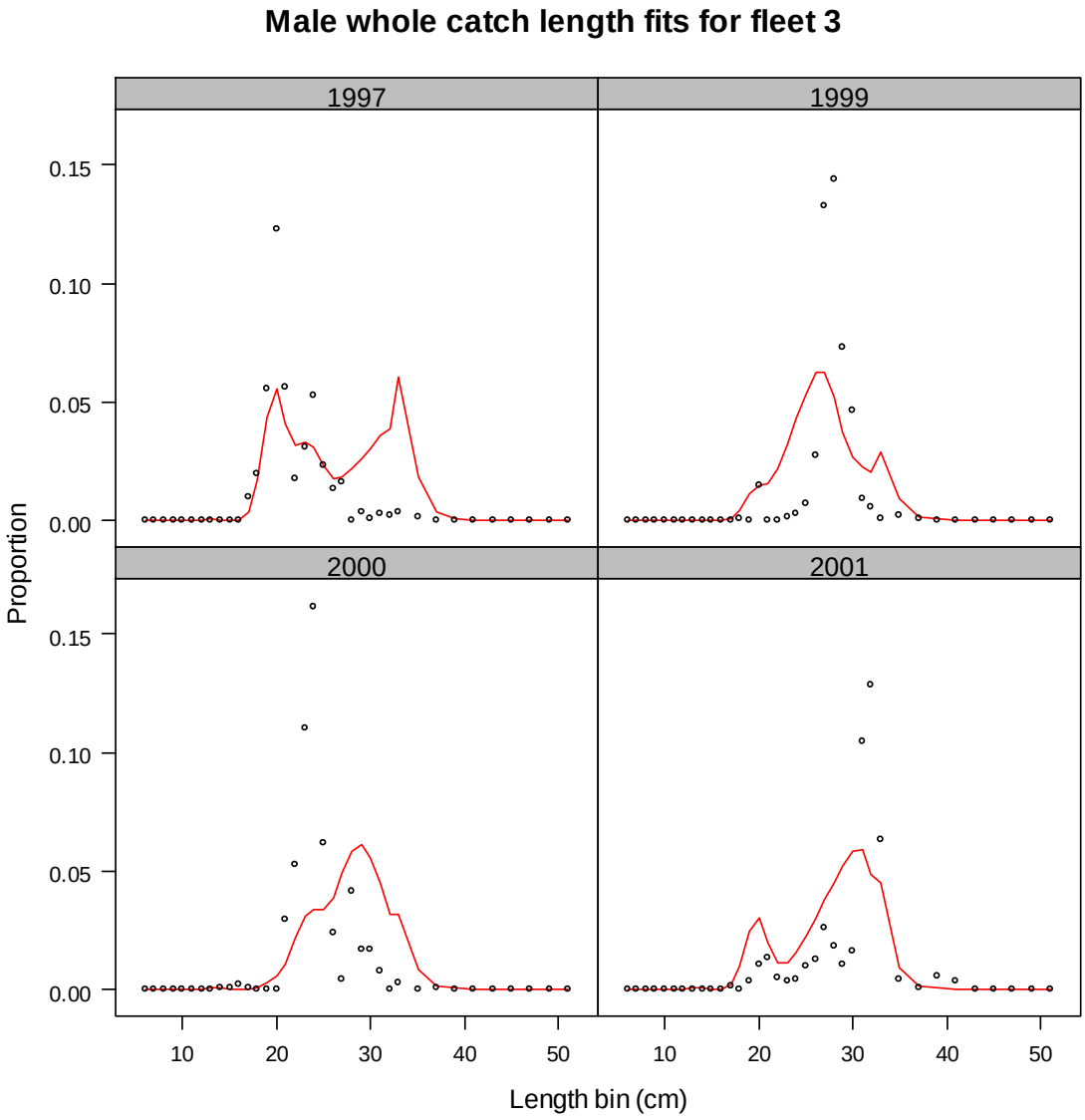


Figure 17. AFSC Slope Survey male length compositions and model fits

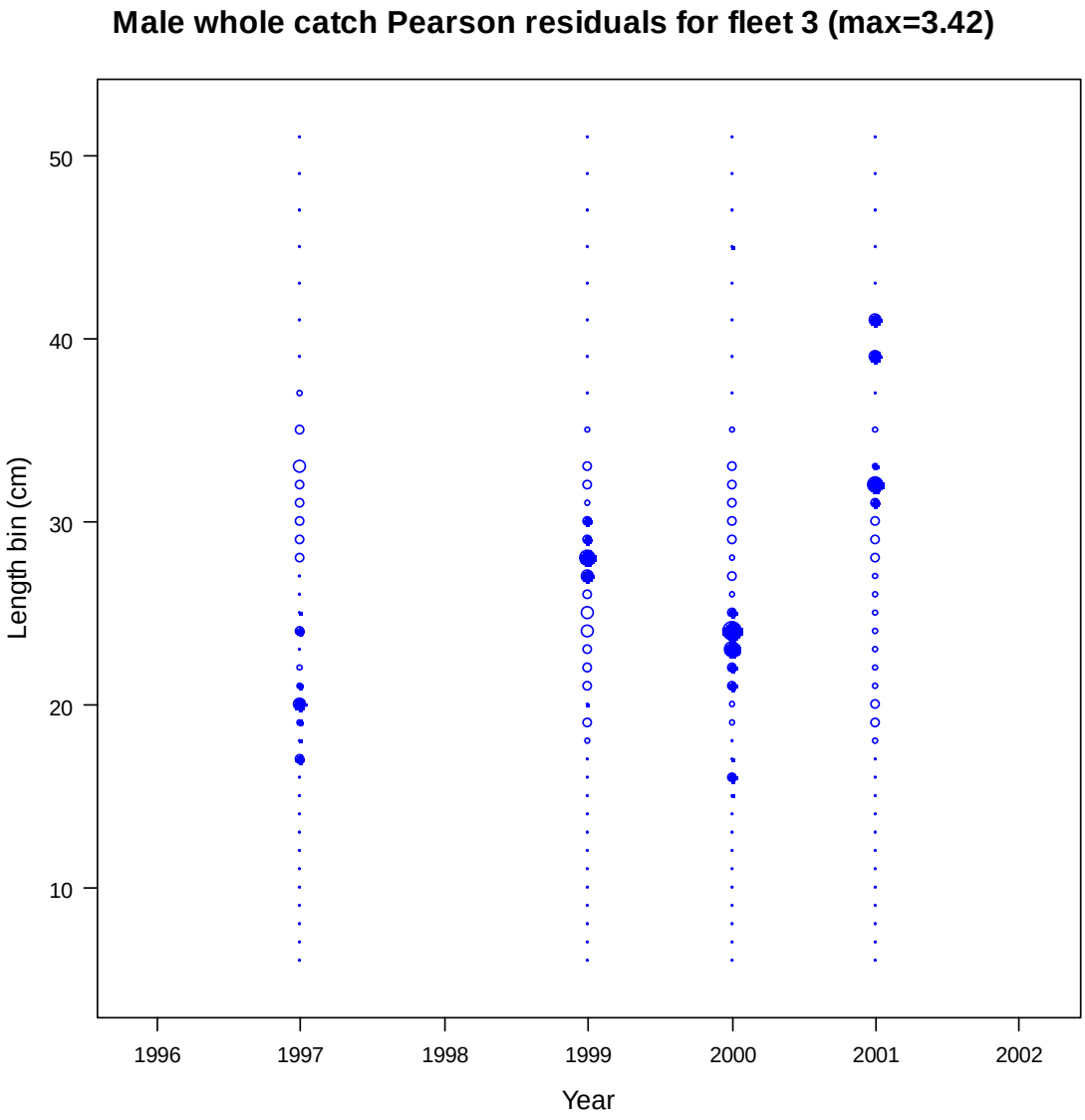


Figure 18. Pearson residuals for male length composition fits to AFSC Slope Survey data.

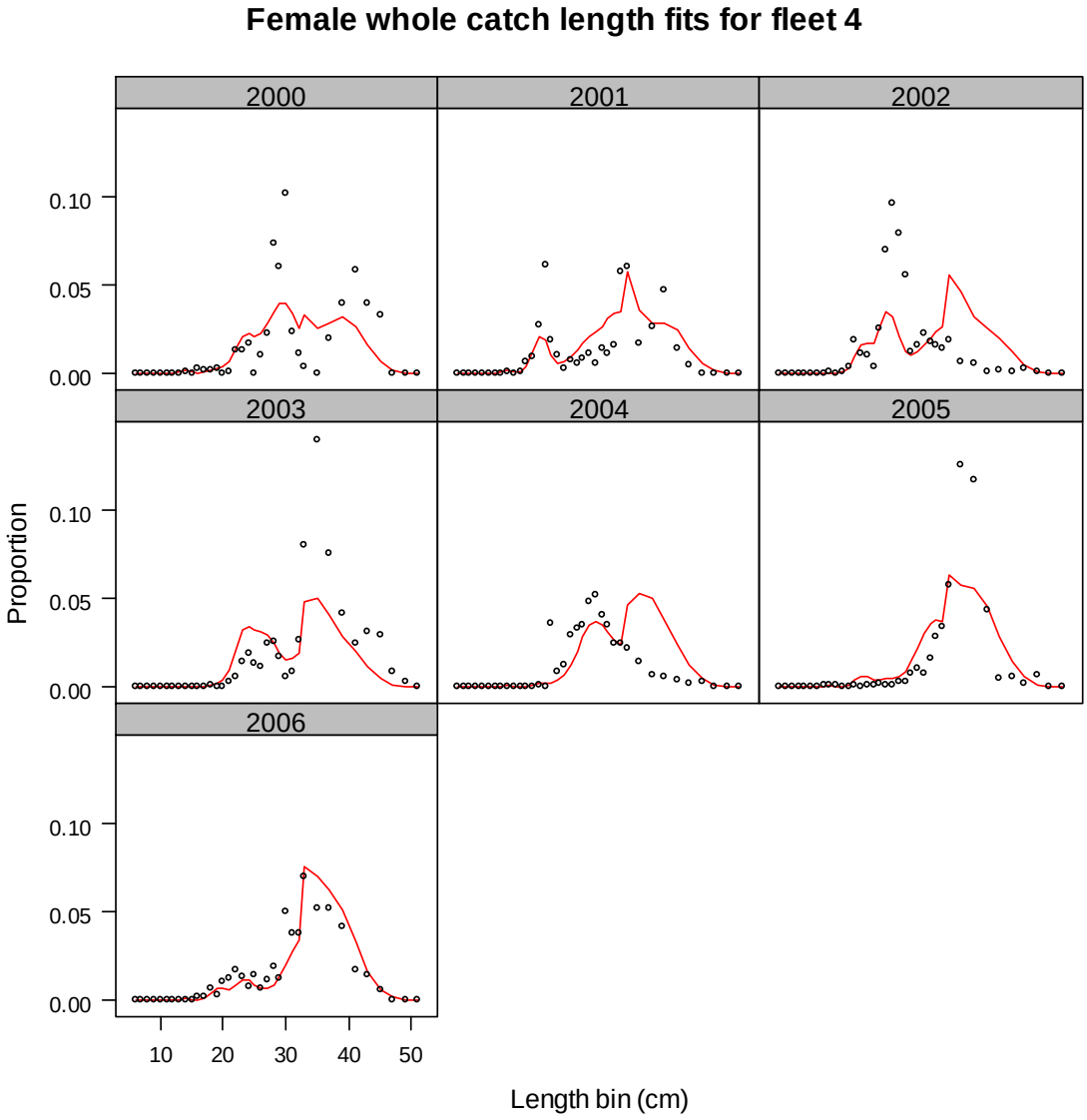


Figure 19. NWFSC Slope Survey female length compositions and model fits

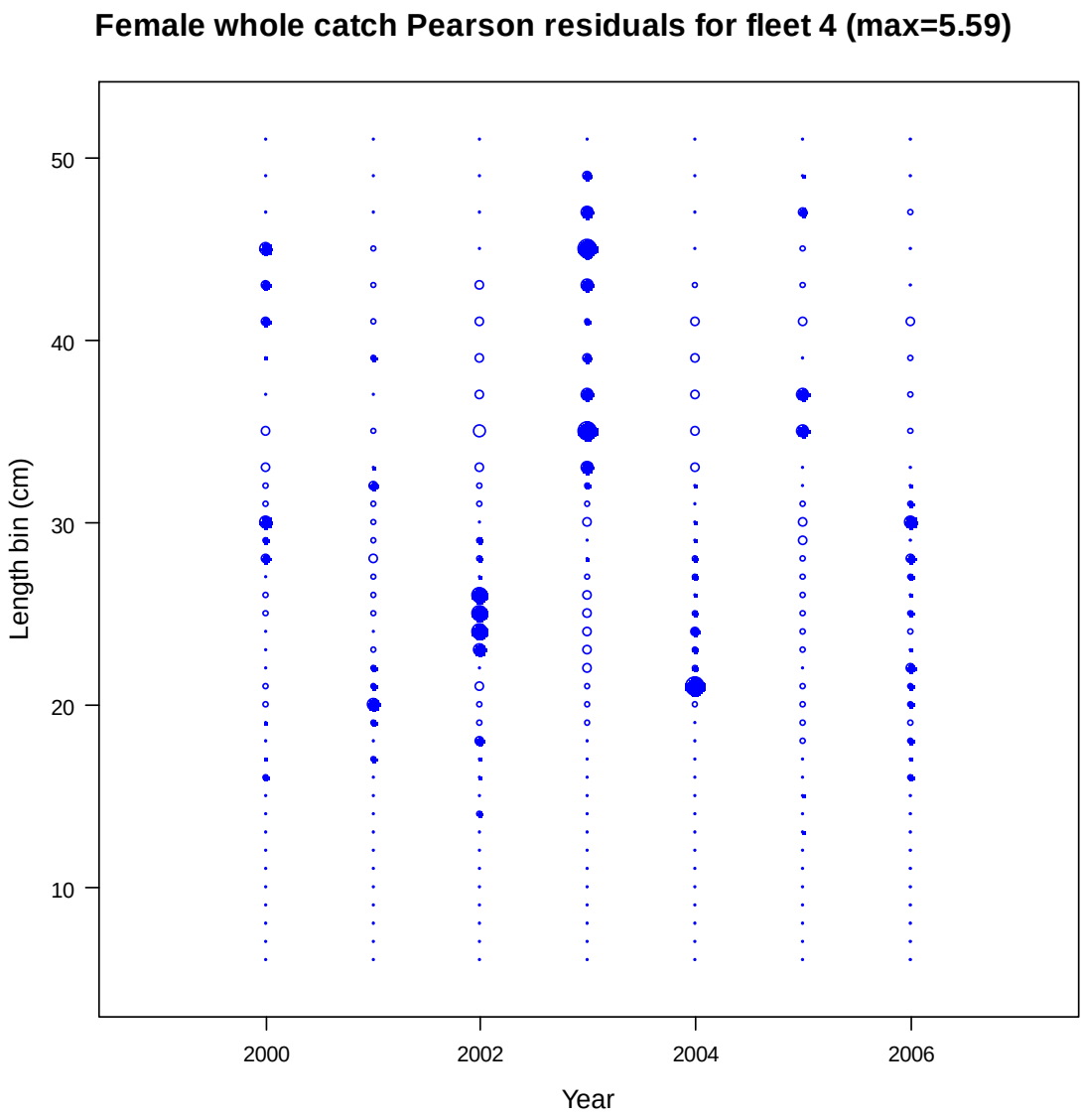


Figure 20. Pearson residuals for female length composition fits to NWFSC Slope Survey data.

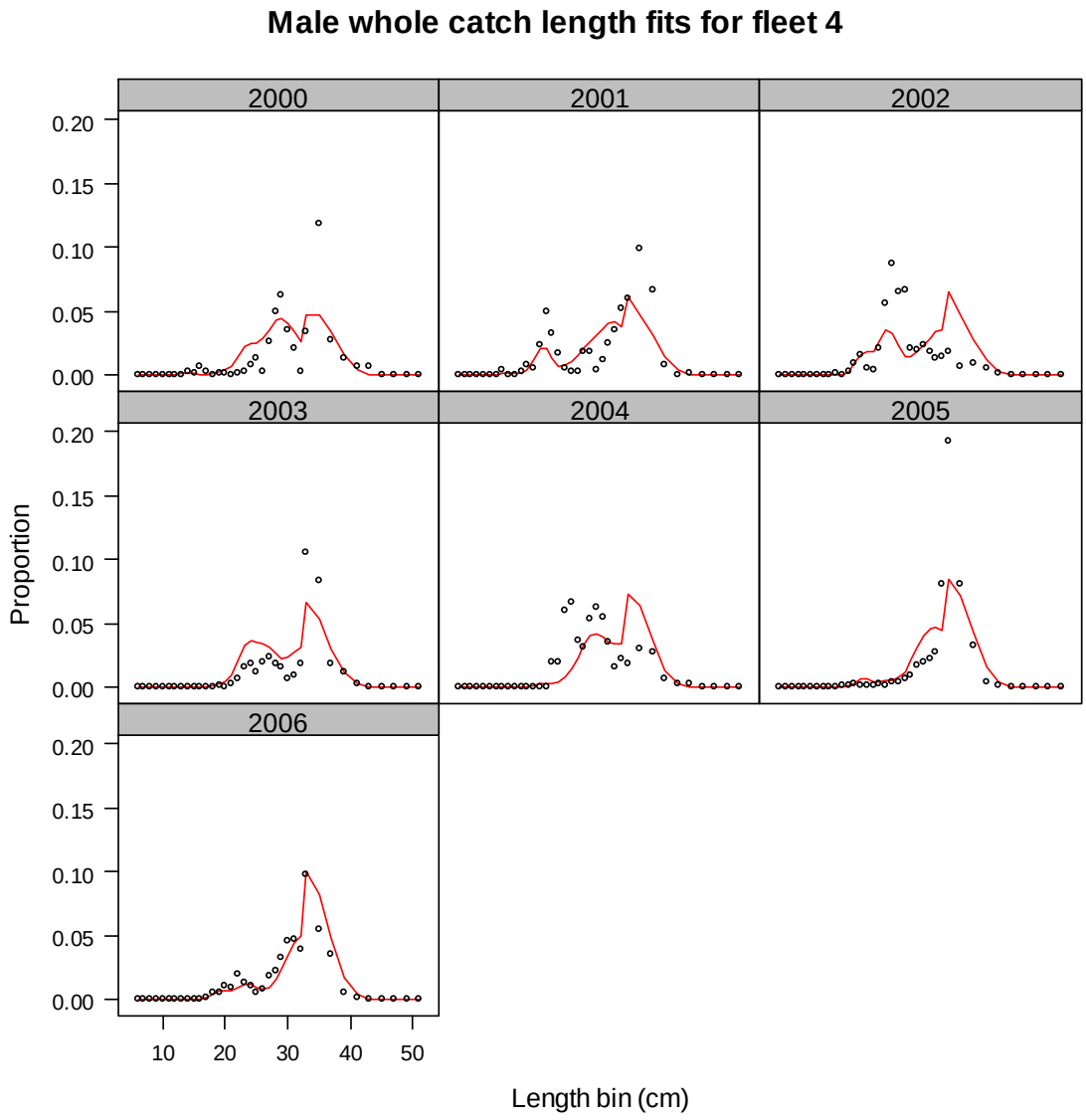


Figure 21. NWFSC Slope Survey male length compositions and model fits

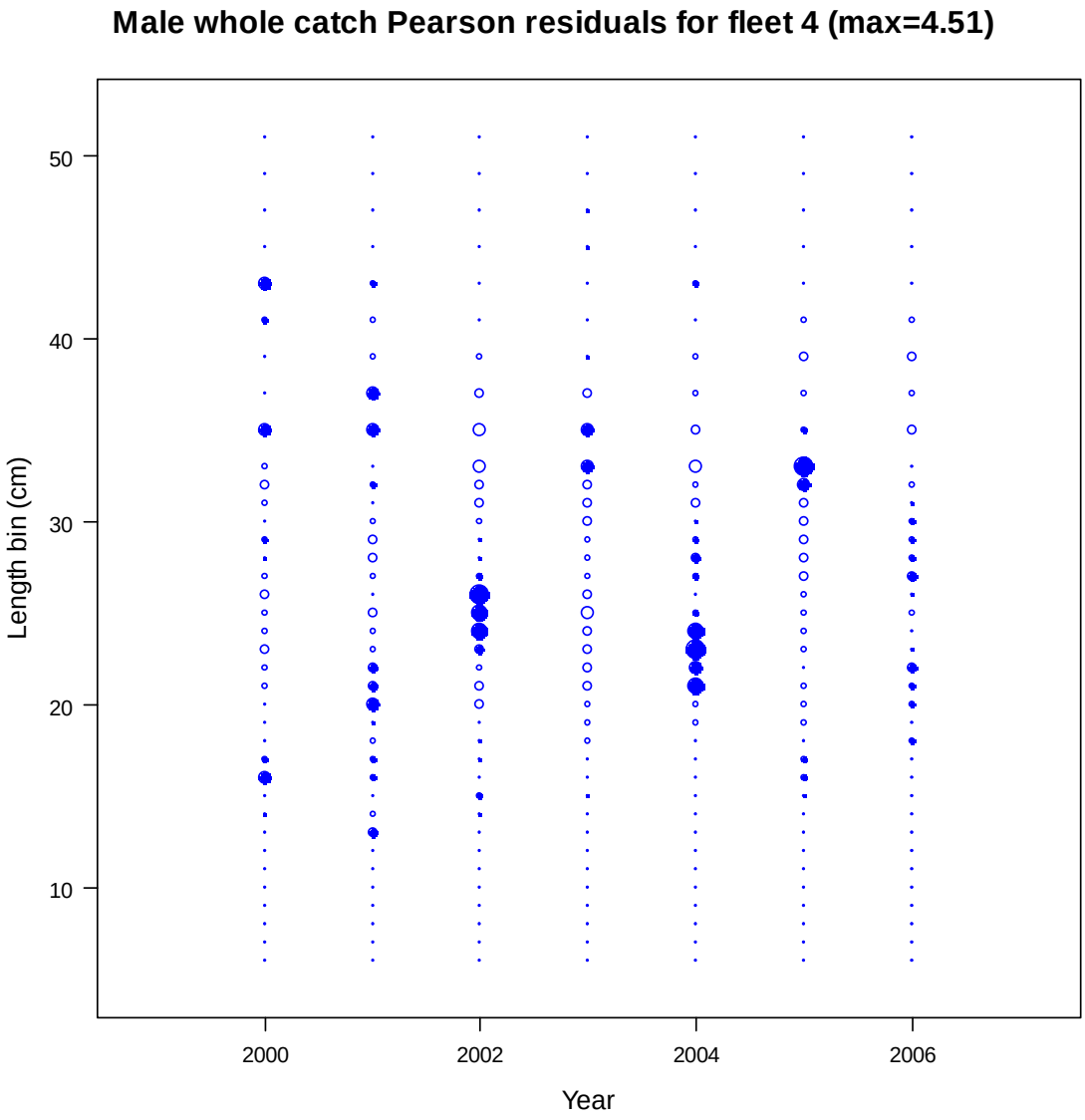


Figure 22. Pearson residuals for male length composition fits to NWFSC Slope Survey data.

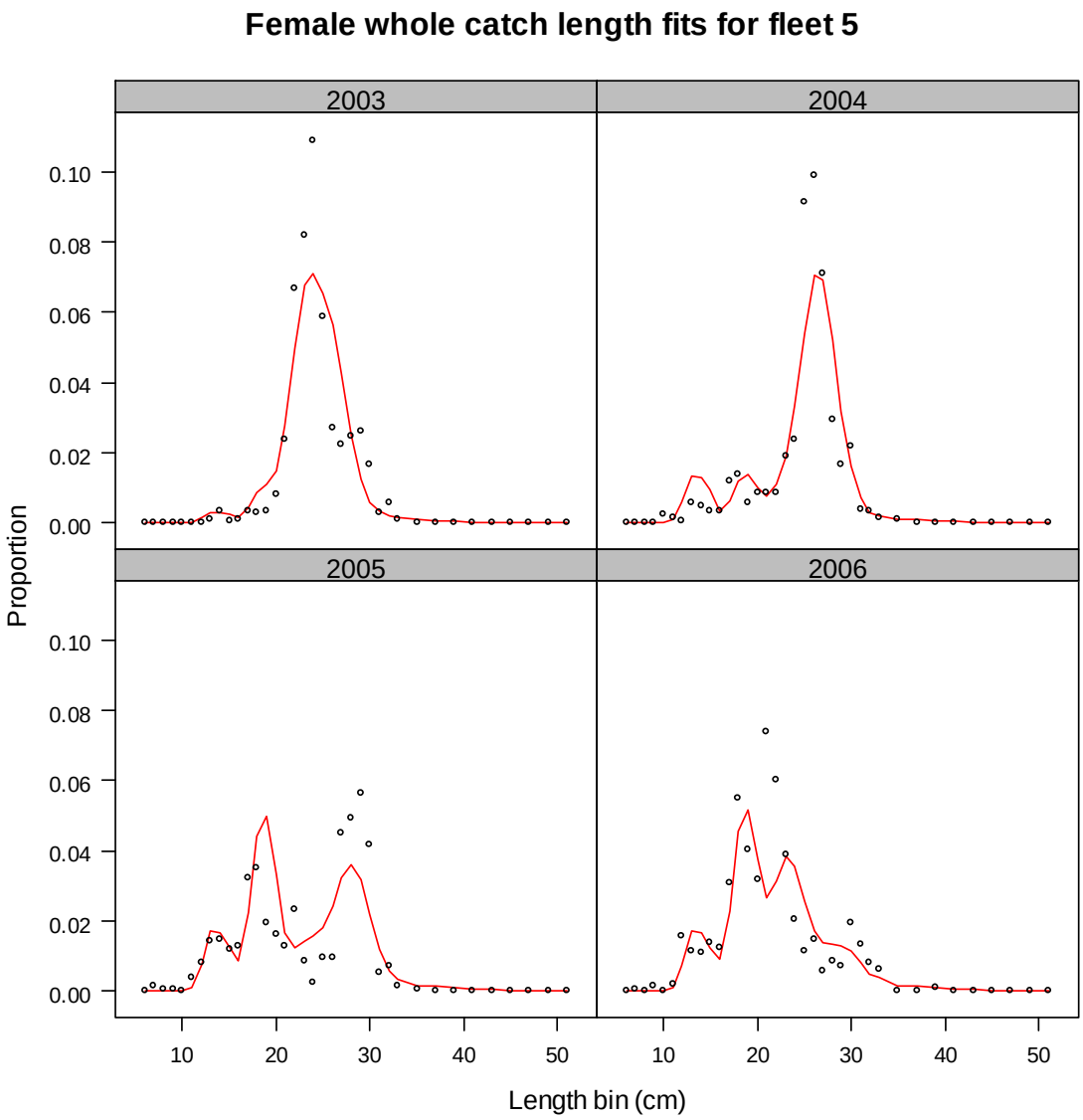


Figure 23. NWFSC Shelf Survey female length compositions and model fits

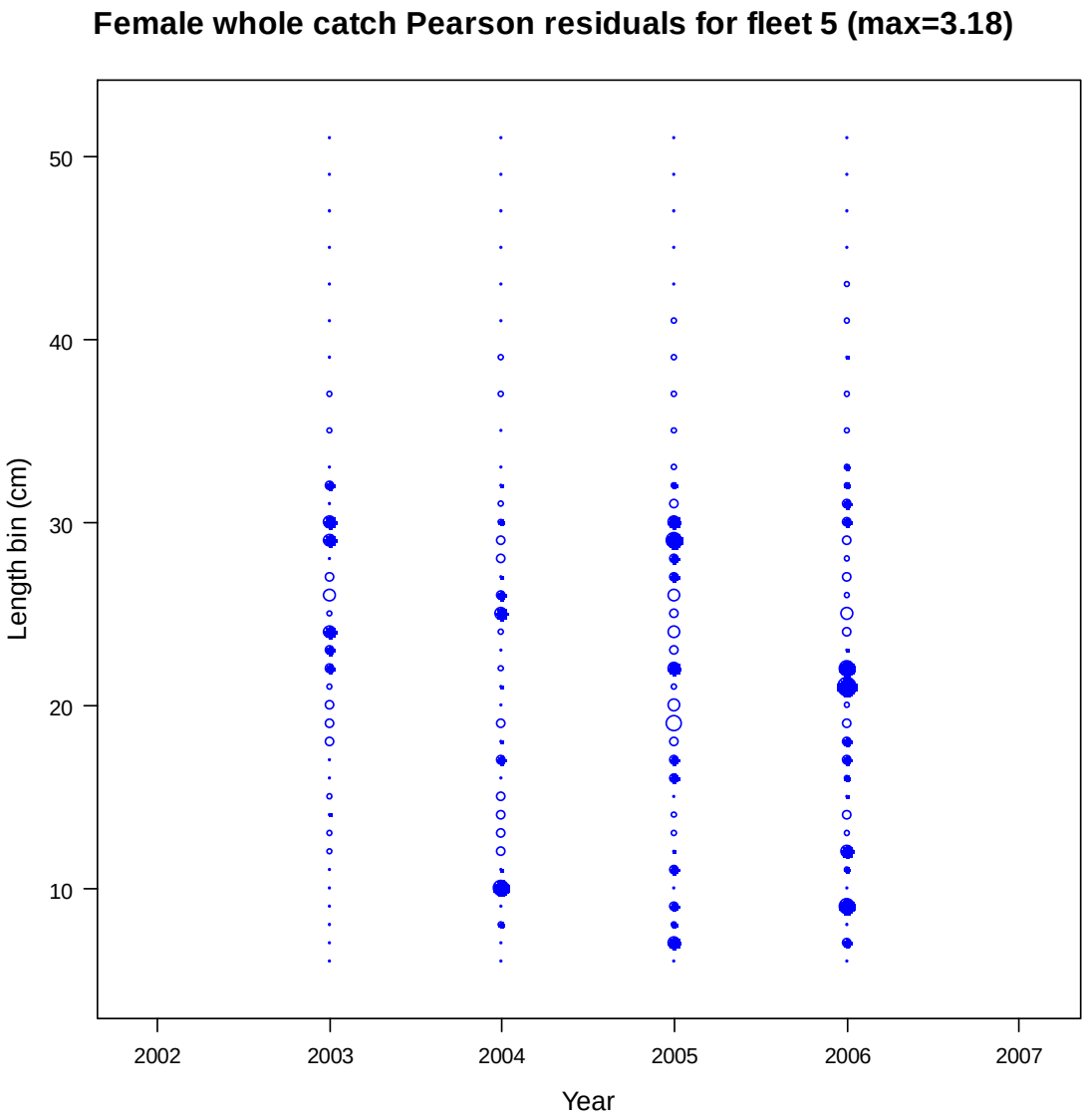


Figure 24. Pearson residuals for female length composition fits to NWFSC Shelf Survey data.

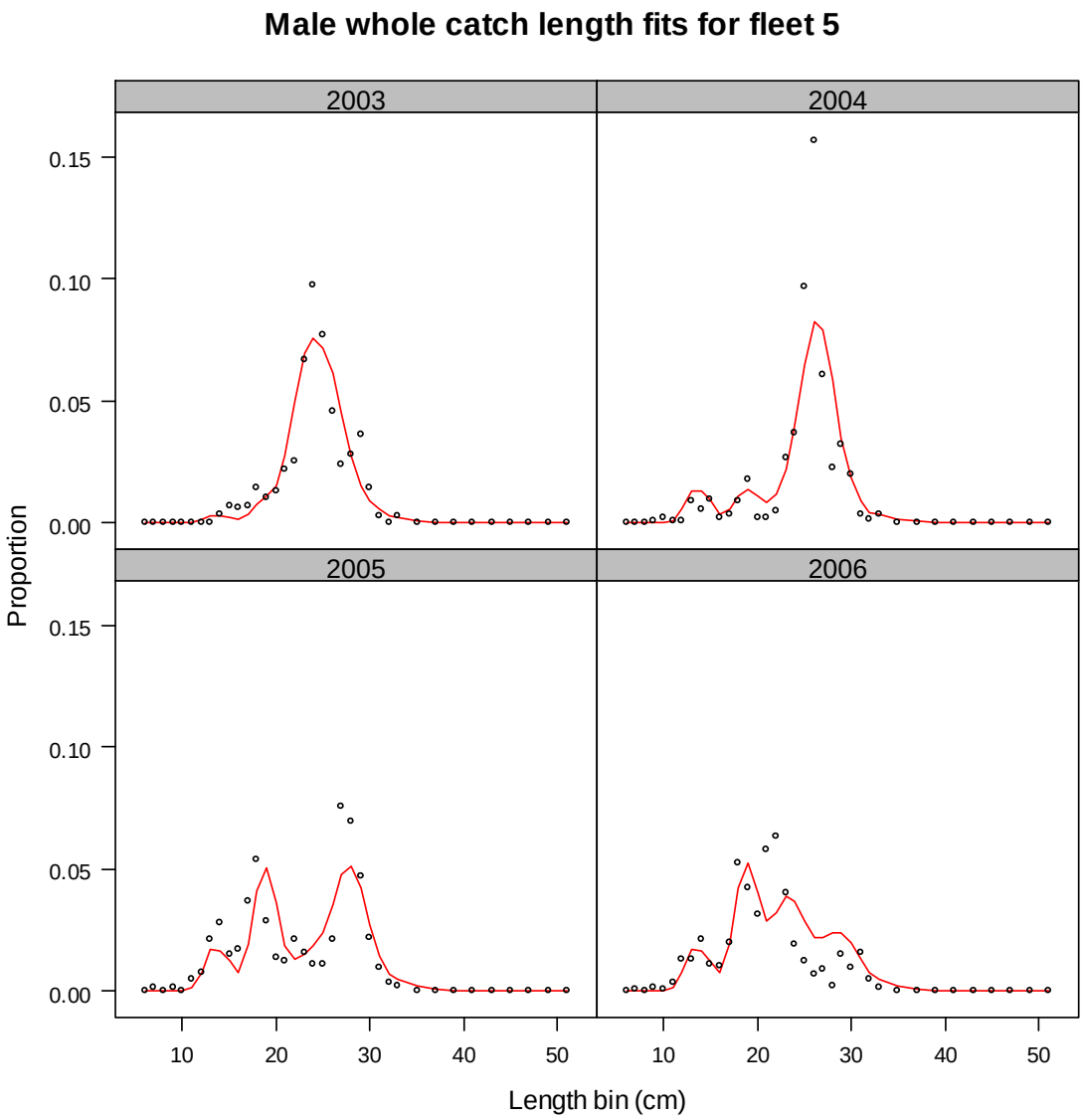


Figure 25. NWFSC Slope Survey male length compositions and model fits

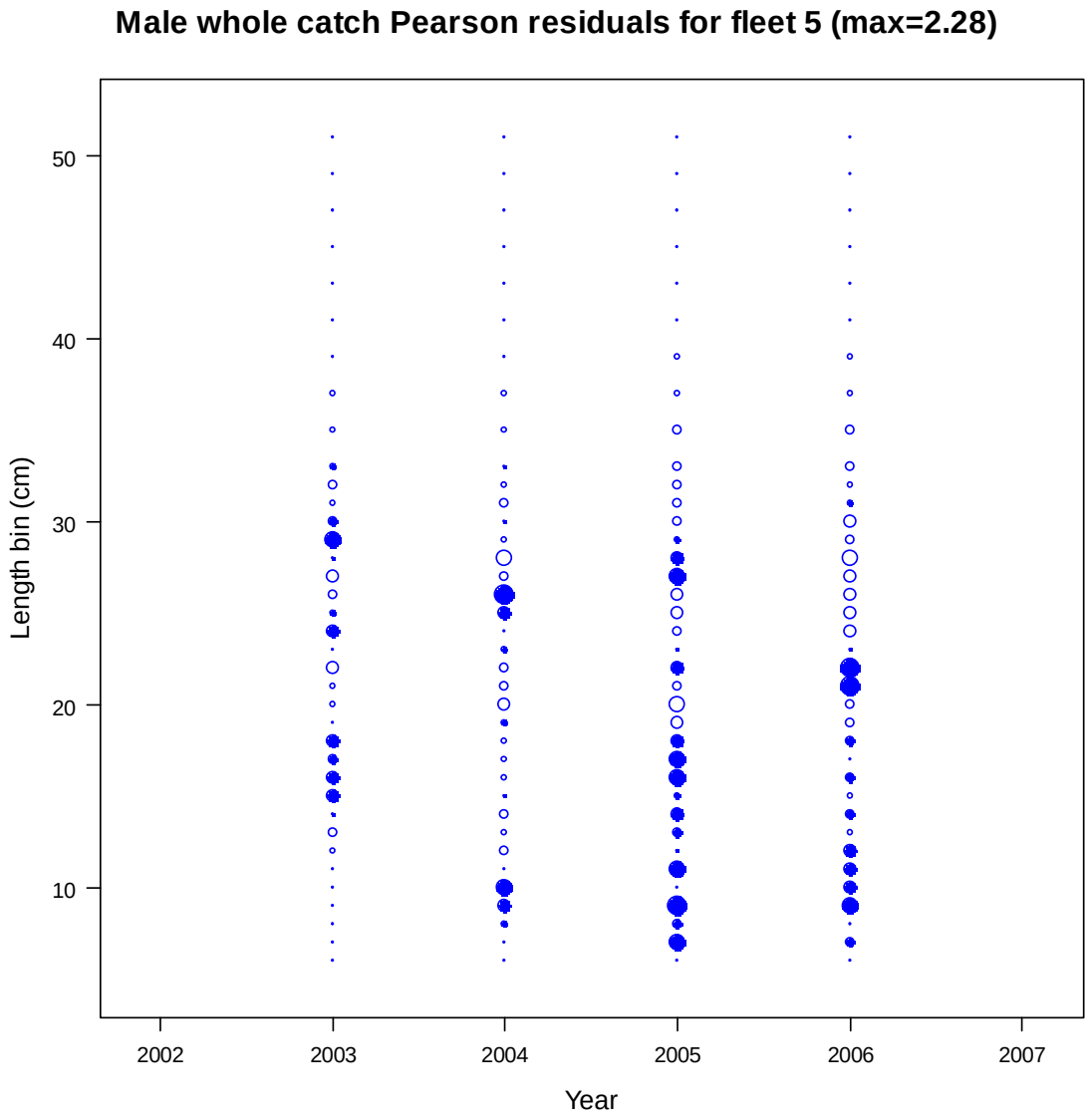


Figure 26. Pearson residuals for male length composition fits to NWFSC Shelf Survey data.

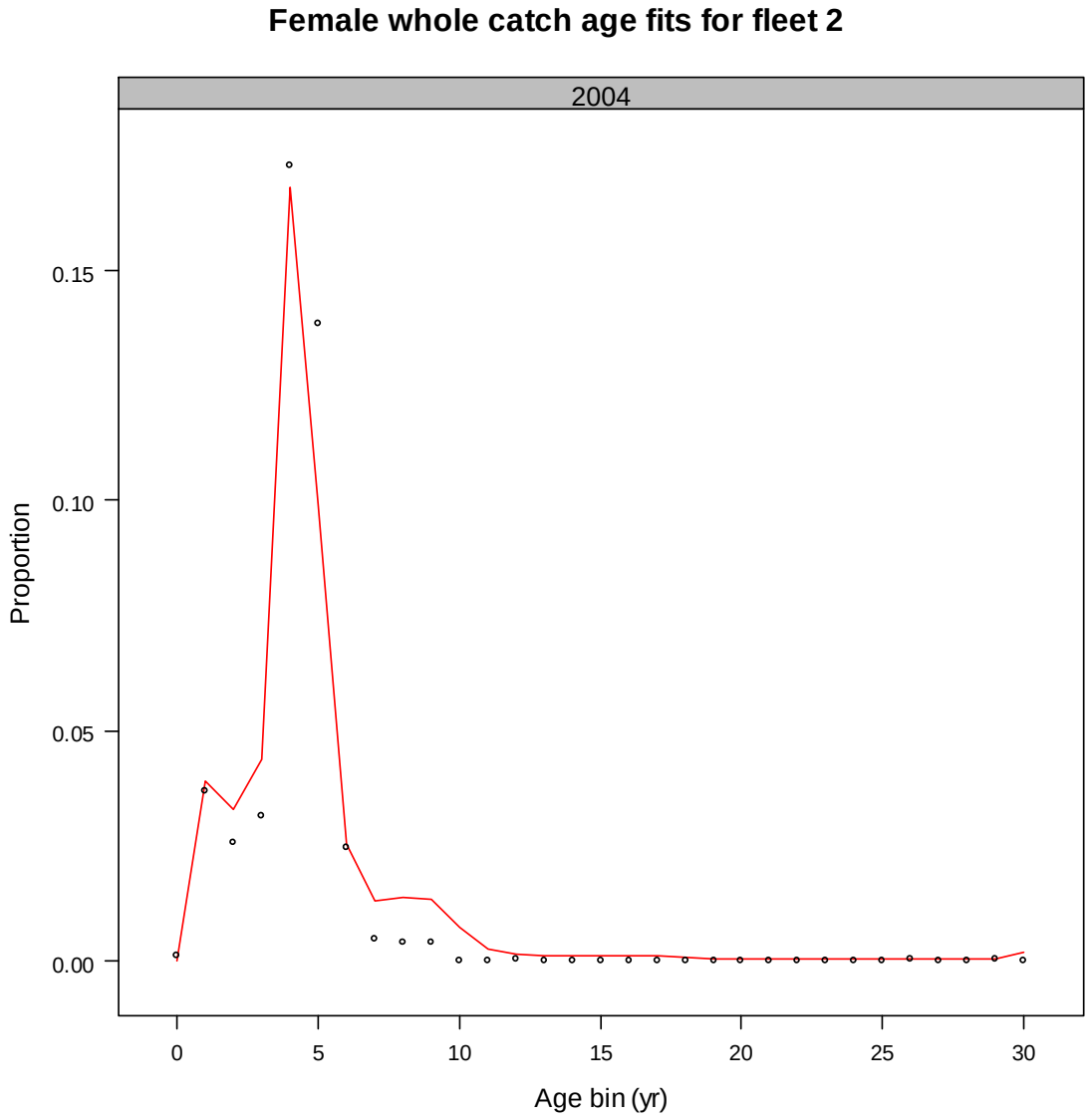


Figure 27. Triennial female 2004 age composition and model fit.

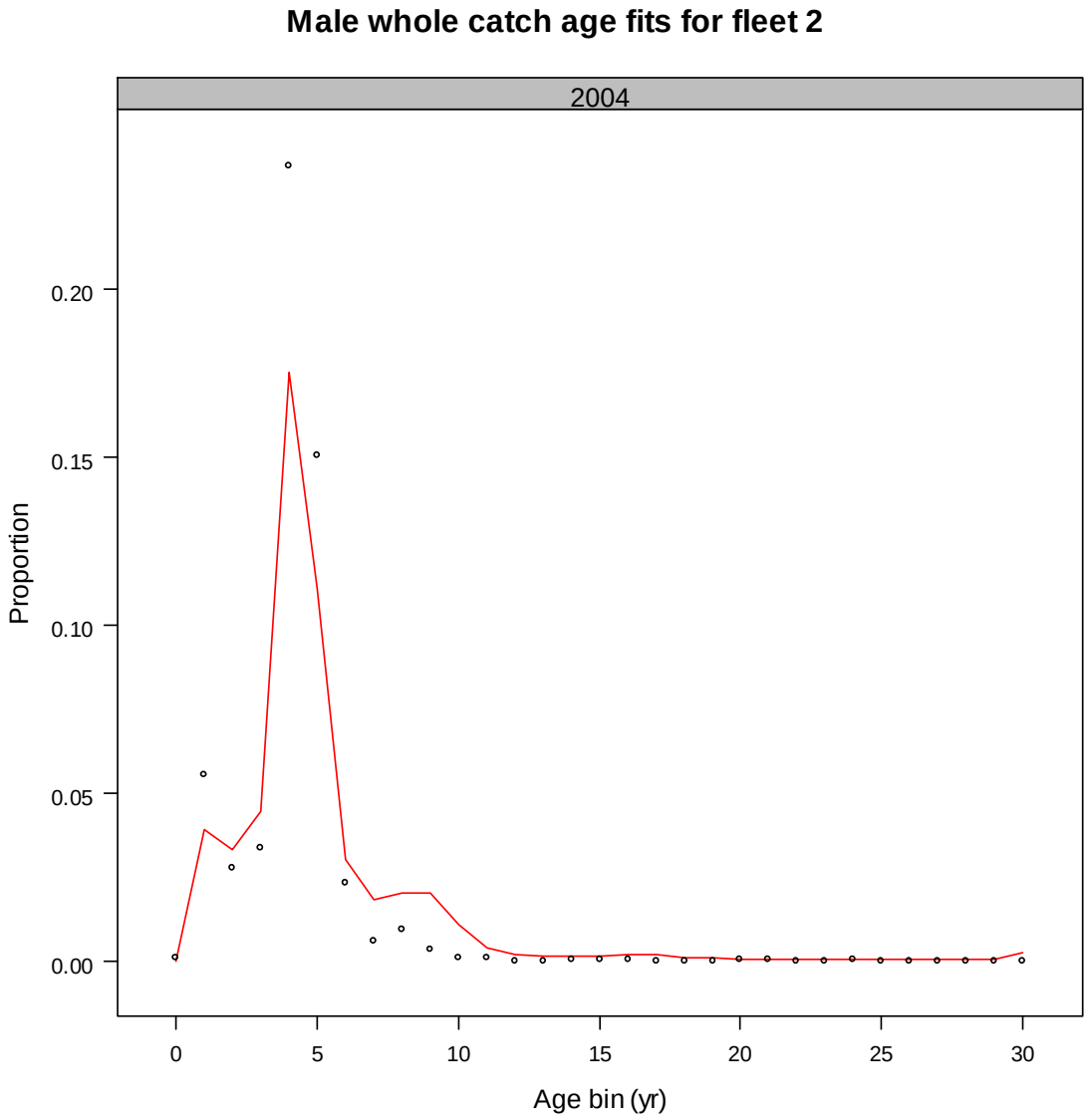


Figure 28. Male Triennial 2004 age composition and model fit.

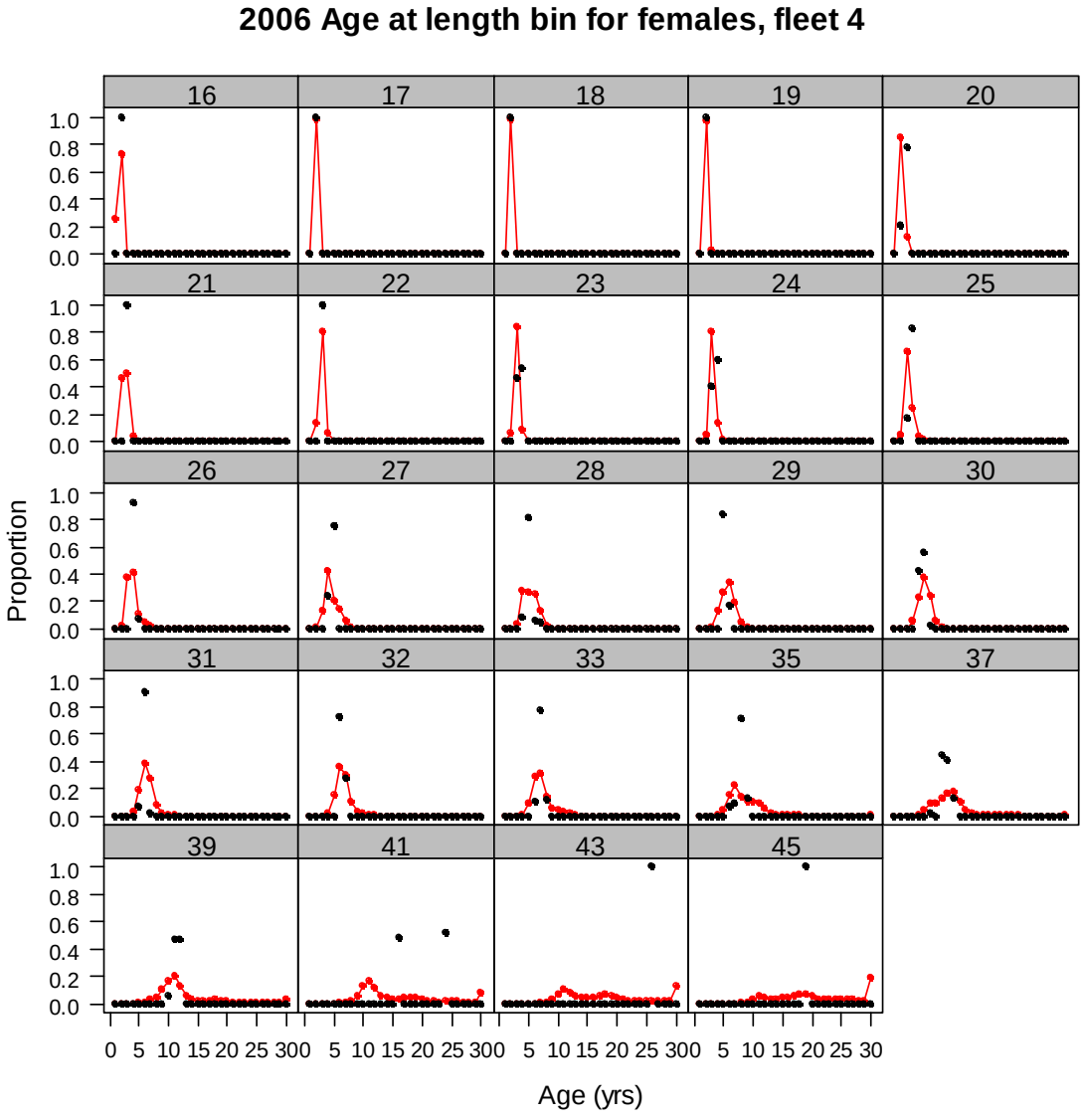


Figure 29. NWFSC Slope Survey female 2006 conditional age-at-length data and model fits.

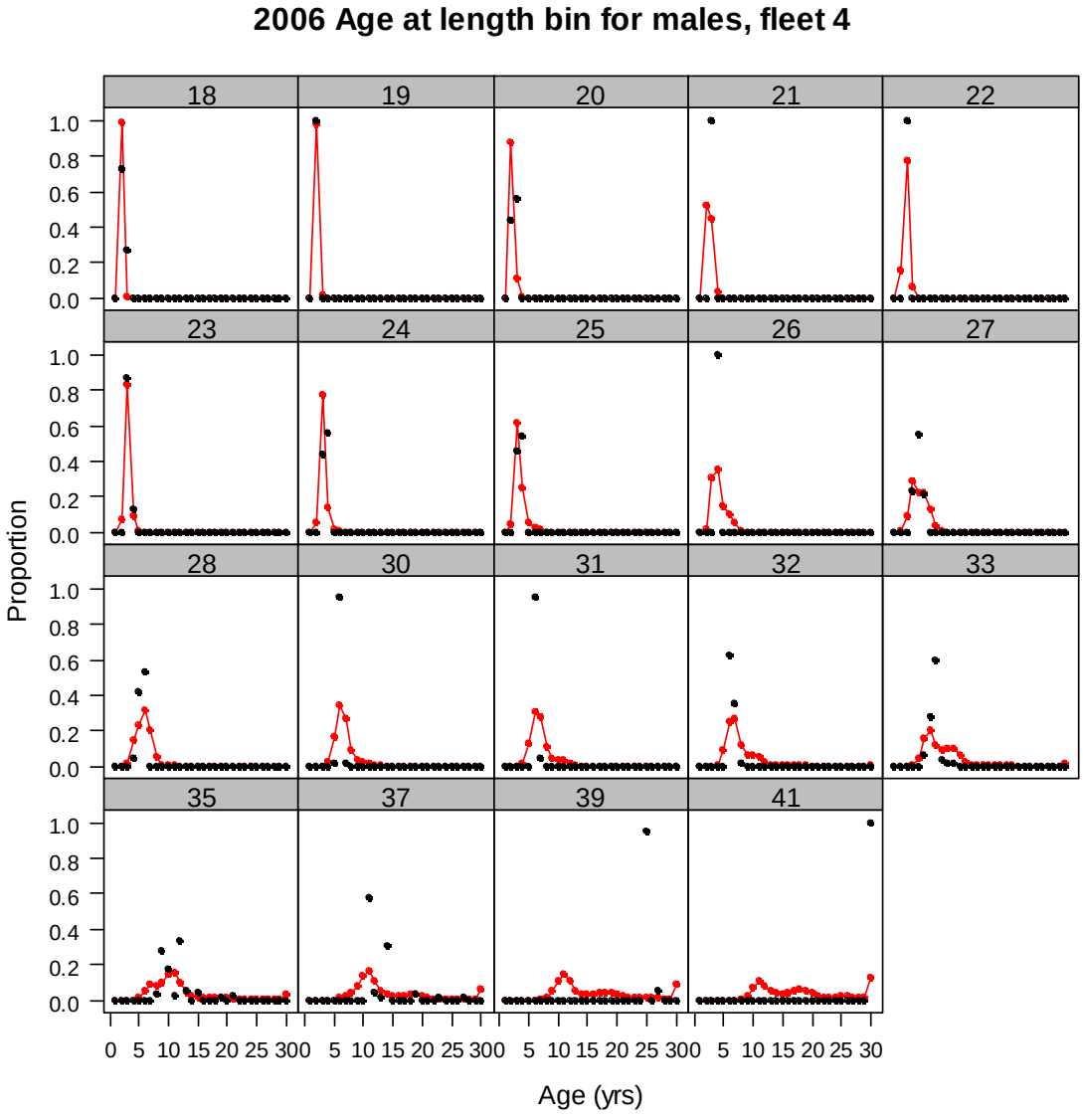


Figure 30. NWFSC Slope Survey male 2006 conditional age-at-length data and model fits.

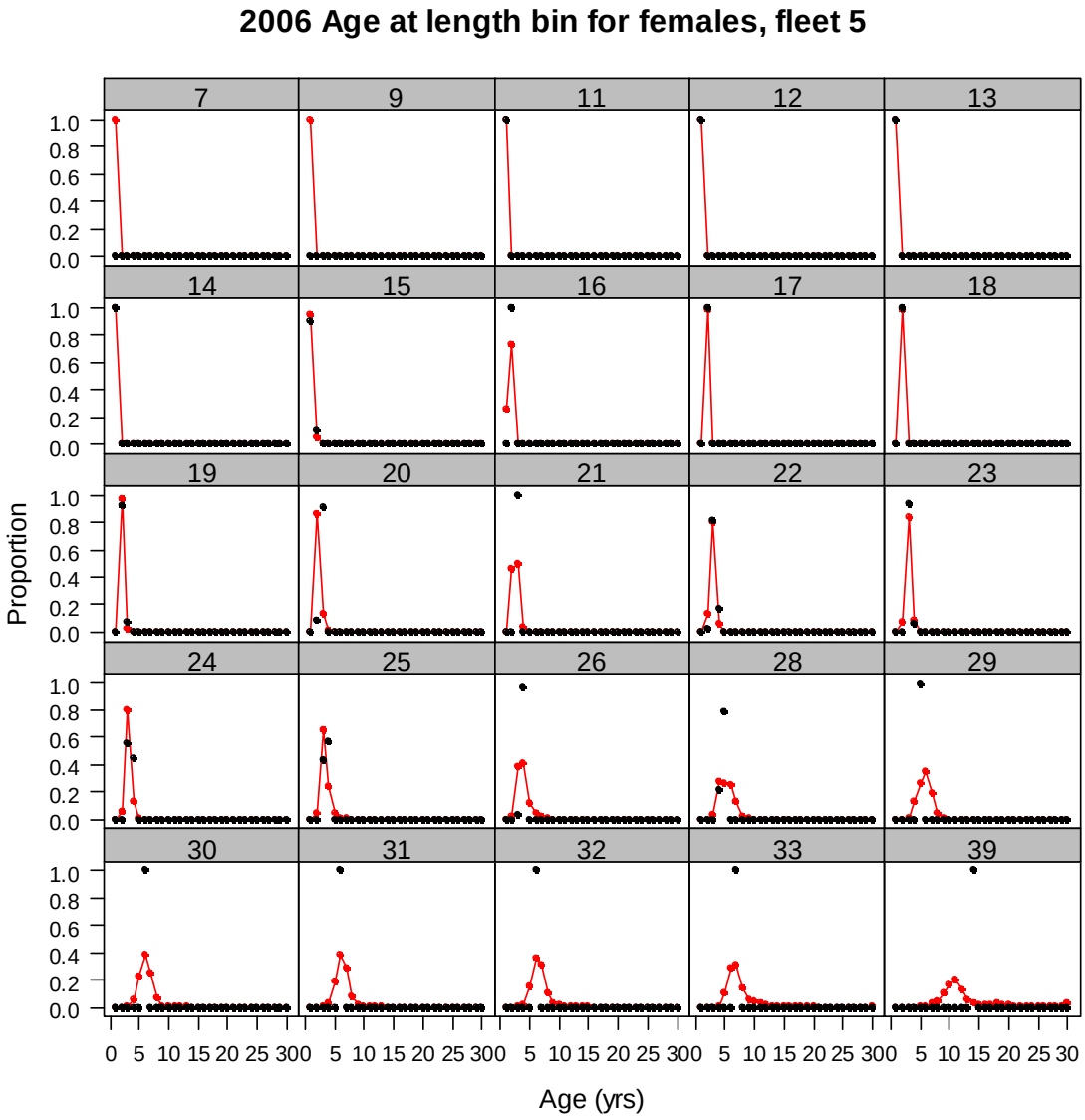


Figure 31. NWFSC Shelf Survey female 2006 conditional age-at-length data and model fits.

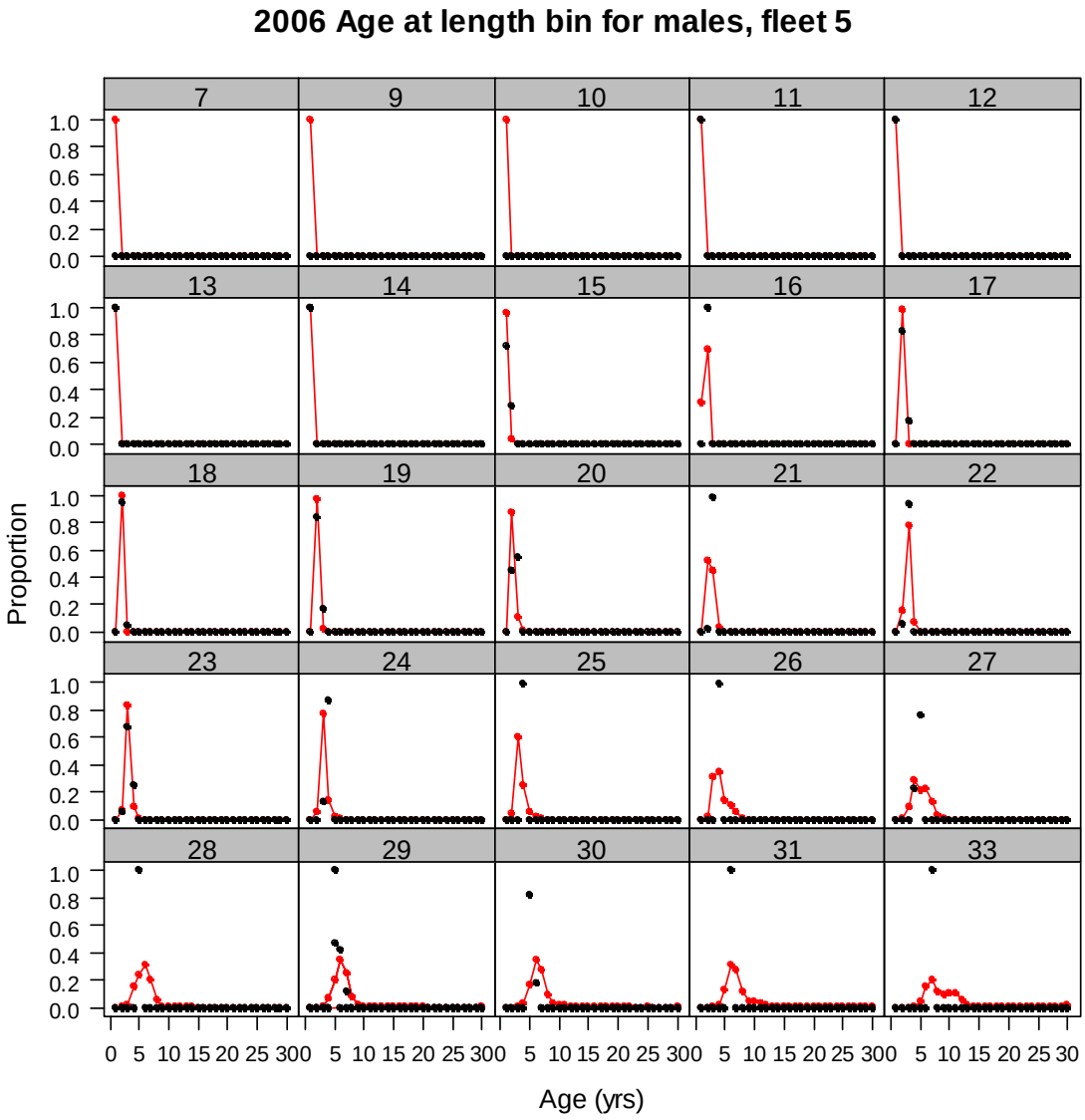


Figure 32. NWFSC Shelf Survey male 2006 conditional age-at-length data and model fits.

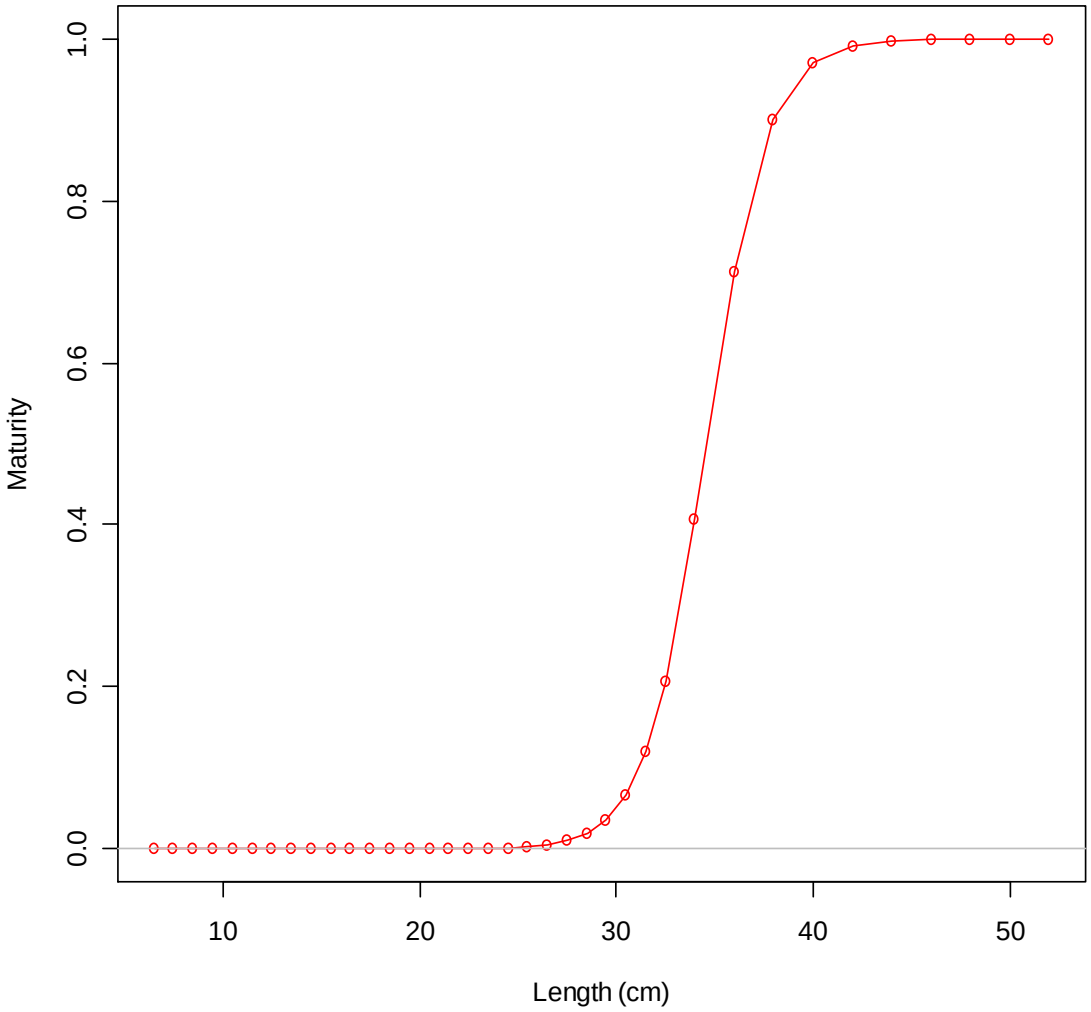


Figure 33. Maturity ogive for female darkblotched rockfish.

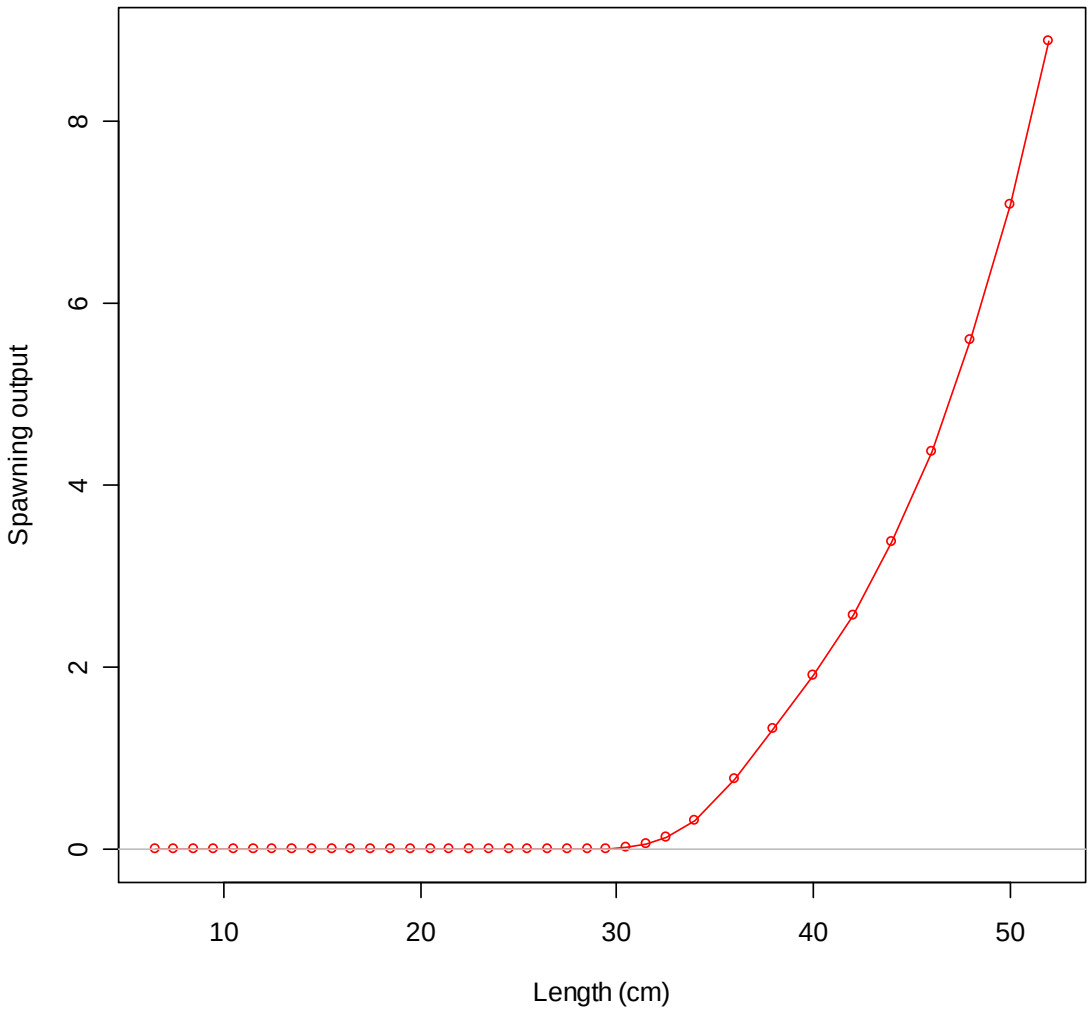


Figure 34. Length to spawning output relationship.

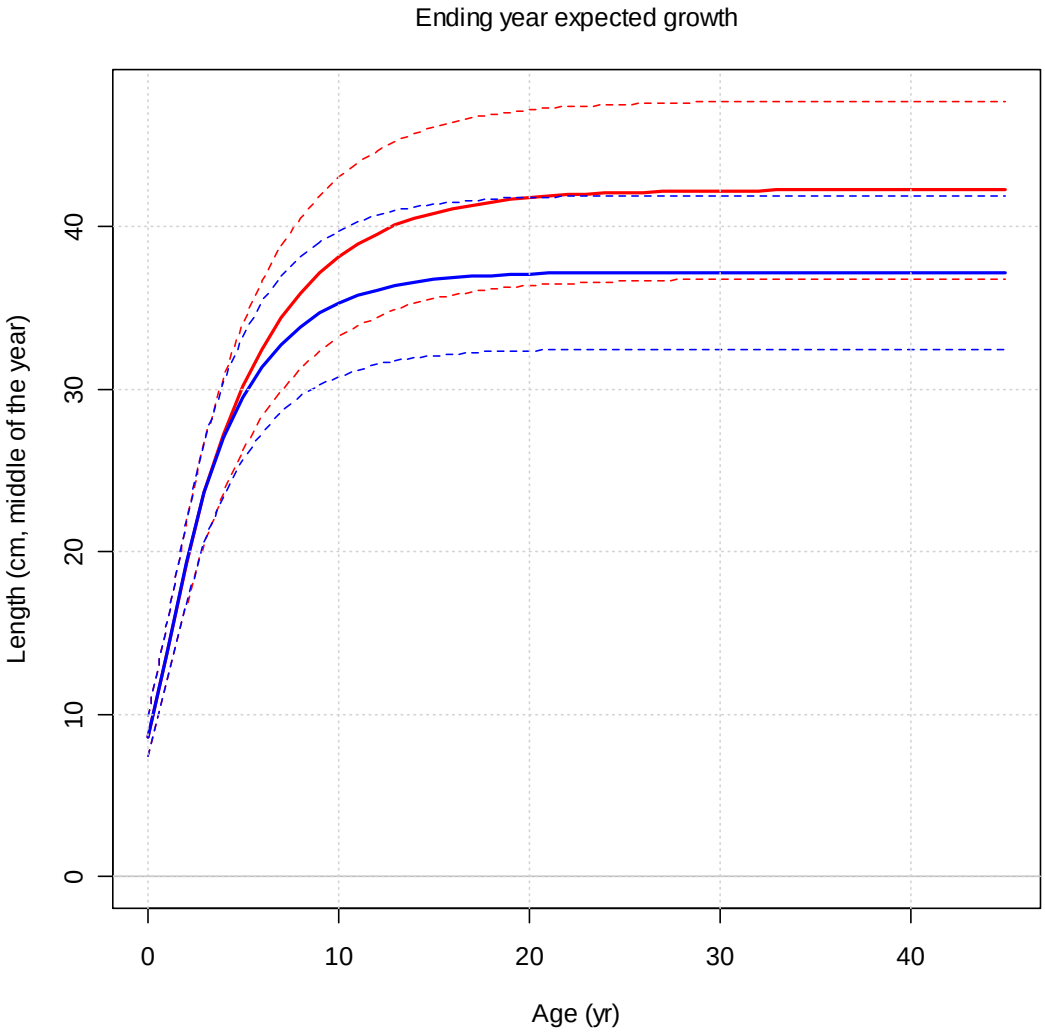


Figure 35. Growth curve for female (upper) and male darkblotched rockfish estimated in the model.

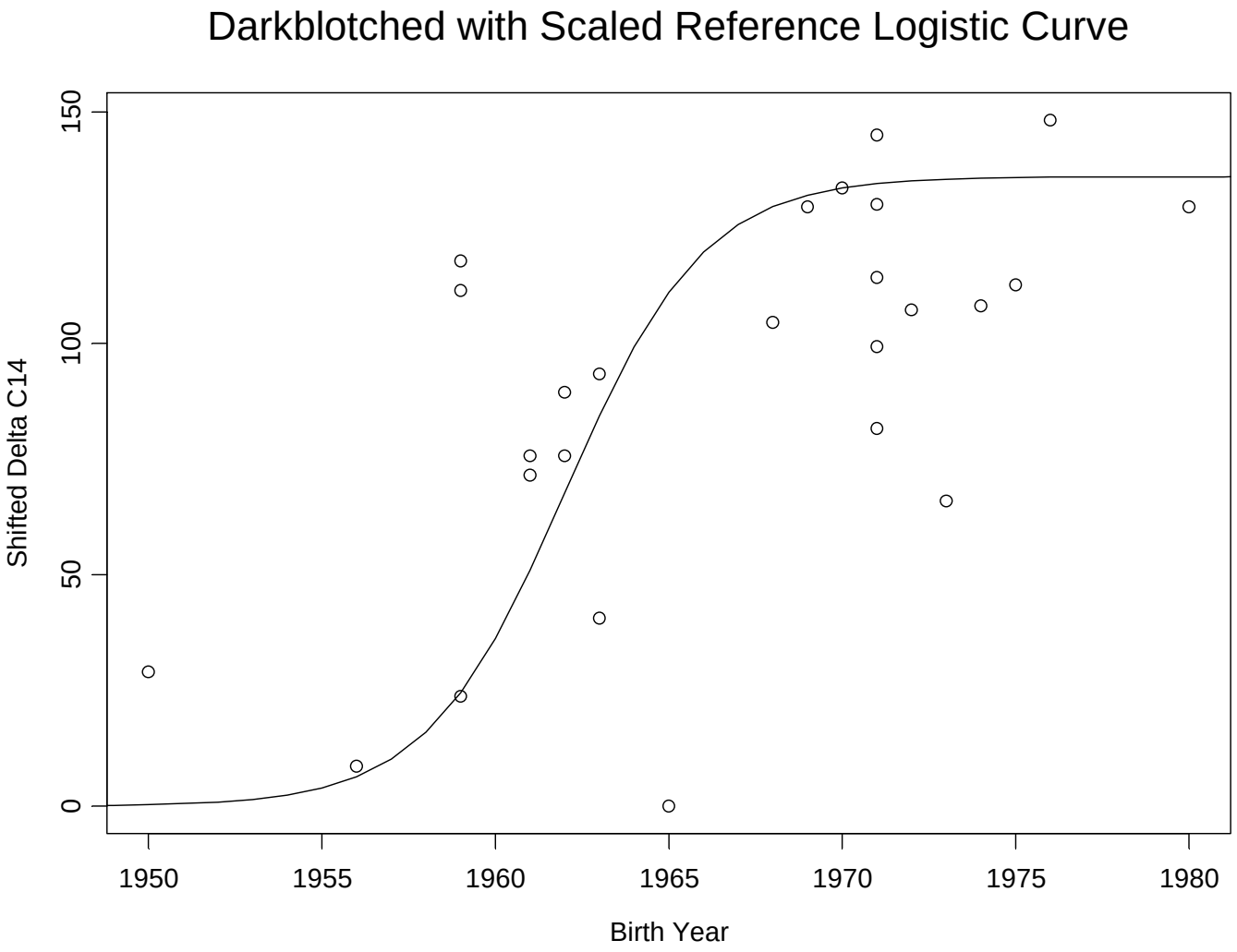


Figure 36. Comparison of darkblotched rockfish bomb radiocarbon values at annulus based birth to expected curve based on reference. Otoliths were collected in 2000-2002 and aged in 2003. A number of the otoliths appear to be underaged by as much as 10 years or more, and a few appear to be overaged.

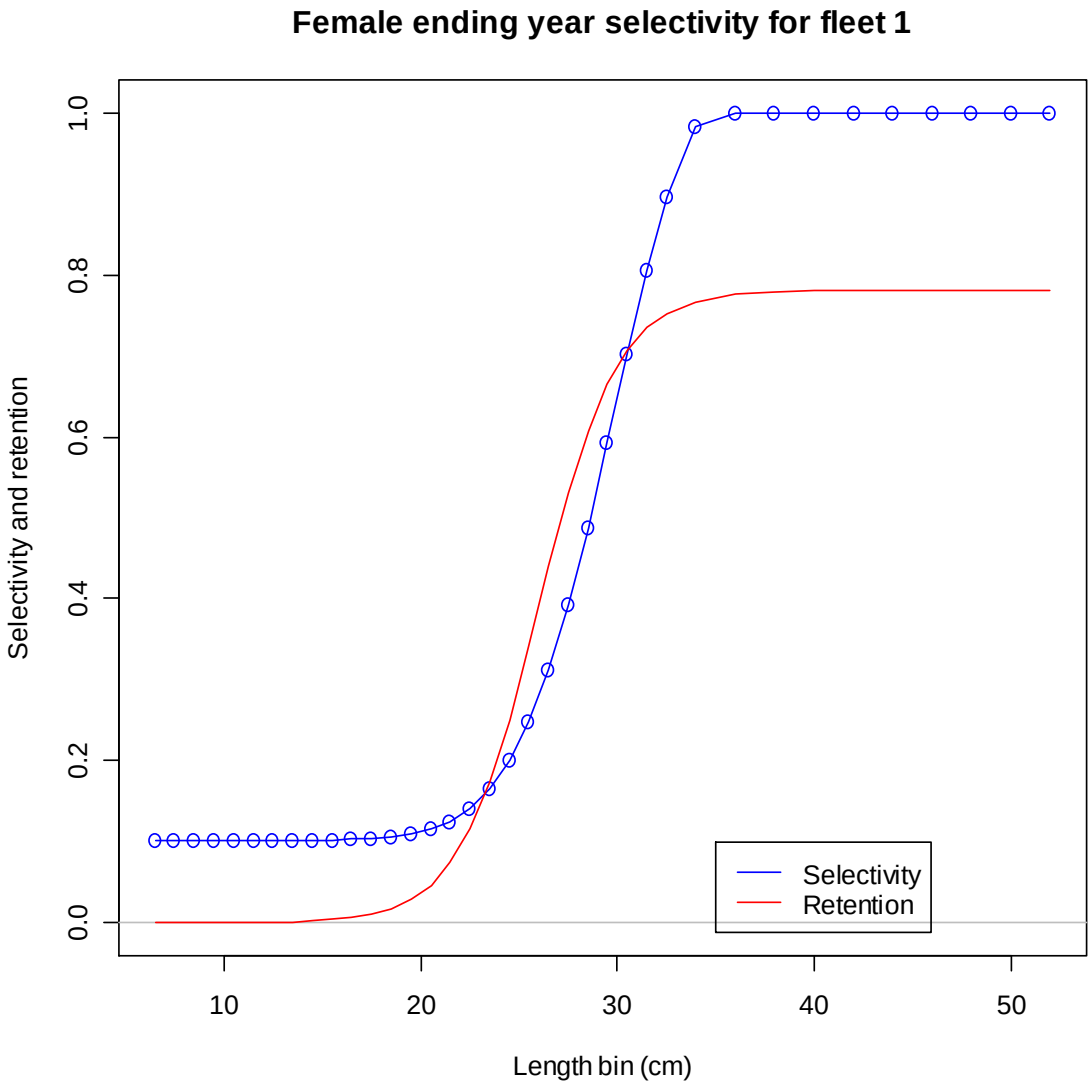


Figure 37. Male and female fishery selectivity and 2003-2006 retention (as the proportion retained at length).

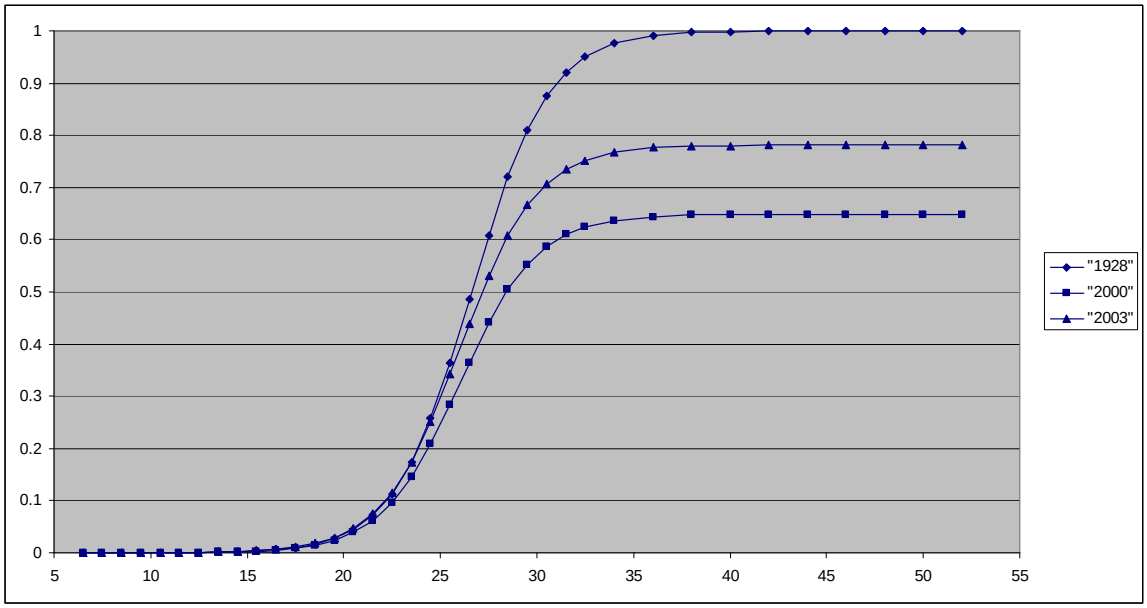


Figure 38. Retention in the three periods (through 1999, 2000-2002, 2003-)

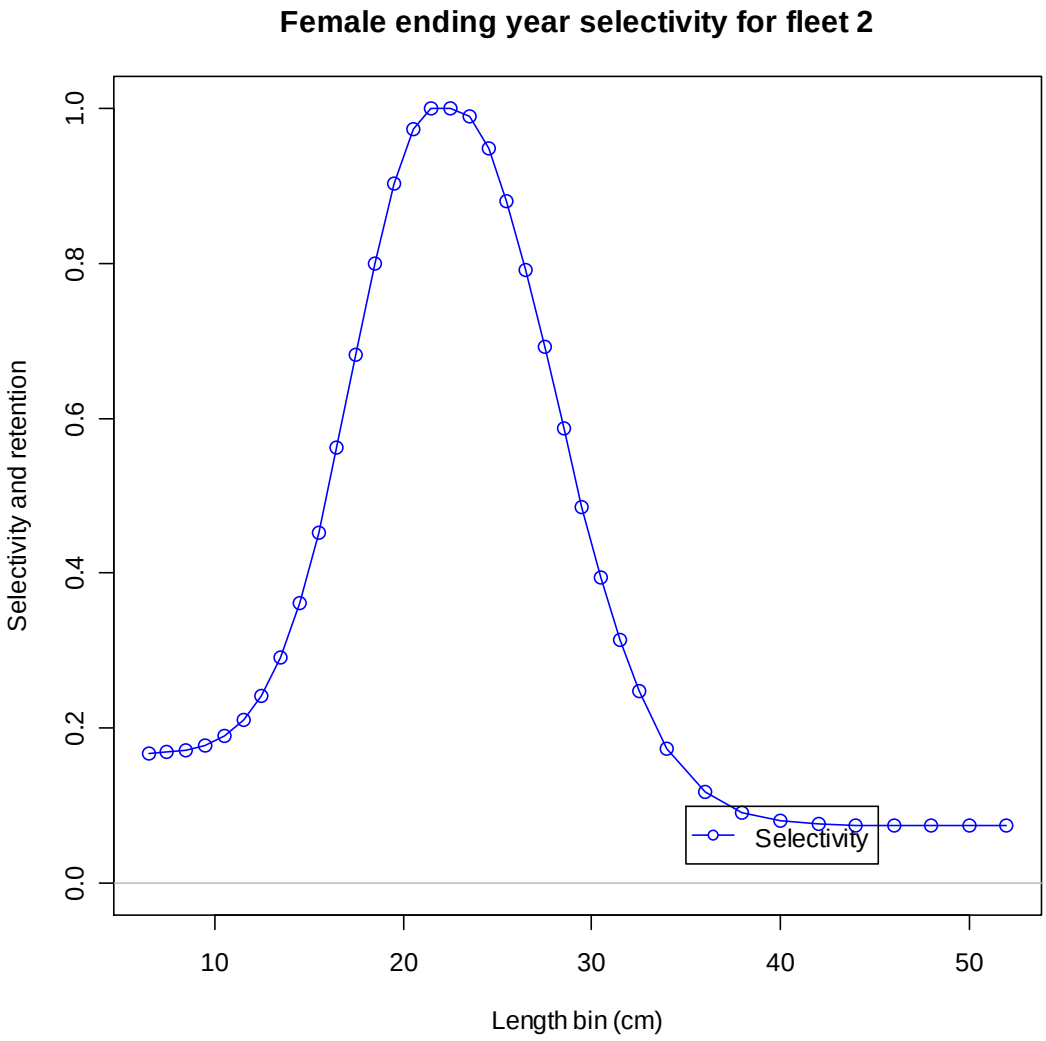


Figure 39. Male and Female selectivity for the Triennial Shelf Survey.

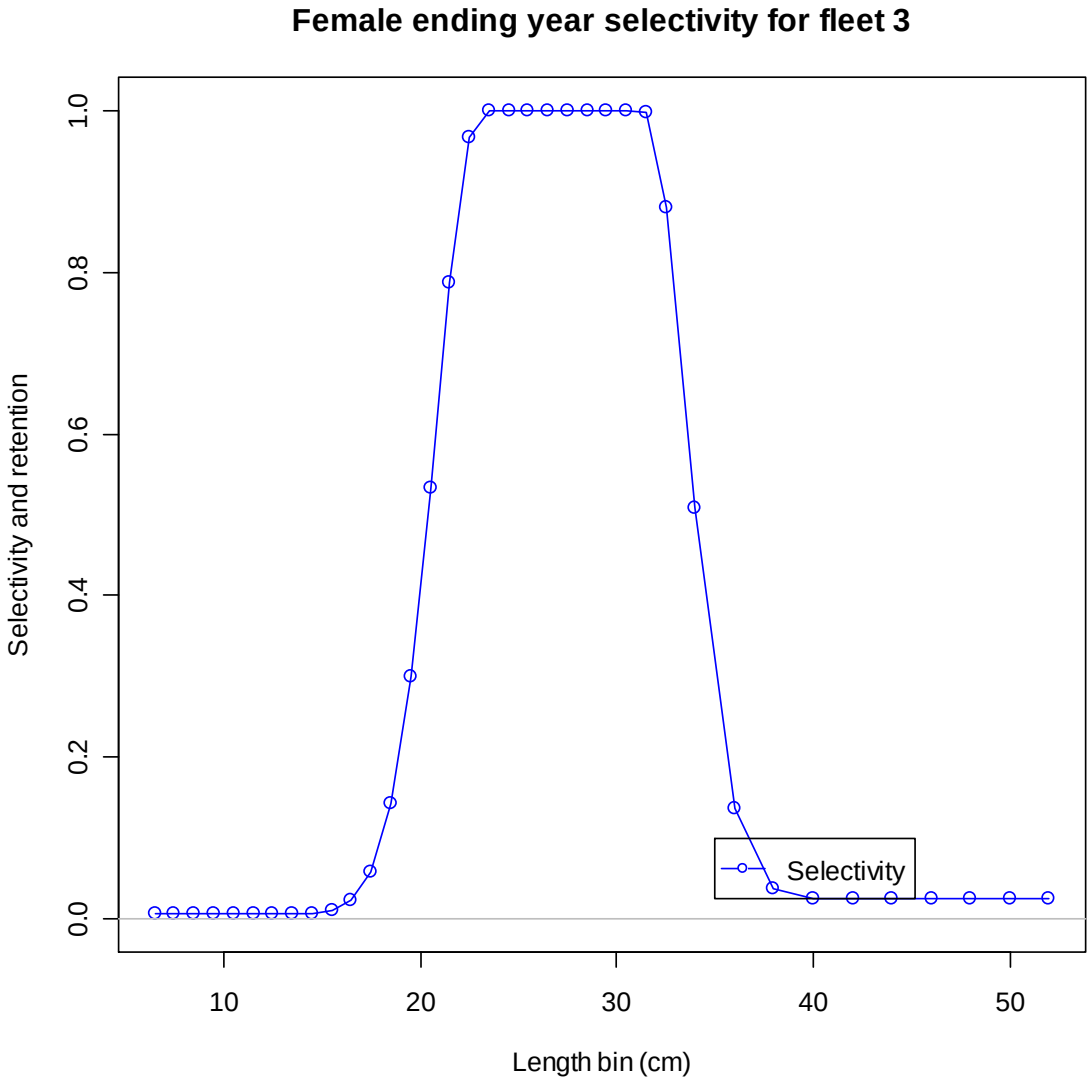


Figure 40. Male and female selectivity for the AFSC Slope Survey.

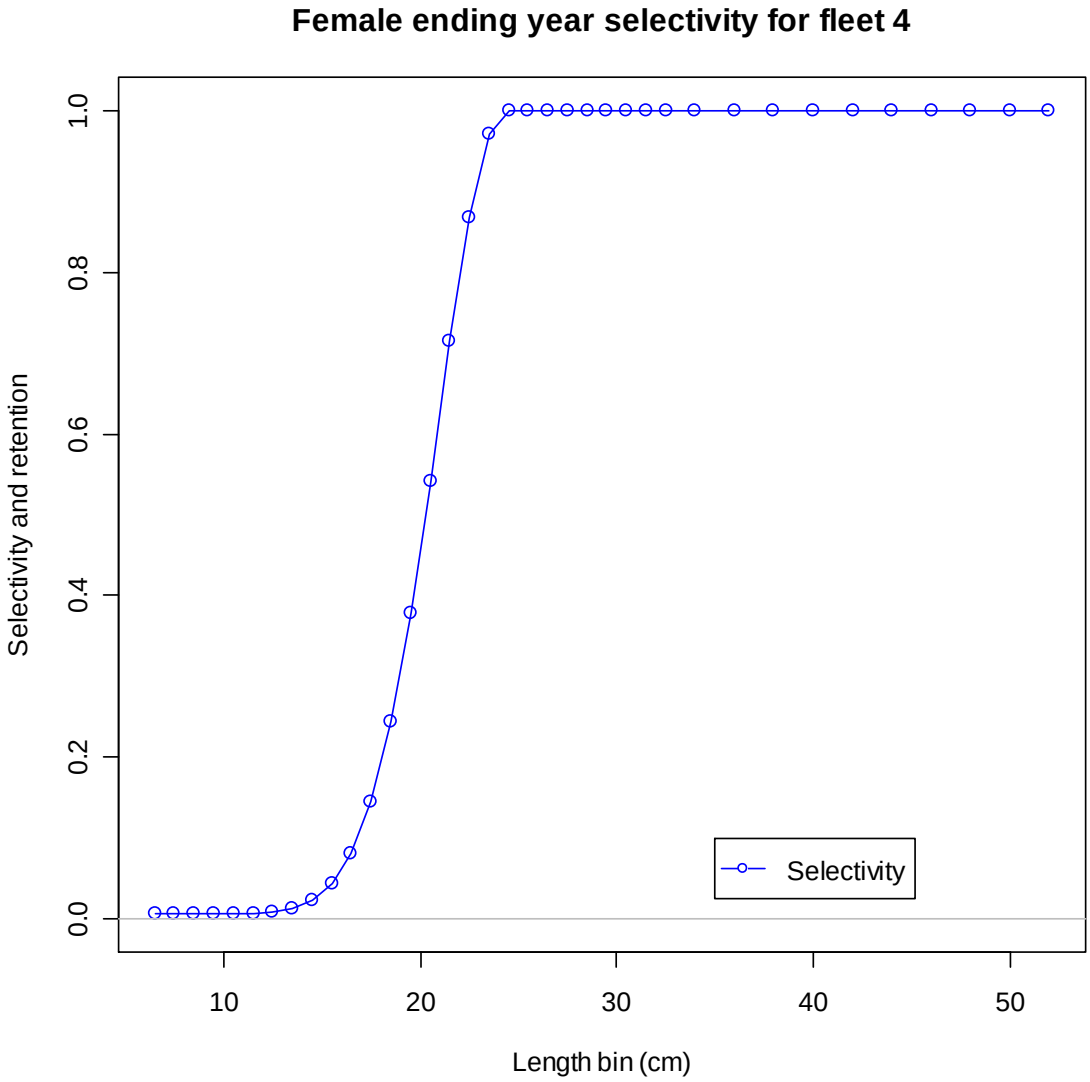


Figure 41. Male and female selectivity for the NWFSC Slope Survey.

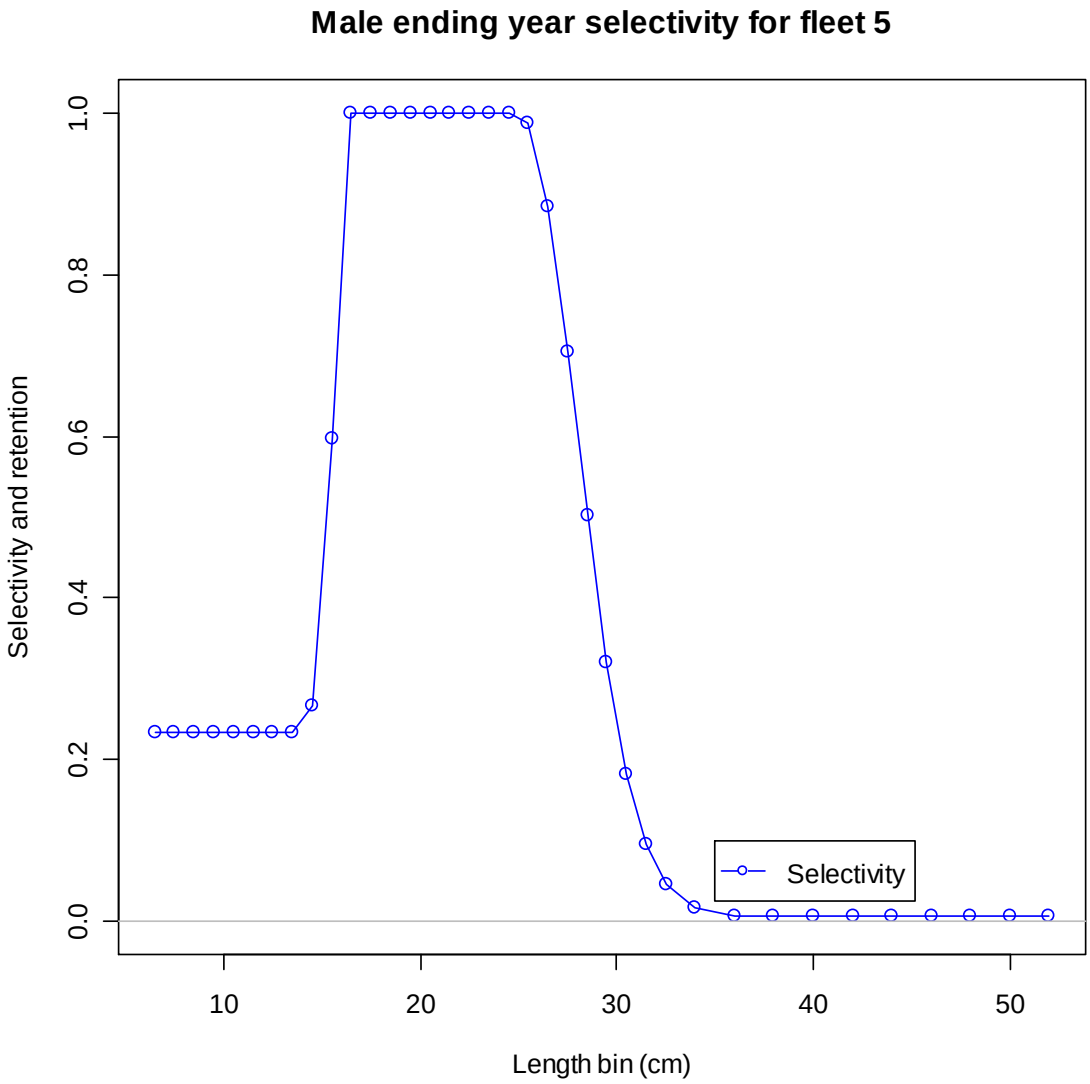


Figure 42. Male and female selectivity for the NWFSC Shelf Survey.

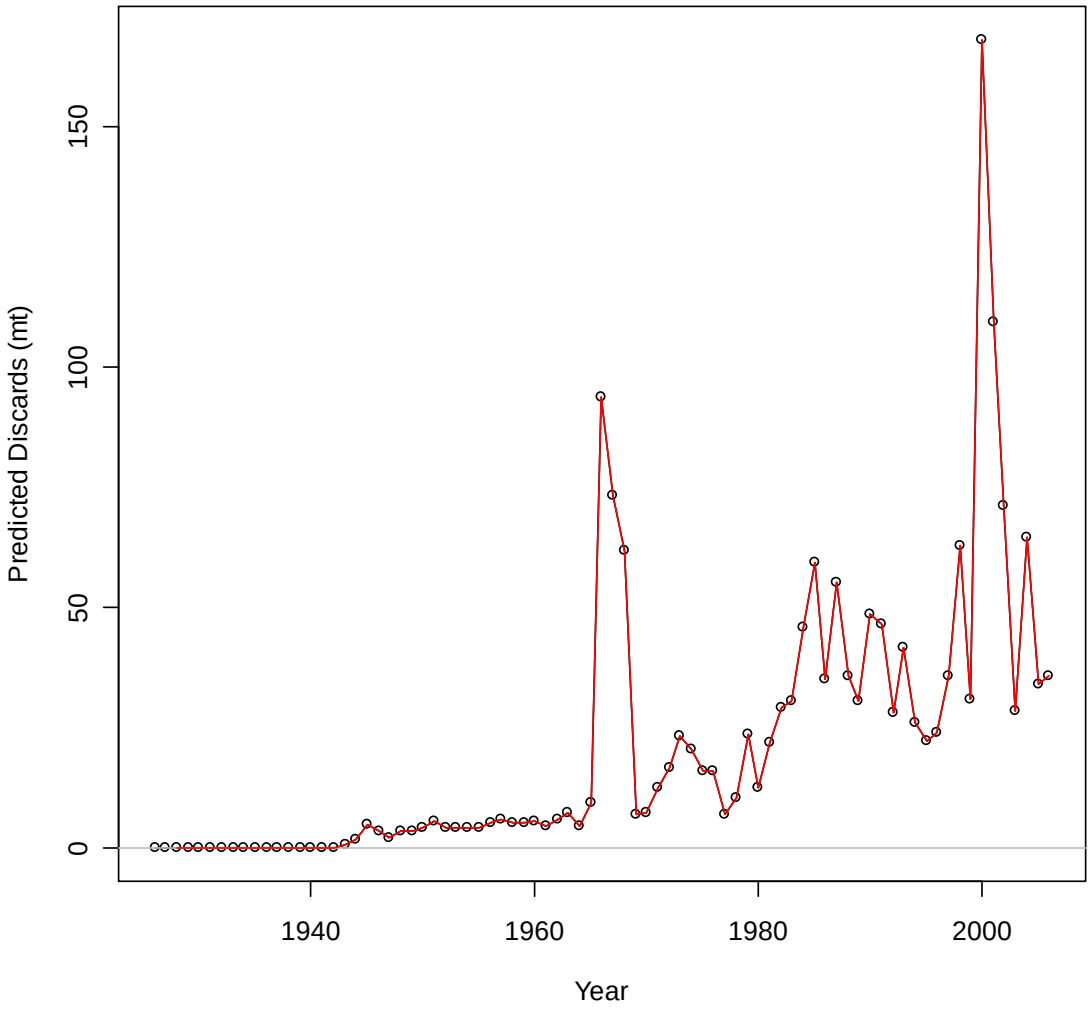


Figure 43. Time series of estimated discards.

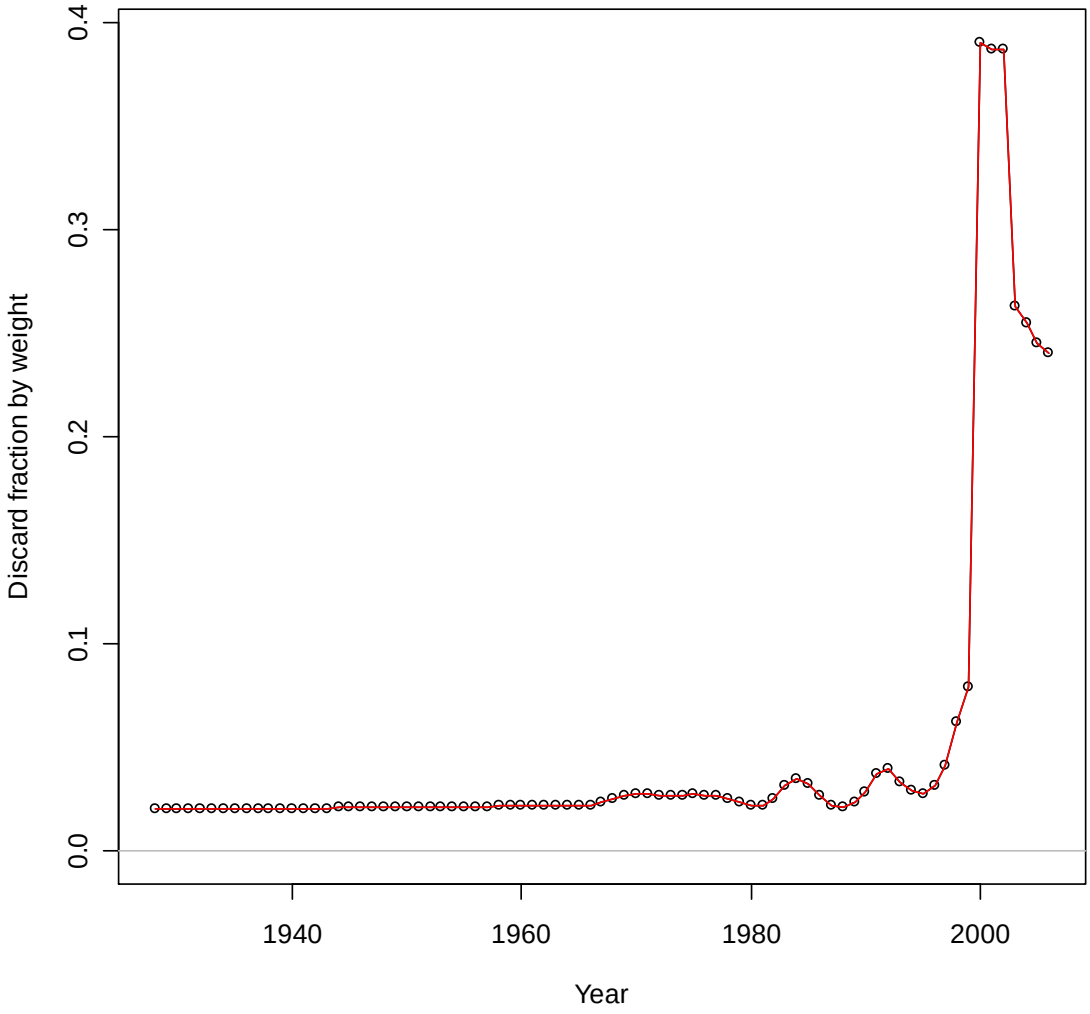


Figure 44. Time series of estimated discard fraction.

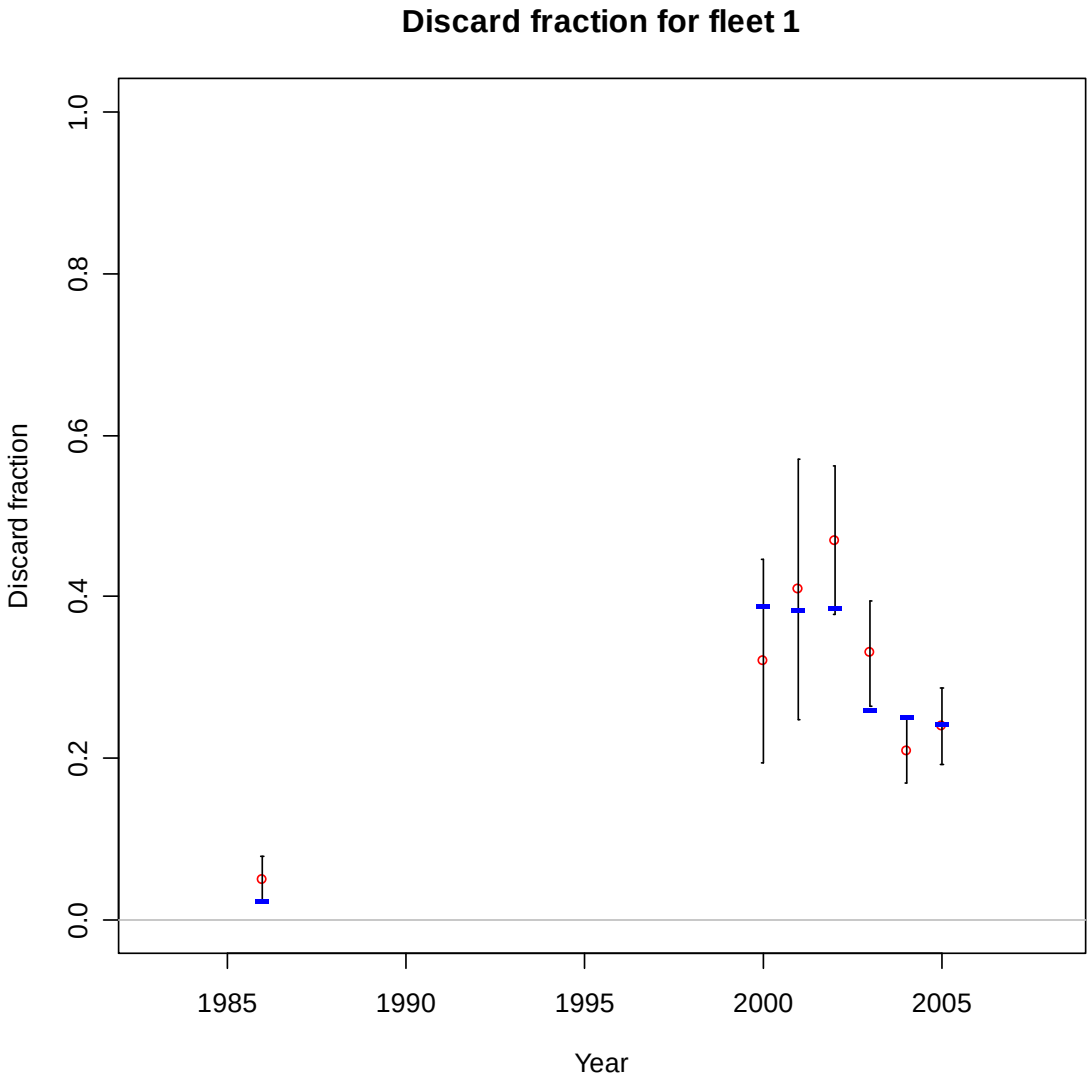


Figure 45. Fit to discard fraction data.

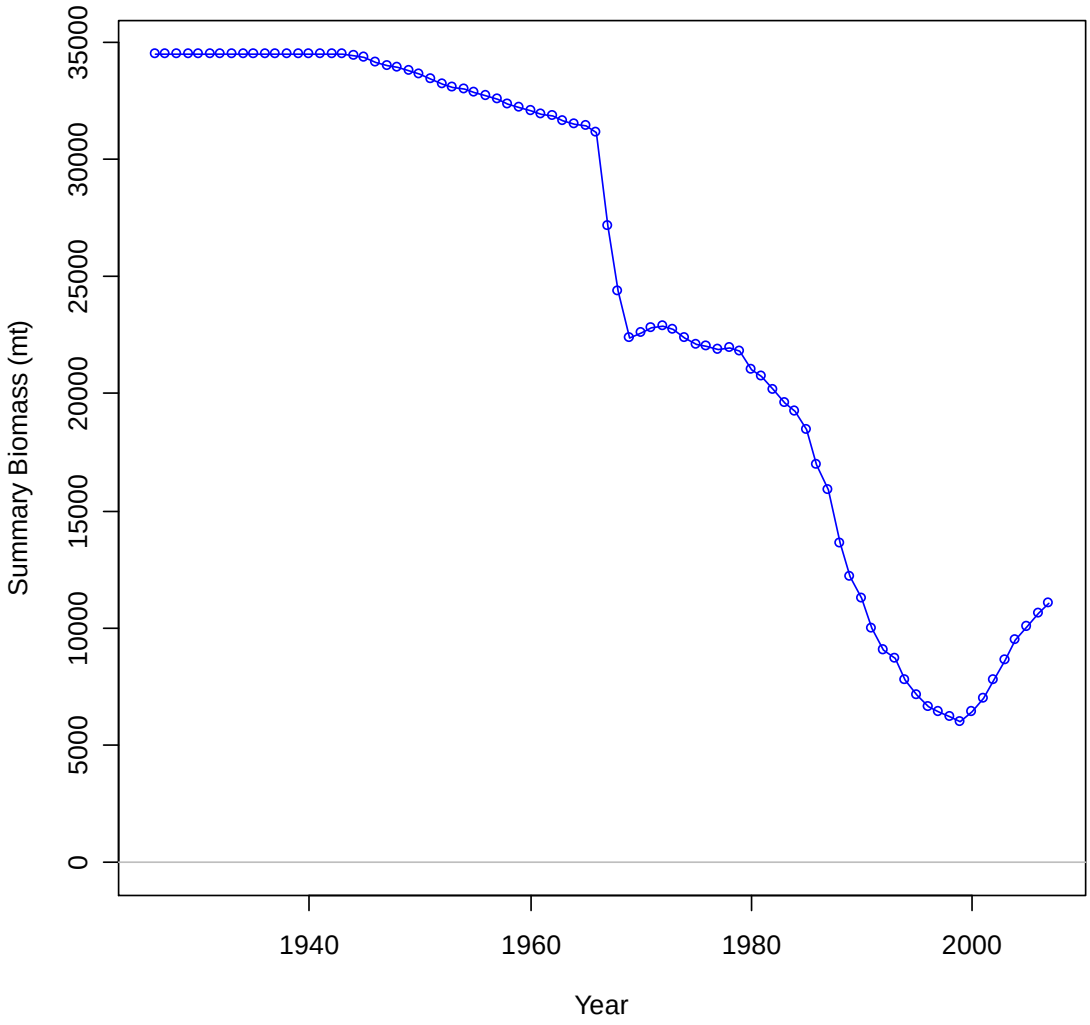


Figure 46. Time series of summary biomass.

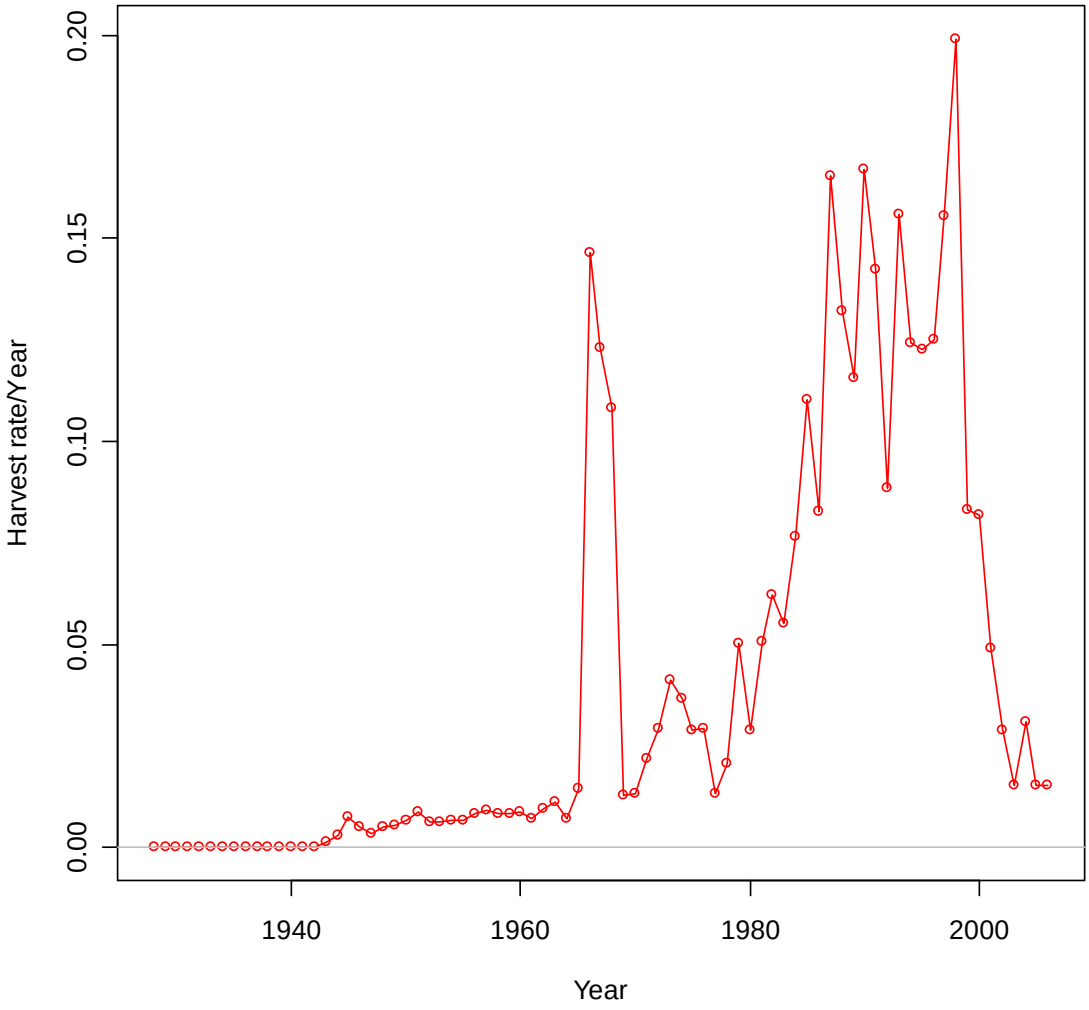
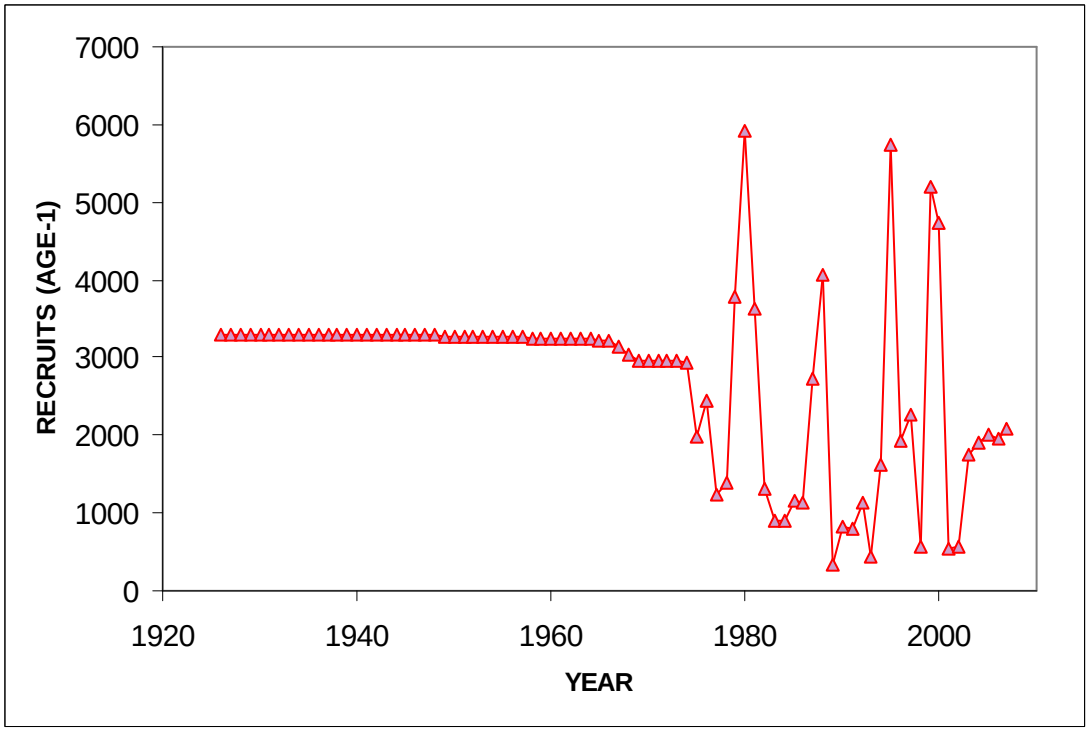


Figure 47. Time series of exploitation rate (catch/summary biomass).



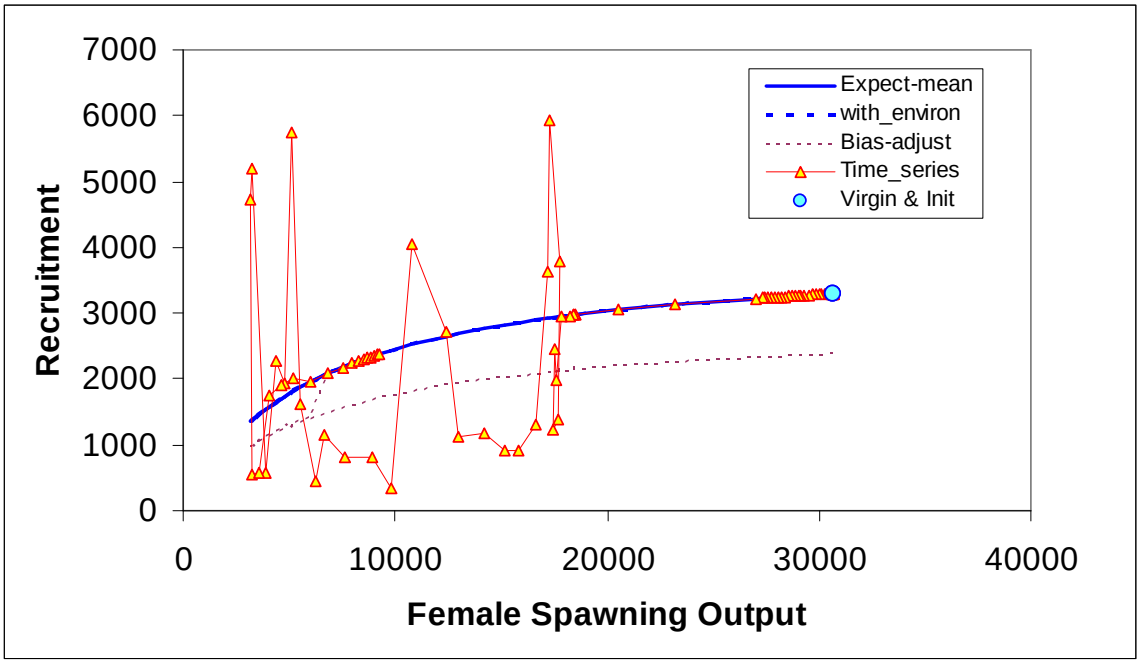


Figure 48. Time series of recruitment and spawner-recruit curve.

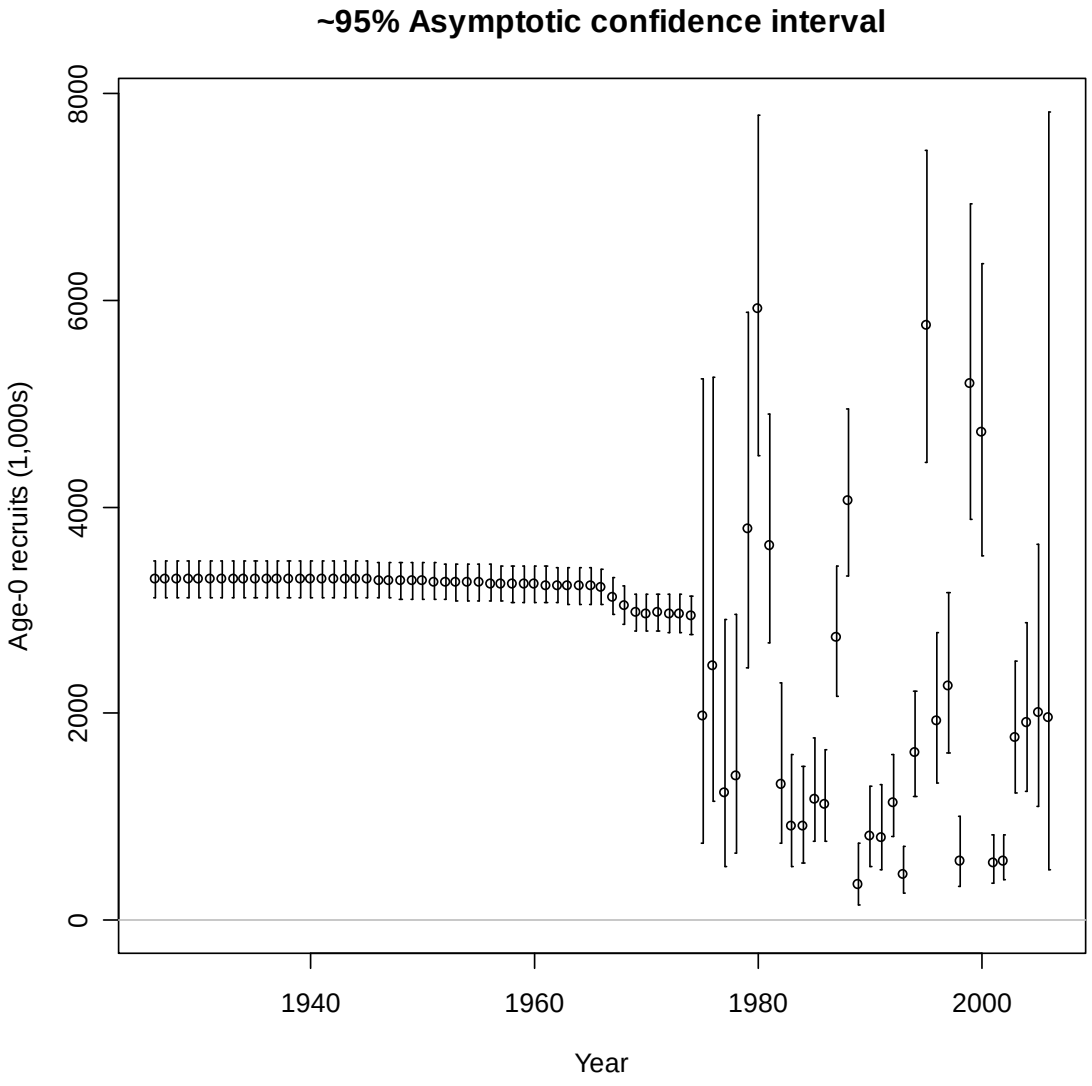


Figure 49. Time series of recruitment with confidence intervals.

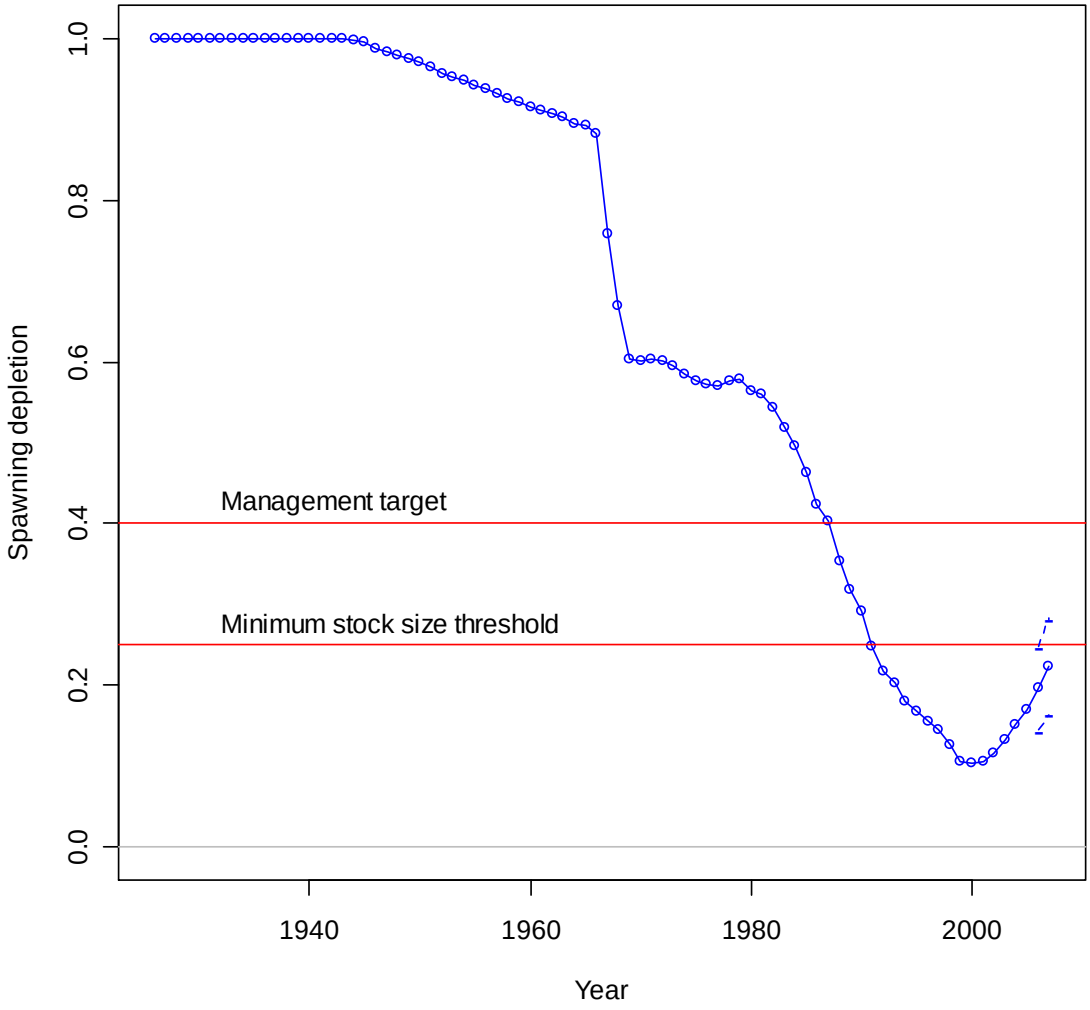
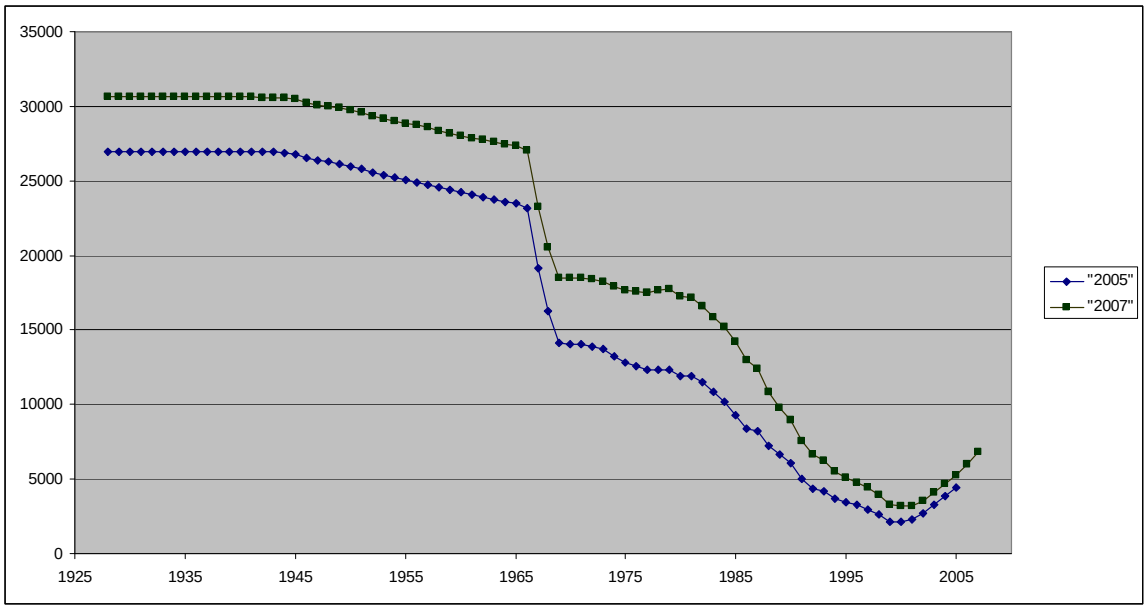


Figure 50. Time series of spawning output depletion level.

(A)



(B)

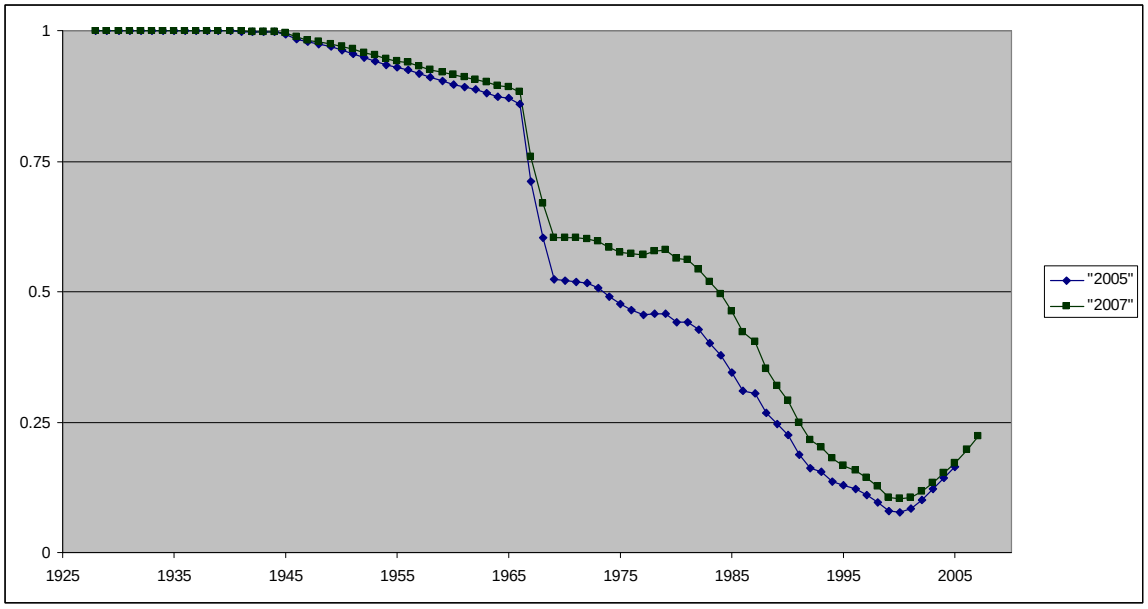


Figure 51. Comparison of histories of spawning output (A) and depletion (B) between the 2005 and 2007 assessments.

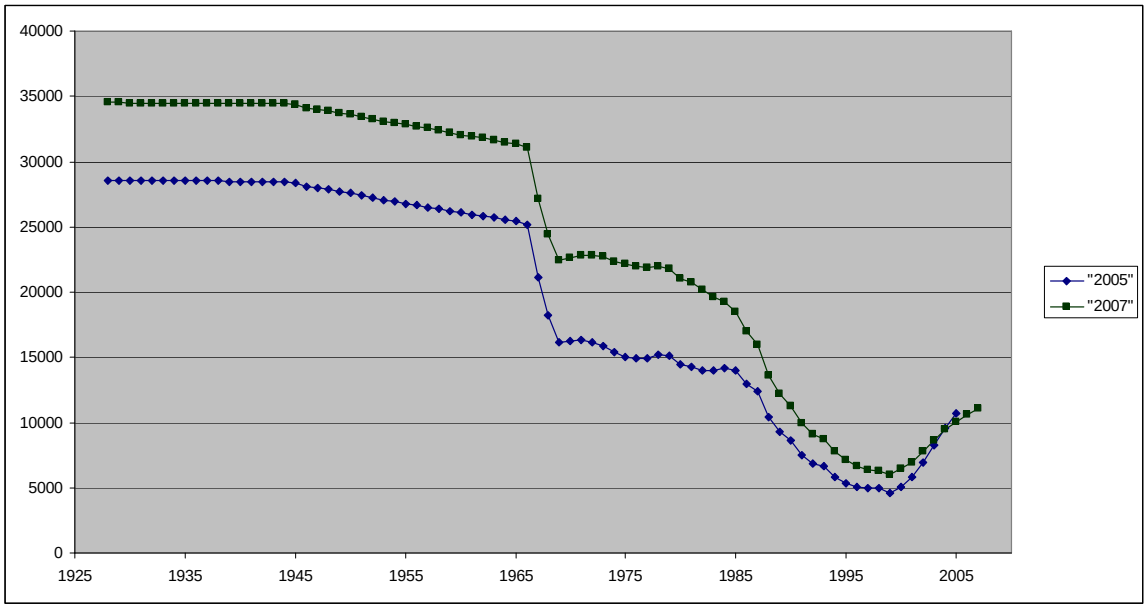
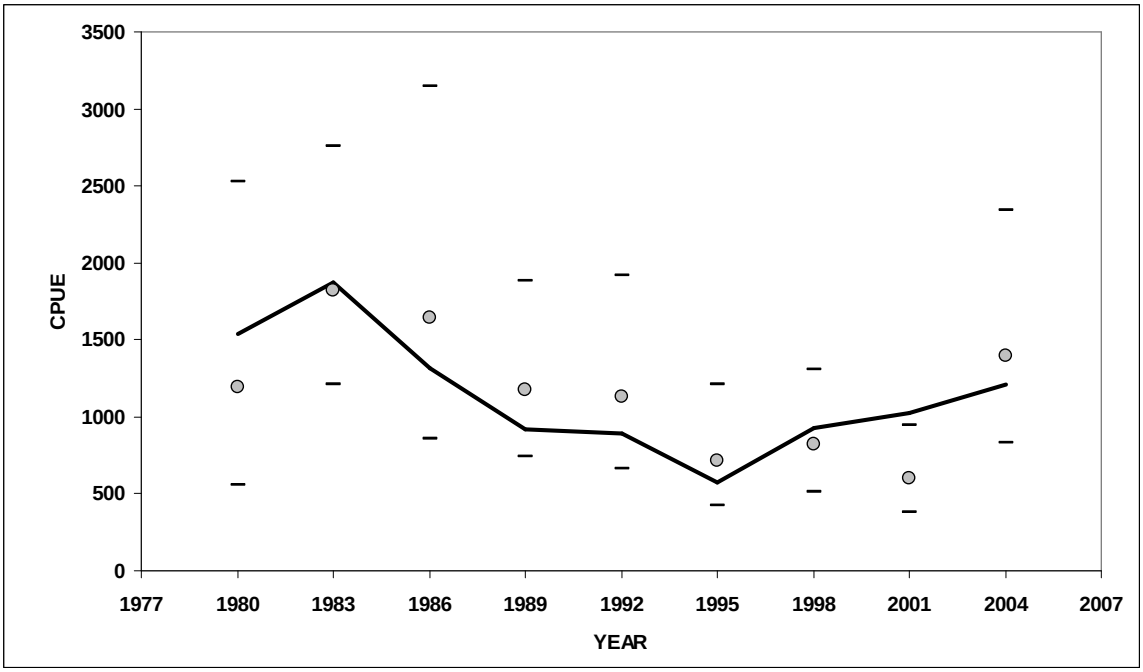


Figure 52. Comparison of time history of summary biomass for 2005 and 2007 assessments. The difference in virgin biomass (and virgin spawning output in the previous figure) is due to similar estimation of productivity at moderate stock sizes and a lower steepness value (0.6 (2007) versus 0.95 (2005)), which indicates increased recruitment at virgin biomass (e.g. at B_{40} (40% of spawning output, in this case), average recruitment = $0.8R_0$ when h = .6, and $0.98R_0$ when h = .95).



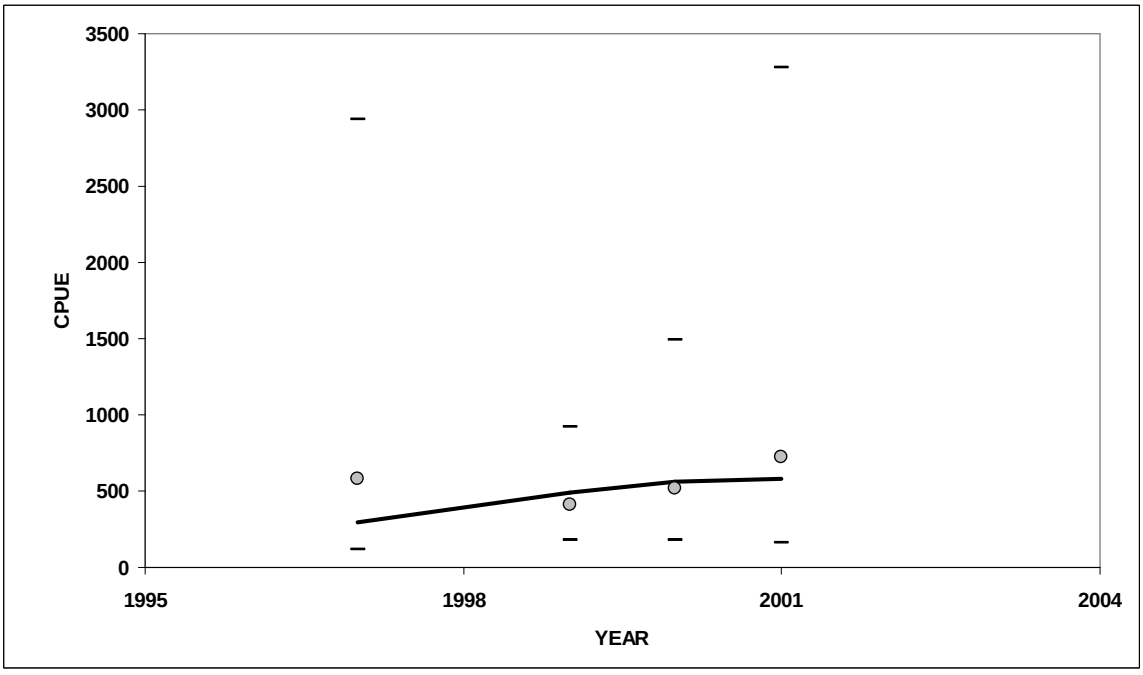


Figure 53. Model fits to Triennial shelf and AFSC Slope Survey indices

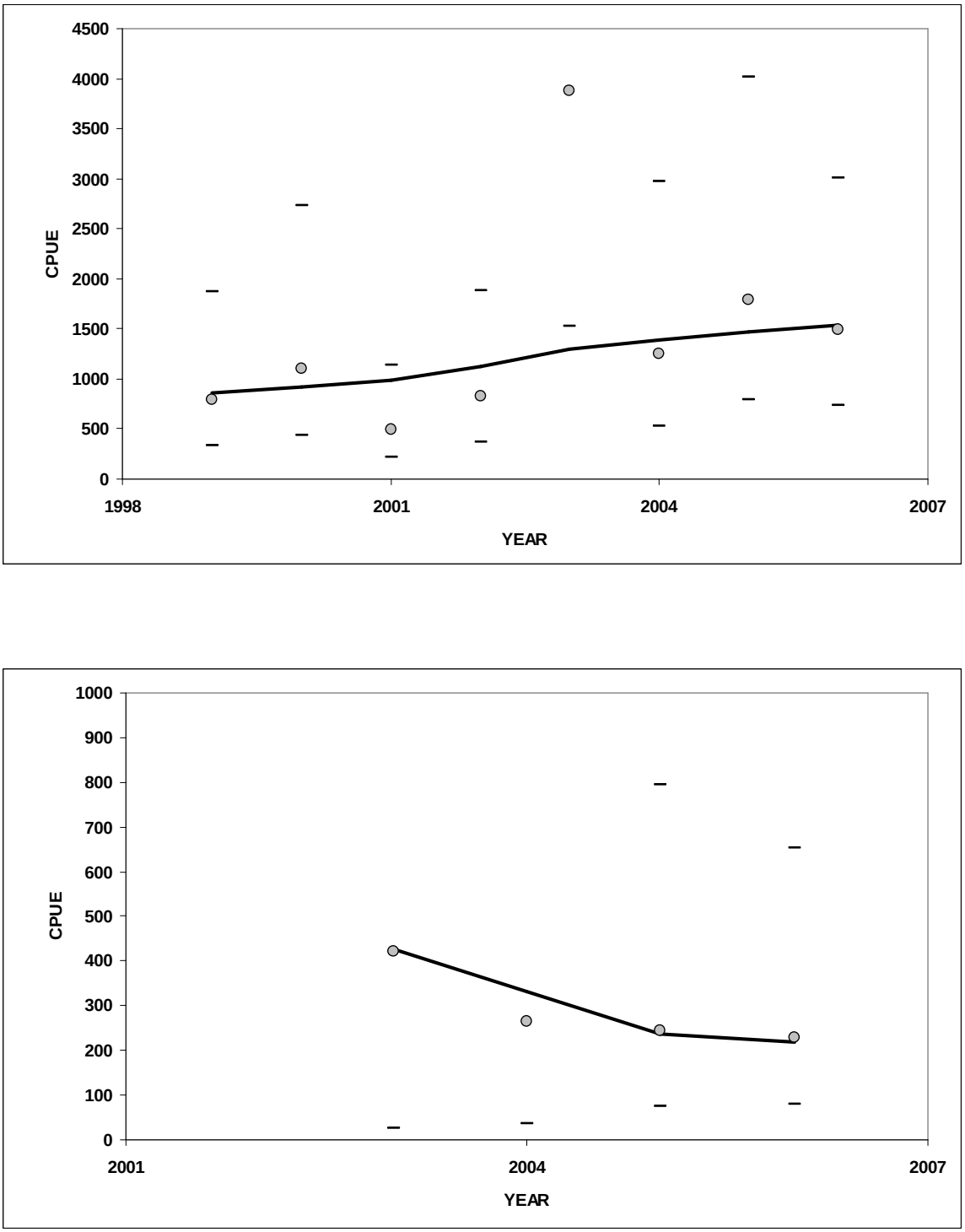


Figure 54. Model fits to NWFSC slope (top) and Shelf Survey indices.

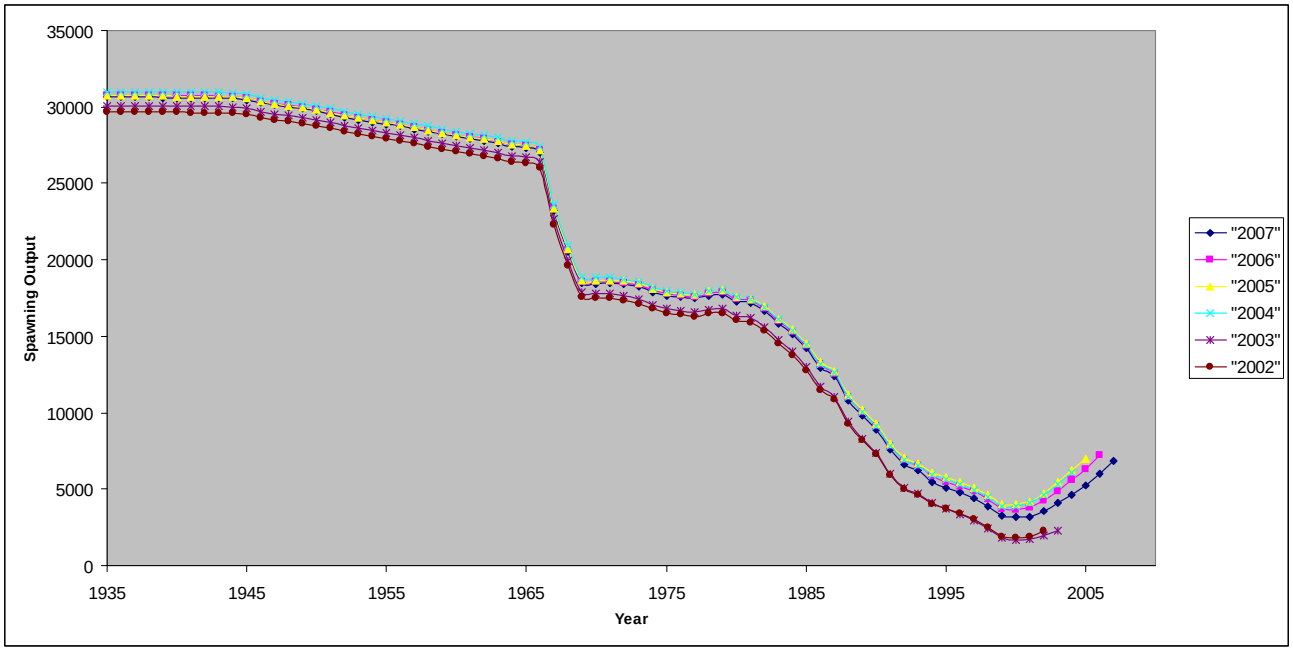


Figure 55. Search for retrospective pattern showing spawning output estimates from current assessment ("2007") and retrospective assessments as if counducted in 2002-2006.

Appendix: Input Files

Starter File:

```
##  SS2 Version 2.00.f
dat.txt
ctl.txt
0  #Read SS2.PAR 1= yes
1  #Verbosity
1  #detailed .rep file
0  #number of boostrap files to create
9  # Phases greater than this are set to -1
Code_version_:_
10 #burn in for mcmc chain
2  #thinning intervalfor mcmc
0.0 #jitter initial param values
0.01   #push init param values from bounds
-1     #min year for spbio sd report (neg value to styr-2; virgin level)
-1     #max " (neg = endyr)
0.0001 #convergence criterion
0 #retrospecitive year beyond which obs data nullified (0 = no retro, neg value = # years
to ignore)
1 #fishery keeper (1 = normal, 0 = set all to 0 (for dynamic Bzero)
0.06 # Ball Park F
1999 # year for above
1 #F method = 1 = popes (as in V.1.xx), 2 = continuous F
1 #summary age
1 #forecast option 0-4
1 #MSY option 0-4
0 #Do output for rebuilder package
1999 #year declared for rebuilder package
-1 #start year for rebuilding package (-1 sets to endyr+1)
```

Control File:

```
##  SS2 Version 2.00.f
##
1 # Morphs
1 # Sub-Morphs
1 # Areas
1  1  1  1  1 # Areas per Type
# Recruitment Distribution Pattern
1  # Recruitment distribution
0 # Allow Seasonal Recruitment Interaction
0 # Allow Migration
0  0  0 #dummy for migration
2 # Blocks
1  2  #blocks in each design
2000 2006
2000  2002  2003  2006
0.5 # Recruit Fraction Female
1000 # Sub-Morph Ratio Between/Within
-1  # Sub-Morph Distribution
# Natural Mortality & Maturity
4 # last age for M young
15 # first age for M old
1.7 #age for growth Lmin
29 #Age for growth Lmax
0.1 #SD constant added to Length at age (0.1 to mimic SS2 v 1.xx)
0 #Variability about growth (0 CV~f(LAA) (as in SS2v1.xx),1 CV~f(A), 2 sd~(LAA), ,3
sd~f(A)
1 #maturity option - 1 L logistic, 2 age log. 3 read mat at age
2 # first age allowed to mature
3  #Mg parm offset option
1 #MG parm adjust method
-7 #MG parm dev phase
# Maturity & Growth Parameters
```

```
# min   max   init     prior pr_type  sd      phase   env     UseDev  Minyr   Maxyr   DevSD
      use_bl bl_type
0.01    0.15    0.07    0.08    0       0.8     -3      0       0       0       0       0
        0       0       # natM Young
-3      3       0       0       0       0.8     -3      0       0       0       0       0
        0       0       # natM old exp offset
12      16      14.5    14.6    0       5       2       0       0       0       0       0
        0       0       # Lmin
40      60      42.44   42.5    0       10      2       0       0       0       0       0
        0       0       # Lmax
0.05    0.25    0.215   0.2     0       0.8     3       0       0       0       0       0
        0       0       # VBK
0.05    0.25    0.065   0.07    0       0.8     3       0       0       0       0       0
        0       0       # CV Young
-3      3       0       0       0       0.8     4       0       0       0       0       0
        0       0       # CV old offset
-3      3       0       0       0       0.8     -3      0       0       0       0       0
        0       0       # Male natmort offset
-3      3       0       0       0       0.8     -3      0       0       0       0       0
        0       0       # male natmore offset
-3      3       0       0       0       0.8     -5      0       0       0       0       0
        0       0       # Male Lmin offset
-3      3       -0.12   0       0       0.8     3       0       0       0       0       0
        0       0       # Male Lmax offset *
-3      3       0.233   0       0       0.8     3       0       0       0       0       0
        0       0       # Male VBK offset *
-3      3       0       0       0       0.8     -6      0       0       0       0       0
        0       0       # Male cv Y offset
-3      3       0       0       0       0.8     -6      0       0       0       0       0
        0       0       # Male cv old offset
-3      3       2.10E-05 0      0       0.8     -3      0       0       0       0       0
        0       0       # F L to wt coeff
-3      3       2.96142 2.64694 0       0.8     -3      0       0       0       0       0
        0       0       # F L to Wt exp
0       60      34.59   55      0       0.8     -3      0       0       0       0       0
        0       0       # Mat infl
-3      3       -0.6429 -0.25   0       0.8     -3      0       0       0       0       0
        0       0       # Mat logistic slope (negative)
-3      3       0.1458  1       0       0.8     -3      0       0       0       0       0
        0       0       # fecund intercept
0       2       1.325   1       0       0.8     -3      0       0       0       0       0
        0       0       # fecund multiplier
-3      3       2.10E-05 0      0       0.8     -3      0       0       0       0       0
        0       0       # Male L to wt coeff
-3      3       2.96142 2.64694 0       0.8     -3      0       0       0       0       0
        0       0       # Male L to wt exp
0       1       1       1       0       50      -50     0       0       0       0       0
        0       0       # Recruitment apportionment by growth pattern
0       1       1       1       0       50      -50     0       0       0       0       0
        0       0       # Rec app by Area
0       1       1       1       0       50      -50     0       0       0       0       0
        0       0       # Rec app by Season
0       1       1       1       0       50      -50     0       0       0       0       0
        0       0       # Cohort growth deviation

0 # Environmental Custom Flag
0 # TimeBlock Custom Flag


3 #Recruitment Function 1 BH w/flat top, 2 Ricker, 3 BH, 4 none
# Recruitment Parms
# Low   High    Init    Prior PrType   SD      phase
3       31      8.2     8       0       10      1       # R0
0.2     0.95    0.6     0.507   2       0.141   -2      # h
0       2       0.8     0.8     0       0.8     -1      # sigma R
-5      5       0       0       0       1       -3      # Env link coeff
-5      5       0       0       0       1       -3      # Init Equilb offset to virgin
-1      1       0       0       0       100     -1      # placeholder for Autocorrelation


0 #Index of Env Var
```

```
2 #Env target param - 1 = rec devs, 2 = R0, 3 = h
1 #Rec dev type 0 = none, 1 = devvector (sum=0), 2 = simple deviations
1975 #First year of rec resid
2005 #Last year of rec resid
-8 # Lower bound
8  #Upper bound
3  #Phase
1900  #First year of full bias correction linear ramp for this year - plus-age to this
year
# Initial Fishing Mortality Parameters
0  1  0  0.01  0  99  -1

# Catchability Specification
0  0  0  0  1  0
0  0  0  0  1  0
0  0  0  0  1  0
0  0  0  0  1  0
0  0  0  0  1  0

# Catchability Parameters
#-10  10  -1 -1  0  99  1
#-10  10  -1.5 -1.5  0  99  1
#-10  10  -1.8 -1.7  0  99  1
#-10  10  -1.8 -1.7  0  99  1

# Selectivity Specification
#Type   Retent  Moffset Special
#Length
24      1       0       0 #Fishery
24      0       0       0 #Triennial
24      0       0       0 #AFSC slope
24      0       0       0 #NW slope
24      0       0       0 #NW shelf

10      0       0       0 #AGe selects 10 = flat
10      0       0       0
10      0       0       0
10      0       0       0
10      0       0       0

# Selectivity Parameter
#Peak
#Width
#Var Asc
#Var desc
#init
#Final
#Low    High    Init    Prior   PrType  SD      Phase   env     usedev  minyr   maxyear sd
       block   blswitch
20      45      36      32      0       50      2       0       0       0       0       0.5
        0       0       # 1 = baseparm*exp(blockparm)
-6      4       1       0       0       50      2       0       0       0       0       0
        0       0
-1      9       4       4       0       50      3       0       0       0       0       0
        0       0

-1      9       5       5.5     0       50      3       0       0       0       0       0
        0       0

-5      9       -2      -2      0       50      2       0       0       0       0       0
        0       0

-5      9       9       5       0       50      -3      0       0       0       0       0
        0       0

15      70      27      35      0       99      2       0       0       0       0       0.5
        1       2
0.1     10      2       1       0       99      2       0       0       0       0       0.5
        0       0       # 1 = parm + blockparm
0.001   1       1       1       0       99      -3      0       0       0       0       0.5
        2       2       # 2 = parm' = blockparm
```

```
0       0       0       0       0       99      -3      0       0       0       0       0.5
        0       0

10      45      21      23      0       50      2       0       0       0       0       0
        0       0
-6      4       -4      -1      0       50      2       0       0       0       0       0
        0       0
-1      9       4       4       0       50      3       0       0       0       0       0
        0       0

-1      9       4       6       0       50      4       0       0       0       0       0
        0       0

-5      9       -2      -4      0       50      2       0       0       0       0       0
        0       0

-5      9       -3      -1      0       50      3       0       0       0       0       0
        0       0

10      45      23      28      0       50      2       0       0       0       0       0
        0       0
-6      4       -1      -1      0       50      2       0       0       0       0       0
        0       0
-1      9       2       4       0       50      3       0       0       0       0       0
        0       0

-1      9       2       4       0       50      3       0       0       0       0       0
        0       0

-5      9       -5      -4      0       50      -4      0       0       0       0       0
        0       0

-5      9       -4      -2      0       50      3       0       0       0       0       0
        0       0



10      45      25      28      0       50      2       0       0       0       0       0
        0       0
-6      4       3       1       0       50      2       0       0       0       0       0
        0       0
-1      9       3       4       0       50      3       0       0       0       0       0
        0       0

-1      9       4       4       0       50      3       0       0       0       0       0
        0       0

-5      9       -5      -4      0       50      -4      0       0       0       0       0
        0       0

-5      9       9       1       0       50      -3      0       0       0       0       0
        0       0

8       45      18      20      0       50      2       0       0       0       0       0
        0       0
-6      4       -1      -1      0       50      3       0       0       0       0       0
        0       0
-1      9       0       2       0       50      3       0       0       0       0       0
        0       0

-1      9       3       4       0       50      4       0       0       0       0       0
        0       0

-5      9       -1      -3      0       50      4       0       0       0       0       0
        0       0

-5      9       -5      -4      0       50      -3      0       0       0       0       0
        0       0

1 # 2 = new (v2.00.c) sel parm adjust method, 1 old
0 # Environmental Custom Flag
```

```
1 # TimeBlock Custom Flag # 1
#-10 10 0 0   0  50  3
#-5 9 -4 -4   0  50  4
#-5 9 8 8   0  50  4
15  70  25  30  0  99  4
0.3  1  .7  .7  0  99  3
0.3  1  .8  .8  0  99  3

-4 #selparm_dev_phase
# Variance Adjustment Factors
0  0  0  0  0   # const added to survey cv
0  0  0  0  0   # const added to discard sd
0  0  0  0  0   # const added to body weight sd
.76  .71  .64  .69  1   # mult scalar for length comps
1 .71  1  1  1   # mult scalar for age comps
1  1  1  1  1   # mult scalar for length at age obs

# Degrees of Freedom for Discard & Mean Body Weight
30
30
# Lambdas
1 # Max Lambda Phase
0 # sd offset
# CPUE Lambda
0
1
1
1
1
# Discard Lambda
1
0
0
0
0
# Mean Body Weight
0
# Length Composition
1
1
1
1
1
# Age Composition
1
1
1
1
1
# Mean Size at Age
0
0
0
0
0
# Initial Equilibrium
0
# Recruitment Deviations
1
# Prior Lambda
1
# Deviation Time Series
1
# Crash Penalty lambda
50
0.9 # Max Allowable Harvest Rate
999
```

Data File:

```
##rewt half length discard n for rewt
##  SS2 Version 2.00f
1928 # start year
2006 # end year
1       # N seasons per year
12      # Months per season
1       # Spawning Season
1       # N fishing fleets
4       # N surveys
FISHERY%TRIENNIAL%SLOPE%NWSLOPE%NWSHELF #Names divided by "%"
0.5  0.7  0.92  0.6  0.6 #Timing of each fishery/survey (.42 POP)
2       # Number of Genders
45      # Accumulator age
# Catch
0       #inital equilibrium catch
# Landings
1  #1928
3
3
1
1
1
2
2
2
2
5
7
8
9

10
39
91
236
160
100
160
171
201
261
195
194
201
197
244
269
246
243
258
203
276
323
208
415
4129
3001
2358
256
265
441
595
836
733
567
574
263
410
992
```

```
557
956.5 #1981-2004 updated 6.14.2007
1116.2 #Tagart 1982 value for Oregon = 920
939.9
1273.8
1787.1
1265.2
2420.0
1655.1
1274.9
1650.9
1208.1
687.4
1193.7
864.4
783.0
729.6
824.1
944.0
361.8
262.0
173.2
112.6
80.0
189.0
104.7 #2005 New 6.14.2007
113.3 #2006 New 6.14.2007

25   # number of Survey data points
1980  1  2  1189  0.377  # Triennial
1983  1  2  1825  0.206
1986  1  2  1641  0.325
1989  1  2  1179  0.234
1992  1  2  1129  0.265
1995  1  2  718   0.261
1998  1  2  818   0.236
2001  1  2  601   0.225
2004  1  2  1397  0.258
1997  1  3  578   0.813 #AFSC slope
1999  1  3  407   0.407
2000  1  3  520   0.526
2001  1  3  724   0.755
#1979  1  4  4555  0.41  #POP (not GLMM'd) added .2 to cvs
#1985  1  4  5595  0.37
1999  1  4  790        0.430  #NWFSC slope
2000  1  4  1098 0.456
2001  1  4  495  0.416
2002  1  4  827  0.410
2003  1  4  3885 0.467
2004  1  4  1254 0.431
2005  1  4  1789 0.405
2006  1  4  1487 0.352
2003  1  5  422  1.391 #NWFSC shelf
2004  1  5  265  1.011
2005  1  5  244  0.590
2006  1  5  228  0.526
2   # Discards Type 1 = biomass(mt), 2 = fraction of total
7   # Discards N observations
1986  1  1  0.05  0.3
2000  1  1  0.32  0.2
2001  1  1  0.41  0.2
2002  1  1  0.47  0.1
2003  1  1  0.33  0.1
2004  1  1  0.21  0.1  #Updated based on new info
2005  1  1  0.24  0.1  #NEW
0   # Mean Body Weight
#2002  1  1  1  0.52  0.3
#2003  1  1  1  0.73  0.3

# Composition Conditioners
-0.0001 #compress tails until observed proportion is greater than (- = no compression)
```

```
0.0001 #Add to obs and exp proportions then renormalize
37 # Number of Length Bins
6  7  8  9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24  25  26  27  28
29  30  31  32  33  35  37  39  41  43  45  47  49  51

57   # Length Composition Observations
#Year   Seas    Fleet   Gender  Part    effn    6       7       8       9       10      11
        12      13      14      15      16      17      18      19      20      21      22
        23      24      25      26      27      28      29      30      31      32      33
        35      37      39      41      43      45      47      49      51      6       7
        8       9       10      11      12      13      14      15      16      17      18
        19      20      21      22      23      24      25      26      27      28      29
        30      31      32      33      35      37      39      41      43      45      47
        49      51
1977    1       1       3       2       22      0.00    0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
        0.006578947     0       0.023026316     0.016447368     0.029605263     0.078947368
        0.065789474     0.072368421     0.082236842     0.046052632     0.046052632
        0.075657895     0.016447368     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0.003289474     0.003289474
        0.013157895     0.016447368     0.032894737     0.0625  0.078947368     0.085526316
        0.049342105     0.036184211     0.032894737     0.019736842     0       0
        0.003289474     0       0       0       0.003289474     0       0
1978    1       1       3       2       9       0.00    0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0.01    0.015   0.025   0.04    0.045   0.06    0.065   0.09    0.12
        0.015   0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0.02    0.04    0.055   0.08
        0.145   0.065   0.05    0.055   0.005   0       0       0       0       0       0
        0       0
1981    1       1       3       2       44      0.00    0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0.009352168     0       0.000923447     0.009658981     0
        0.017071936     0.009914631     0.002308139     0.004315309     0.029660242
        0.079223767     0.163936007     0.201138023     0.07768508      0.045483208
        0.007295434     0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0.001580486     0       0.001576187     0
        0.004283547     0.007270873     0.046535231     0.184208021     0.087405632
        0.009173651     0       0       0       0       0
1982    1       1       3       2       89      0.00    0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
        0.000209381     0       0.000276902     0.001000681     0.00038614      0.005672158
        0.006879098     0.010054919     0.006879155     0.01852027      0.035607596
        0.035969079     0.09680007      0.106453931     0.150588258     0.107370175
        0.050012385     0.016759029     0.003351308     0.018290696     0.003854013     0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0.002052348     0.000400223     0.00490636
        0.003430074     0.001632034     0.005899893     0.004138135     0.010646879
        0.008556366     0.01623941      0.049246598     0.12613895      0.064697219
        0.015629436     0.004155975     0.005121676     0.000582645     0.000582645
        0.000582645     0.000425247
1983    1       1       3       2       165     0.00    0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0.001558261     0.000755252     0.001921727     0.001684603     0.002958102
        0.001907771     0.005548072     0.006593778     0.005409392     0.025342831
        0.042579281     0.129231481     0.106978782     0.158768882     0.066233371
        0.034024602     0.006325025     0.004974093     0.002342174     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       4.20147E-05     0.000553799     0.000278982     0.00073901
        0.001073818     0.001301158     0.004911195     0.004834157     0.010500749
        0.013123356     0.047878464     0.108049036     0.113874963     0.062764421
        0.017942506     0.000784066     0.002421205     0       0.001894812     0.001894812
1984    1       1       3       2       333     0.00    0       0       0       0       0
        0       0       0       0       0.0001455       0       0       0       0       0
        0       0       0.000273317     0.000479761     0.000723049     0.001014262
        0.007088889     0.012052446     0.011529141     0.00817034      0.018918255
        0.032310116     0.062905043     0.118295281     0.099920392     0.107032918
        0.081542127     0.035738699     0.008357854     0.002410767     0       0       0
```

```
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0.001903934     0.002068308     0.000882328
        0.000807418     0.003281165     0.009473278     0.007829539     0.0083354
        0.016750228     0.064557223     0.123650076     0.087221681     0.055677021
        0.005926855     0.001267992     0.001232823     0       0       0.000226573
1985    1       1       3       2       486     0.00    0       0       0       0       0
        6.46695E-05     0       0       0       0       0       0       0       0
        0.000356996     5.30603E-05     0.000379775     0.001248356     0.000821946
        0.001327191     0.004531869     0.00414171      0.007254773     0.017542105
        0.023968267     0.034859106     0.057125733     0.070378564     0.079307216
        0.08456412      0.07108764      0.042441247     0.028954555     0.002628247
        0.001280595     0.000285876     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       3.98455E-05     0
        0.000421666     0.000121728     0.000439149     0.002210422     0.001835626
        0.005776825     0.004297625     0.013519143     0.016396334     0.023866345
        0.041263531     0.084824282     0.119990452     0.079574708     0.04171739
        0.017789248     0.006301526     0.002437656     0.001143502     0.001143502
        0.000285876
1986    1       1       3       2       278     0.00    0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0.002071054     0       0.000159037     0.000739251     0.001897864     0.002365606
        0.007196057     0.012056497     0.016022808     0.045839908     0.123178156
        0.081935263     0.097712823     0.085617346     0.075472013     0.028118091
        0.011721602     0.001773021     6.52695E-05     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0.002071054     0       0.000159037     6.52695E-05     0.000366787     0.001610705
        0.003423968     0.005407715     0.00795615      0.01719403      0.026988024
        0.036217687     0.089140217     0.114044498     0.072261733     0.024888035
        0.004263426     0       0       0       0       0
1987    1       1       3       2       412     0.00    0       0       0       0       0
        0       0       0       0       0       0       0       0       0
        5.13221E-05     5.13221E-05     0.000393739     0.000781583     0.000356925
        0.00034488      0.000240063     0.001776388     0.004286446     0.007125981
        0.01730589      0.071290522     0.119509346     0.12964213      0.082883901
        0.037657544     0.013366455     0.001432218     0.000578332     0.000119354     0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       7.33442E-05     0.000184316     0.000172226
        0.000261177     0.000351181     0.000270387     0.002035782     0.003762314
        0.012557375     0.018388235     0.044763024     0.138283505     0.170281506
        0.092834757     0.019667667     0.003648208     0.002094189     0       0.000986991
        0       0.000189475
1988    1       1       3       2       187     0.00    0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0.000661529     0.000196366     0.000196366     0.002288348     0.001753395
        0.000845588     0.004490349     0.001996761     0.003119104     0.011005669
        0.090355708     0.131260802     0.108269463     0.113863453     0.049264139
        0.011334184     0.003469253     0.002226819     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0.00061068      0.000838988     0.002180599
        0.001374062     0.002724592     0.007244706     0.007556083     0.033517473
        0.115773569     0.160844237     0.094703317     0.030369262     0.005380377     0
        0.000284758     0       0       0
1989    1       1       3       2       144     0.00    0       0       0       0       0
        0       0       0       0       0       0       0       0.000788562     0       0
        0       0       0.000342101     0.000684202     0.003813284     0.006497847
        0.008279591     0.011320896     0.006280937     0.019584264     0.021176669
        0.068227491     0.152058179     0.070295726     0.070753187     0.039862396
        0.02535664      0.01054275      0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0.000788562
        0       0       0       0.000342101     0       0.000840567     0.005667921
        0.008389814     0.004228372     0.006906767     0.014798088     0.014258987
        0.038924843     0.150251382     0.15339481      0.056826018     0.024289354
        0.004111149     0       0       0.000116543     0       0
1990    1       1       3       2       183     0.00    0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0.003509186     0.007076532     0.012307275     0.005499779
        0.010292605     0.0178002       0.026634944     0.066443951     0.078963855
        0.102143846     0.081646352     0.047993095     0.051572853     0.022488357
        0.00733607      0.004945395     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0.002037258     0.000794896     0.004306384     0.012841297
```

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        0.021916993    0.020533715    0.026667583    0.115233875    0.113686381
        0.07186936     0.046307552    0.015132791    0.002017621    0       0       0
        0
1991    1       1      3       2      143     0.00   0       0      0       0       0
        0       0      0       0      0       0      0       0      0       0
        0.004502616    0.001125654    0.004171721    0.011722977    0.008692469
        0.006130147    0.008949655    0.012865958    0.009707662    0.020097676
        0.01521165     0.036985609    0.077349652    0.092913414    0.100668455
        0.071645477    0.093169508    0.03928339     0.014403562    0.000973144    0
        0       0      0       0      0       0      0       0      0       0       0
        0.000156387    0.000156387    0       0.000936875    0       0       0.000253575
        0.005315507    0.004363072    0.011188102    0.009460796    0.006194133
        0.010109999    0.009935742    0.006951237    0.015268149    0.074181058
        0.104470409    0.057022386    0.041166472    0.008699816    0.0035995       0
        0       0      0
1992    1       1      3       2      58      0.00   0       0      0       0       0
        0       0      0       0      0       0      0       0      0       0       0
        0       0.001834152    0      0.005064503    0.002045318    0.003100424
        0.010497037    0.006619798    0.021779543    0.029846103    0.044157496
        0.074575408    0.097876095    0.123876327    0.08100722     0.058061504
        0.014121777    0.001502666    0       0      0       0      0       0       0
        0       0      0       0      0       0      0       0      0       0       0
        0       0      0.001834152    0      0.000376819    0.000587985    0.012786846
        0.010456193    0.025858325    0.009282842    0.020880342    0.055033373
        0.123374151    0.105258023    0.045698233    0.007414299    0.002535094    0
        0.002657951    0       0
1993    1       1      3       2      66      0.00   0       0      0       0       0
        0       0      0       0      0       0      0       0.001326852    0.001326852
        0.000529545    0.000627547    0.000698097    0.00465315     0.001749212    0
        0.003644621    0.008934061    0.012401269    0.019291458    0.032008647
        0.025389116    0.035429065    0.084834623    0.086639714    0.057803359
        0.035916937    0.010201857    0.006681646    0.002653704    0.001326852    0
        0       0      0       0      0       0      0       0      0       0       0
        0       0      0       0      0.002967805    0.000627547    0       0.000891664
        0.00066896     0.001951283    0.000514647    0.025643361    0.010762748
        0.031407735    0.032932631    0.035250464    0.133968983    0.168430268
        0.077328712    0.026204645    0.013801075    0.002579289    0       0       0
        0
1994    1       1      3       2      119     0.00   0       0      0       0       0
        0       0      0       0      0       0      0       0      0       0
        0.000486962    0.0005523      0.001261186    0.002080256    0.000206603
        8.08674E-05    0.00395701     0.003671261    0.016330346    0.017242556
        0.031433589    0.068712007    0.083310377    0.072308072    0.09507374
        0.057324993    0.044985485    0.016925356    0.004257853    0       0       0
        0       0      0       0      0       0      0       0      0       0       0
        0       0      0       0      0       0      0.000774224    0.000387112
        0.001110299    0.000206603    0.002941659    0.00509324     0.019123151
        0.017938335    0.044080903    0.117328466    0.115705675    0.094963222
        0.047738785    0.009108951    0.000720429    0.000162525    0.002415603    0
        0
1995    1       1      3       2      182     0.00   0       0      0       0       0
        0       0      0       0      0       0      0       0      0       0       0
        7.5112E-05     0.000842581    0.00103051     0.004328691    0.000298303
        0.000353183    0.003162351    0.003903803    0.01492967     0.030259922
        0.067003728    0.086987607    0.110947827    0.090413201    0.089036943
        0.043183575    0.01205678     0.001709596    0       0      0       0       0
        0       0      0       0      0       0      0       0      0       0       0
        0       0      0.000176592    0.000151496    0       0.000257318    0.003482031
        0.001496789    0.003280135    0.003258285    0.006303803    0.038715587
        0.05642791     0.100674695    0.137462385    0.064107783    0.018006873
        0.003596029    0.000210132    0.001868772    0       0      0
1996    1       1      3       2      425     0.00   0       0      0       0       0
        0       0      0       0      0       0      0       0      0       0
        4.4132E-05     9.79892E-05    0.001017638    0.001810586    0.002524783
        0.003911297    0.008358274    0.00499809     0.010147499    0.011154298
        0.014841308    0.068020984    0.072108902    0.078021995    0.072263013
        0.058561772    0.032922472    0.018824588    0.004818657    0.001283494    0
        0       0      0       0      0       0      0       0      0       0       0
        0       0      0       0      0       0      0.000738064    0.002115989
        0.002135368    0.003965466    0.003747479    0.006087129    0.008217658
        0.019305634    0.037848989    0.063050967    0.146403653    0.155591814
```

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        0.05245478      0.021938869     0.005684752     0.001754296     0.00126601
        0.00137796      0.000583352     0
1997    1       1       3       2       405     0.00    0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
        0.000107574     0.001286331     0.003112263     0.004527188     0.007768017
        0.004160193     0.010876911     0.013772948     0.020018207     0.016811859
        0.034504001     0.062972004     0.074900139     0.071906155     0.075918314
        0.061748173     0.036327925     0.028495065     0.004323518     0.00234148      0
        0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0.000240184     0       0.000765582     0.001101765
        0.002852196     0.007999562     0.003568754     0.007733687     0.01729388
        0.031664628     0.029503885     0.05100225      0.105120983     0.109387124
        0.054315905     0.028789816     0.009183832     0.002756809     0.000764451
        7.64451E-05     0       0

1998    1       1       3       2       413     0.00    0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0.00077297
        0.001710499     0.000595458     0.003524946     0.004954793     0.006429663
        0.010992014     0.013309321     0.015245814     0.011396353     0.021977456
        0.019643736     0.059829735     0.067030796     0.095875499     0.072577318
        0.073341428     0.049825482     0.017456194     0.003512397     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0.000684321     0.001993926     0.002259521     0.003921156
        0.006969045     0.017105825     0.014467784     0.015986877     0.014165177
        0.016693662     0.017883009     0.031793267     0.113308959     0.095849058
        0.057319504     0.025982234     0.009297566     0.001010899     0.000466569
        0.00206659      0.000773178     0
1999    1       1       3       2       283     0.00    0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0.000378758
        0.003302169     0.002475511     0.007438374     0.01766571      0.031852205
        0.040150355     0.037303993     0.032815354     0.042094662     0.019545283
        0.018221781     0.039840287     0.076460423     0.076567399     0.042771808
        0.031086862     0.020513626     0.012963533     0.00433673      0.000994425
        0.000133616     0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0.00063759      0.001029413
        0.005024613     0.008747049     0.015627039     0.042818832     0.026758096
        0.034498175     0.031109732     0.032229715     0.024779777     0.023918037
        0.070250385     0.064077541     0.034598183     0.020983278     0.003197983
        0.000267232     0.000133616     0       0.000267232     0.000133616
2000    1       1       3       2       338     0.00    0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
        0.000639877     0.000362422     0.001323518     0.00590163      0.0110556
        0.014979416     0.045363009     0.042304294     0.040805138     0.044344475
        0.049902656     0.049267739     0.045232306     0.050065879     0.054747034
        0.04862616      0.025973569     0.015225913     0.001696292     0.00044911      0
        0       0       0       0       0       0       0       0       5.81063E-05     0
        0.000116213     0       0       0       0       0       0.001520227     0.001269471
        0.006045863     0.001421582     0.017725991     0.020600764     0.039255683
        0.051223399     0.051232118     0.026024049     0.039170777     0.068554806
        0.060494894     0.040467463     0.019758711     0.004838564     0.0008137
        0.000921161     5.04885E-05     0.000169932     0
2001    1       1       3       2       538     0.00    0       0       0       0       0
        0       0       0       0       0       0       0       0       0.0004126
        0.000565224     0.000962535     0.000343335     0.001009835     0.004227819
        0.006504627     0.009313837     0.023128351     0.021078364     0.052456174
        0.066198822     0.069522369     0.09263898      0.050794878     0.029205079
        0.030043291     0.018447661     0.014555963     0.010743217     0.003761249
        5.33968E-05     0.000274668     0       0       0       0       0       0       0
        0       0       0       0       0       0       0.002724611     0
        0.0004126       0.000310116     0.000618003     0.002438096     0.004869561
        0.013859663     0.031992527     0.039997801     0.067099195     0.073832988
        0.067634494     0.076321501     0.056361103     0.027166211     0.018112717
        0.006746372     0.00168807      0.000578438     0.000993656     0       0
2002    1       1       3       2       455     0.00    0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0.000704333
        0.003054397     0.003202724     0.005323664     0.003790139     0.00547812
        0.005839653     0.010556814     0.010297423     0.018084463     0.025823854
        0.043051972     0.123735428     0.07028114      0.044852441     0.043882823
        0.055643925     0.057480583     0.016076684     0.006399192     0.000755325     0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0.00119196      0.001413878     0.002684754
```

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        0.004116186    0.00368149     0.005571691    0.009152354    0.012983777
        0.017642843    0.027593557    0.047985141    0.066330273    0.099895195
        0.098660903    0.026263208    0.014791388    0.005179363    7.96834E-05
        0.000155753    0       0.000311506    0
2003    1       1       3       2       479     0.00    0       0       0       0       0
        0       0       0       0       6.16818E-05     9.17458E-05     0.000726288
        6.01282E-05    0.00059285     0.000393383    0.001726721    0.001387374
        0.006224385    0.002365948    0.001755124    0.004615748    0.006238493
        0.004538233    0.00755836     0.009809054    0.011480538    0.086516108
        0.134030401    0.089972147    0.060373103    0.047144544    0.044701015
        0.019539008    0.004892412    0.002024299    0.000262553    0       0       0
        0       0       0       0       0       0       0       6.16818E-05     0.000151874
        0.000402705    0.00036798     0.000578488    0.001309846    0.001552878
        0.003261087    0.002742601    0.002099171    0.002431258    0.004591832
        0.011443694    0.010047596    0.014893835    0.020495555    0.040983798
        0.142879073    0.09689387     0.061865398    0.017075806    0.008368159
        0.002962136    0.003078653    0       0       0.00037938
2004    1       1       3       2       499     0.00    0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        7.32641E-05    0       0.000598524    0.006170027    0.00674888     0.00803408
        0.014796286    0.016238221    0.017587649    0.026779299    0.045130183
        0.088193406    0.060646497    0.075707574    0.07144489     0.035479158
        0.022235967    0.011319017    0.000713445    0.000596483    0       0       0
        0       0       0       0       2.78887E-05     0       0       0       0
        0       0       0       0       2.78887E-05     0.000158889    0.005454061
        0.00152489     0.008370252    0.011447853    0.02484531     0.031404379
        0.045674303    0.041021577    0.127518985    0.111140163    0.057467138
        0.018281841    0.003935684    0.00191987     0.001286177    0       0       0
2005    1       1       3       2       386     0.00    0       0       0       0       0
        0       0       0       0       0       0       0       0       0
        8.7425E-05     4.31757E-05    0.001553216    0.001683198    0.004324975
        0.007606499    0.011145276    0.016083496    0.025052334    0.034088456
        0.04672868     0.077008893    0.087901845    0.094300228    0.062991708
        0.040743933    0.020965344    0.005835447    0.005011961    0.001185878
        0.0005718      0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0.000576343    0.000161272
        0.001173837    0.002167191    0.005559964    0.011543479    0.013498114
        0.015441683    0.038886897    0.052027269    0.046117082    0.102524631
        0.099080228    0.041466011    0.018567018    0.004904467    0.000555271
        0.000413116    0.000137705    0       0.000284654
2006    1       1       3       2       244     0.00    0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0.000253014    0.000927719    0.000674705    0.000506029    0.002704169
        0.007110264    0.002624141    0.017605568    0.031712362    0.069000176
        0.091869841    0.067975115    0.08383897     0.045817189    0.030987837
        0.023855064    0.009679905    0.001777844    0.000337352    0.000933291    0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0.000253014    0.000421691    0.000506029
        0.000755674    0.001083829    0.009770011    0.012830207    0.035375247
        0.068107835    0.06173724     0.14102891     0.09982894     0.051576337
        0.020851345    0.003219011    0.001787269    0.000676857    0       0       0
#Discard
#1986   1       1       0       1       100     0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0.006756757
        0.006756757    0.040540541    0.040540541    0.081081081    0.101351351
        0.074324324    0.108108108    0.195945946    0.195945946    0.074324324
        0.067567568    0.006756757    0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0
#2002   1       1       0       1       127     0       0       0       0       0
        0.000500134    0.000500134    0.000500134    0       0.000500134    0.006299151
        0.011800624    0.018445049    0.023404997    0.023231734    0.052289594
        0.055042128    0.04520059     0.104138479    0.079559171    0.05004554
        0.020914966    0.024717381    0.019531991    0.025855856    0.022694644
        0.047039058    0.140564336    0.129710719    0.063745901    0.014279025
        0.011893171    0.005696519    0.00189884     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0
#2003   1       1       0       1       159     0       0       0       0       0       0
        0       0.000219668     0       0.000219668     0.000329503     0.000329503
        0.000109834     0.004497106     0.0159139       0.022500811     0.029892874
        0.025016281     0.016417594     0.008035254     0.003723185     0.02541656
        0.02650659      0.038107796     0.026789967     0.034143595     0.086330864
        0.248692702     0.18653093      0.100521041     0.053012453     0.02922873
        0.00521923      0.00858063      0.003713731     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0
#2004   1       1       0       1       182     0       0       0       0       0       0
        0.000365581     0.000365581     0.002267614     0.00019591      0.000561491
        0.00058773      0.000757402     0.001978696     0.001025588     0.00058773
        0.004638996     0.005118755     0.015263086     0.022691885     0.019499513
        0.018964023     0.025106964     0.012075538     0.024002538     0.037024115
        0.090885288     0.185661575     0.224603071     0.108596001     0.104098616
        0.032060425     0.051123474     0.009696903     0.00019591      0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0
#2005   1       1       0       1       319     0       0       0.000334883     0
        0.000358919     0.000900125     0.002784916     0.00542258      0.006575631
        0.007663917     0.00432837      0.010849396     0.019930111     0.01958284
        0.008053074     0.005210488     0.008367227     0.004215873     0.006536775
        0.00640007      0.040282497     0.059461948     0.052043795     0.055854351
        0.062035752     0.076944303     0.063453959     0.178174789     0.169324467
        0.085323657     0.023708242     0.01091535      0.001618782     0.002383113     0
        0.000624914     0.000334883     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0
#2006   1       1       0       1       269     0       0       0.000288101     0.001258454
        0.002739218     0.006330344     0.010016292     0.016065028     0.019907314
        0.015747628     0.012170974     0.015308526     0.028993369     0.030891774
        0.029568479     0.043854442     0.02024746      0.023354889     0.013841023
        0.006147608     0.004566981     0.007677204     0.006206044     0.015034299
        0.045687408     0.066375188     0.07006814      0.174153773     0.120797089
        0.0964466       0.021237724     0.040098953     0.024616323     0.005566923
        0.002214352     0       0.002522077     0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0
#Discard by half for it rewt
1986    1       1       0       1       50      0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0.006756757
        0.006756757     0.040540541     0.040540541     0.081081081     0.101351351
        0.074324324     0.108108108     0.195945946     0.195945946     0.074324324
        0.067567568     0.006756757     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0
2002    1       1       0       1       64      0       0       0       0       0
        0.000500134     0.000500134     0.000500134     0       0.000500134     0.006299151
        0.011800624     0.018445049     0.023404997     0.023231734     0.052289594
        0.055042128     0.04520059      0.104138479     0.079559171     0.05004554
        0.020914966     0.024717381     0.019531991     0.025855856     0.022694644
        0.047039058     0.140564336     0.129710719     0.063745901     0.014279025
        0.011893171     0.005696519     0.00189884      0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0
2003    1       1       0       1       80      0       0       0       0       0       0
        0       0.000219668     0       0.000219668     0.000329503     0.000329503
        0.000109834     0.004497106     0.0159139       0.022500811     0.029892874
        0.025016281     0.016417594     0.008035254     0.003723185     0.02541656
```

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        0.02650659     0.038107796    0.026789967    0.034143595    0.086330864
        0.248692702    0.18653093     0.100521041    0.053012453    0.02922873
        0.00521923     0.00858063     0.003713731    0      0      0      0      0
        0      0      0      0      0      0      0      0      0      0      0
        0      0      0      0      0      0      0      0      0      0      0
        0      0      0      0      0      0      0      0      0      0      0
        0
2004    1      1      0      1      91     0      0      0      0      0      0
        0.000365581    0.000365581    0.002267614    0.00019591     0.000561491
        0.00058773     0.000757402    0.001978696    0.001025588    0.00058773
        0.004638996    0.005118755    0.015263086    0.022691885    0.019499513
        0.018964023    0.025106964    0.012075538    0.024002538    0.037024115
        0.090885288    0.185661575    0.224603071    0.108596001    0.104098616
        0.032060425    0.051123474    0.009696903    0.00019591     0      0      0
        0      0      0      0      0      0      0      0      0      0      0
        0      0      0      0      0      0      0      0      0      0      0
        0      0      0      0      0      0      0      0      0      0      0
        0      0      0
2005    1      1      0      1      160    0      0      0.000334883    0
        0.000358919    0.000900125    0.002784916    0.00542258     0.006575631
        0.007663917    0.00432837     0.010849396    0.019930111    0.01958284
        0.008053074    0.005210488    0.008367227    0.004215873    0.006536775
        0.00640007     0.040282497    0.059461948    0.052043795    0.055854351
        0.062035752    0.076944303    0.063453959    0.178174789    0.169324467
        0.085323657    0.023708242    0.01091535     0.001618782    0.002383113    0
        0.000624914    0.000334883    0      0      0      0      0      0      0
        0      0      0      0      0      0      0      0      0      0      0
        0      0      0      0      0      0      0      0      0      0      0
        0      0      0      0      0      0      0      0
2006    1      1      0      1      135    0      0      0.000288101    0.001258454
        0.002739218    0.006330344    0.010016292    0.016065028    0.019907314
        0.015747628    0.012170974    0.015308526    0.028993369    0.030891774
        0.029568479    0.043854442    0.02024746     0.023354889    0.013841023
        0.006147608    0.004566981    0.007677204    0.006206044    0.015034299
        0.045687408    0.066375188    0.07006814     0.174153773    0.120797089
        0.0964466      0.021237724    0.040098953    0.024616323    0.005566923
        0.002214352    0      0.002522077    0      0      0      0      0      0
        0      0      0      0      0      0      0      0      0      0      0
        0      0      0      0      0      0      0      0      0      0      0
        0      0      0      0      0      0      0      0      0
#Triennial
1980  1  2  3  0      54  0  0  0  0  0  0.0006  0.0016  0.0044  0  0.0014  0.0016  0.004
0.0059  0.0141  0.0011  0.0071  0.0084  0.0103  0.0305  0.0339  0.0402  0.044  0.0434
0.0171  0.0151  0.0348  0.0378  0.0692  0.0327  0.0365  0.0226  0.0096  0.0094  0.0058  0
0  0  0  0  0  0  0  0  0.001  0.003  0.0016  0.0028  0.0023  0.0078  0.009  0.0147
0.0066  0.0059  0.0056  0.0079  0.0074  0.0132  0.0227  0.0171  0.0368  0.0272  0.042
0.0541  0.0356  0.0414  0.0513  0.0366  0  0.0036  0  0  0  0  0
1983  1  2  3  0      210  0  0  0  0  0  0.0006  0.0011  0.0019  0.001  0.0019  0.0043
0.0205  0.038  0.0223  0.0293  0.031  0.0442  0.0396  0.0352  0.034  0.0398  0.0232
0.0151  0.005  0.0062  0.0061  0.004  0.0072  0.0075  0.009  0.0205  0.0212  0.011
0.0044  0.0013  0.0001  0  0  0  0  0  0.0001  0.0012  0.0013  0.0043  0.002  0.0017
0.0055  0.0207  0.0315  0.0316  0.026  0.0377  0.0656  0.0553  0.0402  0.0369  0.0365
0.0256  0.0112  0.0053  0.0074  0.0036  0.0043  0.0063  0.0216  0.0197  0.0085  0.0015
0.0006  0  0  0  0
1986  1  2  3  0      168  0  0  0  0  0.0005  0.0003  0.0004  0.0044  0.0125  0.009
0.0057  0.0029  0.0082  0.0173  0.0148  0.0073  0.0063  0.0105  0.0169  0.0201  0.0325
0.0332  0.0256  0.0458  0.0418  0.0375  0.0304  0.0492  0.0233  0.0116  0.0092  0.0096
0.007  0.0036  0.002  0.0008  0  0.0007  0.0003  0  0  0.0007  0.0001  0.003  0.0052
0.0097  0.0082  0.0047  0.0026  0.0032  0.0106  0.0163  0.0069  0.0061  0.0153  0.0148
0.0197  0.0424  0.0378  0.0378  0.064  0.0412  0.0459  0.0343  0.0282  0.0184  0.0048
0.0096  0.0056  0.0016  0  0  0  0
1989  1  2  3  0      416  0  0  0  0.0002  0.0002  0.0005  0.0061  0.0384  0.0657
0.0285  0.0049  0.015  0.0332  0.0615  0.0318  0.0374  0.0136  0.0204  0.0206  0.0175
0.0168  0.0141  0.0097  0.0087  0.0086  0.0101  0.0033  0.0097  0.0088  0.0071  0.0055
0.0047  0.0004  0.0008  0.0002  0  0  0  0  0  0.0008  0.0003  0.0018  0.0083  0.0378
0.0647  0.0453  0.0079  0.0139  0.0419  0.0571  0.0333  0.0246  0.0157  0.0177  0.0125
0.0172  0.011  0.0151  0.0111  0.0114  0.012  0.0053  0.0069  0.0105  0.0039  0.0033
0.0028  0.0009  0.0005  0.0002  0  0  0
1992  1  2  3  0      135  0  0  0  0  0.0002  0.0016  0  0.0015  0.0022  0.0035  0.0014
0.0004  0.0021  0.019  0.0399  0.0247  0.0061  0.0108  0.0161  0.0287  0.025  0.0466
0.0958  0.0707  0.0447  0.0256  0.0084  0.0078  0.0005  0.0007  0.0004  0.0002  0.0006
```

```
0.0007  0  0  0  0  0  0  0  0.0002  0  0.0013  0.0015  0.0016  0.0048  0.0025  0.0011
0.0038  0.0179  0.0288  0.0287  0.0109  0.007  0.0312  0.0263  0.0188  0.0929  0.111
0.0769  0.0313  0.0085  0.0031  0.0016  0.0009  0.0013  0.0002  0  0  0  0  0  0
1995  1  2  3  0      275  0  0  0.0004  0  0.0003  0.0006  0.0007  0.0082  0.023  0.0121
0.002  0.0006  0.0056  0.0132  0.0085  0.0089  0.0096  0.0264  0.0454  0.0386  0.0243
0.0237  0.0172  0.0134  0.0164  0.0086  0.0083  0.0215  0.0327  0.0337  0.03  0.037
0.0262  0.0101  0.0043  0  0  0  0  0.0004  0  0.0003  0.0013  0.0027  0.0107  0.0239
0.0122  0.0017  0.0016  0.005  0.0108  0.0195  0.0121  0.0111  0.0287  0.047  0.0403
0.024  0.0162  0.0141  0.0108  0.0093  0.0147  0.0147  0.0529  0.0599  0.0354  0.0055
0.0011  0.0008  0  0  0  0
1998  1  2  3  0      318  0  0  0  0  0.0003  0.0022  0.0093  0.0078  0.0032  0.0009
0.0067  0.0116  0.0079  0.0155  0.0246  0.0465  0.0765  0.0818  0.0362  0.0321  0.0294
0.0271  0.0189  0.0111  0.0055  0.0036  0.0034  0.0064  0.0047  0.0013  0.0003  0.0029
0.0004  0.0003  0.0003  0  0  0  0  0  0  0  0.007  0.0129  0.0106  0.0012  0.0016
0.0061  0.0139  0.0107  0.0105  0.0327  0.0535  0.0817  0.0745  0.0525  0.0337  0.0293
0.0277  0.0181  0.0084  0.0075  0.0084  0.0064  0.0087  0.0008  0.0016  0.0003  0  0  0
0  0.001  0
2001  1  2  3  0      395  0  0  0.0009  0.0016  0.0005  0.0023  0.0143  0.0359  0.0226
0.0063  0.003  0.0117  0.0386  0.0867  0.0836  0.0232  0.0022  0.0044  0.0039  0.0076
0.009  0.0093  0.0049  0.0111  0.0045  0.0246  0.0304  0.1062  0.0068  0.0043  0.0064
0.0017  0.0016  0.0002  0.0006  0  0  0  0  0.0009  0.0016  0.0003  0.0024  0.0113
0.0307  0.0198  0.0076  0.0025  0.011  0.0422  0.0774  0.0761  0.0275  0.0043  0.0015
0.0045  0.0064  0.0071  0.0083  0.0042  0.0059  0.0066  0.0224  0.0149  0.0225  0.0044
0.0033  0.0004  0.0007  0  0  0  0  0
#2004  1  2  3  0      405  0  0.0007  0.0004  0  0.0004  0.0013  0.008  0.0126  0.0135
0.0018  0.002  0.0033  0.0066  0.008  0.0033  0.0033  0.0063  0.0101  0.0187  0.0261
0.0415  0.0527  0.0411  0.0341  0.0442  0.0329  0.0239  0.0336  0.0071  0.0071  0.0005
0.0003  0.0004  0  0  0  0.0001  0  0.0007  0.0004  0  0.0004  0.0025  0.0097  0.0267
0.0148  0.0028  0.0028  0.004  0.0065  0.0078  0.0062  0.0037  0.0071  0.0066  0.0231
0.0324  0.0805  0.0727  0.0464  0.0493  0.0549  0.0404  0.0203  0.023  0.0062  0.0013
0.0003  0.0003  0.0001  0  0  0  0
#AFSC
1997  1  3  3  0      42  0  0  0  0  0  0  0  0  0  0  0  0.0099  0.0396  0.0556  0.0545
0.0484  0.039  0.0366  0.085  0.1285  0.03  0.0226  0.0009  0.0009  0.0004  0  0.0009
0.0084  0.0003  0  0  0.0008  0.0005  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0.0099
0.0198  0.0561  0.1236  0.0567  0.0178  0.0315  0.0533  0.0232  0.0138  0.0164  0  0.0033
0.0009  0.0032  0.0021  0.0038  0.0013  0.0004  0  0.0001  0  0  0  0  0
1999  1  3  3  0      42  0.0014  0  0  0  0  0  0  0  0  0.0034  0  0.0034  0.0005
0.0014  0.0014  0.0018  0.0005  0.0034  0.0189  0  0.0098  0.0772  0.116  0.113  0.0734
0.0615  0.0199  0.0194  0.0001  0.0011  0.0004  0.0001  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0.0005  0  0.0152  0  0  0.0015  0.0028  0.0074  0.0277  0.1335  0.1448
0.0736  0.0469  0.0092  0.0058  0.0005  0.0024  0.0005  0  0  0  0  0  0  0
2000  1  3  3  0      36  0  0  0  0  0  0  0  0  0  0.0001  0.0006  0  0  0.0007  0.0101
0.01  0.0366  0.0676  0.0821  0.0756  0.0131  0.026  0.0282  0.021  0.0385  0.0448
0.0022  0.0034  0  0.0002  0.0002  0  0.0002  0.0002  0.0003  0  0  0  0  0  0  0  0  0
0  0.0007  0.0006  0.0019  0.0007  0  0  0  0.0299  0.0533  0.1108  0.1628  0.0624
0.0239  0.0041  0.0416  0.0169  0.0173  0.0078  0  0.0027  0.0002  0.0005  0  0  0
0.0001  0  0  0
2001  1  3  3  0      37  0  0  0  0  0  0  0  0  0  0  0  0  0  0.003  0.0162  0.0138
0.0121  0.0074  0.0013  0.0101  0.0068  0.0126  0.0159  0.0213  0.0238  0.0368  0.1106
0.1632  0.0754  0.0084  0.0008  0.0058  0.0006  0.0039  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0.0014  0  0.0037  0.0106  0.0135  0.0053  0.0034  0.0042  0.0101  0.0129
0.0261  0.0185  0.0104  0.0163  0.1051  0.1296  0.064  0.0046  0.0008  0.0058  0.0039  0
0  0  0  0
# POP # 1979  1  4  3  0  78  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0.011  0.021
0.014  0.02  0.055  0.051  0.04  0.049  0.061  0.054  0.029  0.017  0.021  0.024  0.025
0.006  0.003  0.002  0.002  0  0.001  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0.004
0.007  0.024  0.019  0.036  0.017  0.026  0.04  0.058  0.069  0.051  0.026  0.016  0.043
0.036  0.011  0.008  0.004  0  0  0  0  0
# 1985  1  4  3  0     205  0  0  0  0  0  0  0  0  0  0  0  0  0  0.001  0.002  0.012  0.011
0.008  0.021  0.043  0.034  0.032  0.045  0.058  0.046  0.043  0.03  0.032  0.026  0.004
0.005  0.005  0.005  0.001  0.001  0.001  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0.003  0.013  0.017  0.012  0.021  0.04  0.036  0.038  0.064  0.069  0.058  0.064  0.049
0.015  0.019  0.006  0.005  0.001  0  0  0  0  0  0
#NWFSC Slope and Shelf
2000    1       4       3       0       46      0       0       0       0       0       0
        0       0       0.000719347     0       0.002472138     0.001406115     0.001406115
        0.002819034     0       0.00071448      0.013552271     0.013446374     0.016939868
        0       0.010745129     0.022304662     0.073931755     0.061157049     0.1028647
        0.023696561     0.0115264       0.004181701     0       0.020293282     0.039464483
        0.059196724     0.039909532     0.032887032     0       0       0       0       0
```

```
        0       0       0       0       0       0       0.002125462     0.00070917
        0.006690594     0.002812286     0       0.000698439     0.001406115     0
        0.001373314     0.002095344     0.008094524     0.012508235     0.002230945
        0.025701386     0.049054231     0.062974307     0.035100691     0.021124224
        0.002457977     0.033610445     0.119811842     0.027476135     0.013154791
        0.006577395     0.006577395     0       0       0       0
2001    1       4       3       0       79      0       0       0       0       0       0
        0       0       0.001230496     0       0.000717904     0.006849279     0.00949804
        0.027383138     0.061277025     0.018617255     0.010225538     0.002640537
        0.007275526     0.006000075     0.008308387     0.011524563     0.005988288
        0.013767361     0.011677244     0.01628674      0.057666125     0.061119135
        0.016837983     0.026615893     0.047780213     0.014559002     0.004852909     0
        0       0       0       0       0       0       0       0       0       0
        0.004068122     0       0       0.001973619     0.007672991     0.005199115
        0.02290083      0.049420236     0.032377764     0.016325665     0.004542887
        0.002786092     0.002769371     0.018230207     0.01827242      0.004205179
        0.011811012     0.025400473     0.034766939     0.052916008     0.060207707
        0.099753544     0.066273569     0.007931206     0       0.001496387     0       0
        0       0
2002    1       4       3       0       123     0       0       0       0       0       0
        0       0       0.001044436     0       0.001068986     0.004077679     0.019285241
        0.011193339     0.010209487     0.003424601     0.02519036      0.070657637
        0.097064281     0.079620477     0.056097769     0.012345736     0.01589208
        0.023109528     0.017606678     0.016315885     0.014008219     0.019262343
        0.006875332     0.005770886     0.001066832     0.001565721     0.000478359
        0.002972802     0.000997777     0       0       0       0       0       0       0
        0       0       0       0.000497453     0.001044436     0       0.00256436
        0.009344938     0.015279632     0.00461289      0.003429626     0.020434336
        0.055651928     0.087920621     0.065948487     0.066459435     0.020870487
        0.019036012     0.023715372     0.01889618      0.013316523     0.013919496
        0.01829055      0.006051125     0.009022778     0.004658974     0.00183189      0
        0       0       0       0
2003    1       4       3       0       183     0       0       0       0       0       0
        0       0       0       0       0       0       0.000584258     0.000194753
        0.000327155     0.002607145     0.005906372     0.014184258     0.019210801
        0.012870511     0.011284605     0.024243956     0.026013986     0.017202956
        0.005783083     0.008358143     0.026492952     0.080301901     0.140792306
        0.076130062     0.041690489     0.024760041     0.030918922     0.029620126
        0.00838577      0.002406085     0       0       0       0       0       0       0
        0       0       0       0.000194753     0       0       0.000194753     0.000584258
        0.000209158     0.002381218     0.007052933     0.015507437     0.017969078
        0.012067755     0.020107098     0.023659061     0.018548727     0.015623372
        0.005792757     0.009440231     0.017858237     0.106462876     0.083184375
        0.017991974     0.011767468     0.002567479     0.000120818     0.000264654
        0.000178892     0       0
2004    1       4       3       0       82      0       0       0       0       0       0
        0       0       0       0       0       0       0       0.001015773     0
        0.035759822     0.008939989     0.012732802     0.029854244     0.033407434
        0.034683068     0.048218443     0.052378488     0.040714979     0.034723744
        0.024585239     0.02447 0.021313088     0.01371321      0.006900374     0.005365957
        0.004141758     0.001447013     0.002694744     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
        0       0       0.019313948     0.019400277     0.060112432     0.066522804
        0.036303209     0.031270666     0.053124787     0.062822909     0.05433433
        0.035761839     0.015756455     0.021900715     0.0176179       0.030349491
        0.027178998     0.006468059     0.002794385     0.001906626     0       0       0
        0
2005    1       4       3       0       117     0       0       0       0       0       0
        0       0.000408042     0.000408042     0.000408042     0       0       0.00116009
        0       0.001303232     0.000756616     0.00164726      0.001305986     0.00120196
        0.002297208     0.003144863     0.007977066     0.010515688     0.007116156
        0.016010377     0.028427142     0.034508325     0.057794188     0.126779627
        0.11749635      0.044031134     0.004229274     0.005577086     0.002234605
        0.006367646     0.000333258     0       0       0       0       0       0       0
        0       0       0       0.000408042     0.001224082     0.001728045     0.00244812
        0.001598852     0.001276498     0.001004433     0.002330615     0.001477765
        0.003363797     0.003685233     0.006225287     0.00963288      0.016851718
        0.019993447     0.021958964     0.027826005     0.081385545     0.194095414
        0.081241307     0.03250564      0.003373917     0.000622318     0.000302808     0
        0       0       0
```

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2006    1       4       3       0       144     0       0       0       0       0       0
        0       0       0       0       0.001611022     0.00202593      0.006890246
        0.002348124     0.010200502     0.012321913     0.016850418     0.013232019
        0.007410074     0.01402603      0.006813102     0.01131459      0.018453737
        0.011847005     0.05042789      0.037862066     0.03823314      0.070317746
        0.052107919     0.052231502     0.041514101     0.01699581      0.014641447
        0.005548414     0       0       0       0       0       0       0       0
        0       0       0       0       0       0.000743991     0.005557854     0.005106761
        0.009810658     0.009239292     0.019192087     0.012694072     0.010731289
        0.005106056     0.008068024     0.018399921     0.022265594     0.032585447
        0.045221471     0.04654681      0.039092142     0.098510965     0.054697295
        0.035804888     0.004656319     0.000744317     0       0       0       0       0
2003    1       5       3       0       80      0       0       0       0       0       0
        0       0.001033821     0.003264143     0.000531555     0.001149471     0.003392429
        0.002938114     0.003538456     0.007976506     0.02370056      0.067252426
        0.082275886     0.109710051     0.059207467     0.027327386     0.02220029
        0.024764507     0.026308795     0.016675531     0.002833845     0.00589196
        0.000842187     0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0.003447576
        0.007131976     0.00600761      0.006903103     0.014829148     0.01007645
        0.013133561     0.022230416     0.025623431     0.067271506     0.098096009
        0.077884364     0.046089472     0.023893868     0.02790095      0.036467756
        0.014665631     0.002575431     0       0.002956357     0       0       0       0
        0       0       0       0       0
2004    1       5       3       0       71      0       0       0.00027594      0
        0.002448397     0.001519763     0.000661263     0.005662886     0.004779793
        0.003598197     0.003378604     0.011815219     0.013935385     0.005812924
        0.008524054     0.00856587      0.008629711     0.019087377     0.023924967
        0.091738083     0.099560714     0.071640511     0.029552661     0.016490101
        0.022183872     0.003844784     0.00340005      0.001700108     0.000850054     0
        0       0       0       0       0       0       0       0       0.00027594
        0.000928634     0.002363772     0.000506588     0.000928634     0.008866361
        0.005732523     0.009576892     0.002006809     0.003689611     0.008724934
        0.01807031      0.002376524     0.002209511     0.005109017     0.026786053
        0.037356414     0.09765774      0.15803127      0.060791353     0.023030613
        0.032380378     0.020073973     0.00340005      0.001700025     0.003844784     0
        0       0       0       0       0       0       0       0
2005    1       5       3       0       129     0       0.001279818     0.000403396
        0.000475512     0       0.004091402     0.007985199     0.014101043     0.014713385
        0.011784319     0.013129034     0.032630652     0.03505006      0.019626015
        0.016237509     0.012772582     0.023271685     0.008541256     0.002617619
        0.009484516     0.00947093      0.045459762     0.049488995     0.056483747
        0.042102431     0.00535363      0.007262106     0.001275875     0.000637938     0
        0       0       0       0       0       0       0       0       0.001279818
        0.000403396     0.001540318     0       0.005066564     0.007695525     0.021602481
        0.028440509     0.014884242     0.017506652     0.036957565     0.053992163
        0.02907414      0.013563242     0.012527669     0.021274657     0.015645061
        0.010801028     0.01073795      0.021075598     0.075897358     0.070230643
        0.047104401     0.021915264     0.00969971      0.003356481     0.001997149     0
        0       0       0       0       0       0       0       0
2006    1       5       3       0       120     0       0.000473618     0       0.001481883
        0       0.001780672     0.015558792     0.011480106     0.010835133     0.013642557
        0.012347498     0.031147869     0.055124212     0.040702169     0.031806935
        0.074143528     0.060517819     0.038936704     0.020735223     0.011616848
        0.014982584     0.005846379     0.008828632     0.00740037      0.019593427
        0.013496899     0.007946555     0.006096397     0       0       0.00110666      0
        0       0       0       0       0       0       0.000473618     0       0.001481883
        0.001030881     0.003642106     0.01288739      0.013454683     0.021318183
        0.011039329     0.01057915      0.01992001      0.052647764     0.042879959
        0.031311619     0.058633377     0.063668279     0.040594269     0.019455111
        0.012265951     0.007043895     0.008837809     0.001850027     0.015361347
        0.009796713     0.01610065      0.004898357     0.001198171     0       0       0
        0       0       0       0       0       0
31 # Number of Age Bins
0  1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24
25  26  27  28  29  30

1 # Number of Aging Error Matrices
0.5  1.5  2.5  3.5  4.5  5.5  6.5  7.5  8.5  9.5  10.5  11.5  12.5  13.5  14.5  15.5
16.5  17.5  18.5  19.5  20.5  21.5  22.5  23.5  24.5  25.5  26.5  27.5  28.5  29.5  30.5
31.5  32.5  33.5  34.5  35.5  36.5  37.5  38.5  39.5  40.5  41.5  42.5  43.5  44.5  45.5
```

```
0.05   0.1   0.158113883  0.324442842  0.376192055  0.484366512  0.719693812  0.737838276
0.758854932  0.781541625  0.83763068  0.907620383  0.977610085  1.047599788  1.117589491
1.187579194  1.257568896  1.327558599  1.397548302  1.467538004  1.537527707  1.60751741
1.677507113  1.747496815  1.817486518  1.887476221  1.957465924  2.027455626  2.097445329
2.167435032  2.237424735  2.307414437  2.37740414  2.447393843  2.517383546  2.587373248
2.657362951  2.727352654  2.797342356  2.867332059  2.937321762  3.007311465  3.077301167
3.14729087  3.217280573  3.5

556   # Age and Conditional Age-at-length Composition Observations
1991   1      1      1      2      1      16     19     2.0    0      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      0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0
1991   1      1      1      2      1      20     22     3.5    0      0      0
       0      0.928571429    0.071428571    0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0
1991   1      1      1      2      1      23     25     4.9    0      0      0
       0      0      0.45   0.35   0      0.05   0      0      0.05   0.05   0
       0      0      0      0      0      0      0      0      0      0.05   0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0
1991   1      1      1      2      1      26     27     5.2    0      0      0
       0      0      0.047619048    0.19047619     0.380952381    0.095238095
       0.047619048    0.047619048    0.047619048    0.047619048    0      0.047619048
       0      0      0      0.047619048    0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0
1991   1      1      1      2      1      28     28     3.0    0      0      0
       0      0      0      0      0.333333333    0.333333333    0.333333333    0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0
1991   1      1      1      2      1      29     29     5.4    0      0      0
       0      0      0      0.045454545    0      0.136363636    0.454545455
       0.272727273    0.045454545    0      0      0      0      0      0      0
       0      0.045454545    0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
1991   1      1      1      2      1      30     30     3.5    0      0      0
       0      0      0      0      0      0      0.214285714    0      0.285714286
       0.285714286    0      0      0      0      0      0.071428571    0      0
       0.071428571    0      0.071428571    0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0
1991   1      1      1      2      1      31     31     9.9    0      0      0
       0      0      0      0      0      0      0.025  0      0.025  0.025  0.175
       0.15   0.05   0.05   0.05   0.025  0.025  0.075  0.025  0.025  0      0
       0.025  0      0      0.05   0.025  0.175  0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0
1991   1      1      1      2      1      32     32     6.2    0      0      0
       0      0      0      0      0      0      0      0      0      0      0
       0.04   0.04   0.04   0.08   0.12   0.04   0.08   0.08   0      0      0
       0.08   0.04   0      0.08   0      0.28   0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0
```

```
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
1991    1       1       1       2       1       33      33      6.4     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0.052631579     0       0       0.052631579     0.052631579     0
        0.105263158     0.052631579     0.105263158     0       0.052631579     0       0
        0.210526316     0.315789474     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0
1991    1       1       1       2       1       34      34      0.5     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0.142857143     0       0       0.142857143
        0       0       0.285714286     0       0       0       0       0.428571429     0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0
1991    1       1       1       2       1       35      35      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       0.5     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       0
1991    1       1       2       2       1       11      15      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       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       0       0       0
1991    1       1       2       2       1       16      19      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       0       0       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
1991    1       1       2       2       1       20      22      2.7     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       0       0       0       0       0       0       0
        0.636363636     0.363636364     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
1991    1       1       2       2       1       23      25      2.5     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       0       0       0       0       0       0.1
        0.3     0.5     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
1991    1       1       2       2       1       26      27      4.2     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       0       0
        0       0.235294118     0.588235294     0.117647059     0       0       0.058823529
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0
1991    1       1       2       2       1       28      28      7.2     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       0       0
        0       0       0.068965517     0.206896552     0.24137931      0.206896552     0
        0.137931034     0       0       0       0       0.034482759     0       0.034482759
        0       0       0       0       0       0       0.034482759     0       0       0
        0.034482759
1991    1       1       2       2       1       29      29      9.1     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
```

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        0       0       0       0.027027027     0.081081081     0.081081081     0.054054054
        0.189189189     0.081081081     0.054054054     0       0       0.081081081     0
        0       0       0.081081081     0.027027027     0.054054054     0.027027027     0
        0       0       0.027027027     0       0.135135135
1991    1       1       2       2       1       30      30      6.2     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       0       0
        0       0       0       0       0       0.04    0       0.04    0.08    0.08    0
        0.12    0       0.04    0       0.04    0.08    0.04    0       0       0.04    0
        0.04    0.12    0       0.24
1991    1       1       2       2       1       31      31      4.4     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0.055555556     0.055555556     0.111111111     0.055555556     0       0
        0.055555556     0.055555556     0       0.055555556     0.055555556     0       0
        0.5
1991    1       1       2       2       1       33      33      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       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       0
1998    1       1       1       2       1       16      19      1.4     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       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
1998    1       1       1       2       1       20      22      3.1     0       0       0
        0.111111111     0.777777778     0.111111111     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
1998    1       1       1       2       1       23      25      1.8     0       0       0
        0       0.2     0.6     0.1     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       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
1998    1       1       1       2       1       26      27      2.3     0       0       0
        0       0       0       0.769230769     0.076923077     0.076923077     0.076923077
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0
1998    1       1       1       2       1       28      28      3.7     0       0       0
        0       0       0       0.047619048     0.285714286     0.19047619      0.19047619
        0.142857143     0       0       0       0.095238095     0       0.047619048     0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
1998    1       1       1       2       1       29      29      3.1     0       0       0
        0       0       0       0       0       0.277777778     0.222222222     0.055555556
        0.055555556     0.222222222     0.055555556     0       0.055555556     0       0
        0       0.055555556     0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0
1998    1       1       1       2       1       30      30      8.1     0       0       0
        0       0       0       0       0       0.02173913      0.195652174     0.217391304
```

```
      0.086956522   0      0.043478261   0.02173913    0.043478261   0.108695652
      0.086956522   0.02173913    0.02173913    0.02173913    0.02173913    0
      0      0      0.02173913    0.02173913    0      0      0.02173913
      0.02173913    0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0      0      0
1998  1      1      1      2      1      31     31     6.8    0      0      0
      0      0      0      0      0      0      0      0.051282051   0.128205128
      0.025641026   0.025641026   0.051282051   0.128205128   0.051282051
      0.076923077   0.102564103   0.025641026   0.051282051   0.025641026
      0.025641026   0.051282051   0.025641026   0      0      0.025641026   0
      0.025641026   0.102564103   0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0      0      0
      0      0
1998  1      1      1      2      1      32     32     3.7    0      0      0
      0      0      0      0      0      0      0      0.047619048   0
      0.047619048   0.047619048   0.047619048   0      0.095238095   0.047619048
      0.142857143   0      0      0.047619048   0.095238095   0.142857143   0
      0.047619048   0      0      0      0      0.19047619    0      0      0
      0      0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0
1998  1      1      1      2      1      33     33     4.2    0      0      0
      0      0      0      0      0      0      0      0      0      0      0
      0      0.05   0.05   0.05   0      0      0.05   0      0.05   0.05   0
      0.05   0      0      0.2    0      0.45   0      0      0      0      0
      0      0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0      0      0
      0      0      0      0
1998  1      1      1      2      1      34     34     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      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      0      0      0
      0      0      0      0      0      0      0      0      0      0      0
      0      0      0      0
1998  1      1      2      2      1      16     19     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      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      0      0      0      0      0      0      0      0      0      0
      0      0      0      0
1998  1      1      2      2      1      20     22     5.4    0      0      0
      0      0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0      0
      0.935483871   0.064516129   0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0
1998  1      1      2      2      1      23     25     1.8    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      0      0      0      0      0      0      0      0
      0.8    0.1    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
1998  1      1      2      2      1      26     27     2.5    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      0      0      0      0      0      0
      0.071428571   0.571428571   0.142857143   0.071428571   0.071428571
      0.071428571   0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0      0      0
1998  1      1      2      2      1      28     28     4.2    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      0      0
      0      0      0.041666667   0.333333333   0.25   0      0.041666667   0
```

```
        0       0.041666667     0.041666667     0.083333333     0       0.041666667     0
        0       0       0.125   0       0       0       0       0       0       0       0
1998    1       1       2       2       1       29      29      4.9     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0.107142857     0.071428571     0.035714286     0.071428571
        0.035714286     0.035714286     0.142857143     0.035714286     0.107142857
        0.035714286     0.035714286     0.107142857     0.071428571     0       0.035714286
        0       0       0       0       0       0       0       0.071428571
1998    1       1       2       2       1       30      30      2.8     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       0       0       0       0       0       0       0       0
        0       0       0       0       0.0625  0       0.0625  0       0       0.0625  0
        0       0.0625  0.125   0.0625  0       0.125   0.0625  0.0625  0       0.0625  0
        0       0.125   0       0.125
1998    1       1       2       2       1       31      31      1.9     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
        0.090909091     0.272727273     0       0       0       0       0       0       0
        0       0       0       0.090909091     0       0       0.545454545
1998    1       1       2       2       1       32      32      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       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0.333333333
        0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0.666666667
1998    1       1       2       2       1       35      35      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       0       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
2003    1       1       1       2       1       11      15      2.4     0       0
        0.708333333     0.208333333     0.083333333     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0
2003    1       1       1       2       1       16      19      8.3     0       0       0
        0.773809524     0.214285714     0.011904762     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0
2003    1       1       1       2       1       20      22      4.3     0       0       0
        0.159090909     0.659090909     0.159090909     0.022727273     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0
2003    1       1       1       2       1       23      25      5.6     0       0       0
        0.035087719     0.368421053     0.140350877     0.280701754     0.105263158
        0.035087719     0.035087719     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0
2003    1       1       1       2       1       26      27      11.2    0       0       0
        0       0.052631579     0.298245614     0.245614035     0.280701754     0.035087719
        0.035087719     0.01754386      0       0.01754386      0       0       0.01754386
        0       0       0       0       0       0       0       0       0       0       0
```

```
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0
2003    1       1       1       2       1       28      28      27.9    0       0       0
        0       0.003533569     0.091872792     0.212014134     0.431095406     0.141342756
        0.042402827     0.007067138     0       0.021201413     0       0.007067138     0
        0       0.021201413     0.014134276     0.007067138     0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0
2003    1       1       1       2       1       29      29      41.5    0       0       0
        0       0       0.018957346     0.170616114     0.345971564     0.213270142
        0.08056872      0.042654028     0.047393365     0.004739336     0.009478673
        0.004739336     0.004739336     0.004739336     0.009478673     0.004739336
        0.023696682     0.009478673     0.004739336     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0
2003    1       1       1       2       1       30      30      31.1    0       0       0
        0       0       0.012658228     0.056962025     0.189873418     0.265822785
        0.075949367     0.088607595     0.063291139     0.03164557      0.037974684
        0.006329114     0.037974684     0.025316456     0.018987342     0.03164557
        0.018987342     0       0       0       0       0.006329114     0.012658228
        0.006329114     0       0       0       0.012658228     0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0
2003    1       1       1       2       1       31      31      20.9    0       0       0
        0       0       0       0       0.066037736     0.028301887     0.056603774
        0.075471698     0.018867925     0.047169811     0.122641509     0.018867925
        0.056603774     0.075471698     0.075471698     0.075471698     0       0.018867925
        0.047169811     0.037735849     0.009433962     0.028301887     0.047169811     0
        0.009433962     0       0       0.08490566      0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2003    1       1       1       2       1       32      32      17.7    0       0       0
        0       0       0       0       0       0.011111111     0.033333333     0.022222222
        0.033333333     0.033333333     0.066666667     0.011111111     0.033333333
        0.077777778     0.088888889     0.055555556     0.066666667     0.033333333
        0.088888889     0.066666667     0.055555556     0.055555556     0.033333333     0
        0.011111111     0.022222222     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       0       0       0
        0       0       0       0
2003    1       1       1       2       1       33      33      15.0    0       0       0
        0       0       0       0       0       0       0.013157895     0.013157895     0
        0       0       0       0       0.026315789     0.039473684     0.013157895
        0.026315789     0.013157895     0.052631579     0.171052632     0.026315789
        0.078947368     0.065789474     0.013157895     0.026315789     0.013157895
        0.065789474     0.342105263     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2003    1       1       1       2       1       34      34      6.3     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0.03125 0       0.09375
        0.03125 0.03125 0.0625  0       0.03125 0.71875 0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2003    1       1       1       2       1       35      35      2.6     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
        0.076923077     0       0.076923077     0       0       0       0.846153846     0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0
```

```
2003    1       1       1       2       1       36      36      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       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       0       0       0
        0       0       0       0
2003    1       1       1       2       1       37      37      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       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       0       0       0
        0       0       0       0
2003    1       1       2       2       1       11      15      2.8     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       0       0       0       0       0       0.392857143
        0.464285714     0.142857143     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0
2003    1       1       2       2       1       16      19      10.8    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       0       0       0       0       0       0.054545455
        0.754545455     0.181818182     0.009090909     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0
2003    1       1       2       2       1       20      22      4.3     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       0       0       0       0       0       0       0.113636364
        0.704545455     0.022727273     0.113636364     0       0       0       0       0
        0       0       0       0.045454545     0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0
2003    1       1       2       2       1       23      25      10.5    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       0       0       0       0       0.018691589
        0.439252336     0.224299065     0.242990654     0.074766355     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0
2003    1       1       2       2       1       26      27      25.6    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       0       0       0       0       0       0       0
        0.007692308     0.184615385     0.369230769     0.2     0.146153846     0.023076923
        0.023076923     0.015384615     0       0.007692308     0       0       0.015384615
        0       0       0       0       0.007692308     0       0       0       0       0
        0       0       0       0
2003    1       1       2       2       1       28      28      58.2    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       0
        0.001692047     0.037225042     0.219966159     0.280879865     0.172588832
        0.091370558     0.016920474     0.016920474     0.010152284     0.013536379
        0.013536379     0.013536379     0.037225042     0.020304569     0.010152284     0
        0.020304569     0.003384095     0.00676819      0       0.003384095     0
        0.00676819      0.003384095     0       0       0
2003    1       1       2       2       1       29      29      45.3    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       0       0       0       0       0       0       0       0
        0       0.091304348     0.134782609     0.139130435     0.069565217     0.060869565
        0.052173913     0.026086957     0.034782609     0.039130435     0.026086957
        0.043478261     0.039130435     0.017391304     0.013043478     0.026086957
        0.034782609     0.030434783     0.02173913      0.008695652     0.013043478
        0.004347826     0.017391304     0.008695652     0       0.047826087
2003    1       1       2       2       1       30      30      28.0    0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
```

	0	0	0	0	0	0	0	0	0	0	0
	0	0.007042254		0.028169014		0.021126761		0.035211268		0.021126761	
	0.035211268		0.014084507		0.056338028		0.049295775		0.014084507		
	0.070422535		0.042253521		0.049295775		0.021126761		0.049295775		
	0.063380282		0.077464789		0.070422535		0.056338028		0.056338028		
	0.028169014		0.028169014		0.028169014		0	0.077464789			
2003	1	1	2	2	1	31	31	7.3	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	0	0	0	0	0	0	0	0
	0	0	0	0.027027027		0	0	0	0	0	
	0.027027027		0	0.027027027		0	0.027027027		0	0	
	0.054054054		0.027027027		0	0.027027027		0.054054054		0.081081081	
	0.027027027		0.054054054		0	0.567567568					
2003	1	1	2	2	1	32	32	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	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0.066666667		0	0	0	0	0.066666667		0	
	0.133333333		0	0	0.066666667		0	0	0.666666667		
2003	1	1	2	2	1	33	33	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	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0.25	0	0	0	0	0	0
	0	0	0	0.75							
2003	1	1	2	2	1	34	34	0.4	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	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							
2003	1	1	2	2	1	37	37	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	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							
2004	1	1	1	2	1	20	22	1.0	0	0	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
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2004	1	1	1	2	1	23	25	7.1	0	0	0
	0	0.144578313		0.626506024		0.156626506		0	0.048192771		
	0.024096386		0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	
2004	1	1	1	2	1	26	27	9.6	0	0	0
	0	0.053571429		0.553571429		0.142857143		0.160714286		0.071428571	
	0	0	0.017857143		0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	
2004	1	1	1	2	1	28	28	17.5	0	0	0
	0	0.029411765		0.088235294		0.264705882		0.37254902		0.156862745	
	0.068627451		0.009803922		0	0.009803922		0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0										

```
2004    1       1       1       2       1       29      29      25.2    0       0       0
        0       0       0.006802721     0.142857143     0.265306122     0.360544218
        0.149659864     0.047619048     0.006802721     0       0.006802721     0
        0.006802721     0       0       0       0       0       0.006802721     0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0
2004    1       1       1       2       1       30      30      19.5    0       0       0
        0       0       0.00877193      0.00877193      0.157894737     0.263157895
        0.254385965     0.149122807     0.043859649     0.026315789     0.035087719
        0.00877193      0.00877193      0.00877193      0.00877193      0.00877193      0
        0       0       0       0.00877193      0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0
2004    1       1       1       2       1       31      31      13.7    0       0       0
        0       0       0       0       0.0125  0.15    0.2125  0.1     0.1     0.0625  0.0625
        0.0625  0.05    0.025   0.05    0.025   0.025   0.0125  0.0125  0       0.0125  0.0125
        0       0       0       0       0       0.0125  0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2004    1       1       1       2       1       32      32      9.9     0       0       0
        0       0       0       0       0       0.017241379     0       0.017241379
        0.068965517     0.051724138     0.086206897     0.086206897     0.068965517
        0.051724138     0.051724138     0.034482759     0.051724138     0.051724138
        0.103448276     0.086206897     0       0.034482759     0.068965517     0       0
        0.017241379     0.017241379     0.034482759     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2004    1       1       1       2       1       33      33      8.9     0       0       0
        0       0       0       0       0       0       0.019230769     0       0
        0.038461538     0       0       0.019230769     0.096153846     0.096153846
        0.038461538     0.019230769     0.057692308     0.057692308     0.019230769
        0.019230769     0.057692308     0.057692308     0.057692308     0.019230769
        0.019230769     0.019230769     0.288461538     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2004    1       1       1       2       1       34      34      4.6     0       0       0
        0       0       0       0       0.037037037     0       0       0       0       0
        0       0       0       0.037037037     0       0       0.037037037     0
        0.037037037     0       0.037037037     0.074074074     0.074074074     0
        0.037037037     0       0.037037037     0.592592593     0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0
2004    1       1       1       2       1       35      35      2.1     0       0       0
        0       0       0       0       0       0       0       0.083333333     0       0
        0       0       0       0       0       0       0       0       0       0.083333333
        0       0       0.166666667     0       0       0       0       0.666666667     0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0
2004    1       1       1       2       1       36      36      0.9     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0.2     0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0.8     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       0       0       0
2004    1       1       2       2       1       20      22      2.1     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
        0.583333333     0.416666667     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
```

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2004    1       1       2       2       1       23      25      12.1    0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0.014184397
        0.127659574     0.609929078     0.205673759     0.042553191     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0
2004    1       1       2       2       1       26      27      22.8    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       0       0       0       0       0       0       0
        0.022556391     0.285714286     0.338345865     0.248120301     0.052631579
        0.015037594     0.015037594     0       0.007518797     0       0.007518797     0
        0       0       0       0.007518797     0       0       0       0       0       0
        0       0       0       0       0
2004    1       1       2       2       1       28      28      41.1    0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0.025   0.15    0.225   0.279166667     0.175   0.070833333     0.020833333
        0.020833333     0.004166667     0.0125  0.008333333     0.004166667     0       0
        0       0.004166667     0       0       0       0       0       0       0       0
        0       0
2004    1       1       2       2       1       29      29      29.8    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       0       0       0       0       0       0       0       0
        0.011494253     0.040229885     0.16091954      0.189655172     0.189655172
        0.114942529     0.045977011     0.028735632     0.022988506     0.005747126
        0.017241379     0.034482759     0.022988506     0.028735632     0       0.022988506
        0.011494253     0.022988506     0.005747126     0       0       0.005747126     0
        0.011494253     0       0.005747126
2004    1       1       2       2       1       30      30      13.7    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       0       0       0       0       0       0       0       0
        0       0       0.05    0.0875  0.075   0.0625  0.05    0.0875  0.0625  0.0125  0.05
        0.0125  0.1125  0.075   0.0125  0.025   0.0125  0.025   0.025   0.025   0.025   0.025
        0       0.0125  0.0125  0.0625
2004    1       1       2       2       1       31      31      4.3     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       0       0       0       0       0       0       0       0
        0       0       0.04    0       0       0       0       0.04    0       0.08    0
        0       0       0.08    0.12    0.04    0.08    0       0.04    0.12    0       0.04
        0       0.04    0.04    0.24
2004    1       1       2       2       1       32      32      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       0       0       0       0       0       0       0       0
        0       0       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
2004    1       1       2       2       1       33      33      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       0       0       0       0       0       0       0       0
        0       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
2004    1       1       2       2       1       34      34      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       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
        0       0       0       0.5
2005    1       1       1       2       1       20      22      0.2     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       0       0       0       0       0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2005    1       1       1       2       1       23      25      1.9     0       0       0
        0       0.090909091     0.545454545     0.363636364     0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2005    1       1       1       2       1       26      27      5.1     0       0       0
        0       0       0.344827586     0.551724138     0       0.068965517     0
        0.034482759     0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0
2005    1       1       1       2       1       28      28      8.0     0       0       0
        0       0       0.133333333     0.288888889     0.222222222     0.111111111
        0.155555556     0.066666667     0.022222222     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0
2005    1       1       1       2       1       29      29      13.3    0       0       0
        0       0       0       0.093333333     0.346666667     0.32    0.146666667
        0.066666667     0.013333333     0       0       0.013333333     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
2005    1       1       1       2       1       30      30      11.1    0       0       0
        0       0       0       0       0.238095238     0.174603175     0.317460317
        0.174603175     0.015873016     0.015873016     0.015873016     0       0
        0.031746032     0.015873016     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2005    1       1       1       2       1       31      31      6.7     0       0       0
        0       0       0       0       0.026315789     0.105263158     0.026315789
        0.105263158     0.026315789     0.157894737     0.052631579     0.052631579
        0.131578947     0.157894737     0.026315789     0.052631579     0       0       0
        0.026315789     0.026315789     0.026315789     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
2005    1       1       1       2       1       32      32      3.2     0       0       0
        0       0       0       0       0       0.111111111     0.055555556     0.111111111
        0       0.055555556     0.055555556     0       0.166666667     0       0.111111111
        0       0       0       0.055555556     0.166666667     0.055555556     0       0
        0       0.055555556     0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2005    1       1       1       2       1       33      33      4.2     0       0       0
        0       0       0       0       0       0       0       0       0       0.041666667
        0       0       0       0       0.083333333     0.083333333     0.083333333
        0.083333333     0.083333333     0       0.125   0.083333333     0       0
        0.041666667     0.041666667     0       0.25    0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2005    1       1       1       2       1       34      34      1.4     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0.125
        0       0.125   0       0       0       0.75    0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
```

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2005    1       1       1       2       1       35      35      1.6     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0.111111111     0.111111111     0
        0       0.111111111     0       0       0.111111111     0       0       0.555555556
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0
2005    1       1       1       2       1       36      36      0.7     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0.25    0       0       0
        0       0       0       0       0       0.75    0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2005    1       1       1       2       1       37      37      0.2     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       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2005    1       1       2       2       1       20      22      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       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       0
2005    1       1       2       2       1       23      25      4.8     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       0       0       0       0       0       0       0       0
        0.592592593     0.259259259     0.074074074     0.037037037     0.037037037     0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0
2005    1       1       2       2       1       26      27      7.4     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0.261904762     0.333333333     0.214285714     0.142857143     0.047619048     0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0
2005    1       1       2       2       1       28      28      15.6    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       0       0       0       0       0       0       0       0
        0.034090909     0.170454545     0.238636364     0.125   0.170454545     0.102272727
        0.022727273     0.011363636     0       0.022727273     0       0.022727273     0
        0.034090909     0.011363636     0       0.011363636     0.011363636     0.011363636
        0       0       0       0       0       0       0
2005    1       1       2       2       1       29      29      18.6    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       0       0       0       0       0       0       0       0
        0.019047619     0.076190476     0.095238095     0.20952381      0.133333333
        0.085714286     0.047619048     0.019047619     0.038095238     0.019047619
        0.038095238     0.028571429     0.00952381      0.038095238     0.047619048
        0.028571429     0       0.019047619     0.019047619     0.019047619     0
        0.00952381      0       0       0       0
2005    1       1       2       2       1       30      30      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       0       0       0       0       0       0       0       0       0
        0       0.022222222     0       0.044444444     0.088888889     0.044444444     0
        0.044444444     0.022222222     0       0.044444444     0       0.066666667
        0.044444444     0.044444444     0.044444444     0.022222222     0.066666667
        0.066666667     0.066666667     0.133333333     0.088888889     0.022222222     0
        0.022222222     0
2005    1       1       2       2       1       31      31      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
```

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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0.058823529     0       0       0.117647059     0       0
        0.058823529     0       0       0       0       0       0.117647059     0
        0.058823529     0       0.058823529     0       0.117647059     0       0       0
        0       0.411764706
2005    1       1       2       2       1       32      32      1.6     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       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0.111111111
        0       0       0       0       0.888888889
2005    1       1       2       2       1       33      33      0.4     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       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
2006    1       1       1       2       1       20      22      0.2     0       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       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2006    1       1       1       2       1       23      25      1.4     0       0       0
        0       0       0       0.625   0.25    0.125   0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2006    1       1       1       2       1       26      27      3.1     0       0       0
        0       0       0.117647059     0.470588235     0.176470588     0.176470588     0
        0       0       0       0       0       0       0       0.058823529     0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0
2006    1       1       1       2       1       28      28      11.2    0       0       0
        0       0       0.016129032     0.161290323     0.274193548     0.274193548
        0.129032258     0.064516129     0.064516129     0       0       0       0
        0.016129032     0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0
2006    1       1       1       2       1       29      29      6.5     0       0       0
        0       0       0       0.055555556     0.083333333     0.333333333     0.083333333
        0.166666667     0.083333333     0.083333333     0.027777778     0.027777778
        0.027777778     0       0.027777778     0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0
2006    1       1       1       2       1       30      30      7.1     0       0       0
        0       0       0       0.025641026     0.076923077     0.076923077     0.153846154
        0.179487179     0.179487179     0.051282051     0.051282051     0.025641026
        0.076923077     0.051282051     0       0.025641026     0       0.025641026     0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2006    1       1       1       2       1       31      31      3.3     0       0       0
        0       0       0       0       0       0       0       0.055555556     0.222222222
        0.111111111     0       0       0       0       0.166666667     0.222222222
        0.055555556     0       0.055555556     0       0.055555556     0       0       0
        0       0       0       0.055555556     0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
```

```
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0
2006    1       1       1       2       1       32      32      2.9     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0.0625  0.125   0.0625  0.0625  0.125   0       0       0.125   0       0.125   0
        0       0       0.0625  0       0.0625  0.1875  0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2006    1       1       1       2       1       33      33      0.4     0       0       0
        0       0       0       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     0.5     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       0
2006    1       1       1       2       1       34      34      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       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       0       0       0
        0       0       0       0
2006    1       1       1       2       1       35      35      0.4     0       0       0
        0       0       0       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       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2006    1       1       2       2       1       23      25      1.4     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0.25    0.25    0.375   0       0.125   0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2006    1       1       2       2       1       26      27      5.8     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       0       0       0       0       0       0       0       0
        0       0.15625 0.25    0.34375 0.15625 0.03125 0.03125 0       0       0.03125 0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2006    1       1       2       2       1       28      28      10.9    0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0.133333333     0.183333333     0.066666667     0.116666667     0.266666667
        0.1     0.05    0.016666667     0       0.016666667     0       0.016666667
        0.033333333     0       0       0       0       0       0       0       0       0
        0       0       0
2006    1       1       2       2       1       29      29      8.1     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0.111111111     0.022222222     0.022222222     0.022222222     0.111111111
        0.155555556     0.133333333     0.111111111     0.022222222     0.022222222
        0.022222222     0.022222222     0.111111111     0.066666667     0       0       0
        0       0.022222222     0       0       0       0.022222222     0       0
2006    1       1       2       2       1       30      30      2.9     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0.0625  0       0.125   0       0.125
        0.1875  0.125   0       0       0       0       0.0625  0.125   0       0       0
        0.0625  0       0       0.125
2006    1       1       2       2       1       31      31      1.1     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
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        0       0       0       0       0       0       0       0       0.333333333     0
        0       0       0       0.166666667     0       0       0       0       0       0
        0       0       0       0       0.166666667     0.333333333
2006    1       1       2       2       1       32      32      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       0       0
        0       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
2004    1       1       0       1       1       6       10      0.3     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       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2004    1       1       0       1       1       11      15      2.0     0       0
        0.360267704     0.639732296     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2004    1       1       0       1       1       16      19      6.9     0       0       0
        0.18687718      0.633465624     0.015283836     0.16437336      0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0
2004    1       1       0       1       1       20      22      23.5    0       0       0
        0.028177033     0.815321692     0.079759691     0.031086902     0       0.006389873
        0.012065037     0       0       0       0       0.027199771     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
2004    1       1       0       1       1       23      25      11.9    0       0       0
        0       0.459105107     0.433720654     0.094300618     0.012873622     0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0
2004    1       1       0       1       1       26      27      6.6     0       0       0
        0       0       0.855328304     0.019638039     0.007517975     0.109997706     0
        0.007517975     0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0
2004    1       1       0       1       1       28      28      9.6     0       0       0
        0.008361935     0       0.008361935     0.111673272     0.206642815     0.082251627
        0.025085806     0       0       0       0       0.55762261      0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
2004    1       1       0       1       1       29      29      9.3     0       0       0
        0.006191144     0       0       0.071905774     0.241350402     0.153387248
        0.089539286     0       0       0.412861571     0       0.006191144     0
        0.006191144     0.012382288     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2004    1       1       0       1       1       30      30      5.6     0       0       0
        0       0       0       0.112206577     0       0.416327063     0       0
        0.15298569      0.014413174     0       0.014413174     0       0.014413174     0
        0.079015935     0.167398864     0       0.014413174     0       0       0       0
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        0       0.014413174     0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2004    1       1       0       1       1       31      31      2.0     0       0       0
        0       0       0       0       0.683483227     0.129163295     0       0
        0.129163295     0       0       0       0       0       0.037691579     0       0
        0.010249302     0       0       0       0.010249302     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
2004    1       1       0       1       1       32      32      1.3     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0.499759277     0       0       0       0       0       0       0       0
        0       0       0.420927421     0       0       0       0.079313303     0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2004    1       1       0       1       1       33      33      1.7     0       0       0
        0       0       0       0       0       0       0       0       0       0.135301967
        0       0       0.039482925     0       0       0       0       0       0       0
        0       0       0.039482925     0       0       0       0.715966752     0.06976543
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0
2004    1       1       0       1       1       35      35      0.3     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       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2005    1       1       0       1       1       1       5       0.6     0       0.5     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       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2005    1       1       0       1       1       6       10      6.5     0       0.902615215
        0.097384785     0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0
2005    1       1       0       1       1       11      15      28.0    0       0.027508021
        0.925548717     0.041075355     0       0.005867908     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0
2005    1       1       0       1       1       16      19      12.5    0       0
        0.181179359     0.694366592     0.058753328     0.015530433     0.050170288     0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
2005    1       1       0       1       1       20      22      14.6    0       0       0
        0       0.108146403     0.837391598     0.003658727     0       0       0
        0.050803272     0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0
2005    1       1       0       1       1       23      25      28.3    0       0       0
        0       0.235490856     0.656550272     0.064892281     0.022111163     0.014317768
        0.00319436      0       0       0       0.0034433       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
2005    1       1       0       1       1       26      27      17.0    0       0       0
        0       0       0.525418748     0.251239335     0.136687013     0.062880344     0
        0.003728904     0       0       0       0       0       0       0.010022829     0
        0       0.010022829     0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
2005    1       1       0       1       1       28      28      14.6    0       0       0
        0       0       0.008942898     0.425634874     0.042357471     0.315330958
        0.178824073     0.006614778     0.022294948     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0
2005    1       1       0       1       1       29      29      15.8    0       0       0
        0       0       0       0.021200933     0.28160237      0.27102761      0.015048084
        0.077760663     0.003762021     0.263111014     0.057176617     0.003762021     0
        0.003667656     0       0       0       0       0       0       0
        0.001881011     0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0
2005    1       1       0       1       1       30      30      8.0     0       0       0
        0       0       0       0.004005645     0.295551827     0       0.028039518
        0.324406324     0.017602319     0       0       0.004005645     0.008011291     0
        0.299557472     0       0.010808667     0.004005645     0       0       0
        0.004005645     0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0
2005    1       1       0       1       1       31      31      1.8     0       0       0
        0       0       0       0       0       0       0.138378637     0.16724949
        0.083624745     0       0       0       0       0       0.145475333     0       0       0
        0       0       0       0       0       0       0       0.465271795     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
2005    1       1       0       1       1       32      32      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       0.5     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       0       0       0       0
        0       0       0       0
2005    1       1       0       1       1       33      33      1.2     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0.776895387     0       0       0.223104613     0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0
2005    1       1       0       1       1       34      34      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       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       0       0       0
        0       0       0       0
2005    1       1       0       1       1       36      36      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       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       0       0       0
        0       0       0       0
2005    1       1       0       1       1       37      37      0.3     0       0       0
        0       0       0       0       0       0       0       0       1       0       0
```

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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2004    1       2       3       0       1       1       -1      213     0.00110392
        0.037170243     0.02591038      0.031416999     0.173777906     0.13906161
        0.024789484     0.004510081     0.003999326     0.003803302     0       0
        0.000139717     0       0       0       0       0.00E+00        0.00E+00        0
        0       0       0       0.00E+00        0       0       0.000275636     0       0
        0.000132646     0       0.00110392      0.055804462     0.027995229     0.033750929
        0.238206031     0.151271425     0.023363925     0.005680731     0.009593011
        0.003336342     0.000902929     0.000810247     0       0       0.000255318
        0.000252794     0.000252794     9.31E-05        9.31E-05        0       0.000255318
        0.000524036     0       9.31E-05        0.000269875     0       0       0       0
        0       0
2001    1       3       1       0       1       14      14      1.0     0       0
        0.833333333     0.166666667     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2001    1       3       1       0       1       15      15      1.5     0       0
        0.888888889     0.111111111     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2001    1       3       1       0       1       16      16      2.6     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       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2001    1       3       1       0       1       17      17      1.4     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       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2001    1       3       1       0       1       18      18      0.7     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       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2001    1       3       1       0       1       19      19      0.3     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       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2001    1       3       1       0       1       20      20      0.5     0       0       0
        0.666666667     0.333333333     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0
2001    1       3       1       0       1       21      21      0.2     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       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2001    1       3       1       0       1       22      22      0.3     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       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2001    1       3       1       0       1       23      23      0.3     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       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2001    1       3       1       0       1       24      24      1.0     0       0       0
        0.166666667     0.666666667     0.166666667     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2001    1       3       1       0       1       25      25      0.2     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       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2001    1       3       1       0       1       26      26      1.0     0       0       0
        0       0.166666667     0.5     0.333333333     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0
2001    1       3       1       0       1       27      27      1.5     0       0       0
        0       0       0.444444444     0.555555556     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0
2001    1       3       1       0       1       28      28      3.1     0       0       0
        0       0.055555556     0.166666667     0.777777778     0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2001    1       3       1       0       1       29      29      1.2     0       0       0
        0       0       0.285714286     0.571428571     0.142857143     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2001    1       3       1       0       1       30      30      0.2     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       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2001    1       3       1       0       1       31      31      0.2     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
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2001    1       3       1       0       1       32      32      0.3     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       0.5
        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       0       0       0
        0       0       0       0
2001    1       3       1       0       1       33      33      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       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       0       0       0
        0       0       0       0
2001    1       3       2       0       1       14      14      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       0       0       0       0       0       0.833333333
        0.166666667     0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2001    1       3       2       0       1       15      15      1.9     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0.888888889
        0.111111111     0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2001    1       3       2       0       1       16      16      2.2     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       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
        0       0       0       0
2001    1       3       2       0       1       17      17      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       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
        0       0       0       0
2001    1       3       2       0       1       18      18      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       0.5     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
2001    1       3       2       0       1       19      19      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       0       0       0       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
2001    1       3       2       0       1       20      20      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       0.666666667
        0.333333333     0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0
2001    1       3       2       0       1       21      21      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       0       1
        0       0       0       0       0       0       0       0       0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2001    1       3       2       0       1       22      22      0.9     0       0       0
        0       0       0       0       0       0       0       0       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       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2001    1       3       2       0       1       23      23      0.9     0       0       0
        0       0       0       0       0       0       0       0       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       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2001    1       3       2       0       1       24      24      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       0       0       0       0       0       0       0.166666667
        0.666666667     0.166666667     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2001    1       3       2       0       1       25      25      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       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       0       0
2001    1       3       2       0       1       26      26      1.5     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       0       0       0       0       0
        0.166666667     0.5     0.333333333     0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2001    1       3       2       0       1       27      27      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       0       0       0
        0.444444444     0.555555556     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0
2001    1       3       2       0       1       28      28      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       0       0
        0       0       0       0       0       0       0       0       0       0
        0.055555556     0.166666667     0.777777778     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0
2001    1       3       2       0       1       29      29      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       0       0       0       0       0       0       0       0
        0.285714286     0.571428571     0.142857143     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2001    1       3       2       0       1       31      31      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       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
2001    1       3       2       0       1       32      32      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       0       0
        0       0       0       0       0       0       0       0       0       0       0
```

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        0       0       0       0       0       0.5     0       0       0.5     0       0
        0       0       0       0
2003    1       4       1       0       1       13      13      0.2     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       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2003    1       4       1       0       1       14      14      0.2     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       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2003    1       4       1       0       1       16      16      0.4     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       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2003    1       4       1       0       1       17      17      0.5     0       0       0
        0.212571178     0.787428822     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0
2003    1       4       1       0       1       18      18      0.9     0       0       0
        0.96119347      0.03880653      0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0
2003    1       4       1       0       1       19      19      1.5     0       0       0
        0.717395643     0.282604357     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0
2003    1       4       1       0       1       20      20      1.1     0       0       0
        0.183215095     0.816784905     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0
2003    1       4       1       0       1       21      21      2.2     0       0       0
        0.073463623     0.746708151     0.179828225     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2003    1       4       1       0       1       22      22      2.3     0       0       0
        0       0.544643034     0.455356966     0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2003    1       4       1       0       1       23      23      3.2     0       0       0
        0       0.67802646      0.063755877     0.169406616     0.088811047     0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
```

```
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0
2003  1  4  1  0  1  24  24  3.0  0  0  0
      0  0.89912206  0.024120629  0.076757311  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0
2003  1  4  1  0  1  25  25  1.9  0  0  0
      0  0.556946009  0.033135541  0.047085469  0.362832982  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0
2003  1  4  1  0  1  26  26  0.9  0  0  0
      0  0.088378937  0.005662567  0.891390986  0.014567511  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0
2003  1  4  1  0  1  27  27  1.3  0  0  0
      0  0  0.040315059  0.162626956  0.747023655  0  0.05003433
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0
2003  1  4  1  0  1  28  28  3.6  0  0  0
      0  0  0.022971224  0.002684482  0.323296895  0.316027846
      0.022807441  0.312212111  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
2003  1  4  1  0  1  29  29  4.3  0  0  0
      0  0  0  0  0.217587058  0.216047018  0.291179346
      0.203878455  0.057003328  0.007152397  0  0  0  0  0
      0.007152397  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0
2003  1  4  1  0  1  30  30  3.6  0  0  0
      0  0  0  0  0.289671331  0.298373979  0.298275078
      0.112521237  0  0  0  0  0.001158375  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0
2003  1  4  1  0  1  31  31  1.7  0  0  0
      0  0  0  0  0  0  0.14586162  0.291723239
      0.008759029  0  0.519770271  0  0  0.005466247  0  0
      0  0.013269972  0  0  0.015149623  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0
2003  1  4  1  0  1  32  32  1.3  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0.039949172  0  0  0.109045287  0.725785397  0  0  0
      0.085270972  0  0  0  0  0  0  0  0.039949172
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0  0  0  0  0  0  0
2003  1  4  1  0  1  33  33  1.9  0  0  0
      0  0  0  0  0  0  0  0  0  0  0
      0  0  0.015847998  0.348397818  0  0.005683071  0  0
      0  0.113011522  0  0.003826117  0  0  0  0
```

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      0.513233474    0      0      0      0      0      0      0      0      0
      0      0       0      0      0      0      0      0      0      0      0
      0      0       0      0      0      0      0      0      0      0      0
2003  1      4       1      0      1      34     34     1.7    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      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      0      0      0
      0      0       0      0
2003  1      4       1      0      1      35     35     0.4    0      0      0
      0      0       0      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      0      0      0
      0      0       0      0      0      0      0      0      0      0      0
      0      0       0      0      0      0      0      0      0      0      0
      0      0       0      0
2003  1      4       1      0      1      36     36     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      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      0      0      0
      0      0       0      0
2003  1      4       2      0      1      13     13     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      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      0       0      0
2003  1      4       2      0      1      14     14     0.4    0      0      0
      0      0       0      0      0      0      0      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      0       0      0      0      0      0      0      0      0      0
      0      0       0      0      0      0      0      0      0      0      0
      0      0       0      0
2003  1      4       2      0      1      16     16     0.4    0      0      0
      0      0       0      0      0      0      0      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      0       0      0      0      0      0      0      0      0      0
      0      0       0      0      0      0      0      0      0      0      0
      0      0       0      0
2003  1      4       2      0      1      17     17     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      0.012327489
      0.831726137    0.155946374    0      0      0      0      0      0      0
      0      0       0      0      0      0      0      0      0      0      0
      0      0       0      0      0      0      0      0
2003  1      4       2      0      1      18     18     4.0    0      0      0
      0      0       0      0      0      0      0      0      0      0      0
      0      0       0      0      0      0      0      0      0      0      0
      0      0       0      0      0      0      0      0      0.005606495
      0.815548663    0.178844842    0      0      0      0      0      0      0
      0      0       0      0      0      0      0      0      0      0      0
      0      0       0      0      0      0      0      0
2003  1      4       2      0      1      19     19     3.6    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      0      0      0      0      0      0      0.792886829
      0.207113171    0      0      0      0      0      0      0      0      0
      0      0       0      0      0      0      0      0      0      0      0
      0      0       0      0      0      0
2003  1      4       2      0      1      20     20     2.3    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      0      0      0      0      0      0      0.161191626
      0.650360042    0.188448332    0      0      0      0      0      0      0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2003    1       4       2       0       1       21      21      3.9     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0.169471087
        0.756778372     0.036752637     0       0.036997904     0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0
2003    1       4       2       0       1       22      22      4.5     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       0       0       0       0       0.017824367
        0.567418934     0.358750509     0.05600619      0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0
2003    1       4       2       0       1       23      23      4.3     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       0       0       0       0       0       0       0
        0.678045057     0.195376509     0.023562212     0.103016222     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0
2003    1       4       2       0       1       24      24      4.3     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       0       0       0       0       0       0       0.132904829
        0.644800031     0.086953516     0.006233986     0.04303588      0.04303588      0
        0.04303588      0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
2003    1       4       2       0       1       25      25      1.9     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
        0.33795271      0.496432007     0.086739145     0.078876138     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0
2003    1       4       2       0       1       26      26      2.1     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
        0.177017796     0.08225928      0.740722925     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0
2003    1       4       2       0       1       27      27      1.9     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
        0.016601088     0.273203944     0.123325523     0.400389053     0       0.186480393
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
2003    1       4       2       0       1       28      28      6.2     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       0
        0.005885364     0.027151368     0.358929411     0.473567845     0.035174449
        0.00288406      0.003818979     0.012786466     0.066111406     0.003062013     0
        0       0       0.001357606     0.009271032     0       0       0       0       0
        0       0       0       0       0       0       0
2003    1       4       2       0       1       29      29      4.5     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       0       0       0       0       0       0
        0       0.015412305     0.312557301     0.395787675     0.065646092     0
        0.030445877     0.030445877     0       0.035476351     0       0       0
        0.026668384     0.060891755     0       0       0.026668384     0       0       0
        0       0       0       0       0
2003    1       4       2       0       1       30      30      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       0       0       0       0       0       0       0       0
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        0       0       0       0       0       0.041597828     0.01520158      0       0
        0       0       0       0       0       0       0       0       0       0
        0       0.116001063     0.827199529     0       0       0
2003    1       4       2       0       1       31      31      0.9     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
        0.024704903     0       0       0.059974129     0       0       0       0       0
        0       0       0       0       0       0       0.915320967
2003    1       4       2       0       1       32      32      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       0       0
        0       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
2003    1       4       2       0       1       34      34      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       0       0
        0       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
2003    1       4       2       0       1       35      35      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       0       0
        0       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
2004    1       4       1       0       1       14      14      0.2     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       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2004    1       4       1       0       1       16      16      0.4     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       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2004    1       4       1       0       1       18      18      0.4     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       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2004    1       4       1       0       1       19      19      0.4     0       0       0
        0.943697958     0       0.056302042     0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0
2004    1       4       1       0       1       20      20      1.6     0       0       0
        0.04539174      0.876011182     0.078597078     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2004    1       4       1       0       1       21      21      1.5     0       0       0
        0.09860085      0.247040797     0.654358352     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
```

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0				
2004	1	4	1	0	1	22	22	4.5	0	0	0
	0.020110928		0.587097342		0.39279173		0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0				
2004	1	4	1	0	1	23	23	2.6	0	0	0
	0	0.661351129		0.338648871		0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0					
2004	1	4	1	0	1	24	24	2.4	0	0	0
	0	0.88868454		0.11131546		0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0					
2004	1	4	1	0	1	25	25	3.5	0	0	0
	0	0.330646891		0.441696203		0.227656906		0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0				
2004	1	4	1	0	1	26	26	2.2	0	0	0
	0	0.178160064		0.673145214		0.078727823		0.069966898		0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0			
2004	1	4	1	0	1	27	27	2.8	0	0	0
	0	0.105873815		0.894126185		0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0					
2004	1	4	1	0	1	28	28	2.6	0	0	0
	0	0	0.551566811		0.157192746		0.291240443		0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0				
2004	1	4	1	0	1	29	29	1.0	0	0	0
	0	0	0.358744937		0	0	0.205273816		0.435981247		0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0				
2004	1	4	1	0	1	30	30	0.8	0	0	0
	0	0	0	0	0.133310654		0.27588043		0.314928486		0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0.27588043		0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0			
2004	1	4	1	0	1	31	31	0.6	0	0	0
	0	0	0	0	0	0.173121908		0	0	0	0
	0	0	0.440764278		0	0.386113814		0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2004    1       4       1       0       1       32      32      0.4     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
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        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       0       0       0
        0       0       0       0
2004    1       4       1       0       1       33      33      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       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       0       0       0
        0       0       0       0
2004    1       4       1       0       1       34      34      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       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       0       0       0
        0       0       0       0
2004    1       4       2       0       1       16      16      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       0       0       0       0       0       0.484255131
        0.484255131     0.031489739     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0
2004    1       4       2       0       1       17      17      0.4     0       0       0
        0       0       0       0       0       0       0       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       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2004    1       4       2       0       1       18      18      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       0       0       0       0       0       0       0.87756465
        0.12243535      0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0
2004    1       4       2       0       1       19      19      2.4     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0.584702019
        0.395644204     0       0       0.019653776     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2004    1       4       2       0       1       20      20      2.4     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0.212153373
        0.610365711     0.177480916     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2004    1       4       2       0       1       21      21      2.3     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       0       0       0       0       0       0       0
        0.893073668     0.106926332     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2004    1       4       2       0       1       22      22      2.8     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       0       0       0       0       0       0       0
        0.92174904      0.07825096      0       0       0       0       0       0       0
```

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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2004    1       4       2       0       1       23      23      4.9     0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
        0.885632081     0.114367919     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2004    1       4       2       0       1       24      24      4.3     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       0       0       0       0       0       0       0
        0.870944867     0.129055133     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2004    1       4       2       0       1       25      25      3.0     0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
        0.60277404      0.39722596      0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2004    1       4       2       0       1       26      26      1.6     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       0       0       0       0       0       0       0
        0.244230143     0.755769857     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2004    1       4       2       0       1       27      27      1.6     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       0       0       0       0       0       0       0
        0.096206048     0.903793952     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2004    1       4       2       0       1       28      28      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       0       0       0
        0       0.272890341     0.358046478     0.059811184     0       0       0       0
        0.154625999     0       0       0.154625999     0       0       0       0       0
        0       0       0       0       0       0       0       0       0
2004    1       4       2       0       1       29      29      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       0       0       0       0       0       0       0       0       0
        0       0.046881482     0.139220567     0.186404763     0       0.335413093     0
        0       0       0       0.119359143     0       0.119359143     0       0       0
        0       0.053361811     0       0       0       0       0       0       0       0
2004    1       4       2       0       1       30      30      2.4     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0.044365577     0       0       0       0       0
        0.112953709     0.050498138     0.158475772     0.112953709     0       0
        0.047813816     0       0       0       0       0       0.112953709     0.098948552
        0       0.049134757     0.211902261
2004    1       4       2       0       1       31      31      0.8     0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0.405725224     0.20147046      0       0       0       0       0.185743496
        0       0       0       0       0       0       0.20706082
2004    1       4       2       0       1       32      32      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       0       0
        0       0       0       0       0       0       0       0       0       0       0
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        0       0       0       0       0       0       0       0       0       0       1
        0       0       0       0
2004    1       4       2       0       1       33      33      0.2     0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       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
2005    1       4       1       0       1       9       9       0.2     0       0       1
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2005    1       4       1       0       1       13      13      0.5     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       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2005    1       4       1       0       1       15      15      0.2     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       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2005    1       4       1       0       1       16      16      0.4     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       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2005    1       4       1       0       1       17      17      0.5     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       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2005    1       4       1       0       1       18      18      0.5     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       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2005    1       4       1       0       1       19      19      0.2     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       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2005    1       4       1       0       1       20      20      0.5     0       0       0
        0.227802859     0.162528217     0.609668924     0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2005    1       4       1       0       1       21      21      1.3     0       0       0
        0       0.563026993     0.436973007     0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
```

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0					
2005	1	4	1	0	1	22	22	2.2	0	0	0
	0.037602152		0.076910465		0.697691815		0.187795568		0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0			
2005	1	4	1	0	1	23	23	2.5	0	0	0
	0	0.102451333		0.622778941		0.274769725		0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0				
2005	1	4	1	0	1	24	24	1.4	0	0	0
	0	0.118777533		0.881222467		0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0					
2005	1	4	1	0	1	25	25	3.2	0	0	0
	0	0.033482645		0.706230586		0.260286769		0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0				
2005	1	4	1	0	1	26	26	2.3	0	0	0
	0	0	0.197655987		0.802344013		0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0					
2005	1	4	1	0	1	27	27	2.3	0	0	0
	0	0.011948731		0.122174432		0.851913305		0.013963531		0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0			
2005	1	4	1	0	1	28	28	3.2	0	0	0
	0	0	0.006869349		0.973081321		0.02004933		0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0				
2005	1	4	1	0	1	29	29	4.5	0	0	0
	0	0	0.003911794		0.035766967		0.211125756		0.563840711		0
	0.185354772		0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0		
2005	1	4	1	0	1	30	30	1.8	0	0	0
	0	0	0	0	0	0.011745258		0.492253363		0.007319419	
	0.48868196		0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0			
2005	1	4	1	0	1	31	31	1.3	0	0	0
	0	0	0	0	0	0.482631182		0	0	0.49173332	
	0	0	0.004934922		0	0	0	0	0.010350288		0
	0	0	0	0	0.010350288		0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

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      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0       0       0       0       0       0
2005  1       4       1       0       1       32      32      1.1     0       0       0
      0       0       0       0       0       0       0       0       0       0.158296565
      0.249675577     0       0       0       0       0       0       0       0       0
      0       0       0.264245754     0.06353635      0       0       0       0.264245754
      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0       0       0       0       0       0
2005  1       4       1       0       1       33      33      1.4     0       0       0
      0       0       0       0       0       0       0       0.157230624     0       0
      0.104123346     0.103768904     0       0       0.104123346     0       0       0
      0.104123346     0.104123346     0       0.218383743     0       0       0       0
      0       0.104123346     0       0       0       0       0       0       0       0
      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0       0       0       0       0       0       0       0
      0
2005  1       4       1       0       1       34      34      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       0.202854183     0.594291633     0.202854183     0       0
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      0       0       0       0       0       0       0
2005  1       4       1       0       1       35      35      0.2     0       0       0
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      0       0       0       0       0       0       0       0       0       0       0
      1       0       0       0       0       0       0       0       0       0       0
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      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0
2005  1       4       1       0       1       36      36      0.2     0       0       0
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      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       0       0       0       0       0
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      0       0       0       0
2005  1       4       2       0       1       10      10      0.2     0       0       0
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      0       0       0       0       0       0       0       0       1       0       0
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      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0
2005  1       4       2       0       1       11      11      0.4     0       0       0
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      0       0       0       0
2005  1       4       2       0       1       12      12      0.5     0       0       0
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      0       0       0       0       0       0       0       0       1       0       0
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      0       0       0       0
2005  1       4       2       0       1       13      13      0.5     0       0       0
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      0       0       0       0       0       0       0       0       1       0       0
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      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0
2005  1       4       2       0       1       14      14      0.5     0       0       0
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      0       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       0       0
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      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0
2005  1       4       2       0       1       15      15      0.4     0       0       0
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      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0       0       0       0       0       0.600407558
      0.399592442     0       0       0       0       0       0       0       0       0
      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0       0       0       0
2005  1       4       2       0       1       16      16      0.4     0       0       0
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      0       0       0       0       0       0       0       0       0       1       0
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      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0
2005  1       4       2       0       1       17      17      0.5     0       0       0
      0       0       0       0       0       0       0       0       0       0       0
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      0       0       0       0       0       0       0       0       0       1       0
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      0       0       0       0
2005  1       4       2       0       1       18      18      0.5     0       0       0
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      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       0       0       0
2005  1       4       2       0       1       19      19      0.7     0       0       0
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      0       0       0       0       0       0       0       0       0       0.113787428
      0.886212572     0       0       0       0       0       0       0       0       0
      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0       0       0
2005  1       4       2       0       1       20      20      0.5     0       0       0
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      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       0       0       0       0       0       0       0
      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0
2005  1       4       2       0       1       21      21      0.9     0       0       0
      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0       0       0       0       0       0       0
      0.749309725     0.250690275     0       0       0       0       0       0       0
      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0       0       0       0
2005  1       4       2       0       1       22      22      2.7     0       0       0
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      0       0       0       0       0       0       0       0       0       0       0
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      0.18316579      0.676147377     0.140686833     0       0       0       0       0
      0       0       0       0       0       0       0       0       0       0       0
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2005  1       4       2       0       1       23      23      3.1     0       0       0
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      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0       0       0       0       0       0       0
      0.012188196     0.901664127     0.086147676     0       0       0       0       0
      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0       0       0       0       0
2005  1       4       2       0       1       24      24      3.8     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       0       0       0       0       0       0       0       0
      0.802475461     0.197524539     0       0       0       0       0       0       0
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      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0       0       0
2005  1       4       2       0       1       25      25      4.3     0       0       0
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      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0       0       0       0       0       0       0       0
      0.253196191   0.746803809   0       0       0       0       0       0       0
      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0       0       0
2005  1       4       2       0       1       26      26      3.4     0       0       0
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      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0       0       0       0       0       0       0
      0.002660357   0.194865633   0.788952373   0.013521636   0       0       0
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2005  1       4       2       0       1       27      27      2.9     0       0       0
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      0.036868763   0.157602033   0.805529205   0       0       0       0       0
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2005  1       4       2       0       1       28      28      3.6     0       0       0
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      0.502808401   0.083937093   0.128456373   0.055006719   0.111784905
      0.013132114   0.104874396   0       0       0       0       0       0       0
      0       0       0       0       0       0       0       0       0       0       0
      0
2005  1       4       2       0       1       29      29      3.8     0       0       0
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      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0       0       0       0       0       0       0       0
      0       0.006282836   0.006282836   0.032687186   0.018797144   0.110188913
      0.006935176   0.77739463    0       0       0.015089423   0.007544711
      0.018797144   0       0       0       0       0       0       0       0       0
      0       0       0       0
2005  1       4       2       0       1       30      30      2.9     0       0       0
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      0       0       0       0       0       0.017827399   0.032873134   0.018015507
      0       0.015843003   0       0.005300169   0.008589627   0.017179254   0
      0       0.840058284   0       0       0       0       0       0.035723997   0
      0       0.008589627
2005  1       4       2       0       1       31      31      1.8     0       0       0
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      0       0       0.143403546   0       0       0.143403546   0.068140735
      0.143403546   0.036518096   0.057736918   0.057736918   0       0       0
      0       0.206253152
2005  1       4       2       0       1       32      32      0.2     0       0       0
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2006  1       4       1       0       1       11      11      0.4     0       0       1
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2006  1       4       1       0       1       12      12      0.2     0       0       1
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2006    1       4       1       0       1       13      13      1.2     0       0       1
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2006    1       4       1       0       1       14      14      0.5     0       0       1
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2006    1       4       1       0       1       15      15      1.0     0       0
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2006    1       4       1       0       1       16      16      1.8     0       0       0
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        0       0       0       0
2006    1       4       1       0       1       17      17      2.0     0       0       0
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        0       0       0       0
2006    1       4       1       0       1       18      18      1.6     0       0       0
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2006    1       4       1       0       1       19      19      1.6     0       0       0
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2006    1       4       1       0       1       20      20      2.6     0       0       0
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2006    1       4       1       0       1       21      21      1.4     0       0       0
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        0       0       0       0       0       0
2006    1       4       1       0       1       22      22      0.8     0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
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        0       0       0       0       0       0
2006    1       4       1       0       1       23      23      1.8     0       0       0
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2006    1       4       1       0       1       27      27      3.6     0       0       0
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        0.522839506     0       0       0       0       0       0       0       0       0
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2006    1       4       2       0       1       13      13      1.2     0       0       0
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2006    1       4       2       0       1       18      18      1.8     0       0       0
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2006    1       4       2       0       1       21      21      1.2     0       0       0
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2006    1       4       2       0       1       22      22      2.8     0       0       0
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2006    1       5       2       0       1       24      24      3.2     0       0       0
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2006    1       4       2       0       1       25      25      3.6     0       0       0
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2006    1       4       2       0       1       26      26      4.0     0       0       0
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2006    1       4       2       0       1       27      27      3.0     0       0       0
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2006    1       4       2       0       1       28      28      10.9    0       0       0
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	0										
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	0	0	0	0							
2003	1	5	1	0	1	10	10	0.2	0	0	1
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2003	1	5	1	0	1	12	12	0.7	0	0	1
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	0	0	0	0							
2003	1	5	1	0	1	13	13	0.4	0	0	1
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2003	1	5	1	0	1	16	16	0.7	0	0	
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2003    1       5       1       0       1       23      23      0.9     0       0       0
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2003    1       5       1       0       1       24      24      0.6     0       0       0
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        0       0       0       0
2003    1       5       1       0       1       26      26      0.6     0       0       0
        0       0.669091241     0.16545438      0.16545438      0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2003    1       5       1       0       1       27      27      0.7     0       0       0
        0       0.506346063     0.253173031     0.240480906     0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2003    1       5       1       0       1       28      28      0.2     0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2003    1       5       2       0       1       9       9       0.2     0       0       0
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        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       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2003    1       5       2       0       1       10      10      0.6     0       0       0
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        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       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2003    1       5       2       0       1       11      11      0.7     0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0.362365427     0.238940762
        0.398693811     0       0       0       0       0       0       0       0       0
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2003    1       5       2       0       1       12      12      0.7     0       0       0
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        0       0       0       0
2003    1       5       2       0       1       13      13      1.7     0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
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        0.155274003     0       0       0       0       0       0       0       0       0
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2003    1       5       2       0       1       14      14      1.3     0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0.677697437
        0.322302563     0       0       0       0       0       0       0       0       0
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2003    1       5       2       0       1       15      15      1.1     0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0.384444565
        0.615555435     0       0       0       0       0       0       0       0       0
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2003    1       5       2       0       1       16      16      2.2     0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0.257435715
        0.742564285     0       0       0       0       0       0       0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2003    1       5       2       0       1       17      17      2.2     0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0.121850983
        0.673636151     0.204512866     0       0       0       0       0       0       0
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2003    1       5       2       0       1       18      18      3.5     0       0       0
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        0.157183095     0.044414489     0       0       0       0       0       0       0
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2003    1       5       2       0       1       19      19      4.3     0       0       0
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        0.19868093      0.078669883     0       0       0       0       0       0       0
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2003    1       5       2       0       1       20      20      2.2     0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       1       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2003    1       5       2       0       1       21      21      1.5     0       0       0
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2003    1       5       2       0       1       22      22      1.3     0       0       0
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2003    1       5       2       0       1       23      23      1.5     0       0       0
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2003    1       5       2       0       1       24      24      2.6     0       0       0
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2003    1       5       2       0       1       25      25      0.4     0       0       0
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        0       0       0       0
2003    1       5       2       0       1       26      26      0.2     0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
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        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2003    1       5       2       0       1       28      28      0.4     0       0       0
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        0       0       0       0
2004    1       5       1       0       1       5       5       0.6     0       1       0
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        0       0       0       0
2004    1       5       1       0       1       6       6       0.3     0       1       0
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        0       0       0       0
2004    1       5       1       0       1       7       7       0.2     0       1       0
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        0       0       0       0
2004    1       5       1       0       1       8       8       1.3     0       1       0
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        0       0       0       0
2004    1       5       1       0       1       9       9       1.3     0       1       0
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        0       0       0       0
2004    1       5       1       0       1       10      10      1.1     0       1       0
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2004    1       5       1       0       1       11      11      1.0     0       0.796583585
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        0       0       0       0       0       0
2004    1       5       1       0       1       12      12      0.7     0       0       1
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        0       0       0       0       0       0       0       0       0       0       0
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        0       0       0       0
2004    1       5       1       0       1       13      13      1.8     0       0       1
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2004    1       5       1       0       1       14      14      1.6     0       0       1
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        0       0       0       0
2004    1       5       1       0       1       15      15      1.3     0       0       1
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        0       0       0       0
2004    1       5       1       0       1       16      16      0.7     0       0
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2004    1       5       1       0       1       17      17      0.7     0       0       0
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        0       0       0       0
2004    1       5       1       0       1       18      18      0.2     0       0       0
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2004    1       5       1       0       1       19      19      0.9     0       0       0
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2004    1       5       1       0       1       20      20      1.3     0       0       0
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2004    1       5       1       0       1       21      21      2.7     0       0       0
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2004    1       5       1       0       1       22      22      2.0     0       0       0
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2004  1       5       1       0       1       23      23      0.7     0       0       0
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2004  1       5       1       0       1       24      24      0.2     0       0       0
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2004  1       5       1       0       1       25      25      1.1     0       0       0
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2004  1       5       1       0       1       26      26      0.2     0       0       0
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2004  1       5       1       0       1       27      27      0.2     0       0       0
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      0       0       0       0
2004  1       5       1       0       1       28      28      0.2     0       0       0
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2004  1       5       2       0       1       3       3       0.1     0       0       0
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2004  1       5       2       0       1       4       4       0.2     0       0       0
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2004  1       5       2       0       1       5       5       0.6     0       0       0
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2004  1       5       2       0       1       16      16      0.7     0       0       0
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2004    1       5       2       0       1       21      21      3.4     0       0       0
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      0       0       0       0       0       0       0       0       0       0       0
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2005  1       5       2       0       1       15      15      2.6     0       0       0
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      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0       0       0       0       0       0       0       0
      0       0       0       0
2006  1       5       2       0       1       12      12      2.6     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       0       0       0       0       0       0.827731705
      0.172268295     0       0       0       0       0       0       0       0       0
```

```
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2006    1       5       2       0       1       13      13      7.4     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0.946410513
        0.053589487     0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2006    1       5       2       0       1       14      14      6.1     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0.835404208
        0.164595792     0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2006    1       5       2       0       1       15      15      2.8     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       0       0       0       0       0       0.452425945
        0.547574055     0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2006    1       5       2       0       1       16      16      3.5     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       0       0       0       0.019532397
        0.980467603     0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2006    1       5       2       0       1       17      17      3.7     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       0       0       0       0       0       0.05751955
        0.94248045      0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2006    1       5       2       0       1       18      18      3.2     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       0.062491245
        0.683220891     0.254287864     0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0
2006    1       5       2       0       1       19      19      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       0       0       0       0       0       0       0.127525232
        0.872474768     0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0
2006    1       5       2       0       1       20      20      1.1     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       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       0       0
2006    1       5       2       0       1       21      21      0.4     0       0       0
        0       0       0       0       0       0       0       0       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       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2006    1       5       2       0       1       22      22      0.4     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
        0.232142857     0.767857143     0       0       0       0       0       0       0
```

```
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0
2006    1       5       2       0       1       23      23      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       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       0
2006    1       5       2       0       1       24      24      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       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       0
2006    1       5       2       0       1       25      25      0.4     0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0.82048109      0.17951891      0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0
2006    1       5       2       0       1       26      26      0.9     0       0       0
        0       0       0       0       0       0       0       0       0       0       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       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2006    1       5       2       0       1       28      28      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       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   # Mean Size at Age Observations
0 # Number of Environmental Variables
0   # Environmental Observations
999
```

Forecast File:

```
##  SS2 Version 2.00.c
0.5 #  Target SPR
10 # Number of Forecast Years
10 # Number of Forecast Years with Std Dev
1 # Recruitment Deviation Emphasis
0 # Fraction log-bias adjustment Before End Year+1
0 # Fraction log-bias adjustment After End Year
0.40 #  Top of 40:10 Option
0.10 #  Bottom of 40:10 Option
1.0 #  OY Scalar to ABC
2006 #  First Year for Forecast & MSY Calcs
2006 #  Last Year for Forecast & MSY Calcs
1 # Relative F Flag
1  #Fleet 1 (Season 1)
999
200
228
273
283
292
299
306
313
321
328
```