Update to the status of yelloweye rockfish (*Sebastes ruberrimus*) off the U.S. West Coast in 2007

by

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Executive Summary

Stock

This assessment update reports the status of the yelloweye rockfish (*Sebastes ruberrimus*) resource off the west coast of the United States, from the Mexican border to the Canadian border. The assessment on which this update is based (Wallace et al. 2006) contained both a coast-wide model and area models for Washington, Oregon, and California. This update only looks at the coast-wide model, on which management is currently based.

Catches

For this update, new catch data were added for 2006, based on the Groundfish Management Team's Bycatch Scorecard, and catch histories for all fleets were refreshed for the period 1983-2005. Catches prior to 1983 are taken from Wallace et al. (2006). Annual total catch of yelloweye rockfish peaked around 1980, and remained above 200 mt throughout the mid-1990s. Catch declined sharply between 1997 and 2001.

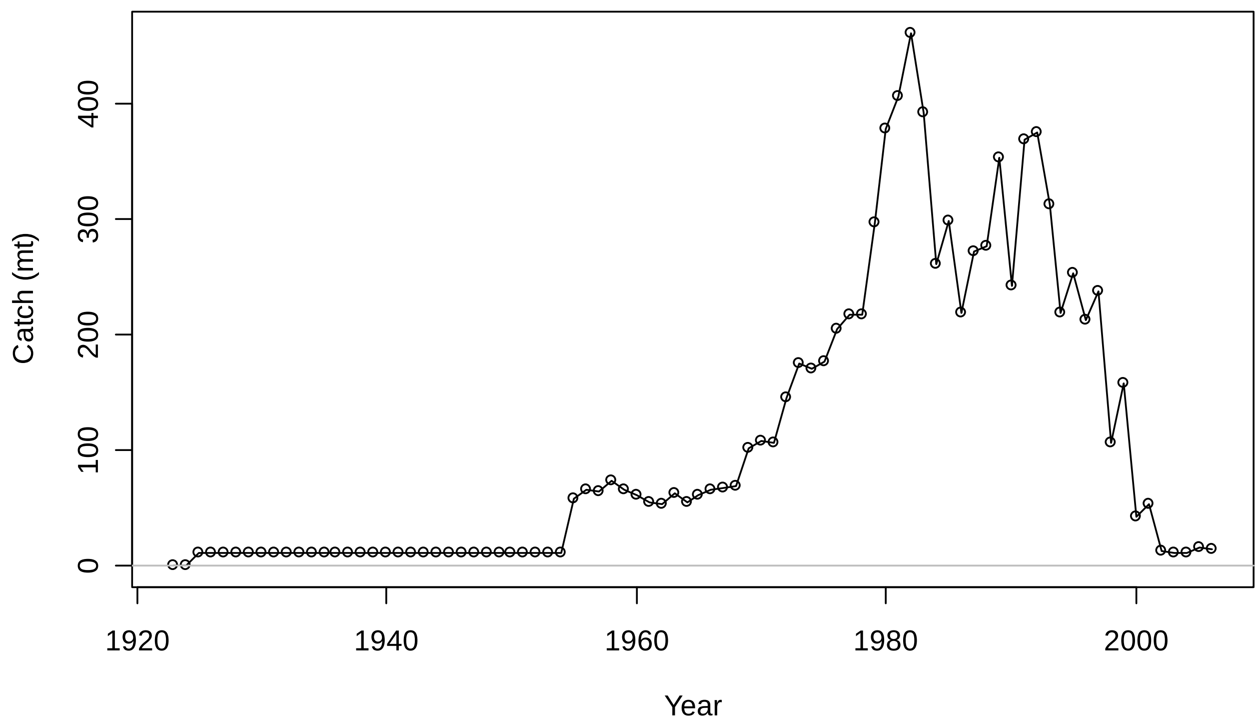

Figure ES1. Reconstructed historical catch (mt) by year and fleet, 1925-2006.

Table ES1. Updated (perhaps to the same value) recent commercial fishery catches by state and fishery. Fleets in the model combine trawl and line for all years in California and Oregon, and from 1923 to 1999 in Washington. Line gear in Washington from 1999 to 2006 is modeled as a separate fleet. (For values not updated see Wallace et al. 2006.)

	California			Oregon			Washington		
Year	Trawl	Line	Sport	Trawl	Line	Sport	Trawl	Line	Sport
1997	6.0	56.4	15.1	71.4	44.1		6.5		
1998	4.0	16.8	5.5	20.8	20.6		4.8		
1999	8.7	13.6	12.6	7.1	54.2		9.9		
2000	0.7	3.3	7.5	0.3	3.3		0.2		
2001	0.6	3.9	4.6	0.7	5.5		0.8		
2002	0.2	0.0	2.1	0.4	0.3		0.4	2.2	
2003	0.0	0.0	3.7	0.2	0.0		0.2	0.3	
2004	0.3	0.1	0.8	0.8	0.1	2.4	1.0	0.9	3.7
2005	0.1	0.0	1.6	0.3	0.1	4.1	0.4	3.0	5.2
2006	0.0	0.3	3.5	0.3	0.6	2.5	0.3	5.2	1.7

Data and Assessment

The most recent assessment for yelloweye rockfish was conducted using SS2, version 1.21 in 2006 by Wallace et al. Fishery-independent data used in that assessment included a CPUE index and size-compositions from the longline survey conducted by the International Pacific Halibut Commission. Catch data, as well as age and size compositions, were included for commercial and recreational fisheries off Washington, Oregon, and California. CPUE indices were also constructed from recreational data from each state.

In the process of refreshing data for use in this updated assessment, several errors were uncovered in the data and input files used for the previous assessment. These include the misspecification of the age- and length-bin values in the SS2 input file and the inclusion of Washington trawl ages in constructing age-composition inputs for the Washington hook and line fishery. These problems were corrected in developing the 2007 base model. Since the corrected bin values were lower than those used in the previous assessment and the Washington trawl data contained a higher proportion of old fish, all three of these corrections led to downward revisions in the amount of spawning biomass and the level of depletion, relative to the 2006 assessment.

In converting the model to SS2c, the prior assessment's old SS1 "super-year" approach for dealing with small sample sizes for age and size compositions in some years was updated using the recommended SS2 method. This change had little effect on model results. Additionally, during the 2006 STAR Panel review, a representative from the Canadian Department of Fisheries and Oceans, who was present, reported that their current model's estimated value for yelloweye natural mortality (M) off British Columbia was 0.033. This information led the Panel to recommend lowering the value of M in the U.S. model from 0.045 (as used in 2005) to 0.036. Subsequently, the Canadian model was updated and a new value of M estimated at 0.043. The Chair of the STAR Panel has conveyed that if the 0.043 value had been available during the review, it would likely have been recommended for use, rather than the 0.036 value (Owen Hamel, personal communication). Additionally, sensitivity analysis conducted across a range of M values, as part of the current assessment, indicates a substantial degradation in model fit with M=0.036, relative to values of M in the 0.043-0.046 range. As a result, current and projected biomass and depletion levels for an alternative base case (with M=0.043) are also reported in this document.

For comparative purposes, the depletion level for 2006, using the 2006 base model was 17.7%. The 2007 base model estimates depletion in 2006 as 14%. The alternative base model, with M=0.043, estimates the 2006 depletion level as 15.8%.

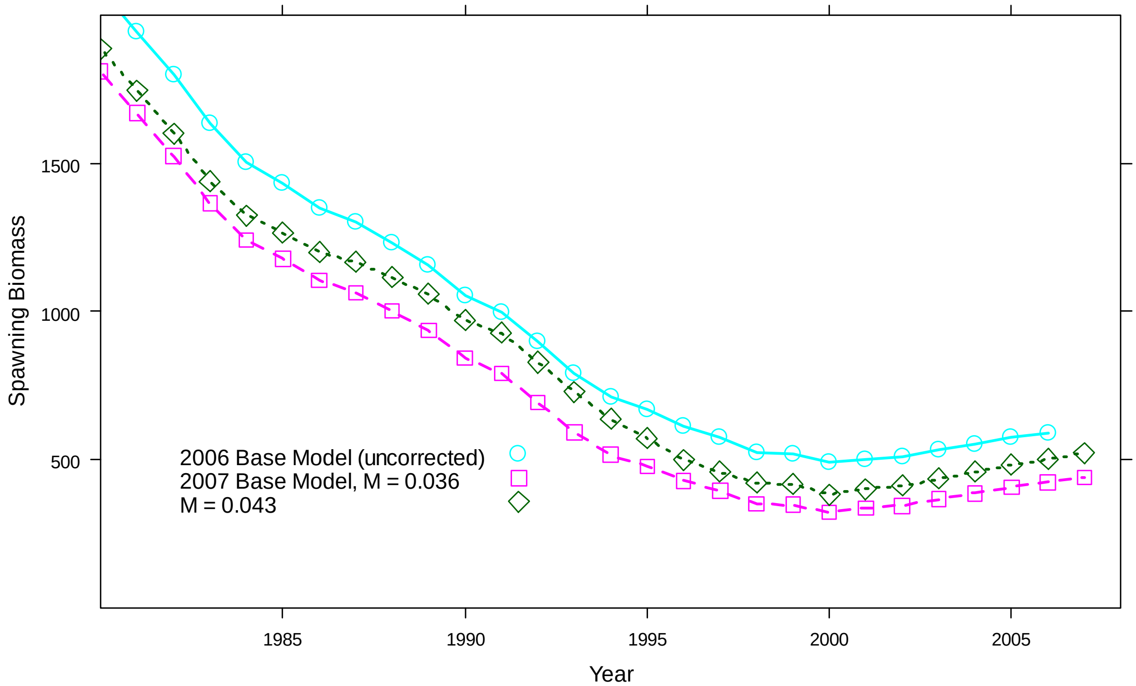

Figure ES2. Comparison of spawning biomass estimates for 1) the uncorrected 2006 coast-wide base model, 2) the 2007 base model, including corrected length- and age-composition specifications and adaptation of the “super-year” method for use with SS2, and 3) the 2007 base model run with natural mortality (M) fixed at 0.043 instead of 0.036. All models were run in SS2c.

Stock Biomass and Reference Points

The long-term biomass trajectory in this assessment is very similar to that in the 2006 assessment. Spawning biomass declined steadily and rather rapidly, beginning in the early-1970s, with no indication of increase until roughly 2001. The amount of spawning biomass in all years is lower in the current base model than in the previous assessment, due to the correction of data/input errors discussed above. Figure ES3 shows the complete spawning biomass trajectory for the 2007 base model. Table ES2 reports the estimated amounts of spawning biomass and depletions levels for the last 10 years. Figure ES4 shows the history of estimated depletion levels for the entire assessment period.

The unfished spawning stock biomass is estimated to be 3,019 mt in the base model, and 3,062 mt in the alternative (M=0.043) model (Table ES3). The spawning biomass targets for these models are 1,208 mt and 1,225 mt, respectively. The overfished biomass levels for these models are 755 mt and 766 mt, respectively. The current spawning biomass is estimated to be 422 mt with the base model and 485 mt with the alternative model. Current depletion estimates for these models are 14.5% and 16.4%, respectively.

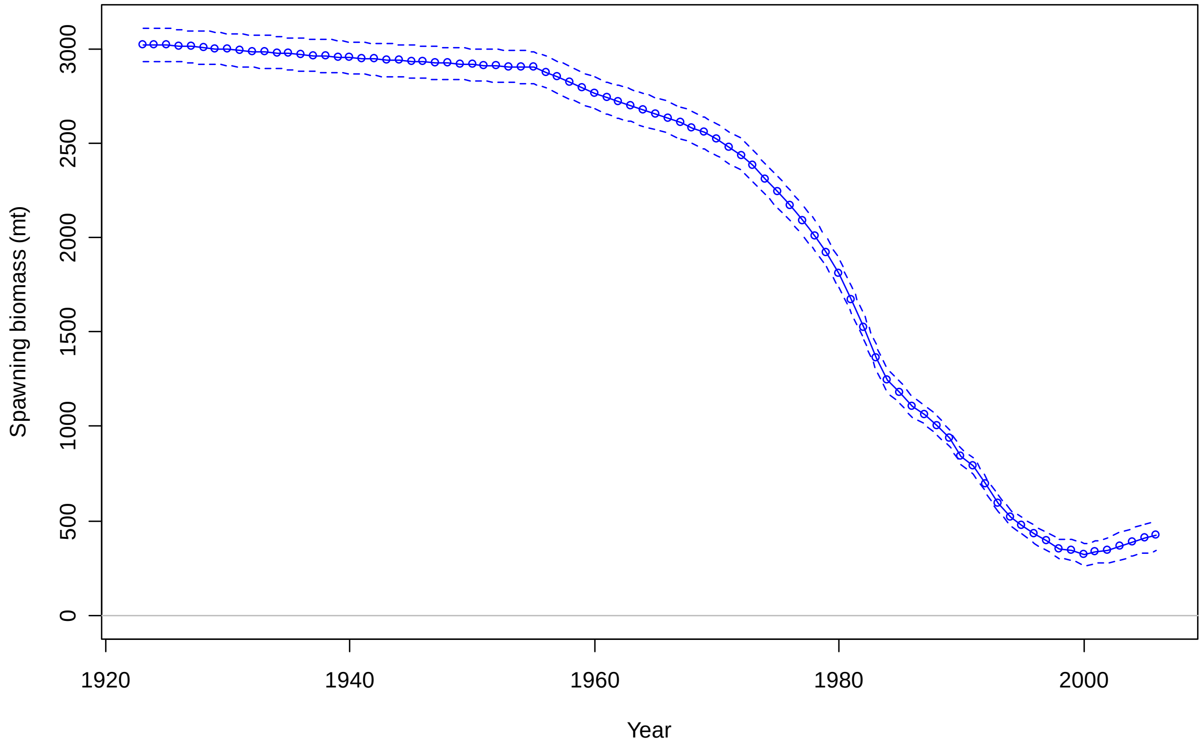

Figure ES3. Estimated spawning biomass time-series with approximate asymptotic 95% confidence interval, using the 2007 base model.

Table ES2. Recent trend in yelloweye spawning biomass and depletion level, using the 2007 base model.

Year	Estimated spawning biomass (mt)	~95% confidence interval	Estimated depletion	~95% confidence interval
1998	349	298-399	11.6%	NA
1999	346	292-400	11.5%	NA
2000	322	264-380	10.6%	NA
2001	336	274-398	11.1%	NA
2002	344	278-410	11.4%	NA
2003	365	295-435	12.1%	NA
2004	386	312-459	12.8%	NA
2005	406	328-483	13.4%	NA
2006	422	342-503	14.0%	11.4-16.6%
2007	438	355-522	14.5%	11.8-17.2%

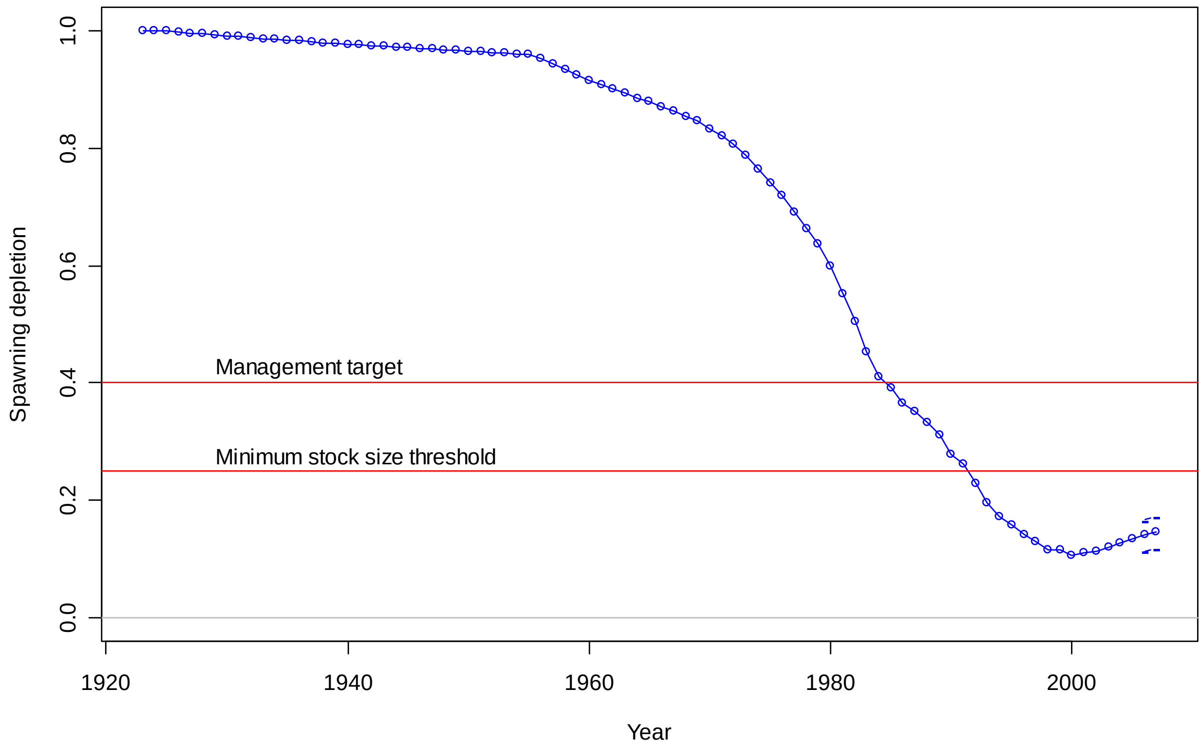

Figure ES4. Time-series of estimated depletion level, 1925-2007 with approximate asymptotic 95% confidence interval for 2006 and 2007, using the 2007 base model.

Table ES3. Benchmarks for comparison of the coast-wide 2006 base model to the 2007 base and alternative models.

Reference Point	2006 Base Model	2007 Base model, with all corrections to age- and size-composition data	2007 Alternative model with M = 0.043
[1/]Unfished Spawning Stock Biomass (SSB_0)	3,322	3,019	3,062
Unfished Exploitable Biomass (B0)	7,448	6,811	7,044
Unfished Recruitment (log(R0))	4.85	4.76	4.76
[1/]SSB_{2006}	588	422	485
Depletion Level (2006)	17.7%	14.0%	15.8%
Depletion Level (2007)		14.5%	16.4%

[1/] These values are expressed in female biomass (one-half of the single-sex model's SSB_0).

Recruitment

As in the 2006 assessment, the level of recruitment is deterministic from the start of the modeled time-period through 1967. From 1968 through 1992, the model estimates very large recruitments in four of the years, and recruitments below the initial level in all other years (Figure ES6). Recruitments after 1992 are taken from the stock-recruit curve. The last 10 years of these amounts are reported in Table ES4.

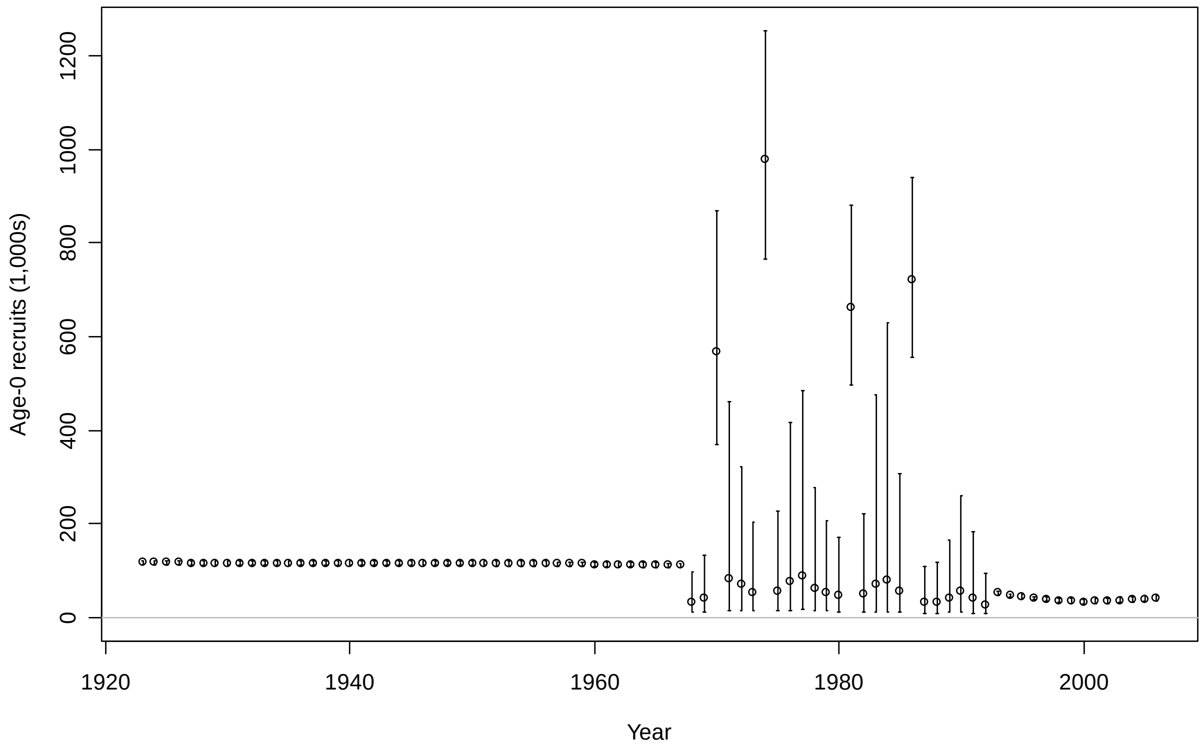

Figure ES6. Time-series of estimated yelloweye recruitments with approximate asymptotic 95% confidence interval.

Table ES4. Recent estimated trend in yelloweye recruitment, using the 2007 base model

Year	Estimated recruitment (1000's)	~95% confidence interval
1998	34.8	30.6 - 39.5
1999	34.5	30.1 - 39.6
2000	32.6	27.9 - 38.2
2001	33.7	28.8 - 39.6
2002	34.4	29.2 - 40.5
2003	36.1	30.7 - 42.4
2004	37.6	32.1 - 44.2
2005	39.1	33.4 - 45.8
2006	40.4	34.5 - 47.2
2007	41.5	16.3 - 105.8

Exploitation status

The estimated spawning potential ratio (SPR) for yelloweye rockfish first dropped below the proxy target of 50% in the early 1970s, where it remained until 2002 (Figure ES7). Throughout the 1980s and 1990s, SPR was below 20%.

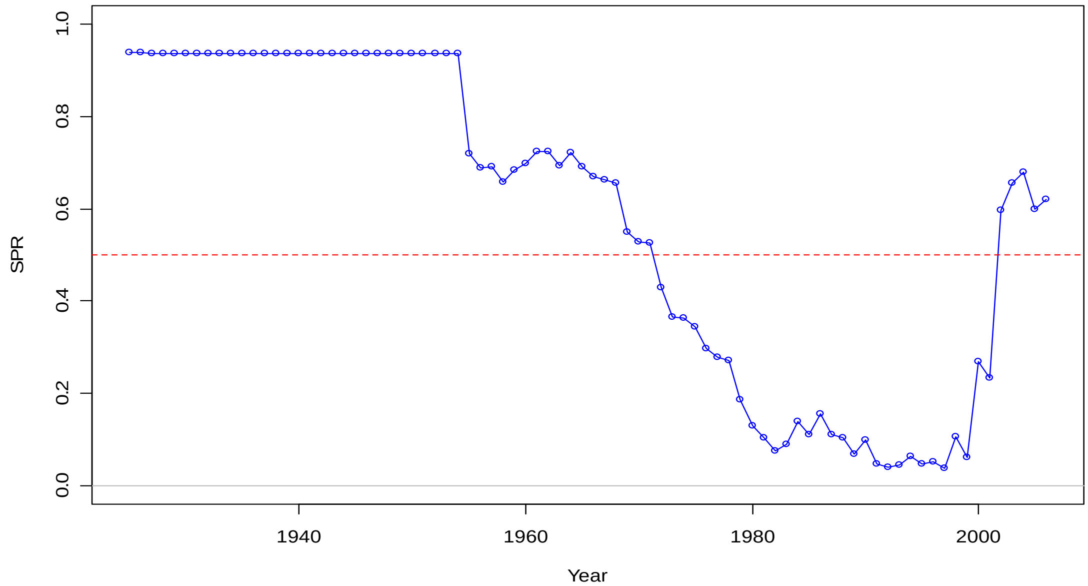

Figure ES7. Time-series of estimated spawning potential ratio 1925-2006.

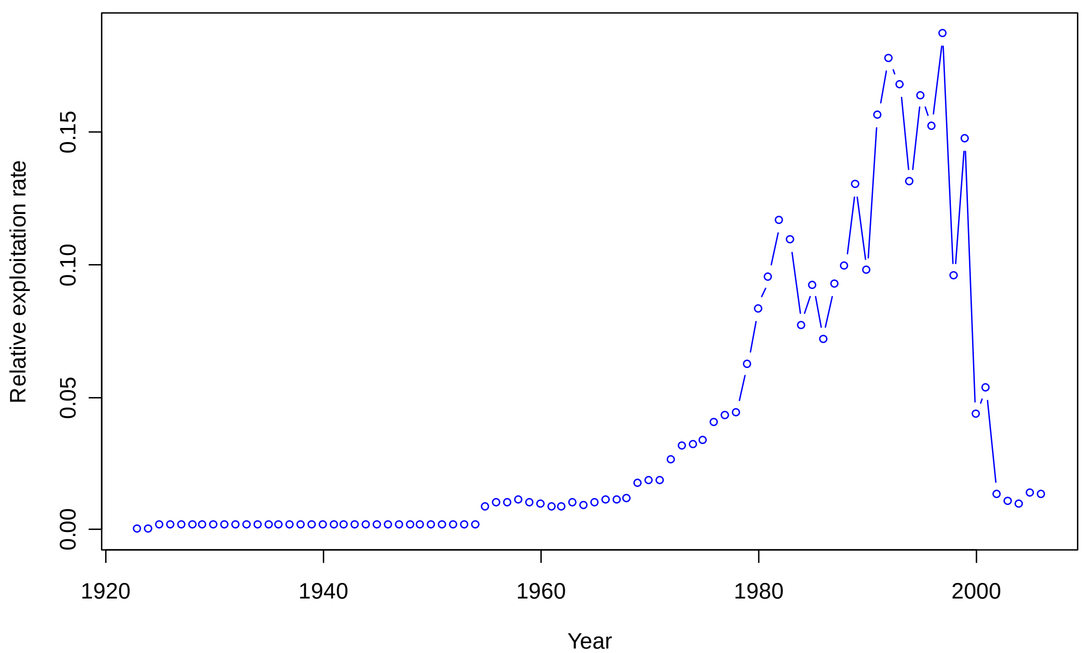

Figure ES8. Time-series of relative exploitation rate (catch/biomass of age 3+ fish) 1925-2006.

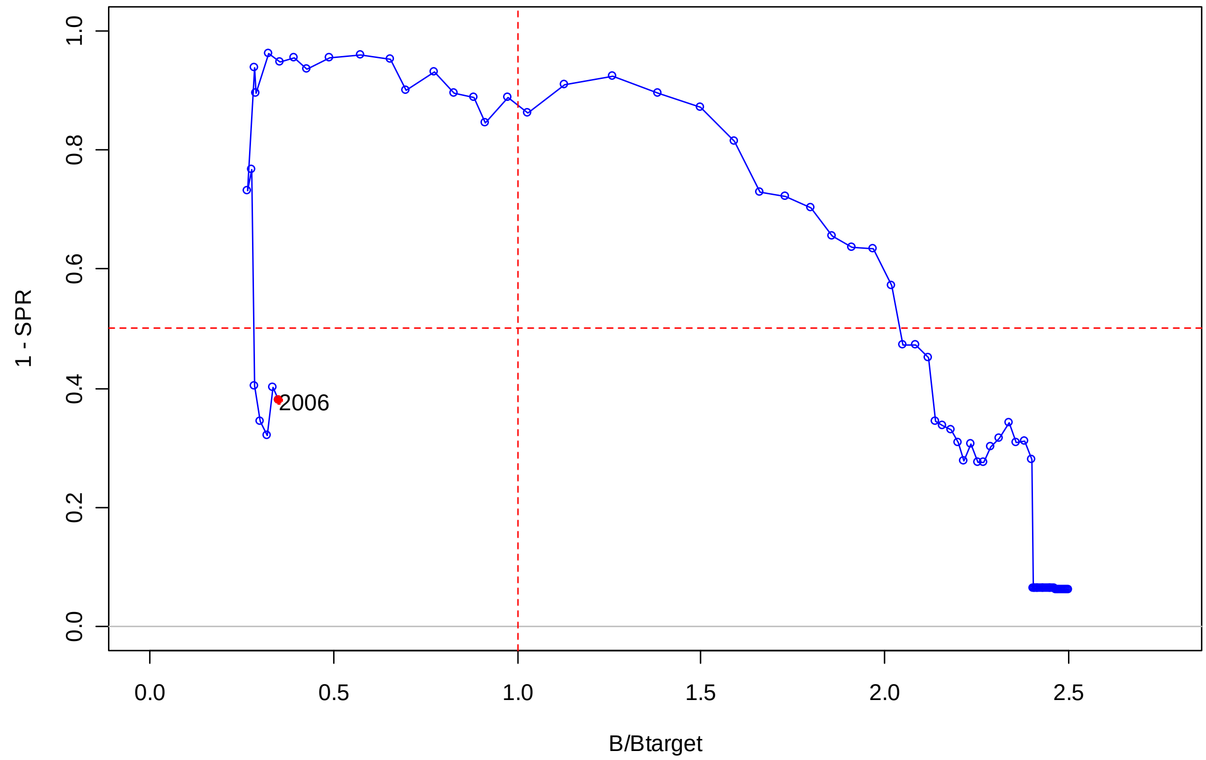

Figure ES9. One minus the estimated spawning potential ratio relative to the proxy target of 50% vs. estimated spawning biomass relative to the proxy 40% level. Higher biomass occurs on the left side of the x-axis, higher exploitation rates occur on the upper side of the y-axis.

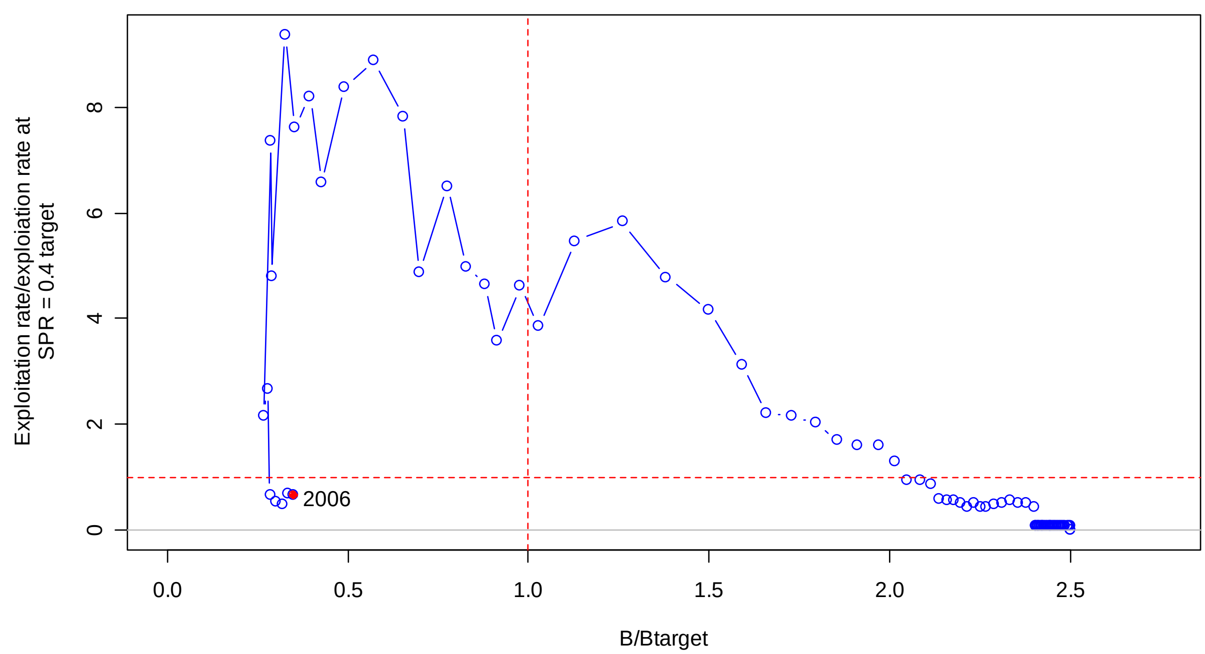

Figure ES10. Relative exploitation rate/exploitation rate at SPR = 0.5 target vs. estimated spawning biomass relative to the proxy 40% level.

Management Performance
Total catches of yelloweye rockfish have been below the specified OYs and ABCs since individual specifications were first established for this species in 2002.

Table ES5. Yelloweye rockfish management performance.

	Total Catch mt	OY mt	ABC mt
2002	13.0	22	52
2003	10.8	22	52
2004	15.7	22	52
2005	15.7	26	54
2006	14.4	27	55

Unresolved problems and major uncertainties (*from Wallace et al. 2006*)
As in the previous assessments, the sparseness of the size and age composition data and the lack of a relevant fishery-independent survey has limited the model's ability to properly assess the status of the resource... Further, due to catch restrictions since 2002, catch-per-unit-effort (CPUE) data no longer reflect the real changes in population abundance, and discard estimates are highly uncertain.

The landings data are basically derived from total landings of unclassified rockfish times an estimated fraction that are yelloweye. In recent years, actual samples are available in many areas, but because yelloweye are rare in the overall catch and that species composition estimates derived from mixed rockfish categories is limited, substantial substitution for missing cells is required. In earlier years (prior to 1983), estimates of fraction yelloweye had to be borrowed from remote years and areas. The consequence of these estimation steps is that the catch is known only with considerable uncertainty and the current version of SS2 does not allow for uncertainty measurements of landings. This makes it nearly impossible to evaluate the true uncertainty of model results. Internal estimates of standard error on depletion estimates were on the order of 2-2.5% and are likely to be serious underestimates of uncertainty.

Research and Data Needs (*from Wallace et al. 2006*)
Additional effort to collect age and maturity data is essential for improved population assessment. Collection of these data can only be accomplished through research studies and/or by onboard observers because this species is now prohibited. In 2006, IPHC and WDFW scientists are conducting a study to increase our knowledge of current stock biomass off Washington coast. Loss of the study due to declining OY will have significant detrimental effects on our ability to adequately assess this stock in the future. We strongly urge Management to make this study the highest priority. Increased effort toward habitat mapping and in-situ observation of behavior will provide information on the essential habitat and distribution for this species.

Alternative survey such as the in-situ 2002 US Vancouver submersible survey in untrawlable habitat is required for future assessment of yelloweye rebuilding status. This study has demonstrated that submersible visual transect surveys can provide a unique alternative method for estimating demersal fish biomass in habitats not accessible to conventional survey tools. For example, because of the low frequency of yelloweye rockfish encountered in the NMFS shelf trawl survey tows, those data were not considered a reliable indicator of abundance and were not used in the 2002 yelloweye stock assessment for PFMC (Methot et al. 2002). Results from this study support this conclusion and illustrate the need for large-scale surveys to assess bottomfish densities in habitats that are not accessible to trawl survey gear. Further, stratified random sampling designs should be employed with sample sizes sufficient to ensure acceptable levels of statistical power (Jagielo et al. 2003). At present, the in-situ visual transect submersible survey method appears to be a useful tool for this purpose, and the utility of this method will likely improve further with technological advances such as the 3-Beam Quantitative Mensuration System (QMS).

Forecasts

Ten-year forecasts were generated for the base and alternative models. In both cases, harvests for 2007-2010 were fixed at the ramped-down amounts adopted by the Council in the 2006 yelloweye rebuilding plan. OY amounts for 2011-2018 were estimated through application of the harvest rate (SPR=71.9%) adopted for 2011 and beyond in existing rebuilding plan. Given these specifications, both models exhibit increases in depletion percentage throughout the forecast period. However, in the base model, the projected OY for 2011 declines from 14 mt (the 2010 ramp-down amount) to 10.3 mt (Table ES6). In the alternative model, with M=0.043, the 2011 OY is 13.7 mt.

Table ES6. Forecast for yelloweye rockfish. OY for 2007-2010 represents the currently adopted ramp-down; 2011-2018 represents fishing at SPR = 71.9% to mimic rebuilding plan.

Year	Bio-Smry	Spawn Bio[1/]	Depletion	Recruit-0	OY (mt)	ABC
2007 Base with M = 0.036						
2007	1134	438	0.15	41.5	23	
2008	1150	455	0.15	42.3	20	
2009	1168	470	0.15	43.1	17	22.9
2010	1187	484	0.16	43.9	14	23.3
2011	1208	497	0.16	44.7	10.3	
2012	1231	508	0.16	45.5	10.5	
2013	1254	518	0.17	46.2	10.7	
2014	1276	527	0.17	46.9	10.9	
2015	1298	535	0.17	47.5	11.1	
2016	1319	542	0.18	48.1	11.3	
2017	1339	549	0.18	48.6	11.5	
2018	1360	555	0.18	49.2	11.6	
2007 Alternative Model with M = 0.043						
2007	1327	503	0.16	61.8	23	
2008	1348	517	0.17	63.0	20	
2009	1371	530	0.17	64.2	17	30.4
2010	1396	544	0.18	65.4	14	31.0
2011	1423	557	0.18	66.5	13.7	
2012	1449	570	0.19	67.6	14.0	
2013	1474	582	0.19	68.5	14.2	
2014	1499	592	0.19	69.4	14.5	
2015	1523	602	0.20	70.2	14.7	
2016	1547	612	0.20	71.0	15.0	
2017	1570	621	0.20	71.7	15.2	
2018	1593	630	0.21	72.4	15.4	

[1/] These values are expressed in female biomass (one-half of the single-sex model's SSB_0).

Table ES7. Summary of recent trends in yelloweye exploitation and stock levels; all values reported at the beginning of the year.

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Landings (mt)	106.6	157.6	42.3	52.7	13.0	10.8	10.1	14.8	14.4	NA
Estimated Discards (mt)	0	0	0	0	0	0	0	0	0	NA
Estimated Total Catch	106.6	157.6	42.3	52.7	13.0	10.8	10.1	14.8	14.4	NA
Exploitation Rate (catch/age 3+ biomass)	0.096	0.148	0.043	0.054	0.013	0.011	0.010	0.014	0.013	NA
Age 3+ Biomass (mt)	1110.0	1068.2	975.0	984.8	984.2	1016.8	1049.7	1082.1	1108.8	1134.4
Base with M = 0.036										
Spawning Biomass (mt)	348.7	345.9	321.9	335.6	343.8	364.9	385.6	405.5	422.5	438.4
~95% Interval	298.4-399	291.9-399.8	264.2-379.7	273.8-397.5	277.9-409.7	295.0-434.8	311.9-459.4	328.2-482.8	341.9-503.1	354.8-521.9
Recruitment (1000's)	34.8	34.5	32.6	33.7	34.4	36.1	37.6	39.1	40.4	41.5
~95% Interval	30.6-39.5	30.1-39.6	27.9-38.2	28.8-39.6	29.2-40.5	30.7-42.4	32.1-44.2	33.4-45.8	34.5-47.2	16.3-105.8
Depletion	11.6	11.5	10.7	11.1	11.4	12.1	12.8	13.4	14.0	14.5
~95% Interval	NA	NA	NA	NA	NA	NA	NA	NA	11.4-16.6	11.8-17.2
Alternative model with M = 0.043										
Spawning Biomass (mt)	392.5	391.9	369.8	386.3	396.9	420.7	443.9	466.2	485.3	503.4
~95% Interval	334.3-450.8	329.9-453.9	303.8-435.8	316.0-456.5	322.4-471.4	342.0-499.3	361.4-526.4	380.1-552.2	396.0-574.6	411.2-595.6
Recruitment (1000's)	51.2	51.2	48.9	50.6	51.7	54.1	56.3	58.4	60.2	61.8
~95% Interval	45.0-58.3	44.7-58.6	42.0-57.0	43.4-59.1	44.2-60.5	46.3-63.1	48.4-65.6	50.3-67.8	51.9-69.8	24.3-157.4
Depletion	12.8	12.8	12.1	12.6	13.0	13.7	14.5	15.2	15.8	16.4
~95% Interval	NA	NA	NA	NA	NA	NA	NA	NA	13.0-18.7	13.5-19.3

Table ES8. Summary of yelloweye reference points. The symmetric approximation of the 95% confidence interval included zero for some quantities, the lower limit is therefore rounded up.

Quantity	Estimate	~95% Confidence interval
Unfished spawning stock biomass (SB_0, mt)	3,019	2,933 - 3,105
Unfished 3+ biomass (mt)	6,810	NA
Unfished recruitment (R_0, thousands)	116.2	111.4 – 121.0
<u>Reference points based on $SB_{40\%}$</u>		
MSY Proxy Spawning Stock Biomass ($SB_{40\%}$)	1,208	1,173 - 1,242
SPR resulting in $SB_{40\%}$ ($SPR_{SB40\%}$)	0.583	0.583 - 0.583
Exploitation rate resulting in $SB_{40\%}$	0.015	NA
Yield with $SPR_{SB40\%}$ at $SB_{40\%}$ (mt)	43.7	42.3 – 45.0
<u>Reference points based on SPR proxy for MSY</u>		
Spawning Stock Biomass at SPR (SB_{SPR})(mt)		
$SPR_{MSY\text{-}proxy}$		
Exploitation rate corresponding to SPR		
Yield with $SPR_{MSY\text{-}proxy}$ at SB_{SPR} (mt)		
<u>Reference points based on estimated MSY values</u>		
Spawning Stock Biomass at *MSY* (SB_{MSY}) (mt)	1,164	1,130 – 1,198
SPR_{MSY}	0.573	0.573 - 0.574
Exploitation Rate corresponding to SPR_{MSY}	0.016	NA
MSY (mt)	43.7	42.4 - 45.1

Introduction

Life History

Yelloweye rockfish (*Sebastes ruberrimus*) can be characterized as relatively low in abundance, extremely long-lived (aged up to 120 years), late maturing, and slow growing. They primarily inhabit high-relief rocky areas from northern Baja to the Aleutian Islands in depths 15 to 550 meters (Rosenthal et al. 1982; Eschemeyer et al. 1983; Love et al. 2000). Adult yelloweye are carnivorous feeding primarily on other rockfishes, herring, sand lance, crab and shrimp (Washington et al. 1978; Rosenthal et al. 1988; Reilly et al. 1994; Love 1996).

Stock Structure

This assessment update treats the yelloweye stock as a single coast-wide assemblage; no attempt to evaluate the separate WOC (Washington, Oregon, California) models has been made. Additional information about stock structure can be found in Wallace et al. (2006).

Fishery

Yelloweye rockfish are highly prized by sport fishers due to their size, beauty, and quality. Commercial fishers value their high market demand and ex-vessel price. Yelloweye rockfish inhabit areas typically inaccessible to trawl gear and catch in the coastal trawl fishery primarily results from incidental harvest associated with other target fisheries operating at the fringes of this habitat. However, due to lack of information it is impossible to determine if yelloweye distribution is now limited due to past intense fishing pressure in more easily accessible habitats. Yelloweye are also caught incidentally in both commercial hook-and-line and sport fisheries targeting other species found in association with the yelloweye habitat preferences. This species has been subjected to a periodic target fishery for both commercial hook-and-line and sport fisheries at least since the 1970's. (Wallace et al. 2006).

Management history

Management of rockfish has had a long history beginning in 1983 when the Pacific Fisheries Management Council (PFMC) first imposed trip limits on landings on about 50 species comprising the *Sebastes* complex. Yelloweye were managed as part of the *Sebastes* complex until 2000, when the Council established three minor rockfish groupings: Nearshore, Shelf and Slope. Since 2002, yelloweye has been managed with its own ABC, OY, and trip limit specifications. See Wallace et al. (2006), for more on management history and performance, including commercial and sport fisheries information.

Assessment

Documentation of updated data sources

Catch Data

The updated yelloweye catch data by year and fishery is given in Table 1. The 2005 GMT Scorecard data in the 2006 model was updated with more finalized data, and the 2006 catch, the majority of which is from the 2006 GMT Scorecard, was divided up by state, using a ratio that included the previous two years of catch data by state. Catch histories for all fleets were refreshed for the period 1983-2005. Catches prior to 1983 are taken from Wallace et al. (2006). Table 2 shows the difference in the catch from the 2007 and 2006 models. Annual total catch of yelloweye rockfish peaked around 1980, and remained above 200 mt throughout the mid-1990s. Catch declined sharply between 1997 and 2001 (Figure 1).

Fishery size and age
Length composition data were updated for the following fisheries: California recreation; California, Oregon, and Washington trawl; and Washington hook & line. Length data were also updated for the IPHC survey index.

Age composition data were updated for these fisheries: California and Washington trawl, and Washington hook & line. The new composition data are available in the SS2c data file in Appendix A.

Indexes
The IPHC survey was the only index that needed to be updated, and the 2006 value was provided by Washington Department of Fish and Wildlife (WDFW) (Theresa Tsou, personal communication).

It appears from the data provided for the IPHC survey and the Washington recreation index that the standard deviation of the non-log-transformed data was input into the SS2 data file for the variability of the indexes. However, index variability is appropriately provided to SS2 in the form of the *standard deviation of the logged data* (or its proxy – the un-logged data's 'standard deviation CV' for values less than 0.2). This header is labeled 'selog' (not 'sdlog' as the need for the standard deviation might imply) in the standard SS2 data file. A change in the 'selog' values for the IPHC survey proved insignificant. There was insufficient time to fully explore the specification of variability the other indexes, and they remain unchanged.

Model Structure

The stock assessment program, Stock Synthesis 2 version 'c', was used for this assessment update. SS2 was written by Dr. Richard Methot, NOAA Fisheries Service in Seattle (Methot 2000). SS2 is a forward population projection model that simulates the dynamics of a stock within a statistical estimation framework.

In the process of compiling data for this updated assessment, several errors were uncovered in the data input files used for the previous assessment. These errors and their associated corrections are detailed below.

Length Composition Vector Correction
The length-composition vector for the 2006 assessment is specified in Appendix A of Wallace et al. (2006) as:

37#N length bins

18	20	22	24	26	28	30	32	34	36	38	40
42	44	46	48	50	52	54	56	58	60	62	64
66	68	70	72	74	76	78	80	82	84	86	88
90											

This vector incorrectly specifies the upper bound of the length bins, not their lower bound, as required by SS2. This error was verified with the prior assessment author (personal communication, Farron Wallace, WDFW).

The correct length composition vector for the 2006 model is:

37 #N length bins

16	18	20	22	24	26	28	30	32	34	36	38
40	42	44	46	48	50	52	54	56	58	60	62
64	66	68	70	72	74	76	78	80	82	84	86
88											

Since the corrected model now sees the entire population as being of smaller length, estimated biomass is reduced throughout the time series, relative to the 2006 assessment. The effect of correcting these model inputs on the 2006 base-model estimates of spawning biomass is presented in Table 3 and Figure 2.

Age Composition Vector Correction

A comparable problem was discovered with the specification of the age-composition vector. In the 2006 model, the age composition vector was specified as:

36 # N age' bins

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	35	40	45	50	55	60	65	70

The correct specification of the age bins is:

36 # N age' bins

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	35	40	45	50	55	60	65

The resulting changes in age compositions can be seen in Figures 3-5. Since the corrected model now sees the entire population as being of younger age, estimated biomass is reduced throughout the time series. The effect of correcting this error on model results is also presented in Table 3 and Figure 2.

Washington Trawl Ages Included with Washington Hook & Line Age compositions

Close examination of data extracted for this assessment revealed that the Washington hook-and-line age compositions used in the 2006 coast-wide base model included the Washington trawl ages for two of the three years (2002 and 2004). These trawl ages had a significant proportion of older fish (see Figures 3 and 4) which were included in the age compositions of both fleets. Additionally, the hook-and-line age composition in 2001 of the 2006 base model showed a large spike of fish at 29 cm (Figure 5) that is not observed in the data extracted for this assessment. Since there were no trawl age-composition data available for 2001, the source of this difference remains unknown. The 2007 base model reflects the correction of the 2002/2004 problem and the revision of the 2001 age composition (Figures 6 and 7). With the older fish from the trawl fishery no longer included in both fleets' age compositions, recent biomass and depletion levels in the 2007 model are reduced further, relative to the 2006 model.

Conversion to SS2c

The 2006 SS2 ver. 1.21 model was converted to SS2c and the models compared. It was found, that in order to make the two models perform comparably during the forecast period, the emphasis for the forecast recruitment devs that occur prior to endyyr + 1 needed to be set to a large value (1000) in the new SS2c, see Figure 8. Methot (2007) states on page 70:

> *"The structure of SS2 creates no sharp dividing line between the estimation period and the forecast period. In many cases one or more recruitments at the end of the time series will lack appreciable signal in the data and should therefore be treated as forecast recruit deviations. To the degree that some variability is observed in these recruitments, partial or full bias correction may be desirable for these devs separate from the purely forecast devs, there is therefore an additional control for the level of bias correction applied to forecast deviations occurring prior to endyear+1."*

Super Year Method Updated

The 2006 assessment employed a "super-year" approach for dealing with small sample sizes for age and size compositions in some years. The method by which super years were handled was updated from the method used in the earlier version of SS2 to the 'compare expected aggregation to observed aggregation' method put forth in the SS2 documentation. This change slightly increased the model estimates of spawning biomass (see Figure 6 and compare the length and age compositions in Appendix A for Wallace et al. (2006) to those in Appendix A of this document.)

Data Added

New and updated data were added in two steps. First, the 2005 data, updated as described above and the 2006 catch data from Table 1 were added to the 2007 model. Length- and age-composition data for 2005 and 2006 were also updated. Secondly, all updated/refreshed data were added to the model. Figures 6 and 7 and Table 4 provide comparisons of the spawning biomass trajectories of the updated and prior models.

Base-run Results

Spawning biomass and spawning depletion for the 2007 base model are displayed in Figure 9.

The 2007 fits to the length-composition data for California, Oregon, and Washington fisheries and the IPHC survey are displayed in Figures 10-13.

Figure 14 shows the expected numbers-at-age, by year, and mean age, by year, for the 2007 base model.

Sensitivity Analysis for Natural Mortality

During the course of the STAR panel which reviewed the 2006 yelloweye rockfish assessment, consensus was reached to reduce the value of M in the models from 0.045 to 0.036. This decision was based on information provided at the meeting by CaiHong Fu (DFO, Canada), who communicated to the STAT team that her current yelloweye model value for M was being estimated with good stability at 0.033. After the 2006 STAR panel, CaiHong updated her catch and dropped some composition data; this resulted in the updated model estimating M at 0.043 (Fu et al., submitted). The Chair of the STAR Panel has conveyed that if the 0.043 value had been available during the review, it would likely have been recommended for use, rather than the 0.036 value (Owen Hamel, personal communication).

The sensitivity of the 2007 base model fit to changes in M is shown in Figures 15 and 16. Models below the dashed line are not significantly different from the lowest model which has an M of 0.045. Model fit is degraded by roughly 19 log-likelihood units with M=0.036, relative to values of M in the 0.043-0.046 range.

Based on this guidance and the sensitivity testing, an alternative model (M=0.043) to the 2007 base case (M=0.036) was developed, to provide a basis for correcting the errant advice received during the 2006 STAR panel. For more information on yelloweye natural mortality, please refer to Table 11 and the section on natural mortality (starting on page 16) in Wallace et al. (2006).

Reference Points

The unfished spawning stock biomass is estimated to be 3,019 mt in the base model, and 3,062 mt in the alternative (M=0.043) model (Table 5). The spawning biomass targets for these models are 1,208 mt and 1,225 mt, respectively. The overfished biomass levels for these models are 755 mt and 766 mt, respectively. The current spawning biomass is estimated to be 422 mt with the base model and 485 mt with the alternative model. Current depletion estimates for these models are 14.5% and 16.4%, respectively. The F_{MSY} proxy harvest rate for yelloweye rockfish if $F_{50\%}$. Reference points for the base model are presented in Table 6.

Harvest projections

Ten-year forecasts were generated for the base and alternative models (Table 7). In both cases, harvests for 2007-2010 were fixed at the ramped-down amounts adopted by the Council in the 2006 yelloweye rebuilding plan. OY amounts for 2011-2018 were estimated through application of the harvest rate (SPR=71.9%) adopted for 2011 and beyond in existing rebuilding plan. Given these specifications, both models exhibit increases in depletion percentage throughout the forecast period. However, in the base model, the projected OY for 2011 declines from 14 mt (the 2010 ramp-down amount) to 10.3 mt (Table ES5). In the alternative model, with M=0.043), the 2011 OY is 13.7 mt. Spawning biomass and spawning depletion forecasts for the 2007 base model can be seen in Figure 9.

Comparison of Alternative Washington Recreational CPUE Indexes

The comparison of including an OSP bottom fish only (BFO) index to an aggregate index that includes both the OSP BFO and OSP halibut-directed trips is shown in Figure 17. See Figure 7 in Wallace et al. (2006) for a plot of these abundance indexes. The 2007 depletion level for the model with both the OSP BFO and OSP halibut is 14.7% versus 14.5% for the 2007 base model (Table 4).

Acknowledgments

I wish to thank Farron Wallace for help with the 2006 yelloweye model, Theresa Tsou for assistance with WDFW data, Wade Van Buskirk for aid with RecFIN data, and Don Bodenmiller for help with the Oregon data. I would also like to heartily thank Ian Stewart for help with SS2 and Jim Hastie for reviewing the manuscript.

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Wallace, F., Tsou, T., Jagielo, T., and Cheng, Y.W. 2006. Status of Yelloweye Rockfish off the U.S. West Coast in 2006. *In* Stock Assessment and Fishery Evaluation. Pacific Fishery Management Council 2130 SW fifth Ave. Suite 224, Portland, Ore. 97210.

Table 1. Updated yelloweye catch data by state and fishery for the 2007 model. Note that in the footnotes, 'Hastie' refers to Hastie (2006) for data listed in year 2004, and Hastie and Bellman (2006) for data listed in year 2005. Light grey in the California sport fishery indicates that the data were interpolated. Dark grey in Washington hook & line fishery indicates that the data from an unlisted source, given in the Table 1 of Wallace et al. (2006), has been used, and the absence of PacFIN data for those years was not assumed to imply zero catch.

	California			Oregon			Washington		
Year	Trawl[1/]	Line[2/]	Sport[3/]	Trawl[1/]	Line[4/]	Sport[5/]	Trawl[1/]	Line[6/]	Sport[7/]
1980			67.1						
1981			46.9						
1982			102.1	14.4					
1983	57.0	5.3	50.5	177.3			6.5		
1984	44.0	3.6	77.3	57.1			3.0		
1985	7.4	3.7	123.6	91.9			10.5		
1986	9.9	22.0	64.6	59.8			2.7		
1987	16.8	34.2	75.2	65.1			6.0		
1988	30.6	23.8	57.5	110.7			15.8		
1989	9.4	34.1	58.7	170.1			27.9		
1990	10.1	59.0	46.1	61.1			18.8		
1991	14.0	129.5	33.6	104.8	33.0		15.8		
1992	15.8	95.5	21.0	107.8	58.0		25.1		
1993	6.2	46.1	8.5	119.3	63.9		17.6		
1994	4.7	48.8	14.4	77.6	24.6		7.2		
1995	3.7	46.9	12.6	125.6	22.7		8.1		
1996	16.2	54.3	12.5	70.3	22.2		8.6		
1997	6.0	56.4	15.1	71.4	44.1		6.5		
1998	4.0	16.8	5.5	20.8	20.6		4.8		
1999	8.7	13.6	12.6	7.1	54.2		9.9		
2000	0.7	3.3	7.5	0.3	3.3		0.2	[redacted]	
2001	0.6	3.9	4.6	0.7	5.5		0.8	[redacted]	
2002	0.2	0.0	2.1	0.4	0.3		0.4	2.2	
2003	0.0	0.0	3.7	0.2	0.0		0.2	0.3	
2004	0.3	0.0	0.8	0.9	0.7	2.4	0.9	4.0	3.7
2005	0.1	0.0	1.6	0.3	0.5	4.1	0.4	3.2	5.2
2006	0.0	0.0	3.5	0.3	0.5	2.5	0.3	2.9	1.7

[1/]PacFIN:1983-2003, 2006; Hastie:2004-2005.
[2/]PacFIN:1983-2003; Hastie:2004-2005; GMT Scorecard:2006.
[3/]MRFSS:1980-1989,1993-2006; Interpolated:1990-1992.
[4/]PacFIN:1991-2003; Hastie:2004-2005; GMT Scorecard:2006.
[5/]Hastie:2004-2005; GMT Scorecard:2006.
[6/] PacFIN:2002-2003; Hastie:2004-2005; GMT Scorecard:2006. 2004, 2005, & 2006 include 1.0, 0.8, & 0.5 for tribal, respectively.
[7/]Hastie:2004; Wallace, F. (personal communication):2005; GMT Scorecard:2006.

Table 2. Difference in catch between 2007 coast-wide model and the 2006 coast-wide model. (i.e. 2007 catch data minus 2006 catch data). California and Oregon commercial include hook & line data.

Year	CaRec	CaCom	OrRec	OrCom	WaRec	WaCom6	WaLine
1983	-0.5	4.7	0	0	0	0	0
1984	-3.5	2.7	0	0	0	0	0
1985	-2.2	2.3	0	0	0	0	0
1986	-0.9	0.9	0	0	0	0	0
1987	0	-2.7	0	-0.6	0	0	0
1988	0	-10.5	0	0	0	0	0
1989	0	-6.6	0	0.7	0	0	0
1990	0	-10.7	0	0	0	0	0
1991	0	2.4	0	1.8	0	0	0
1992	0	-0.9	0	0	0	0	0
1993	0	-0.7	0	0	0	0	0
1994	0	-0.9	0	0	0	0	0
1995	0	2.1	0	-0.8	0	0	0
1996	0	4.7	0	-5.2	0	0	0
1997	0	0.2	0	-0.1	0	0	0
1998	-0.3	-0.8	0	0.1	0	0	0
1999	0	0.1	0	0.1	0	-0.1	0
2000	0	0	0	0	0	0	0
2001	0	0	0	0	0	-0.2	0
2002	0	0.1	0	0	0	0	0
2003	0	0	0	-0.8	0	0	0
2004	-2.7	0.3	0	0.9	-0.8	0.8	3.2
2005	-2.1	-1.5	-0.2	-3.7	0.1	-3.9	3.2

Table 3. Model benchmarks for comparison of 2006 coast-wide models in SS2 ver. 1.21 .

	Models (All SS2 ver. 1.21)		
Reference Point	2006 Star Base	2006 Base: Length Comp Vector Corrected	2006 Base: Length & Age Comp Vector Corrected
[1/]Unfished Spawning Stock Biomass (SSB_0)	3322	3168	3141
Unfished Exploitable Biomass (B0)	7448	7176	7100
Unfished Recruitment (log(R0))	4.85	4.87	4.82
[1/]SSB_{2006}	588	506	501
Depletion Level (2006)	17.7%	16.0%	16.0%

[1/] These values are expressed in female biomass (one-half of the single-sex model's SSB_0).

Table 4. Model benchmarks for comparison of coast-wide models in SS2c. (Includes a small correction for a change in the IPHC Index proxy for the standard error of the log of the index.)

	Model (All SS2c)		
Reference Point	2006 Base: Length & Age Comp Vector Corrected	2005 Data Updated and 2006 Data Added	All Catch, Length & Age Comps Updated (2007 Base)
[1/]Unfished Spawning Stock Biomass (SSB_0)	3103	3143	3019
Unfished Exploitable Biomass (B0)	7033	7155	6811
Unfished Recruitment (log(R0))	4.81	4.87	4.76
[1/]SSB_{2006}	483	503	422
Depletion Level (2006)	15.6%	16.0%	14.0%
Depletion Level (2007)		16.5%	14.5%

[1/] These values are expressed in female biomass (one-half of the single-sex model's SSB_0)

Table 5. Benchmarks for comparison of the coast-wide 2006 base model to the 2007 base and alternative models.

Reference Point	2006 Star Base	2006 Base: Length & Age Comp Vector Corrected	All Catch, Length & Age Comps Updated (2007 Base)	2007Alternative Model with M = 0.043
[1/]Unfished Spawning Stock Biomass (SSB_0)	3322	3141	3019	3062
Unfished Exploitable Biomass (B0)	7448	7100	6811	7044
Unfished Recruitment (log(R0))	4.85	4.82	4.76	4.76
[1/]SSB_{2006}	588	501	422	485
Depletion Level (2006)	17.7%	16.0%	14.0%	15.8%
Depletion Level (2007)			14.5%	16.4%

Table 6. Summary of yelloweye reference points. The symmetric approximation of the 95% confidence interval included zero for some quantities, the lower limit is therefore rounded up. Biomass is in metric tons and numbers are in thousands.

Quantity	Estimate	~95% Confidence interval
Unfished spawning stock biomass (SB_0, mt)	3,019	2,933 - 3,105
Unfished 3+ biomass (mt)	6,810	NA
Unfished recruitment (R_0, thousands)	116.2	111.4 – 121.0
Reference points based on SB$_{40\%}$		
MSY Proxy Spawning Stock Biomass ($SB_{40\%}$)	1,208	1,173 - 1,242
SPR resulting in $SB_{40\%}$ ($SPR_{SB40\%}$)	0.583	0.583 - 0.583
Exploitation rate resulting in $SB_{40\%}$	0.015	NA
Yield with $SPR_{SB40\%}$ at $SB_{40\%}$ (mt)	43.7	42.3 – 45.0
Reference points based on SPR proxy for MSY		
Spawning Stock Biomass at SPR (SB_{SPR})(mt)	845	821 - 869
$SPR_{MSY\text{-}proxy}$	0.500	0.500 – 0.500
Exploitation rate corresponding to SPR	0.020	NA
Yield with $SPR_{MSY\text{-}proxy}$ at SB_{SPR} (mt)	41.5	40.2 - 42.8
Reference points based on estimated MSY values		
Spawning Stock Biomass at *MSY* (SB_{MSY}) (mt)	1,164	1,130 – 1,198
SPR_{MSY}	0.573	0.573 - 0.574
Exploitation Rate corresponding to SPR_{MSY}	0.016	NA
MSY (mt)	43.7	42.4 - 45.1

Table 7. Proxy for rebuilding projection. OY for 2007-2010 represents the currently adopted ramp-down; 2011-2018 represents fishing at SPR = 71.9% to mimic rebuilding plan.

Year	Bio-Smry	Spawn Bio[1/]	Depletion	Recruit-0	OY (mt) Ramp-down Mortality (mt)	ABC
			2007 Base with M = 0.036			
2007	1134	438	0.15	41.5	23	
2008	1150	455	0.15	42.3	20	
2009	1168	470	0.15	43.1	17	22.9
2010	1187	484	0.16	43.9	14	23.3
2011	1208	497	0.16	44.7	10.3	
2012	1231	508	0.16	45.5	10.5	
2013	1254	518	0.17	46.2	10.7	
2014	1276	527	0.17	46.9	10.9	
2015	1298	535	0.17	47.5	11.1	
2016	1319	542	0.18	48.1	11.3	
2017	1339	549	0.18	48.6	11.5	
2018	1360	555	0.18	49.2	11.6	
			2007 Alternative Model with M = 0.043			
2007	1327	503	0.16	61.8	23	
2008	1348	517	0.17	63.0	20	
2009	1371	530	0.17	64.2	17	30.4
2010	1396	544	0.18	65.4	14	31.0
2011	1423	557	0.18	66.5	13.7	
2012	1449	570	0.19	67.6	14.0	
2013	1474	582	0.19	68.5	14.2	
2014	1499	592	0.19	69.4	14.5	
2015	1523	602	0.20	70.2	14.7	
2016	1547	612	0.20	71.0	15.0	
2017	1570	621	0.20	71.7	15.2	
2018	1593	630	0.21	72.4	15.4	

[1/] These values are expressed in female biomass (one-half of the single-sex model's SSB_0).

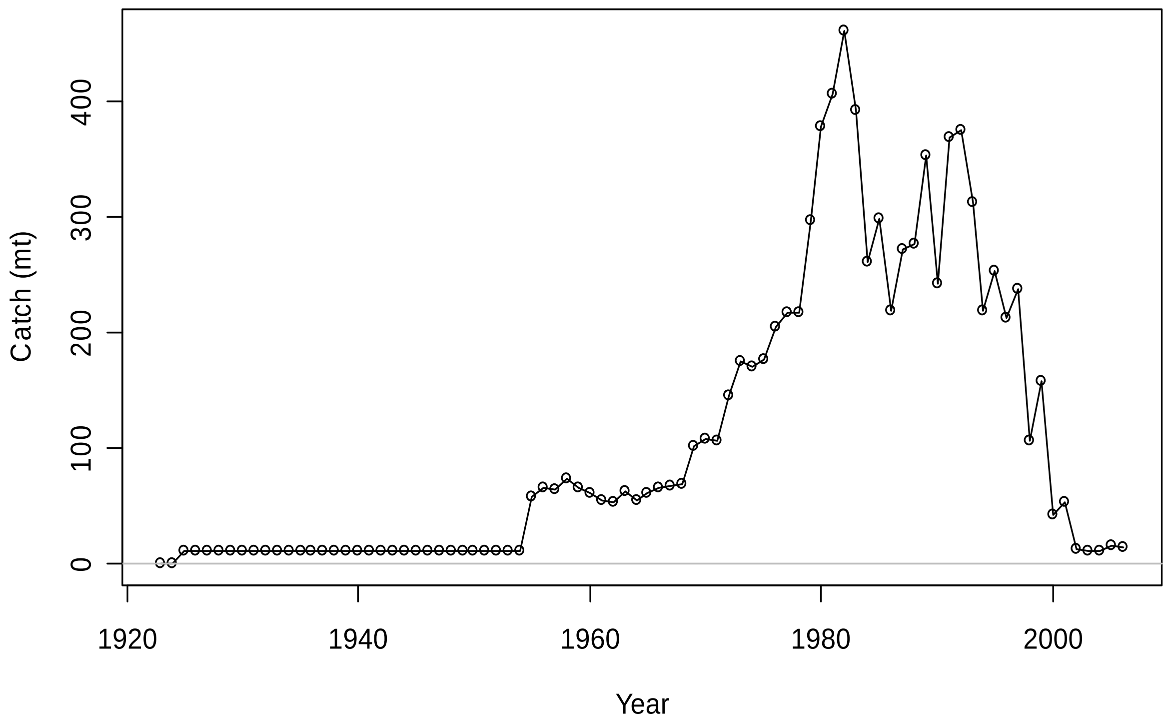
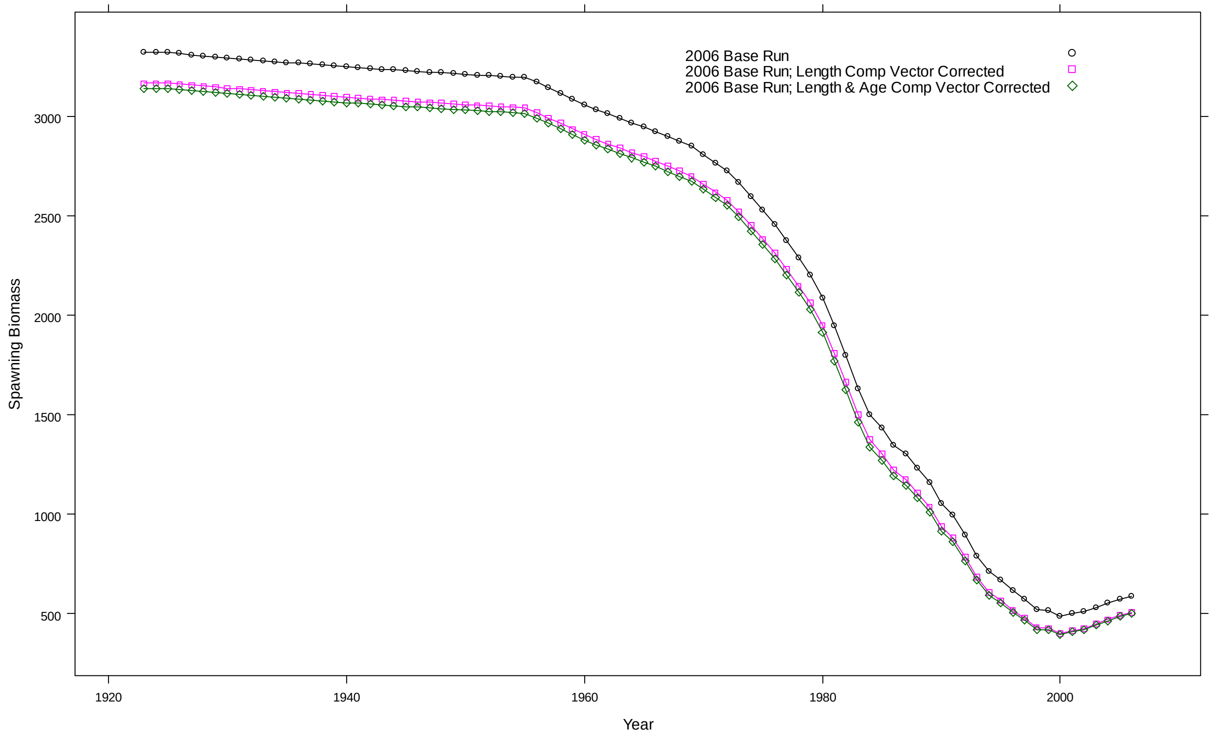


Figure 1. Reconstructed historical catch (mt) by year and fleet, 1925-2006.



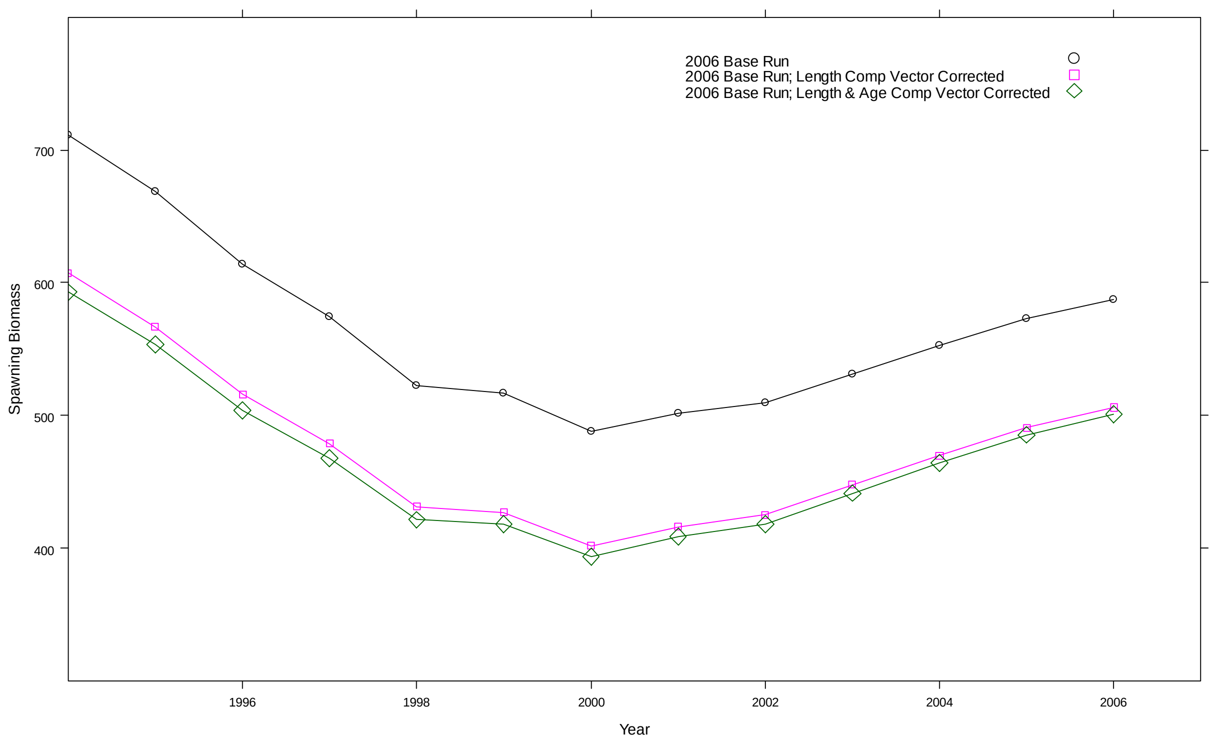


Figure 2. Spawning biomass by year for the 2006 base run in SS2 ver. 1.21, the base run with the length comp vector corrected, and both the length and comp vectors corrected. The top figure is all years, while the bottom figure is zoomed into the most recent years of data.

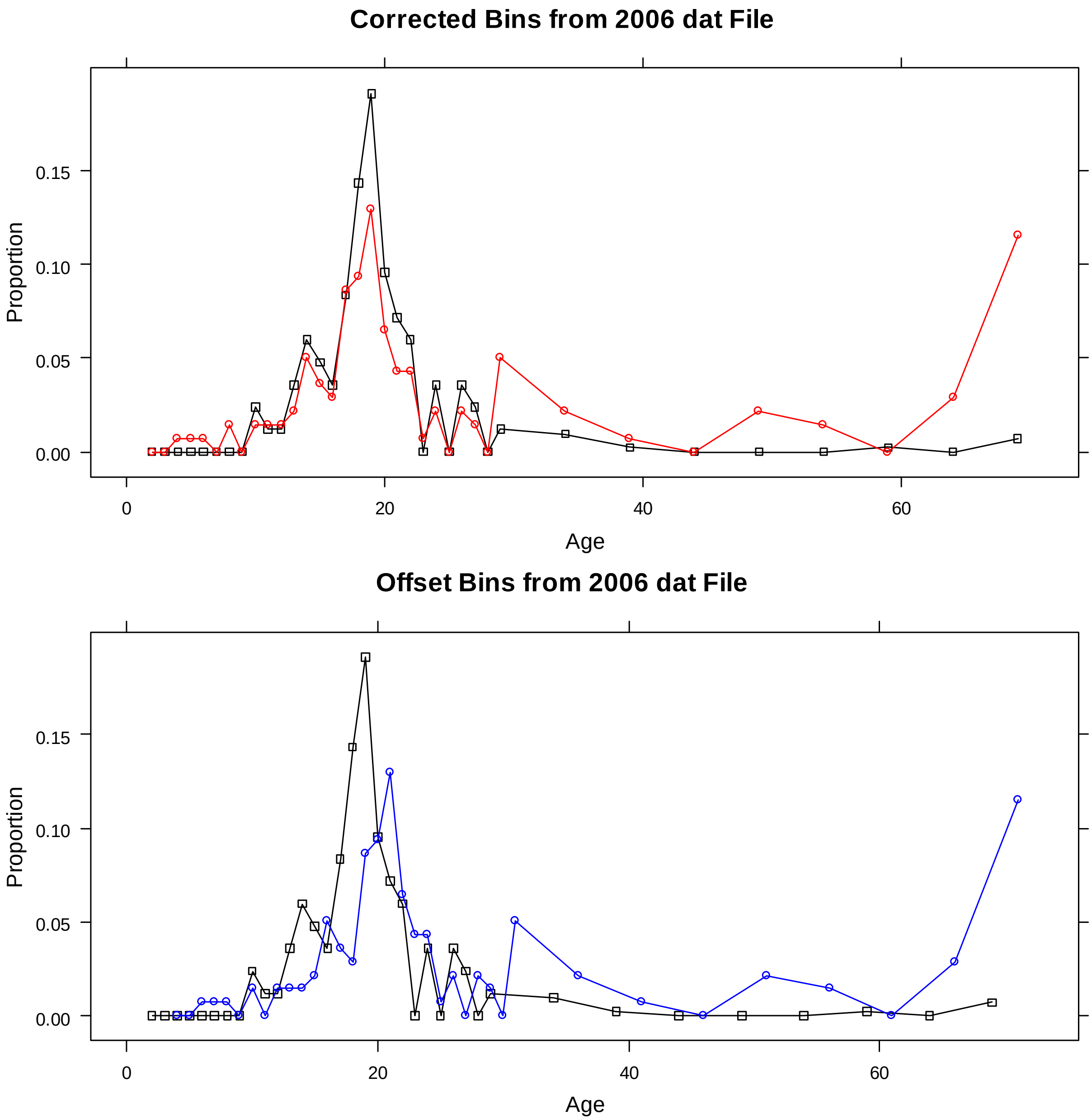
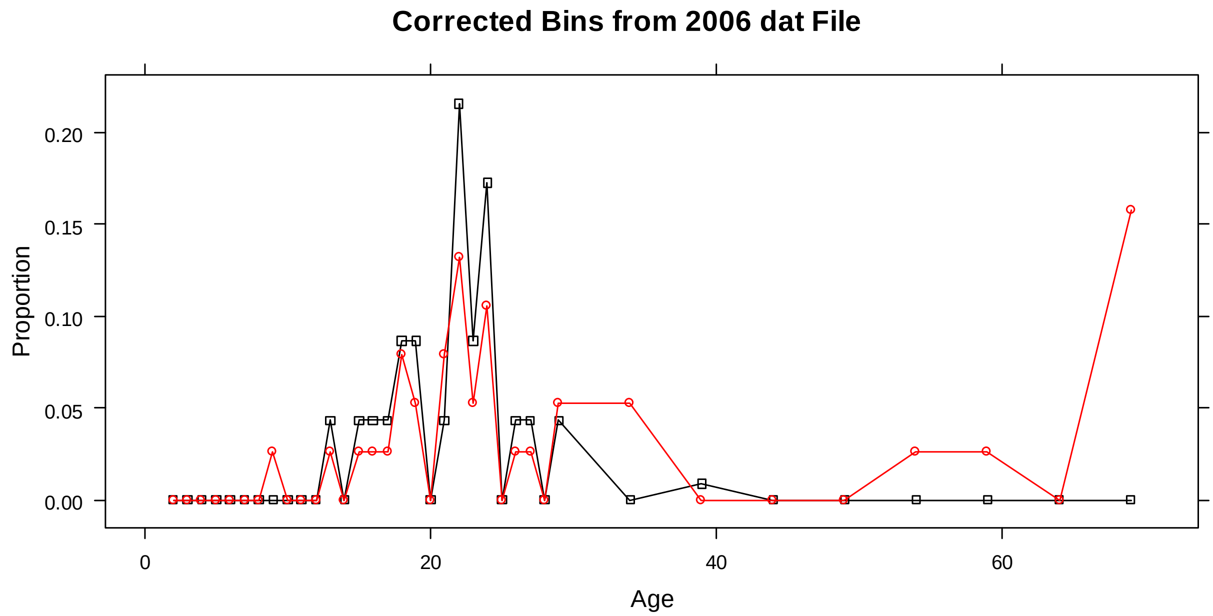


Figure 3. 2002 Washington hook-and-line age compositions for the 2006 coast-wide base model (circles) and the 2007 base model (squares).



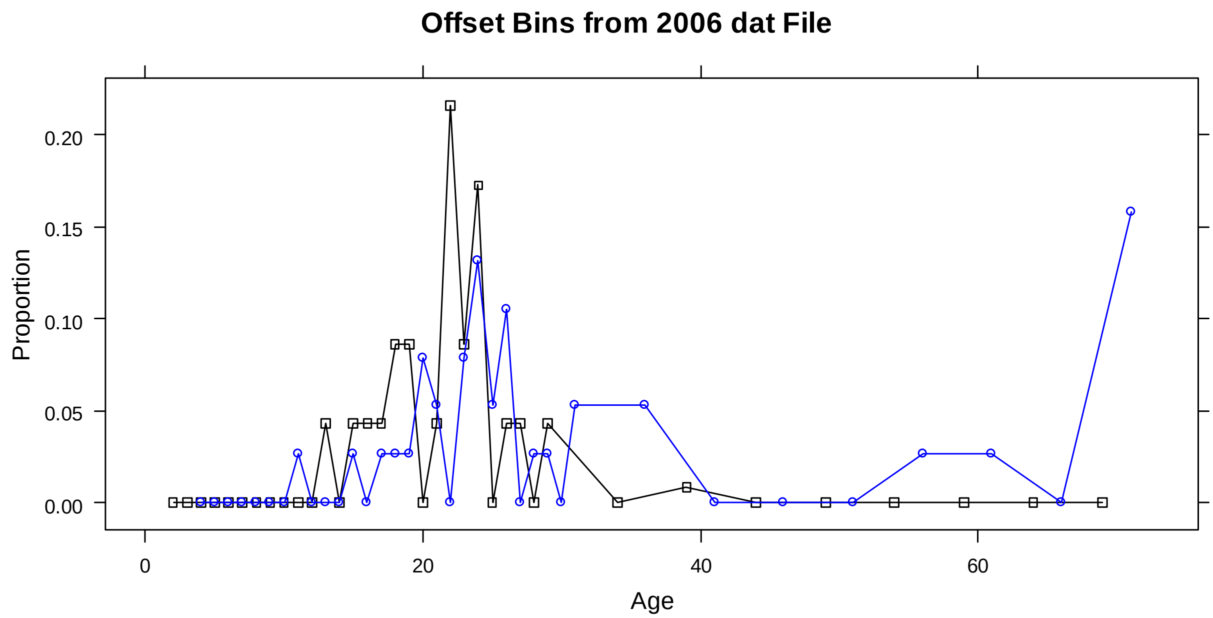


Figure 4. 2004 Washington hook-and-line age compositions for the 2006 coast-wide base model (circles) and the 2007 base model (squares).

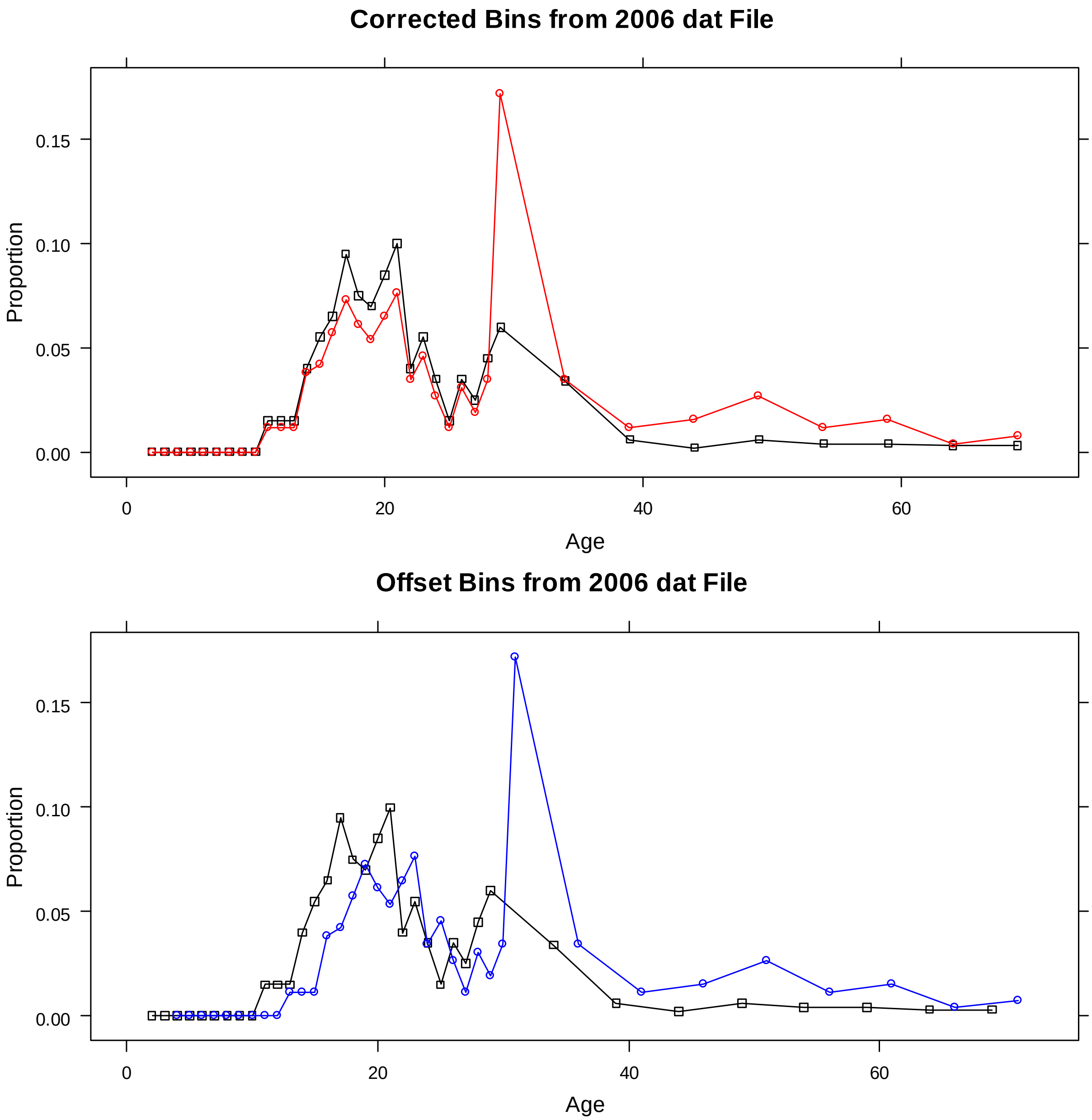
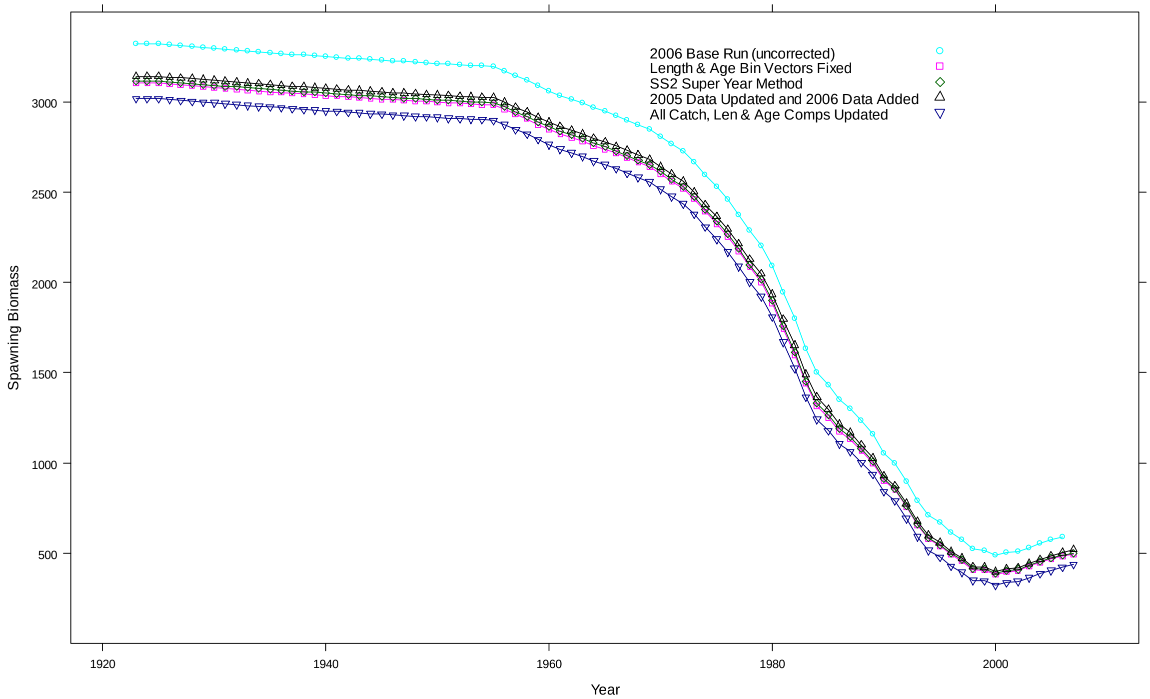


Figure 5. 2001 Washington hook-and-line age compositions used in the 2006 coast-wide base model (circles) and the 2007 base model (squares).



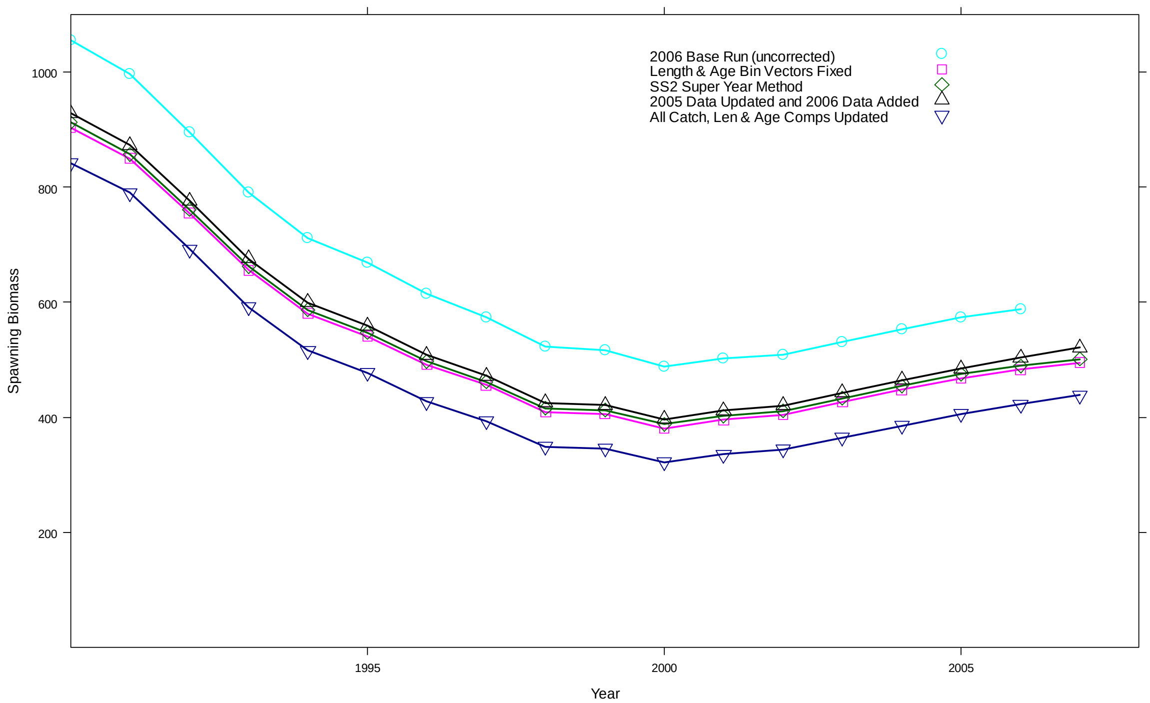


Figure 6. Comparison of spawning biomass by year for 1) the non-adjusted 2006 coast-wide base model, 2) the corrected length and age comp. vector model, 3) the SS2 super year method updated model, 4) the model with 2005 data updated and 2006 data added, and 5) the model with all catch, length and age compositions updated. All models were run in SS2c.

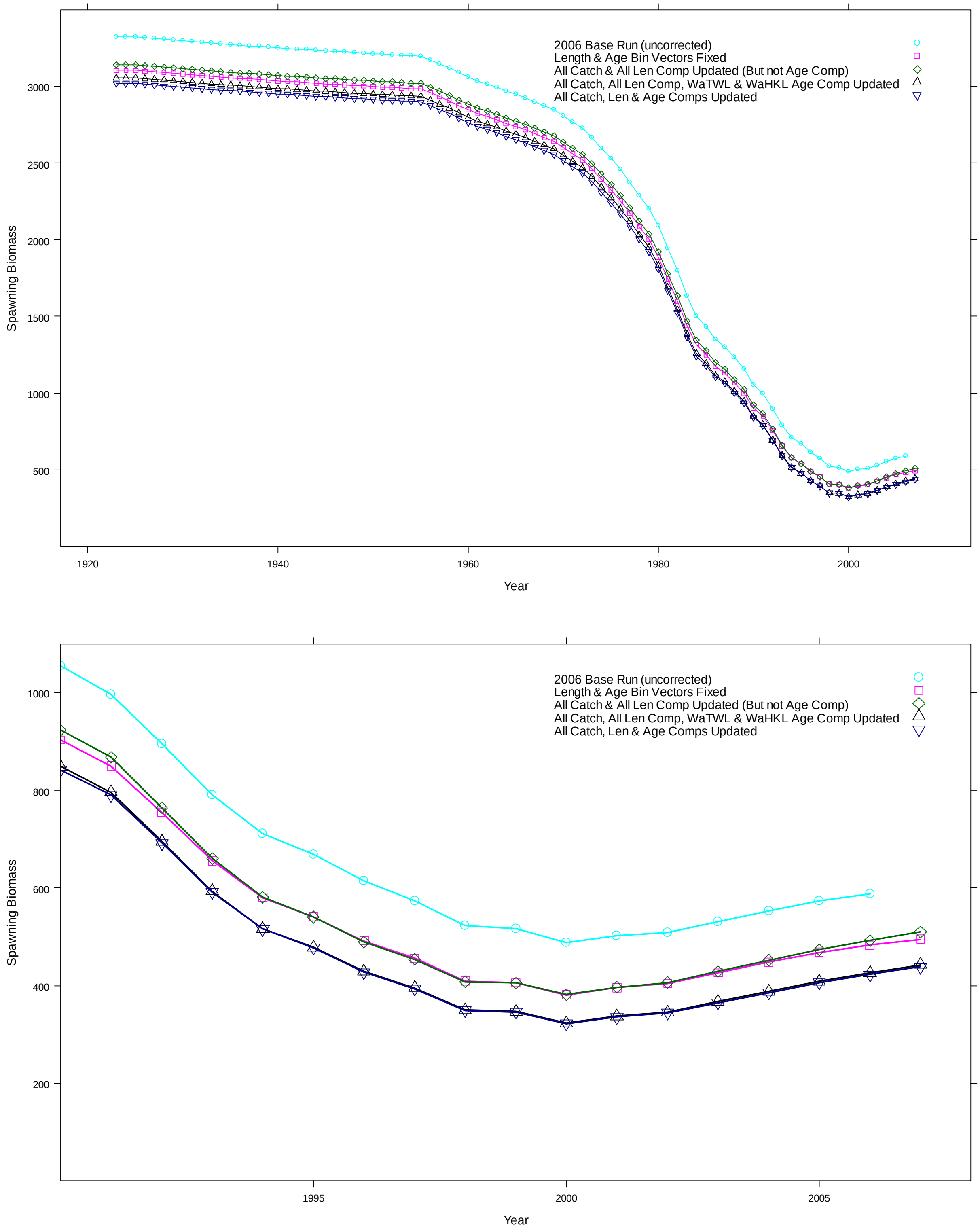
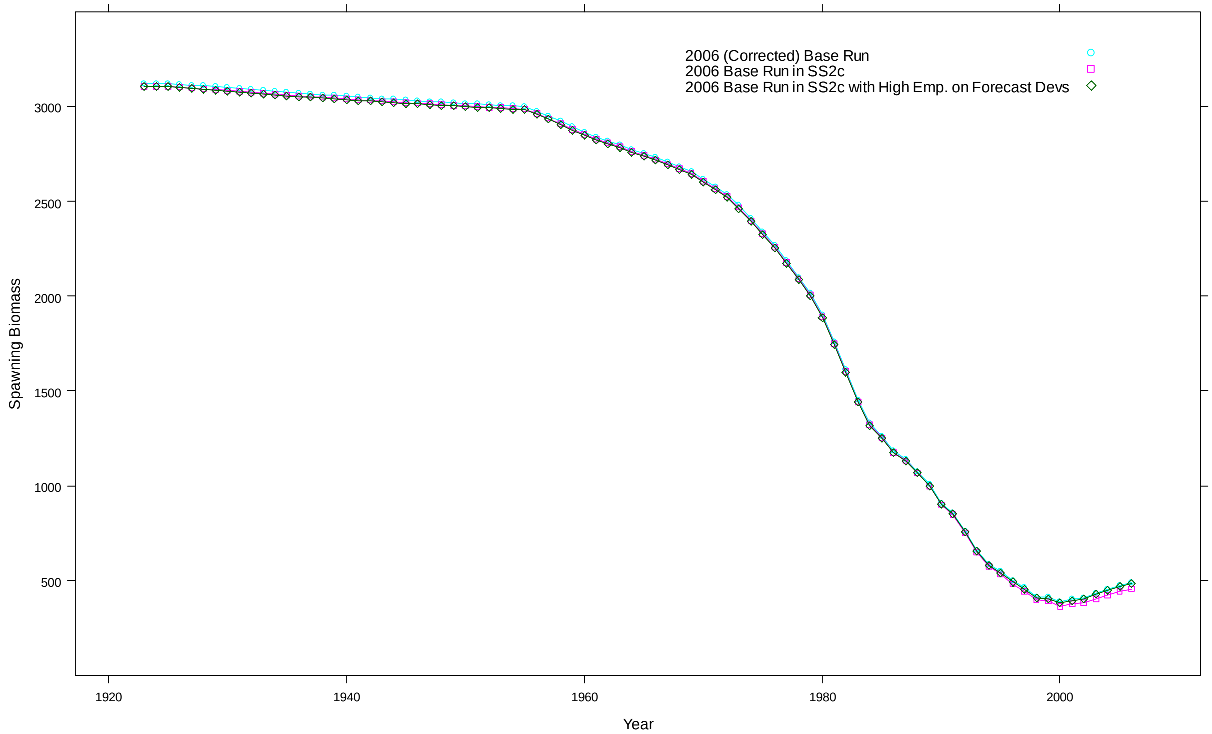


Figure 7. Comparison of spawning biomass by year for the 1) non-adjusted 2006 coast-wide base model, 2) the corrected length and age comp. vector model, 3) the model with all catch and length compositions. updated (but not age compositions), 4) the model with all catch and all length compositions updated plus the WA trawl and WA hook & line age compositions (CA commercial age compositions not updated), and 5) the model with all catch, length and age compositions updated. All models were run in SS2c.



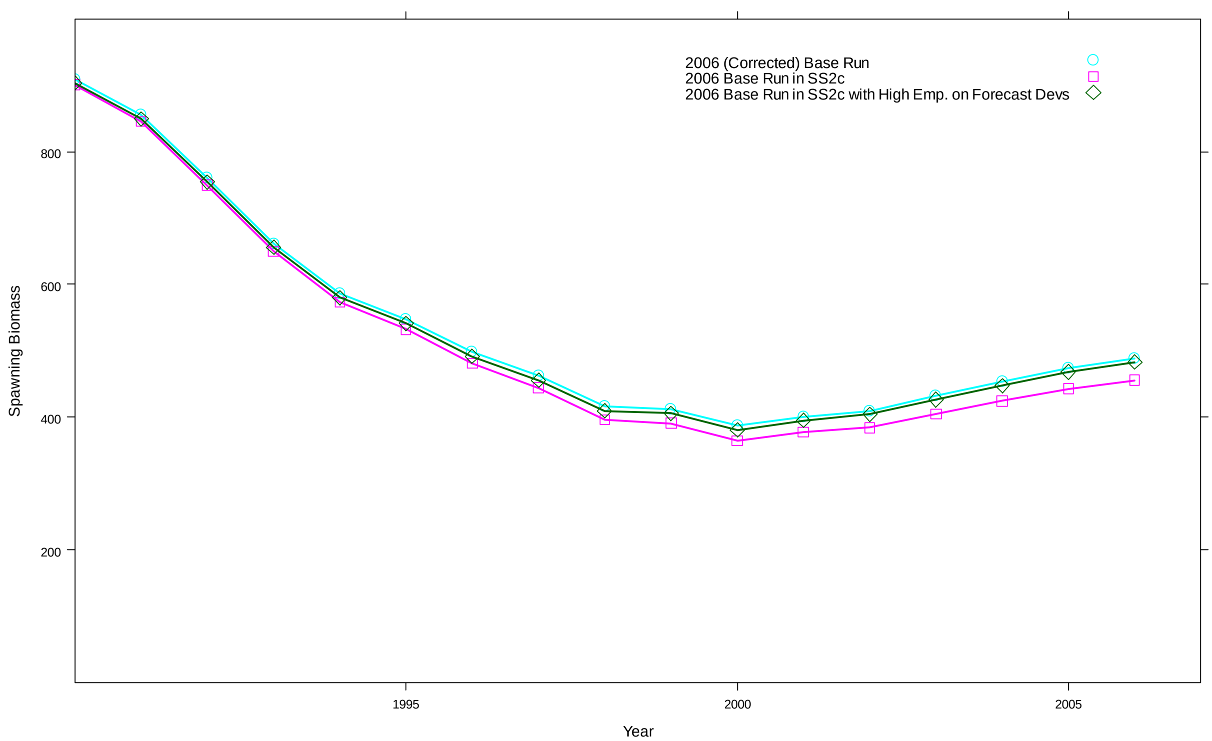


Figure 8. Comparison of spawning biomass by year for the 2006 coast-wide base model, the 2006 model in SS2c with no emphasis on the forecast devs, and the 2006 model in SS2c with emphasis on the forecast devs. All models have length and age comp vector correction.

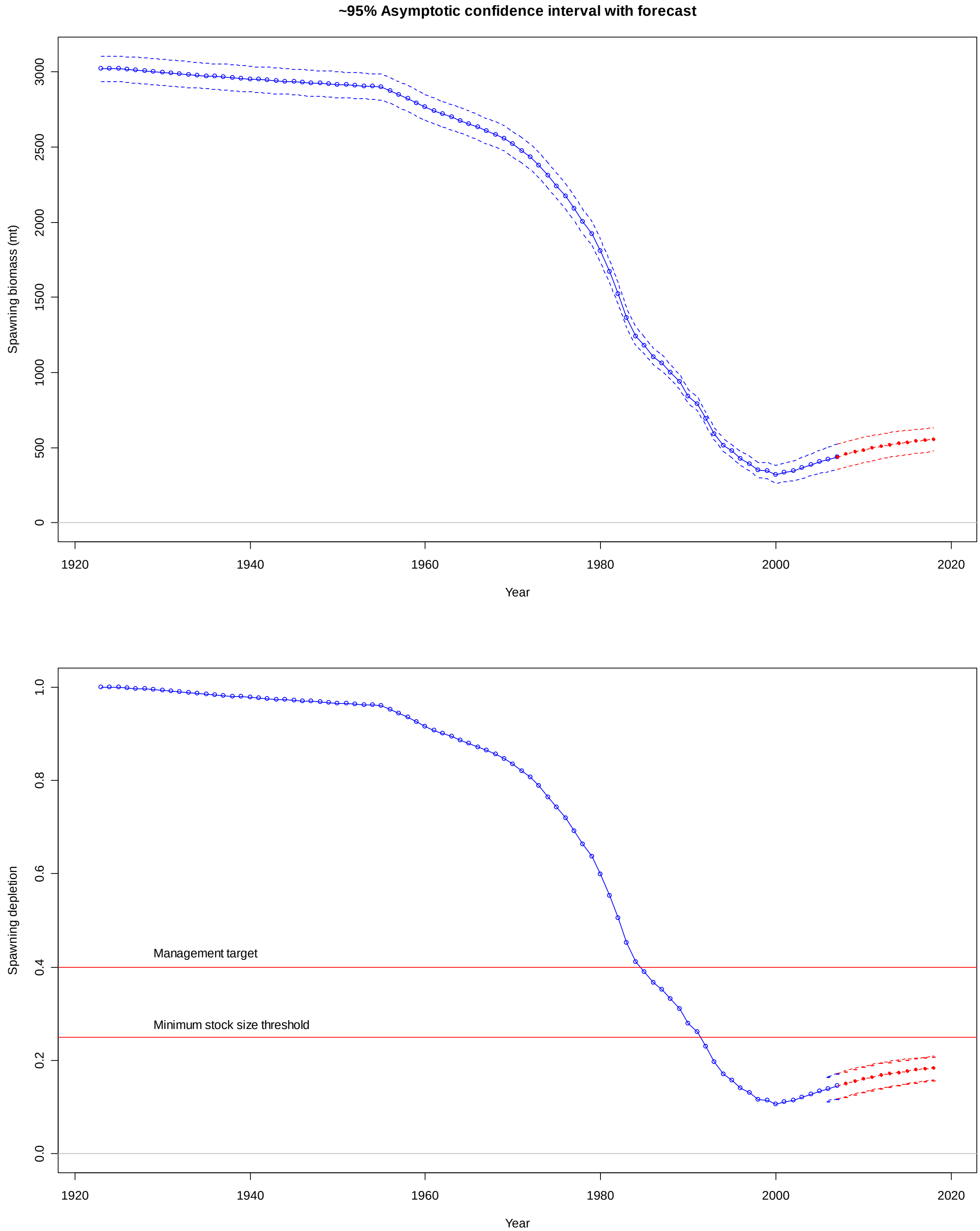
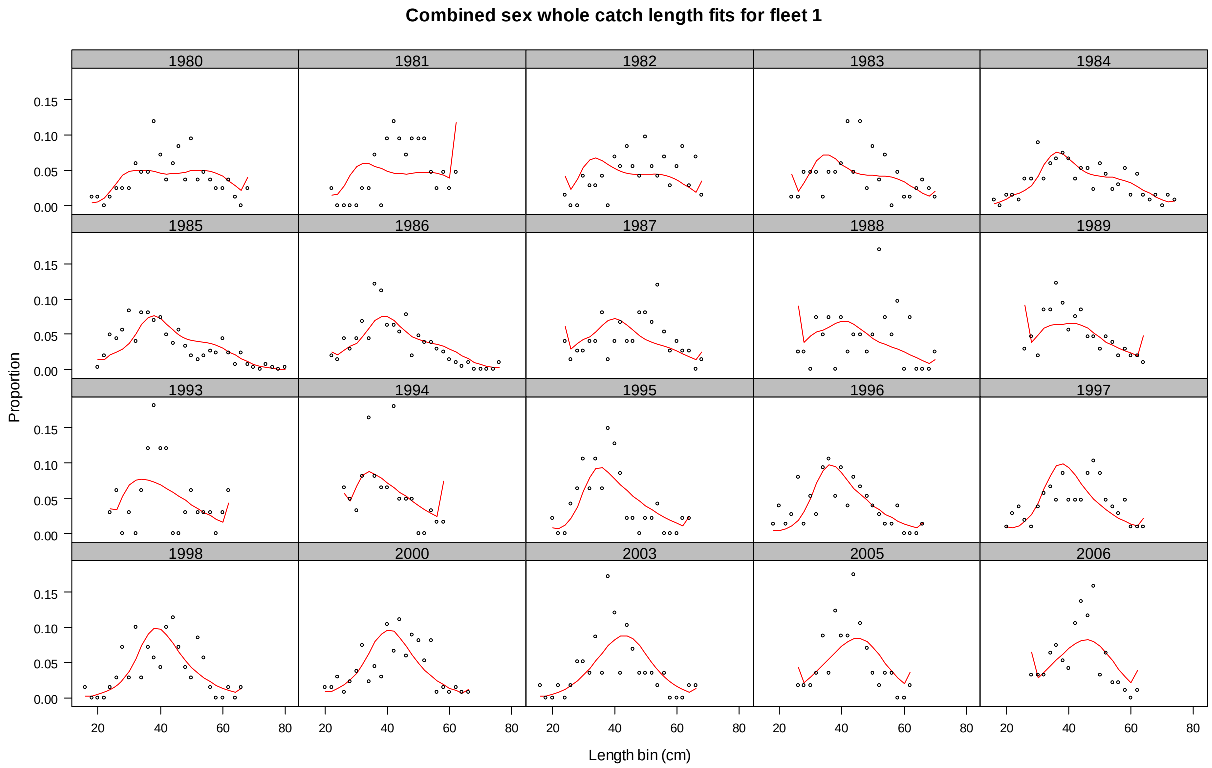


Figure 9. Spawning biomass and spawning depletion, with model forecasts, for the 2007 base model.



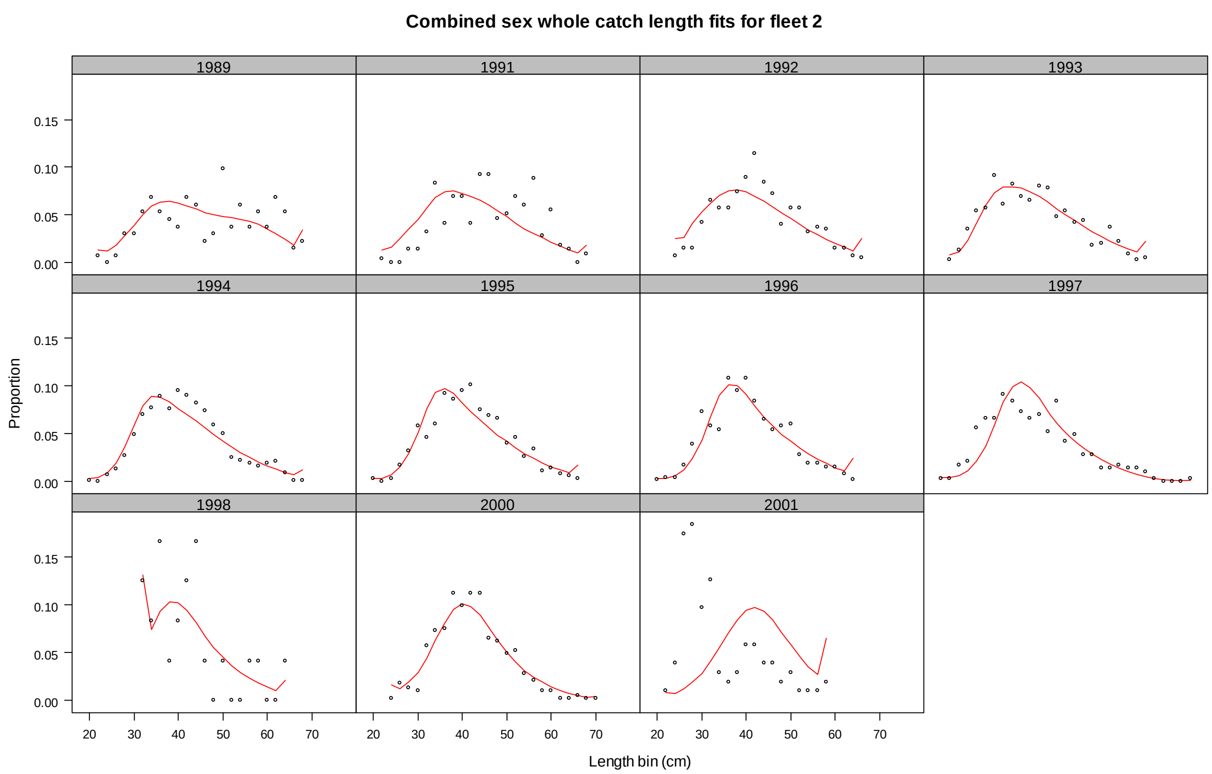
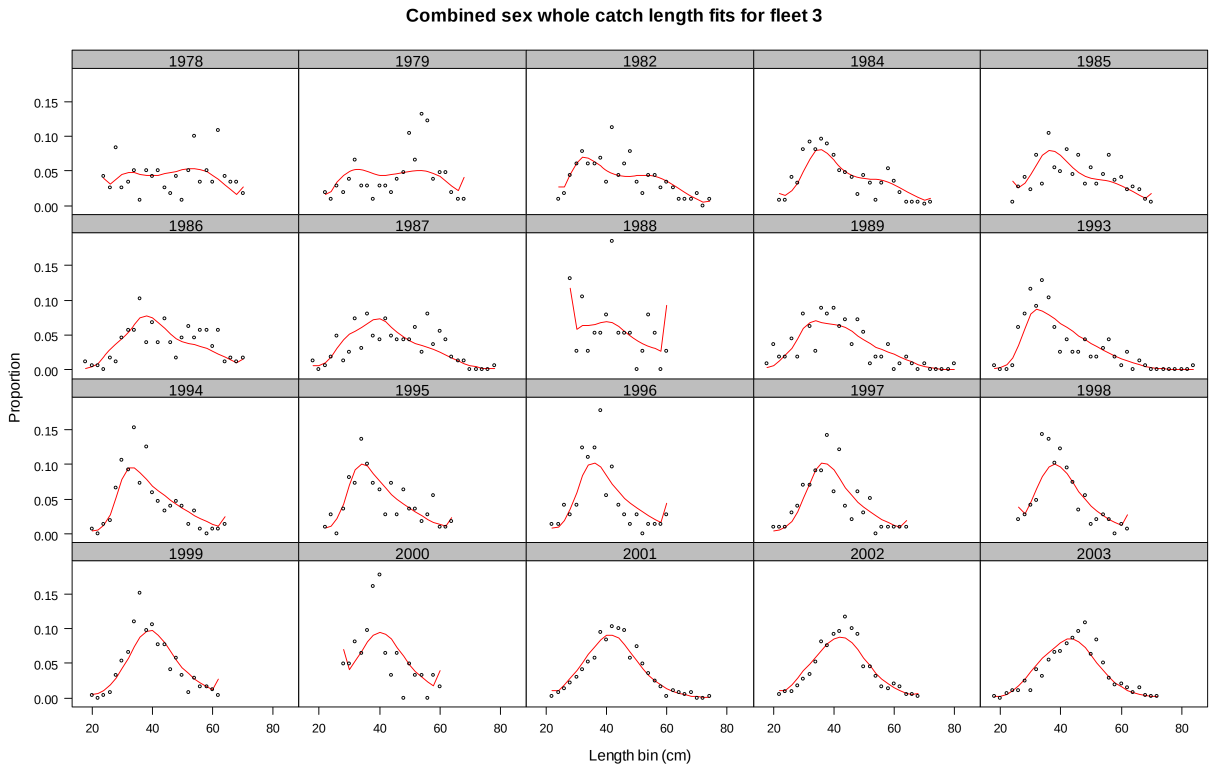


Figure 10. 2007 base model fits to the length-composition data for California recreation (top) and commercial (bottom) fisheries.



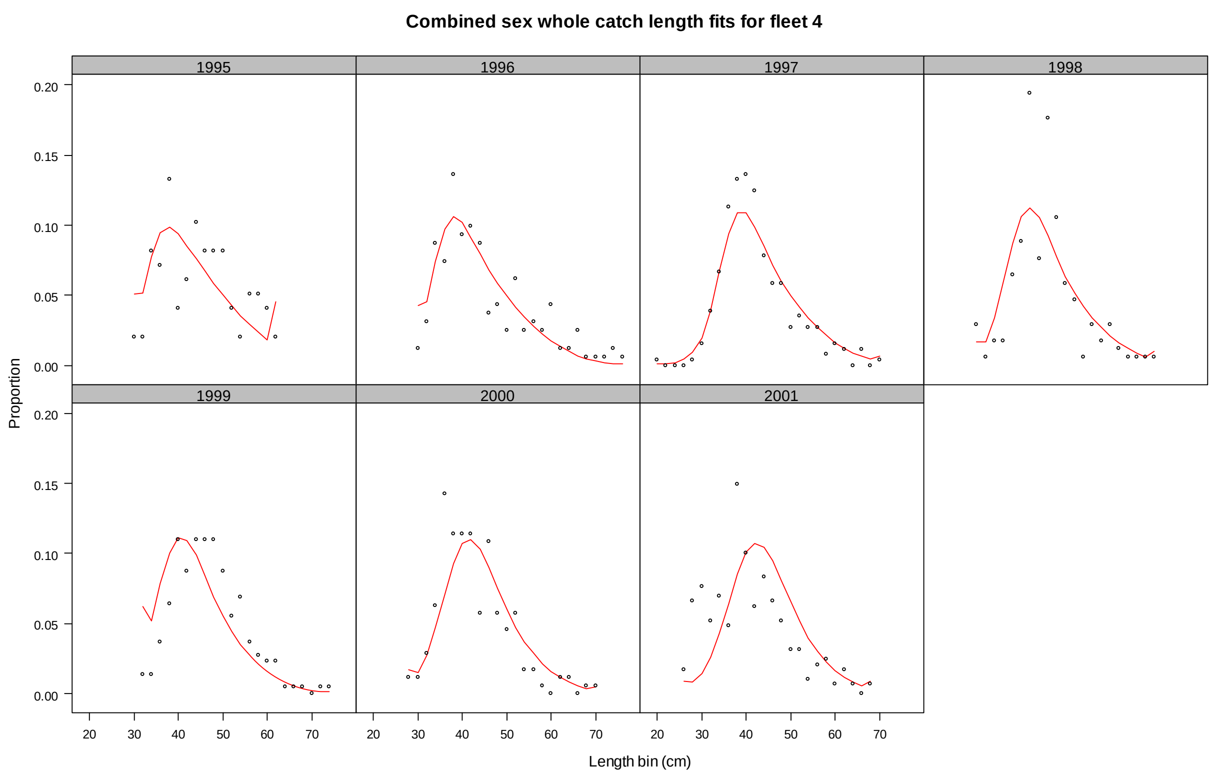


Figure 11. 2007 base model fits to the length-composition data for Oregon recreation (top) and commercial (bottom) fisheries.

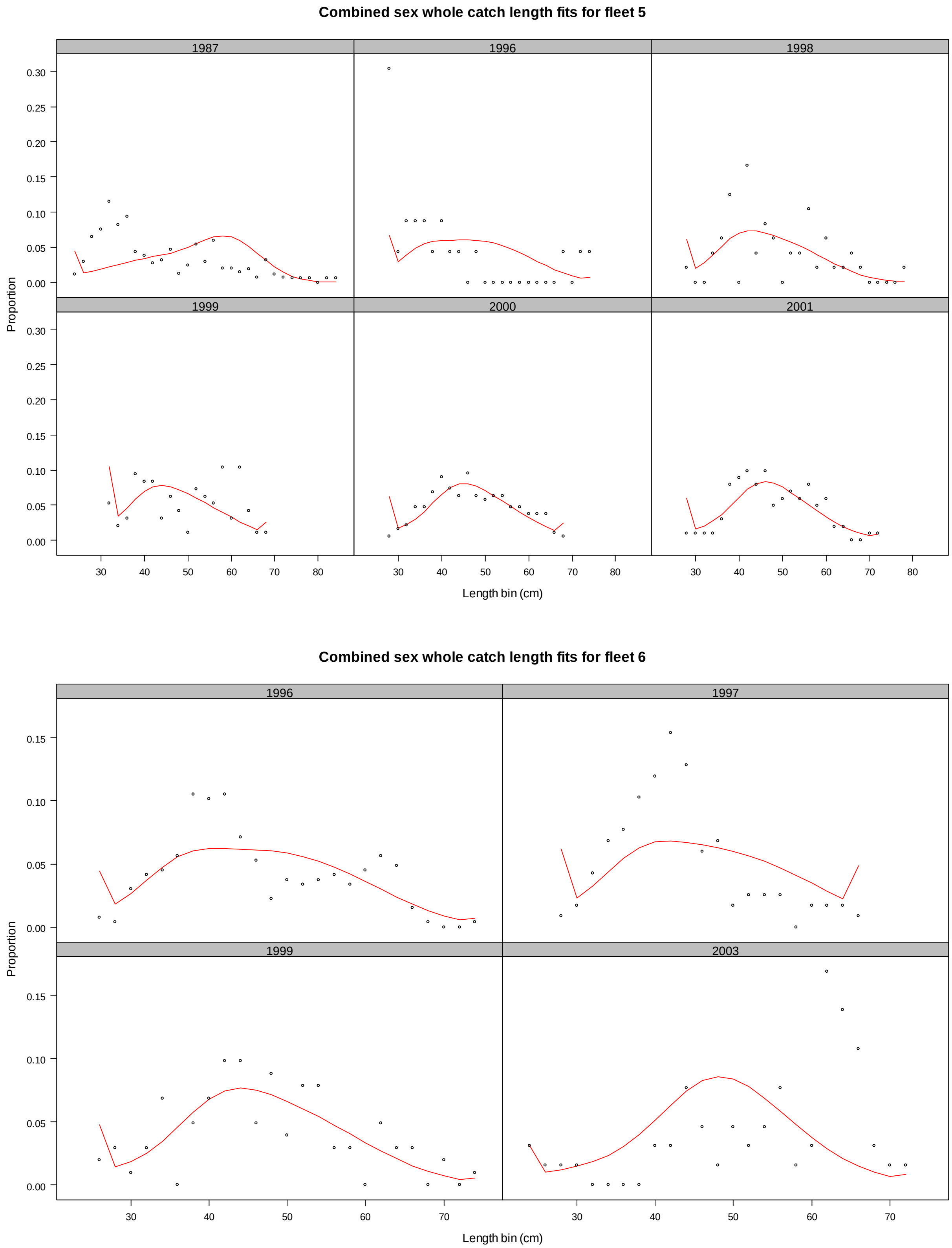
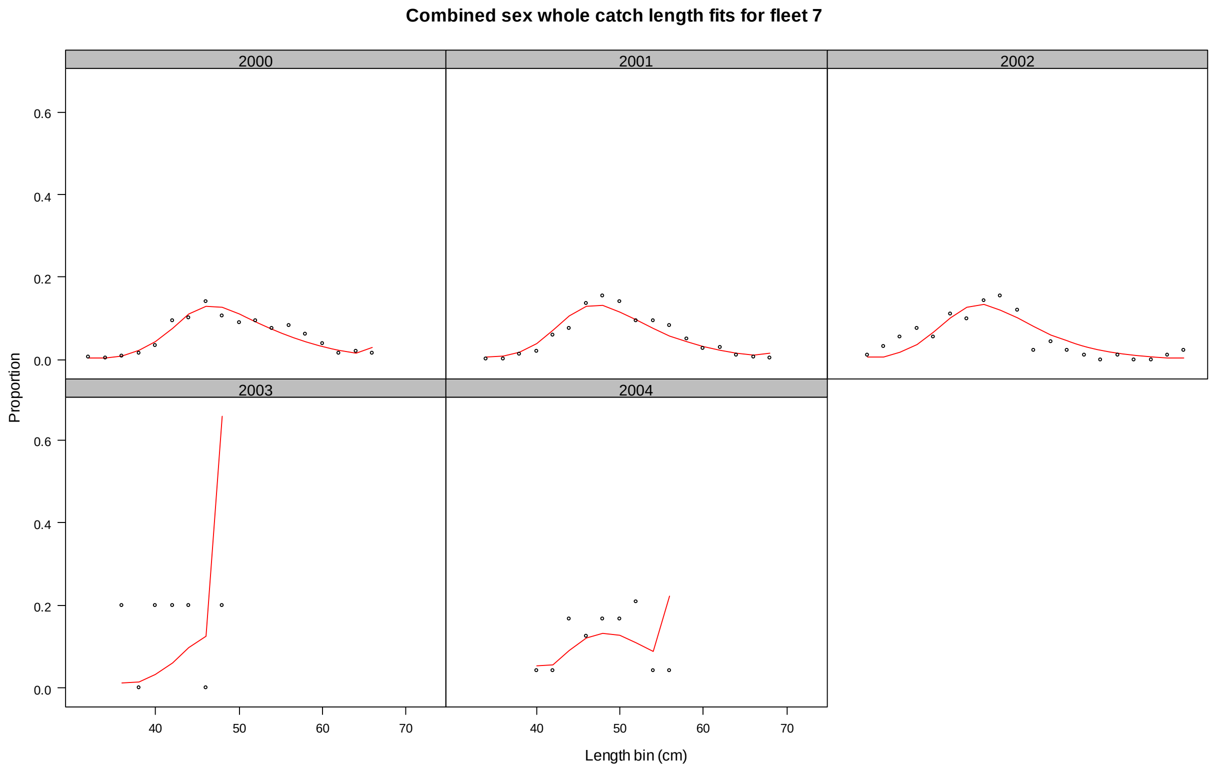


Figure 12. 2007 base model fits to the length-composition data for Washington recreation (top) and commercial (bottom) fisheries.



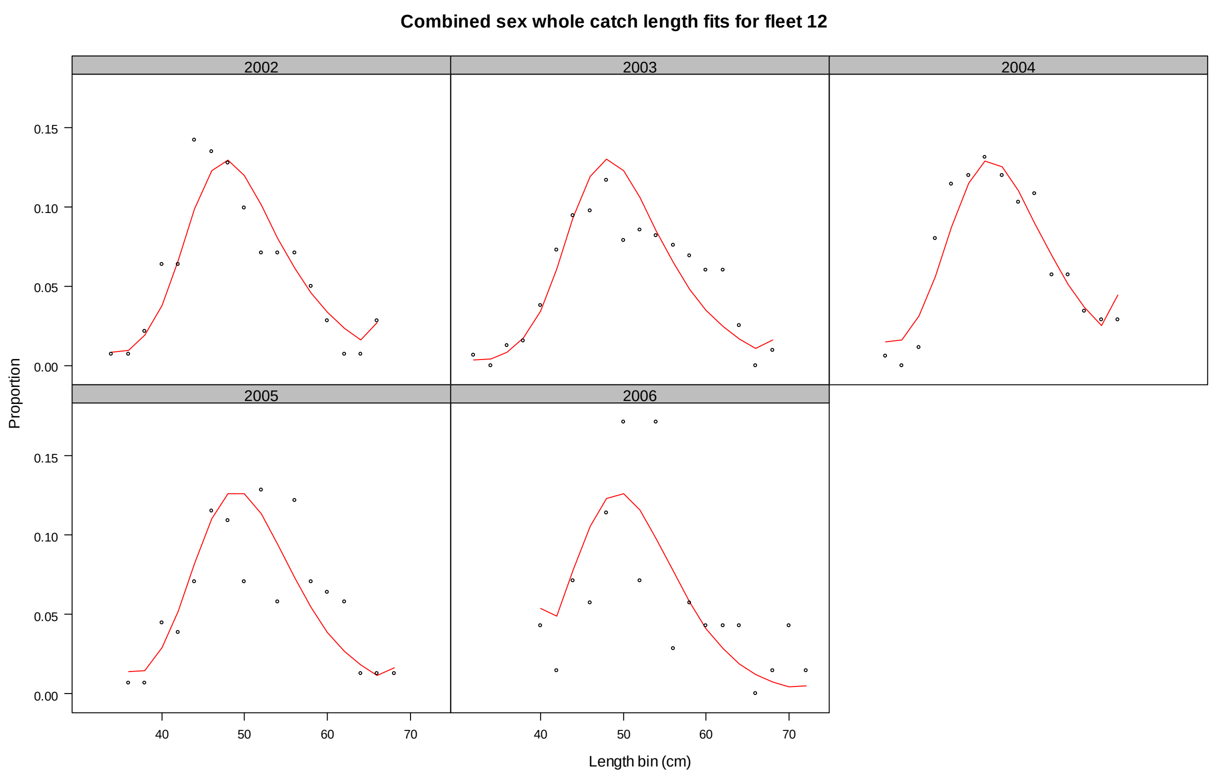


Figure 13. 2007 base model fits to the length-composition data for Washington hook and line (top) fishery and the IPHC survey (bottom).

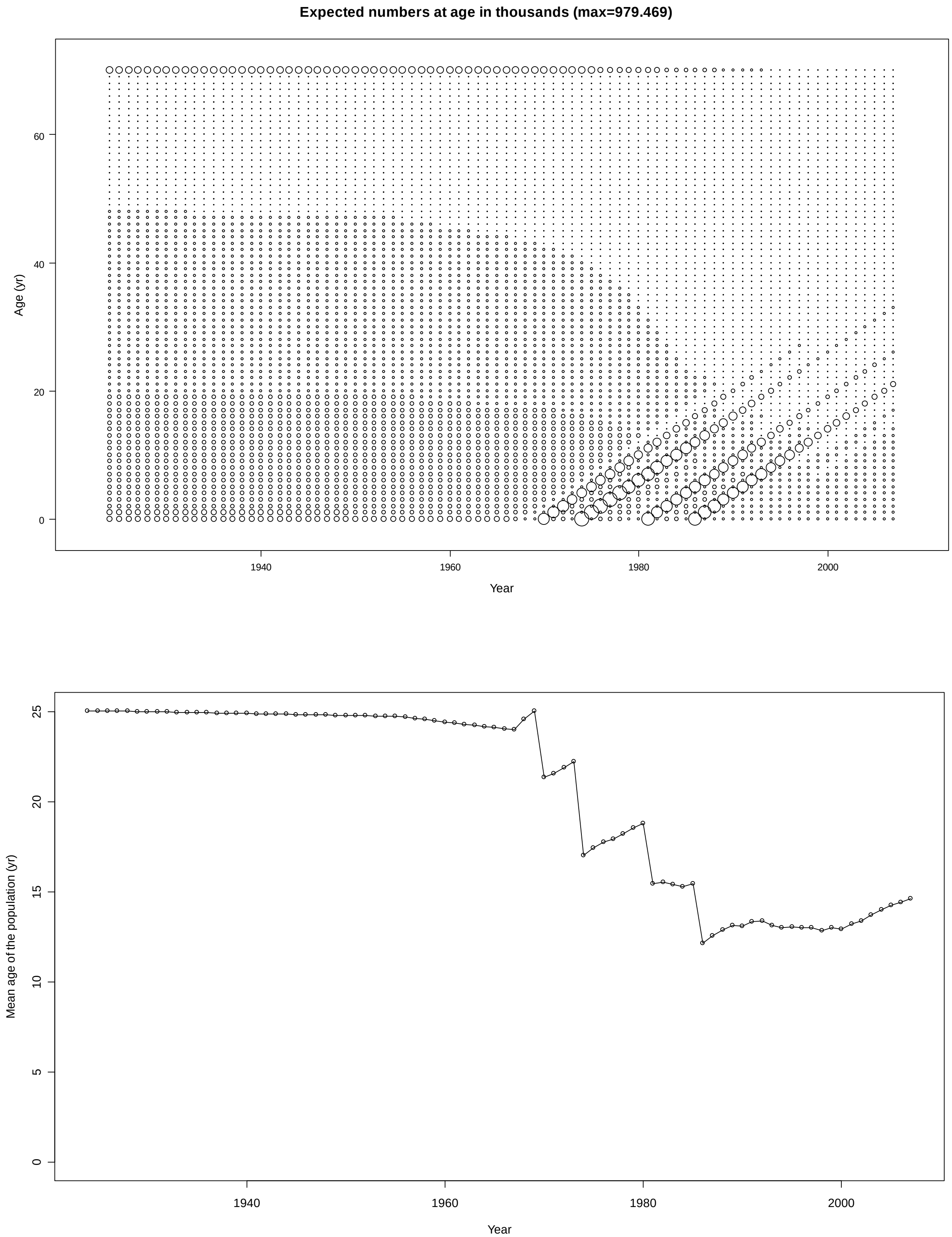


Figure 14. Expected numbers of age, by year (top), and mean age, by year (bottom), for the coast-wide 2007 base model.

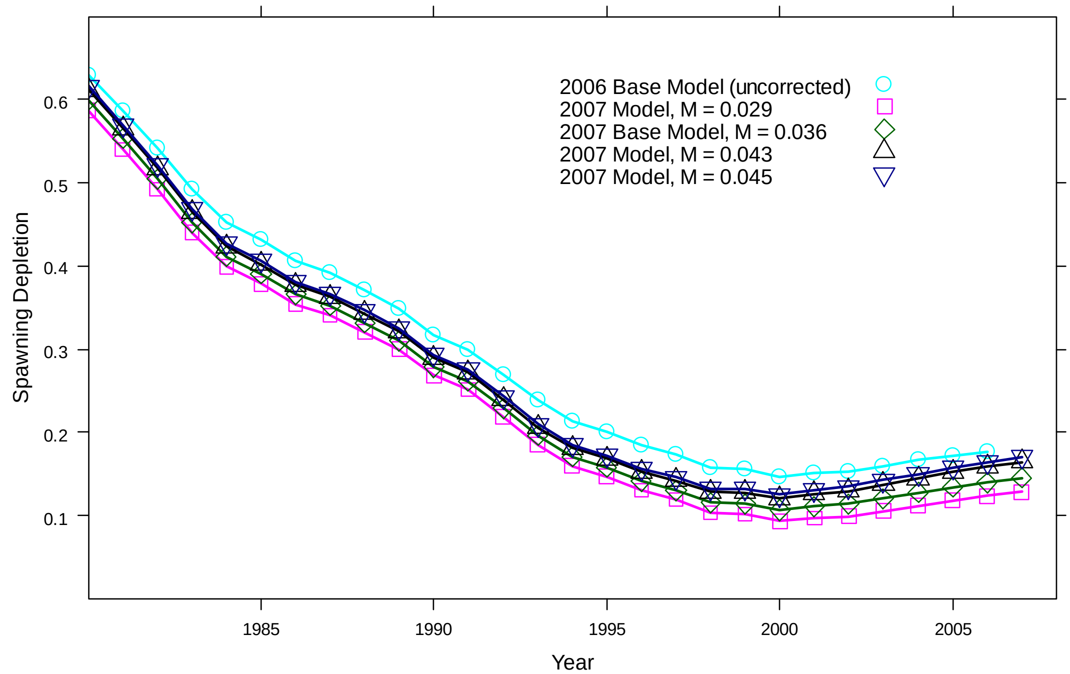


Figure 15. Spawning biomass by year for the uncorrected 2006 base model and the new (corrected) 2007 base model with various levels of natural mortality. Projections from 2007 and beyond are only for comparison purposes.

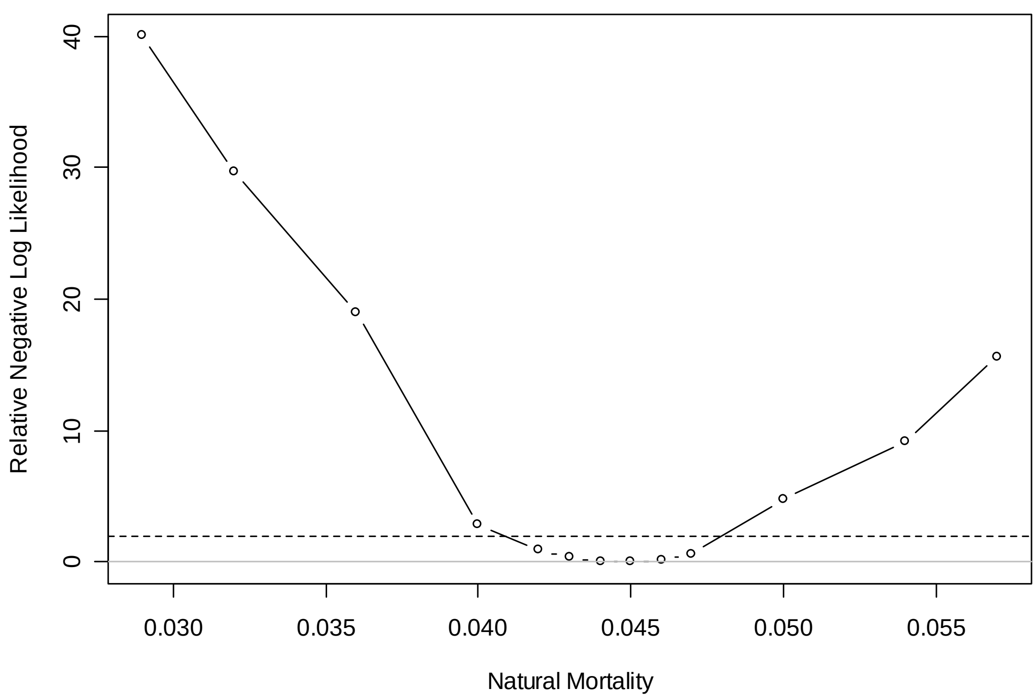


Figure 16. Relative negative log likelihood versus natural mortality (M), showing the sensitivity of the model to changes in M. Models below the dashed are not significantly different from the lowest model. The current base model has an M of 0.036. Assuming a symmetric parabolic curve than the vertical line that bifurcates the curve occurs at a value of approximately 0.041.

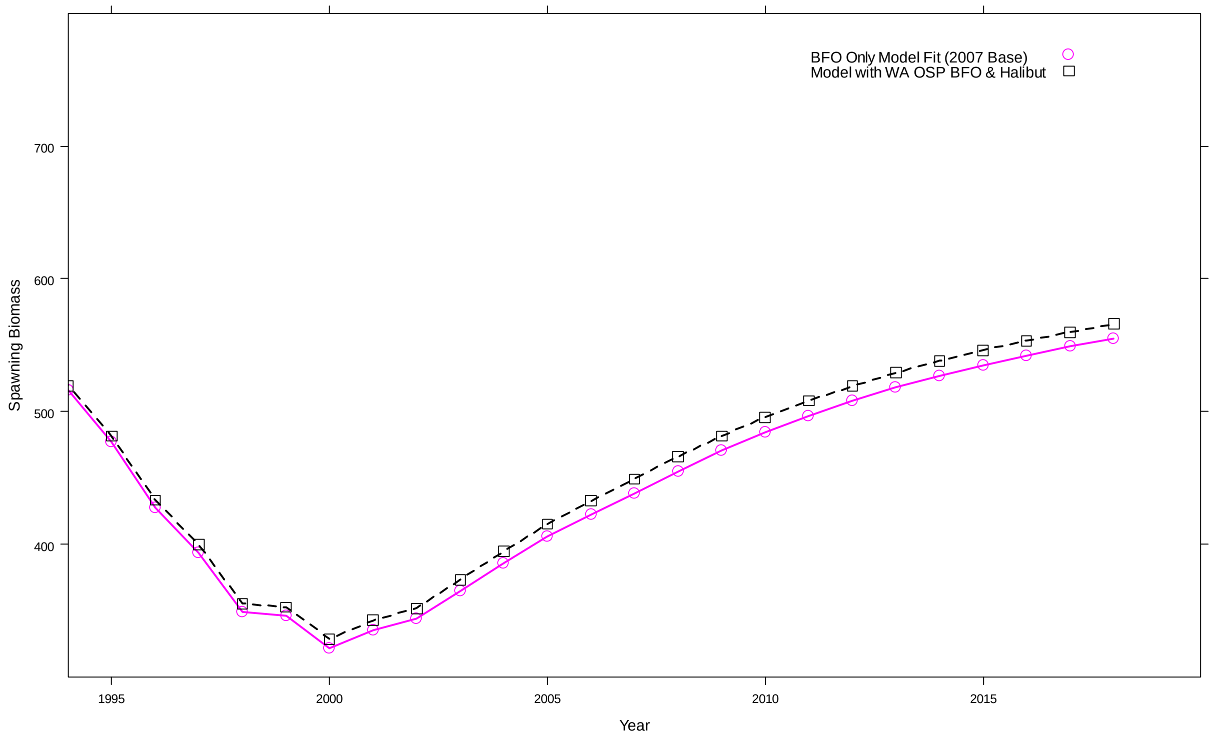


Figure 17. Comparisons of Washington recreational indexes of OSP bottom fish only (BFO) directed trips to a combination of OSP BFO and OSP halibut directed trips.

Appendix A: Control, Forecast, and Data Files for the 2007 Coast-wide Yelloweye Model

Control File

#_data_and_control_files: CST_BASE.dat // CST_BASE.CTL
1 #_N_Growth_Patterns
1 #_N_submorphs

1 #_N_areas
1 1 1 1 1 1 1 1 1 1 1 1 1 #_area_assignments_for_each_fishery_and_survey

#_recruit_design_(G_Pattern_x_birthseas_x_area)_X_(0/1_flag)
1
0 #_recr_distr_interaction
0 #_Do_migration
#_movement_pattern_(season_x_source_x_destination)_x_(0/1_flag)_minage_maxage
0 0 0
0 #_Nblock_Designs
0.5 #_fracfemale
1000 #_submorph_between/within
1 #vector_submorphdist_(-1_first_val_for_normal_approx)
4 #_natM_amin
10 #_natM_amax
6 #_Growth_Age-at-L1
60 #_Growth_Age-at-L2
0.1 #_SD_add_to_LAA
0 #_CV_Growth_Pattern
1 #_maturity_option
1 #_First_Mature_Age
3 #_parameter_offset_approach
1 #_env/block/dev_adjust_method
-1 #_MGparm_Dev_Phase

#Mortality-Growth Parameters

#_LO	HI	INIT	PRIOR	PR_type	SD	PHASE	env-var	use_dev	dev_ minyr	dev_ maxyr	dev_ stddev	Block	Block_ Fxn	#
0.01	0.1	0.043	0.1	0	0.8	-3	0	0	0	0	0.5	0	0	#Natmort_young _Gpattern:_1_Gender:_1
-3	3	0	0	0	0.8	-3	0	0	0	0	0.5	0	0	#Natmort_old
10	35	22.618	30	0	10	2	0	0	0	0	0.5	0	0	#Lmin
40	120	64.6346	66	0	10	2	0	0	0	0	0.5	0	0	#Lmax
0.01	0.2	0.0626	0.05	0	0.8	3	0	0	0	0	0.5	0	0	#VBK
0.05	0.2	0.0819	0.14	0	0.8	3	0	0	0	0	0.5	0	0	#CV-young
-1	1	0.5773	0.4	0	0.8	3	0	0	0	0	0.5	0	0	#CV-old
-3	3	2.0873e-005	2.0873e-005	0	0.8	-2	0	0	0	0	0.5	0	0	#Female_scale
-3	3	2.96956	2.96956	0	0.8	-2	0	0	0	0	0.5	0	0	#Female_exp

```
-3   3   42.1              42.1           0     0.8   -2   0   0   0   0   0.5
         0        0        #Mat_inflection
-3   3   -0.415            -0.415         0     0.8   -2   0   0   0   0   0.5
         0        0        #Mat_slope
-3   3   1                 1              0     0.8   -2   0   0   0   0   0.5
         0        0        #Alpha
-3   3   0                 0              0     0.8   -2   0   0   0   0   0.5
         0        0        #Beta

#Seasonal Recruitment
-4   4   0                 0              -1    99    -3   0   0   0   0   0.5
         0        0        #_recrdistribution_by_growth_pattern
-4   4   0                 0              -1    99    -3   0   0   0   0   0.5
         0        0        #_recrdistribution_by_area    1
-4   4   4                 0              -1    99    -3   0   0   0   0   0.5
         0        0        #_recrdistribution_by_season 1

#Cohort Growth Dev
1    1   1                 1              -1    99    -3   0   0   0   0   0.5
         0        0        #_cohort_growth_deviation

0 #_custom_MG-env_setup

0 #_custom_MG-block_setup


#_Spawner-Recruitment
1     #SR_fxn: 1=Beverton-Holt with flat-top beyond Bzero
#LO  HI  INIT    PRIOR  Pr_type  SD    PHASE
3    31  5.172   5      0        50    1      #Ln(R0)
0.2  1   0.45    1      0        50    -6     #steepness
0    5   0.5     1      0        0.8   -3     #SD_recruitments
-5   5   0       0      0        1     -3     #Env_link
-5   5   0       0      0        1     -3     #init_eq
 0   0   0       0      -1       0     -99    #Future autocorrelation



0 #_SR_env_link
1 #_SR_env_target_1=devs;_2=R0;_3=steepness
1 #do_recr_dev:  0=none; 1=devvector; 2=simple deviations
1968 1992 -10 10 1 #_recr_devs
1492 #_first_yr_fullbias_adj_in_MPD

#_initial_F_parms
#_LO HI INIT PRIOR PR_type SD PHASE
 0 1 0 0.01 0 99 1
 0 1 0 0.01 0 99 1
 0 1 0 0.01 0 99 1
 0 1 0 0.01 0 99 1
 0 1 0 0.01 0 99 1
 0 1 0 0.01 0 99 1
 0 1 0 0.01 0 99 1

#_Q_setup
 # A=do power, B=env-var, C=extra SD, D=devtype(<0=mirror, 0/1=none, 2=cons, 3=rand, 4=randwalk); E=0=num/1=bio,
     F=err_type
 #_A  B  C  D  E  F
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
0 0 0 0 1 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


#_Q_parms(if_any)

#_size_selex_types
#_Pattern Discard Male Special
 1 0 0 0 # 1
 1 0 0 0 # 2
 1 0 0 0 # 3
 1 0 0 0 # 4
 1 0 0 0 # 5
 1 0 0 0 # 6
 1 0 0 0 # 7
 5 0 0 1 # 8
 5 0 0 1 # 9
 5 0 0 3 # 10
 5 0 0 5 # 11
 1 0 0 0 # 12

#_age_selex_types
#_Pattern Discard Male Special
 10 0 0 0 # 1
 10 0 0 0 # 2
 10 0 0 0 # 3
 10 0 0 0 # 4
 10 0 0 0 # 5
 10 0 0 0 # 6
 10 0 0 0 # 7
 15 0 0 1 # 8
 15 0 0 1 # 9
 15 0 0 3 # 10
 15 0 0 5 # 11
 10 0 0 0 # 12

#_selex_parms
#_LO HI INIT PRIOR PR_type SD PHASE env-var use_dev dev_minyr dev_maxyr dev_stddev Block Block_Fxn
#_size_sel: 1
 10 70 31.29 30 0 99 3 0 0 0 0 0.5 0 0 # 1
 0.001 60 9.54 15 0 99 4 0 0 0 0 0.5 0 0 # 2
#_size_sel: 2
 10 70 33.24 30 0 99 3 0 0 0 0 0.5 0 0 # 3
 0.001 60 8.93 15 0 99 4 0 0 0 0 0.5 0 0 # 4
#_size_sel: 3
 10 70 28.61 30 0 99 4 0 0 0 0 0.5 0 0 # 5
 0.001 60 6.69 15 0 99 5 0 0 0 0 0.5 0 0 # 6
#_size_sel: 4
 10 70 34.71 30 0 99 4 0 0 0 0 0.5 0 0 # 7
 0.001 60 8.23 15 0 99 5 0 0 0 0 0.5 0 0 # 8
#_size_sel: 5
 10 70 29.7191 30 0 99 4 0 0 0 0 0.5 0 0 # 9
 0.001 60 7.66227 15 0 99 5 0 0 0 0 0.5 0 0 # 10
#_size_sel: 6
 10 70 34.167 30 0 99 4 0 0 0 0 0.5 0 0 # 11
 0.001 60 7.36903 15 0 99 5 0 0 0 0 0.5 0 0 # 12
```

#_size_sel: 7
10 70 41.96 30 0 99 4 0 0 0 0 0.5 0 0 # 13
0.001 60 13.63 15 0 99 5 0 0 0 0 0.5 0 0 # 14
#_size_sel: 8
1 37 1 5 0 99 -1 0 0 0 0 0.5 0 0 # 15
1 37 37 6 0 99 -1 0 0 0 0 0.5 0 0 # 16
#_size_sel: 9
1 37 1 5 0 99 -1 0 0 0 0 0.5 0 0 # 17
1 37 37 6 0 99 -1 0 0 0 0 0.5 0 0 # 18
#_size_sel: 10
1 37 1 5 0 99 -1 0 0 0 0 0.5 0 0 # 19
1 37 37 6 0 99 -1 0 0 0 0 0.5 0 0 # 20
#_size_sel: 11
1 37 1 5 0 99 -1 0 0 0 0 0.5 0 0 # 21
1 37 37 6 0 99 -1 0 0 0 0 0.5 0 0 # 22
#_size_sel: 12
10 70 41.96 30 0 99 4 0 0 0 0 0.5 0 0 # 23
0.001 60 13.63 15 0 99 5 0 0 0 0 0.5 0 0 # 24
#_age_sel: 1
#_age_sel: 2
#_age_sel: 3
#_age_sel: 4
#_age_sel: 5
#_age_sel: 6
#_age_sel: 7
#_age_sel: 8
#_age_sel: 9
#_age_sel: 10
#_age_sel: 11
#_age_sel: 12

1 #_env/block/dev_adjust_method

0 #_custom_sel-env_setup

0 #_custom_sel-block_setup

-1 #_selparmdev-phase

#_Variance_adjustments_to_input_values
#_1 2 3 4 5 6 7 8 9 10 11 12
0 0 0 0 0 0 0 0 0 0 0 0 #_add_to_survey_CV
0 0 0 0 0 0 0 0 0 0 0 0 #_add_to_discard_CV
0 0 0 0 0 0 0 0 0 0 0 0 #_add_to_bodywt_CV
1 1 1 1 1 1 1 1 1 1 1 1 #_mult_by_lencomp_N
1 1 1 1 1 1 1 1 1 1 1 1 #_mult_by_agecomp_N
1 1 1 1 1 1 1 1 1 1 1 1 #_mult_by_size-at-age_N
30 #_DF_for_discard_like
30 #_DF_for_meanbodywt_like

1 #_maxlambdaphase
1 #_sd_offset
#_lambdas_(columns_for_phases)
1 #_CPUE/survey:_1
1 #_CPUE/survey:_2
1 #_CPUE/survey:_3
1 #_CPUE/survey:_4
1 #_CPUE/survey:_5
1 #_CPUE/survey:_6
1 #_CPUE/survey:_7
1 #_CPUE/survey:_8
1 #_CPUE/survey:_9

1 #_CPUE/survey:_10
1 #_CPUE/survey:_11
1 #_CPUE/survey:_12
0 #_discard:_1
0 #_discard:_2
0 #_discard:_3
0 #_discard:_4
0 #_discard:_5
0 #_discard:_6
0 #_discard:_7
0 #_discard:_8
0 #_discard:_9
0 #_discard:_10
0 #_discard:_11
0 #_discard:_12
0 #_meanbodyweight
0.6 #_lencomp:_1
0.6 #_lencomp:_2
0.6 #_lencomp:_3
0.6 #_lencomp:_4
0.6 #_lencomp:_5
0.6 #_lencomp:_6
0.6 #_lencomp:_7
0 #_lencomp:_8
0 #_lencomp:_9
0 #_lencomp:_10
0 #_lencomp:_11
0.6 #_lencomp:_12
0.6 #_agecomp:_1
0.6 #_agecomp:_2
0.6 #_agecomp:_3
0.6 #_agecomp:_4
0.6 #_agecomp:_5
0.6 #_agecomp:_6
0.6 #_agecomp:_7
0 #_agecomp:_8
0 #_agecomp:_9
0 #_agecomp:_10
0 #_agecomp:_11
0.6 #_agecomp:_12
0.6 #_size-age:_1
0.6 #_size-age:_2
0.6 #_size-age:_3
0.6 #_size-age:_4
0.6 #_size-age:_5
0.6 #_size-age:_6
0.6 #_size-age:_7
0 #_size-age:_8
0 #_size-age:_9
0 #_size-age:_10
0 #_size-age:_11
0 #_size-age:_12
1 #_init_equ_catch
0.5 #_recruitments
1 #_parameter-priors
1e-005 #_parameter-dev-vectors
100 #_crashPenLambda
0.9 #_maximum allowed harvest rate
999

Forecast File

```
0.5     # target SPR
12      # number of forecast years
12      # number of forecast years with stddev
1000    # emphasis for the forecast recrutment devs that occur prior to endyyr+1
0       # fraction of bias adjustment to use with forecast_recruitment_devs before endyr+1
0       # fraction of bias adjustment to use with forecast_recruitment_devs after endyr
0.40    # topend of 40:10 option; set to 0.0 for no 40:10
0.10    # bottomend of 40:10 option
1.0     # OY scalar relative to ABC
-3      # first yr for average fish selex to use in MSY and forecast
0       # last yr for average fish selex to use in MSY and forecast
2       # for forecast:  1=set relative F from endyr; 2=use relative F read below
# relative Fs used for forecast; rows are seasons; columns are fleets
 # Fleet 1 Fleet 2
0.30    0.02    0.30    0.05    0.30    0.02    0.01

# starwars battlefront

 # verify end of input harvest rates
 999

 # specified actual catches into the future
 # (negative values are not used, but there must be a sufficient number of values)
 # fleet1 fleet2
-7.8    -0.52   -7.8    -1.3    -7.8    -0.52   -0.26 #year   1    season  1
-7.8    -0.52   -7.8    -1.3    -7.8    -0.52   -0.26 #year   2    season  1
-7.8    -0.52   -7.8    -1.3    -7.8    -0.52   -0.26 #year   3    season  1
-7.8    -0.52   -7.8    -1.3    -7.8    -0.52   -0.26 #year   4    season  1
-7.8    -0.52   -7.8    -1.3    -7.8    -0.52   -0.26 #year   5    season  1
-7.8    -0.52   -7.8    -1.3    -7.8    -0.52   -0.26 #year   6    season  1
-7.8    -0.52   -7.8    -1.3    -7.8    -0.52   -0.26 #year   7    season  1
-7.8    -0.52   -7.8    -1.3    -7.8    -0.52   -0.26 #year   8    season  1
-7.8    -0.52   -7.8    -1.3    -7.8    -0.52   -0.26 #year   9    season  1
-7.8    -0.52   -7.8    -1.3    -7.8    -0.52   -0.26 #year   10   season  1
-7.8    -0.52   -7.8    -1.3    -7.8    -0.52   -0.26 #year   11   season  1
-7.8    -0.52   -7.8    -1.3    -7.8    -0.52   -0.26 #year   12   season  1
```

Data File

```
1925	#	start	year
2006	#	end	year
1	#	N	seasons	per	year
12	#	vector	with	N	months	in	each	season
1	#	spawning	season
7	#	N	fishing	fleets
5	#	N	surveys;	data	type	ID	below	is	sequential	with	the
	fisheries
CaRec1%CaCom2%OrRec3%OrCom4%WaRec5%WaCom6%WaLine7%CPFV_8%CaMRFSS_9%OrRec_10%WaRec_1
1%IPHC_12
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	#_surveytiming_in_season

1	#	number	of	genders	(1/2);	females	are	gender	1
70	#Accumulator	age
#4	0.2	4	0.2	1	0.2	0.1	#_init_equil_catch_for_each_fishery

0	0	0	0	0	0	0	#_init_equil_catch_for_each_fishery

#_catch_biomass(mtons):_columns_are_fisheries	_rows_are_year*season
#CaRec1	CaCom2	OrRec3	OrCom4	WaRec5	WaCom6	WaLine7

0	8	0	2	0	1	0	#1925
0	8	0	2	0	1	0	#1926
0	8	0	2	0	1	0	#1927
0	8	0	2	0	1	0	#1928
0	8	0	2	0	1	0	#1929
0	8	0	2	0	1	0	#1930
0	8	0	2	0	1	0	#1931
0	8	0	2	0	1	0	#1932
0	8	0	2	0	1	0	#1933
0	8	0	2	0	1	0	#1934
0	8	0	2	0	1	0	#1935
0	8	0	2	0	1	0	#1936
0	8	0	2	0	1	0	#1937
0	8	0	2	0	1	0	#1938
0	8	0	2	0	1	0	#1939
0	8	0	2	0	1	0	#1940
0	8	0	2	0	1	0	#1941
0	8	0	2	0	1	0	#1942
0	8	0	2	0	1	0	#1943
0	8	0	2	0	1	0	#1944
0	8	0	2	0	1	0	#1945
0	8	0	2	0	1	0	#1946
0	8	0	2	0	1	0	#1947
0	8	0	2	0	1	0	#1948
0	8	0	2	0	1	0	#1949
0	8	0	2	0	1	0	#1950
0	8	0	2	0	1	0	#1951
0	8	0	2	0	1	0	#1952
0	8	0	2	0	1	0	#1953
0	8	0	2	0	1	0	#1954	CaCOM.005	CaCOM.01
	OrCOM.005%	OrCOM.01
14.2	24.05	6.2	9.85	1	2	0	#1955	24.05	48.1	9.85	19.7
16.6	28.8	6.5	10.1	1	2	0	#1956	28.8	57.6	10.1	20.2
12.4	31.5	6.7	10.35	1	2	0	#1957	31.5	63	10.35	20.7
15.8	35.45	7	10.6	2	2	0	#1958	35.45	70.9	10.6	21.2
12.4	30.85	7.2	10.85	2	2	0	#1959	30.85	61.7	10.85	21.7
10	28.1	7.5	11.1	2	2	0	#1960	28.1	56.2	11.1	22.2
```

8.3 22.55	7.7	11.35	2	2	0	#1961	22.55	45.1	11.35	22.7	
9.1 20.75	8	11.6	2	2	0	#1962	20.75	41.5	11.6	23.2	
9.4 25.15	8.2	11.85	3	4	0	#1963	25.15	50.3	11.85	23.7	
8.5 17.65	8.5	12.1	3	4	0	#1964	17.65	35.3	12.1	24.2	
12.5	20.7	8.7	12.35	3	4	0	#1965	20.7	41.4	12.35	24.7
15 22.45	9	12.6	3	4	0	#1966	22.45	44.9	12.6	25.2	
16.1	22.2	9.2	12.85	3	4	0	#1967	22.2	44.4	12.85	25.7
17.3	21.65	9.5	13.1	3	4	0	#1968	21.65	43.3	13.1	26.2
16.8	40.5	9.7	27.2	3	4	0	#1969				
21.8	47.1	10	19.2	4	5.1	0	#1970				
18.1	46.8	13.1	19	4	4.6	0	#1971				
24.2	70.6	16.3	24	4	5.5	0	#1972				
29.6	91.7	19.5	22.2	4	7.4	0	#1973				
33 84.3	22.6	18.2	4	8.5	0	#1974					
32 92.4	25.8	14.8	4	7.1	0	#1975					
31 103.7	29	25.9	4.3	10.3	0	#1976					
27.5	100.7	32.1	29.3	8.8	17.8	0	#1977				
24.5	99.3	35.3	28.5	4.5	23.9	0	#1978				
29.9	134.2	38.5	62.2	3.5	28.5	0	#1979				
75.9	168.1	27.5	68.2	2.4	35	0	#1980				
46.9	209.8	34.2	102.2	3.4	9.7	0	#1981				
103.8	177	48.7	114.5	3.4	12.6	0	#1982				
50.5	62.3	62.9	193.2	6.7	16.6	0	#1983				
77.3	47.6	43.6	67.1	12.2	13.4	0	#1984				
123.6	11.1	26.8	101.9	8.8	26.4	0	#1985				
64.6	31.9	27.2	70.6	9	14.7	0	#1986				
75.2	51.0	29.4	80.1	10.5	25.1	0	#1987				
57.5	54.4	9.6	120.1	8.3	25.6	0	#1988				
58.7	43.5	16	180.7	14.6	39.2	0	#1989				
46.1	69.1	16.6	74.3	9.9	26.3	0	#1990				
33.6	143.5	14.9	137.7	18	20.4	0	#1991				
21.0	111.3	25.9	165.8	16.2	33.8	0	#1992				
8.5 52.2	19.7	183.2	18	29.8	0	#1993					
14.4	53.5	18.3	102.2	10.3	19.6	0	#1994				
12.6	50.6	13.8	148.3	9.9	18.0	0	#1995				
12.5	70.5	8.4	92.5	10.8	16.9	0	#1996				
15.1	62.4	14.4	115.4	11.4	18.7	0	#1997				
5.5 20.8	18.9	41.5	14.4	5.5	0	#1998					
12.6	22.3	17.8	61.4	10.6	9.9	23	#1999				
7.5 4.0	9.2	3.6	10.1	0.2	7.7	#2000					
4.6 4.5	3.1	6.2	12.5	0.8	21	#2001					
2.1 0.3	3.6	0.7	3.7	0.4	2.2	#2002					
3.7 0.0	3.8	0.2	2.6	0.2	0.3	#2003					
0.8 0.3	2.4	1.6	3.7	0.9	4.0	#2004					
1.6 0.1	4.1	0.8	5.2	0.4	3.2	#2005					
3.5 0.0	2.5	0.8	1.7	0.3	2.9	#2006					
#CaRec1	CaCom2	OrRec3	OrCom4	WaRec5	WaCom6	WaLine7					

65 #_N_cpue_and_surveyabundance_observations

#Note	all	values	for	indexes	are	the	same	as	SS1	ye-dat09.dat
#Year	seas	index	obs	selog						
# CA	CPFV	CPUE;	using	Henrys	delta	lognormal		and	est._CV's	
1988	1	8	26.19	0.2112						
1989	1	8	25.52	0.1298						
1990	1	8	32.16	0.2652						
1991	1	8	31.59	0.1565						
1992	1	8	20.88	0.1297						
1993	1	8	23.63	0.1555						
1994	1	8	21.67	0.1321						

```
1995	1	8	16.33	0.1592
1996	1	8	17.9	0.1541
1997	1	8	13.31	0.1371
1998	1	8	10.13	0.2478
#	CA	MRFSS	CPUE	Henrys	DeltaLogNormaland	CV's
1980	1	9	4.48	0.2396
1981	1	9	2.78	0.5057
1982	1	9	11.27	0.3608
1983	1	9	4.64	0.5789
1984	1	9	8.46	0.4129
1985	1	9	13.57	0.3634
1986	1	9	6.25	0.3138
#1987	1	9	11.7	0.3697
#1988	1	9	2.96	0.3046
#1989	1	9	3.94	0.3245
1993	1	9	7.72	0.5523
1994	1	9	1.87	0.6164
1995	1	9	3.06	0.3144
1996	1	9	2.08	0.1932
1997	1	9	4.23	0.2492
1998	1	9	3.12	0.2951
1999	1	9	2.14	0.2106
2000	1	9	3.39	0.4028
2001	1	9	1.18	0.3972
#	Oregon	Sport	CPUE	Henry	2/14/2006	MRFSSversion
1979	1	10	16.988	0.224886142
1980	1	10	22.237	0.178339382
1981	1	10	17.9801333	0.168786567
1982	1	10	25.7039667	0.185204629
1983	1	10	31.94824	0.188876127
1984	1	10	21.7533333	0.150233401
1986	1	10	15.2668148	0.143419913
1987	1	10	25.2302857	0.257165588
1988	1	10	14.80976	0.267684898
1989	1	10	10.1664	0.275531766
1990	1	10	16.0214138	0.208205411
1991	1	10	19.0812857	0.171424481
1992	1	10	16.4627	0.20899499
1993	1	10	12.6602333	0.136904372
1994	1	10	10.1659667	0.13175002
1995	1	10	9.6534667	0.257078825
1996	1	10	6.0977241	0.134448599
1998	1	10	10.7553	0.126699316
1999	1	10	13.8429655	0.185692573
#	WA	sport	CPUE	Henrys_Delta_Lognormal
1990	1	11	6.9	0.7
1991	1	11	16.03	1.7
1992	1	11	15.29	1.24
1993	1	11	13.19	1.01
1994	1	11	7.15	0.42
1995	1	11	5.7	0.46
1996	1	11	5.72	0.5
1997	1	11	8.75	1.05
1998	1	11	11.06	1.24
1999	1	11	6.88	0.85
2000	1	11	6.45	0.54
2001	1	11	4.42	0.41
#	IPHC	Oregon	and	Wash	TSOU_CPUE (Changed to using CV not std dev, and not taking the index times 10. -JRW)
1999	1	12	0.571	0.181
2001	1	12	0.482	0.171
2002	1	12	0.336	0.212
```

2003 1 12 0.480 0.136
2004 1 12 0.337 0.162
2005 1 12 0.265 0.153
2006 1 12 0.214 0.187

2 # Discard in fraction of total catch
0 # Number of Discard observaions (- value causes program to ignore)

0 #_N_meanbodywt_obs

0.0001 # compress tails of composition until observed# proportion
is greater than this value

0.0001 # constant added to observed and expected proportions at length
and age tail compression occurs first

#_LengthComp

37 # N length bins and Described Below

16 18 20 22 24 26 28 30 32 34 36 38 40
42 44 46 48 50 52 54 56 58 60 62 64
66 68 70 72 74 76 78 80 82 84 86 88

117 #N Length comp observations
(market)
#Year Seas Type Gender Partitn Nsamp [16,18) [18,20) [20,22) [22,24) [24,26) [26,28)
[28,30) [30,32) [32,34) [34,36) [36,38) [38,40) [40,42) [42,44) [44,46) [46,48) [48,50) [50,52)
[52,54) [54,56) [56,58) [58,60) [60,62) [62,64) [64,66) [66,68) [68,70) [70,72) [72,74) [74,76)
[76,78) [78,80) [80,82) [82,84) [84,86) [86,88) [88,90)
1980 1 1 0 0 85 0 0.0119 0.0119 0 0.0119 0.02381
0.02381 0.02381 0.05952 0.04762 0.04762 0.11905 0.07143 0.03571 0.05952 0.08333 0.03571 0.09524
0.03571 0.04762 0.03571 0.02381 0.02381 0.03571 0.0119 0 0.02381 0 0 0
0 0 0 0 0 0 0
1981 1 1 0 0 42 0 0 0 0.02381 0 0
0 0 0.02381 0.02381 0.07143 0 0.09524 0.11905 0.09524 0.07143 0.09524 0.09524
0.09524 0.04762 0.02381 0.04762 0.02381 0.04762 0 0 0 0 0 0
0 0 0 0 0 0 0
1982 1 1 0 0 72 0 0 0 0 0.01389 0
0 0.04167 0.02778 0.02778 0.04167 0 0.06944 0.05556 0.08333 0.05556 0.04167 0.09722
0.05556 0.04167 0.06944 0.02778 0.05556 0.08333 0.02778 0.06944 0.01389 0 0 0
0 0 0 0 0 0 0
1983 1 1 0 0 84 0 0 0 0 0.0119 0.0119
0.04762 0.04762 0.04762 0.0119 0.04762 0.04762 0.05952 0.11905 0.04762 0.11905 0.02381 0.08333
0.03571 0.07143 0 0.04762 0.0119 0.0119 0.02381 0.03571 0.02381 0.0119 0 0
0 0 0 0 0 0 0
1984 1 1 0 0 135 0.00741 0 0.01481 0.01481 0.00741 0.03704
0.03704 0.08889 0.03704 0.05926 0.06667 0.07407 0.06667 0.03704 0.05185 0.05185 0.02222 0.05926
0.04444 0.02222 0.02963 0.05185 0.01481 0.04444 0.01481 0.00741 0.01481 0 0.01481 0.00741
0 0 0 0 0 0 0
1985 1 1 0 0 200 0 0 0.00333 0.02 0.05 0.04333
0.05667 0.08333 0.04 0.08 0.08 0.07 0.07333 0.05 0.03667 0.05667 0.03333 0.02
0.01333 0.02 0.02667 0.02333 0.04333 0.02333 0.00667 0.02333 0.00667 0.00333 0 0.00667
0.00333 0 0.00333 0 0 0 0
1986 1 1 0 0 200 0 0 0 0.01942 0.01456 0.04369
0.02913 0.04369 0.06796 0.04369 0.12136 0.11165 0.06311 0.06311 0.0534 0.07767 0.01942 0.04854
0.03883 0.03883 0.02913 0.02427 0.01456 0.00971 0.00485 0.00971 0 0 0 0
0.00971 0 0 0 0 0 0

1987	1	1	0	0	79	0	0	0	0	0.04	0.01333
0.02667	0.02667	0.04	0.04	0.08	0.01333	0.04	0.06667	0.04	0.04	0.08	0.08
0.06667	0.12	0.05333	0.02667	0.04	0.02667	0.02667	0	0.01333	0	0	0
0	0	0	0	0	0	0					
1988	1	1	0	0	44	0	0	0	0	0	0.02439
0.02439	0	0.07317	0.04878	0.07317	0	0.07317	0.02439	0.04878	0.04878	0.02439	0.04878
0.17073	0.07317	0.04878	0.09756	0	0.07317	0	0	0	0.02439	0	0
0	0	0	0	0	0	0					
1989	1	1	0	0	107	0	0	0	0	0	0.0283
0.04717	0.01887	0.08491	0.08491	0.12264	0.09434	0.0566	0.07547	0.08491	0.04717	0.04717	0.0283
0.04717	0.03774	0.01887	0.0283	0.01887	0.01887	0.00943	0	0	0	0	0
0	0	0	0	0	0	0					
1993	1	1	0	0	34	0	0	0	0	0.0303	0.06061
0	0.0303	0	0.06061	0.12121	0.18182	0.12121	0.12121	0	0	0.0303	0.06061
0.0303	0.0303	0.0303	0	0.0303	0.06061	0	0	0	0	0	0
0	0	0	0	0	0	0					
1994	1	1	0	0	68	0	0	0	0	0	0.06557
0.04918	0.03279	0.08197	0.16393	0.08197	0.06557	0.06557	0.18033	0.04918	0.04918	0.04918	0
0	0.03279	0.01639	0.01639	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0					
1995	1	1	0	0	48	0	0	0.02128	0	0	0.04255
0.06383	0.10638	0.06383	0.10638	0.06383	0.14894	0.12766	0.08511	0.02128	0.02128	0	0.02128
0.02128	0.04255	0	0	0	0.02128	0.02128	0	0	0	0	0
0	0	0	0	0	0	0					
1996	1	1	0	0	77	0	0.01333	0.04	0.01333	0.02667	0.08
0.01333	0.05333	0.02667	0.09333	0.10667	0.05333	0.09333	0.04	0.08	0.06667	0.05333	0.04
0.02667	0.01333	0.01333	0.04	0	0	0	0.01333	0	0	0	0
0	0	0	0	0	0	0					
1997	1	1	0	0	112	0	0	0.00943	0.0283	0.03774	0.01887
0.00943	0.03774	0.0566	0.06604	0.04717	0.08491	0.04717	0.04717	0.04717	0.08491	0.10377	0.08491
0.04717	0.03774	0.0283	0.04717	0.00943	0.00943	0.00943	0	0	0	0	0
0	0	0	0	0	0	0					
1998	1	1	0	0	71	0.01429	0	0	0	0.01429	0.02857
0.07143	0.02857	0.1	0.02857	0.07143	0.05714	0.04286	0.1	0.11429	0.07143	0.04286	0.02857
0.08571	0.05714	0.01429	0	0	0.01429	0	0.01429	0	0	0	0
0	0	0	0	0	0	0					
1999	1	1	0	0	-9999	0	0	0.01481	0.01481	0.02963	0.00741
0.02222	0.03704	0.07407	0.02222	0.04444	0.02963	0.1037	0.06667	0.11111	0.05926	0.08889	0.08148
0.05185	0.08148	0.00741	0.01481	0.00741	0.01481	0.00741	0.00741	0	0	0	0
0	0	0	0	0	0	0					
1999	1	1	0	0	-137	0	0	0.01481	0.01481	0.02963	0.00741
0.02222	0.03704	0.07407	0.02222	0.04444	0.02963	0.1037	0.06667	0.11111	0.05926	0.08889	0.08148
0.05185	0.08148	0.00741	0.01481	0.00741	0.01481	0.00741	0.00741	0	0	0	0
0	0	0	0	0	0	0					
2000	1	1	0	0	137	0	0	0.01481	0.01481	0.02963	0.00741
0.02222	0.03704	0.07407	0.02222	0.04444	0.02963	0.1037	0.06667	0.11111	0.05926	0.08889	0.08148
0.05185	0.08148	0.00741	0.01481	0.00741	0.01481	0.00741	0.00741	0	0	0	0
0	0	0	0	0	0	0					
2000	1	1	0	0	-9998	0	0	0.01481	0.01481	0.02963	0.00741
0.02222	0.03704	0.07407	0.02222	0.04444	0.02963	0.1037	0.06667	0.11111	0.05926	0.08889	0.08148
0.05185	0.08148	0.00741	0.01481	0.00741	0.01481	0.00741	0.00741	0	0	0	0
0	0	0	0	0	0	0					
2001	1	1	0	0	-9999	0.01724	0	0	0.01724	0	0.01724
0.05172	0.05172	0.03448	0.08621	0.03448	0.17241	0.12069	0.03448	0.10345	0.06897	0.03448	0.03448
0.03448	0.01724	0.03448	0	0	0	0.01724	0.01724	0	0	0	0
0	0	0	0	0	0	0					
2002	1	1	0	0	-86	0.01724	0	0	0.01724	0	0.01724
0.05172	0.05172	0.03448	0.08621	0.03448	0.17241	0.12069	0.03448	0.10345	0.06897	0.03448	0.03448
0.03448	0.01724	0.03448	0	0	0	0.01724	0.01724	0	0	0	0
0	0	0	0	0	0	0					

2003 1 1 0 0 86 0.01724 0 0 0.01724 0 0.01724
0.05172 0.05172 0.03448 0.08621 0.03448 0.17241 0.12069 0.03448 0.10345 0.06897 0.03448 0.03448
0.03448 0.01724 0.03448 0 0 0 0.01724 0.01724 0 0 0 0
0 0 0 0 0 0 0
2004 1 1 0 0 -9998 0.01724 0 0 0.01724 0 0.01724
0.05172 0.05172 0.03448 0.08621 0.03448 0.17241 0.12069 0.03448 0.10345 0.06897 0.03448 0.03448
0.03448 0.01724 0.03448 0 0 0 0.01724 0.01724 0 0 0 0
0 0 0 0 0 0 0

2005 1 1 0 0 62 0 0 0 0 0 0.01754
0.01754 0.01754 0.03509 0.08772 0.03509 0.12281 0.08772 0.08772 0.17544 0.10526 0.07018 0.03509
0.01754 0.03509 0.03509 0 0 0.01754 0 0 0 0 0 0
0 0 0 0 0 0 0
2006 1 1 0 0 101 0 0 0 0 0 0
0.03158 0.03158 0.03158 0.06316 0.07368 0.05263 0.04211 0.10526 0.13684 0.11579 0.15789 0.03158
0.06316 0.02105 0.02105 0.01053 0 0.01053 0 0 0 0 0 0
0 0 0 0 0 0 0

1978 1 2 0 0 -9999 0 0 0 0.00758 0 0.00758
0.0303 0.0303 0.05303 0.06818 0.05303 0.04545 0.03788 0.06818 0.06061 0.02273 0.0303 0.09848
0.03788 0.06061 0.03788 0.05303 0.03788 0.06818 0.05303 0.01515 0.02273 0 0 0
0 0 0 0 0 0 0
1979 1 2 0 0 -132 0 0 0 0.00758 0 0.00758
0.0303 0.0303 0.05303 0.06818 0.05303 0.04545 0.03788 0.06818 0.06061 0.02273 0.0303 0.09848
0.03788 0.06061 0.03788 0.05303 0.03788 0.06818 0.05303 0.01515 0.02273 0 0 0
0 0 0 0 0 0 0
1980 1 2 0 0 -132 0 0 0 0.00758 0 0.00758
0.0303 0.0303 0.05303 0.06818 0.05303 0.04545 0.03788 0.06818 0.06061 0.02273 0.0303 0.09848
0.03788 0.06061 0.03788 0.05303 0.03788 0.06818 0.05303 0.01515 0.02273 0 0 0
0 0 0 0 0 0 0
1981 1 2 0 0 -132 0 0 0 0.00758 0 0.00758
0.0303 0.0303 0.05303 0.06818 0.05303 0.04545 0.03788 0.06818 0.06061 0.02273 0.0303 0.09848
0.03788 0.06061 0.03788 0.05303 0.03788 0.06818 0.05303 0.01515 0.02273 0 0 0
0 0 0 0 0 0 0
1982 1 2 0 0 -132 0 0 0 0.00758 0 0.00758
0.0303 0.0303 0.05303 0.06818 0.05303 0.04545 0.03788 0.06818 0.06061 0.02273 0.0303 0.09848
0.03788 0.06061 0.03788 0.05303 0.03788 0.06818 0.05303 0.01515 0.02273 0 0 0
0 0 0 0 0 0 0
1983 1 2 0 0 -132 0 0 0 0.00758 0 0.00758
0.0303 0.0303 0.05303 0.06818 0.05303 0.04545 0.03788 0.06818 0.06061 0.02273 0.0303 0.09848
0.03788 0.06061 0.03788 0.05303 0.03788 0.06818 0.05303 0.01515 0.02273 0 0 0
0 0 0 0 0 0 0
1984 1 2 0 0 -132 0 0 0 0.00758 0 0.00758
0.0303 0.0303 0.05303 0.06818 0.05303 0.04545 0.03788 0.06818 0.06061 0.02273 0.0303 0.09848
0.03788 0.06061 0.03788 0.05303 0.03788 0.06818 0.05303 0.01515 0.02273 0 0 0
0 0 0 0 0 0 0
1985 1 2 0 0 -132 0 0 0 0.00758 0 0.00758
0.0303 0.0303 0.05303 0.06818 0.05303 0.04545 0.03788 0.06818 0.06061 0.02273 0.0303 0.09848
0.03788 0.06061 0.03788 0.05303 0.03788 0.06818 0.05303 0.01515 0.02273 0 0 0
0 0 0 0 0 0 0
1986 1 2 0 0 -132 0 0 0 0.00758 0 0.00758
0.0303 0.0303 0.05303 0.06818 0.05303 0.04545 0.03788 0.06818 0.06061 0.02273 0.0303 0.09848
0.03788 0.06061 0.03788 0.05303 0.03788 0.06818 0.05303 0.01515 0.02273 0 0 0
0 0 0 0 0 0 0
1987 1 2 0 0 -132 0 0 0 0.00758 0 0.00758
0.0303 0.0303 0.05303 0.06818 0.05303 0.04545 0.03788 0.06818 0.06061 0.02273 0.0303 0.09848
0.03788 0.06061 0.03788 0.05303 0.03788 0.06818 0.05303 0.01515 0.02273 0 0 0
0 0 0 0 0 0 0
1988 1 2 0 0 -132 0 0 0 0.00758 0 0.00758
0.0303 0.0303 0.05303 0.06818 0.05303 0.04545 0.03788 0.06818 0.06061 0.02273 0.0303 0.09848
0.03788 0.06061 0.03788 0.05303 0.03788 0.06818 0.05303 0.01515 0.02273 0 0 0
0 0 0 0 0 0 0

1989	1	2	0	0	132	0	0	0	0.00758	0	0.00758
0.0303	0.0303	0.05303	0.06818	0.05303	0.04545	0.03788	0.06818	0.06061	0.02273	0.0303	0.09848
0.03788	0.06061	0.03788	0.05303	0.03788	0.06818	0.05303	0.01515	0.02273	0	0	0
0	0	0	0	0	0	0					
1990	1	2	0	0	-9998	0	0	0	0.00758	0	0.00758
0.0303	0.0303	0.05303	0.06818	0.05303	0.04545	0.03788	0.06818	0.06061	0.02273	0.0303	0.09848
0.03788	0.06061	0.03788	0.05303	0.03788	0.06818	0.05303	0.01515	0.02273	0	0	0
0	0	0	0	0	0	0					
1991	1	2	0	0	200	0	0	0	0.00465	0	0
0.01395	0.01395	0.03256	0.08372	0.04186	0.06977	0.06977	0.04186	0.09302	0.09302	0.04651	0.05116
0.06977	0.06047	0.08837	0.02791	0.05581	0.0186	0.01395	0	0.0093	0	0	0
0	0	0	0	0	0	0					
1992	1	2	0	0	200	0	0	0	0	0.0075	0.015
0.015	0.0425	0.065	0.0575	0.0575	0.075	0.09	0.115	0.085	0.0725	0.04	0.0575
0.0575	0.0325	0.0375	0.035	0.015	0.015	0.0075	0.005	0	0	0	0
0	0	0	0	0	0	0					
1993	1	2	0	0	200	0	0	0	0.00373	0.01306	0.03545
0.0541	0.05784	0.09142	0.06157	0.08209	0.06903	0.0653	0.08022	0.07836	0.04851	0.0541	0.04291
0.04478	0.01866	0.02052	0.03731	0.02239	0.00933	0.00373	0.0056	0	0	0	0
0	0	0	0	0	0	0					
1994	1	2	0	0	200	0	0	0.00149	0	0.00745	0.01341
0.02683	0.04918	0.07004	0.0775	0.08942	0.07601	0.09538	0.09091	0.08197	0.07452	0.05961	0.05067
0.02534	0.02235	0.01937	0.01639	0.01937	0.02086	0.00894	0.00149	0.00149	0	0	0
0	0	0	0	0	0	0					
1995	1	2	0	0	200	0	0	0.0029	0	0.0029	0.01739
0.03188	0.05797	0.04638	0.06087	0.09275	0.08696	0.09565	0.10145	0.07536	0.06957	0.06667	0.04058
0.04638	0.02609	0.03478	0.01159	0.01449	0.0087	0.0058	0.0029	0	0	0	0
0	0	0	0	0	0	0					
1996	1	2	0	0	200	0	0	0.00217	0.00435	0.00435	0.01739
0.03913	0.07391	0.0587	0.05435	0.1087	0.09565	0.1087	0.08478	0.06522	0.05435	0.0587	0.06087
0.02826	0.01957	0.01957	0.01522	0.01522	0.0087	0.00217	0	0	0	0	0
0	0	0	0	0	0	0					
1997	1	2	0	0	200	0	0	0.00352	0.00352	0.01761	0.02113
0.05634	0.0669	0.0669	0.09155	0.08451	0.07394	0.0669	0.07042	0.05282	0.08451	0.04225	0.0493
0.02817	0.02817	0.01408	0.01408	0.01761	0.01408	0.01408	0.01056	0.00352	0	0	0
0.00352	0	0	0	0	0	0					
1998	1	2	0	0	24	0	0	0	0	0	0
0	0	0.125	0.08333	0.16667	0.04167	0.08333	0.125	0.16667	0.04167	0	0.04167
0	0	0.04167	0.04167	0	0	0.04167	0	0	0	0	0
0	0	0	0	0	0	0					
1999	1	2	0	0	-9999	0	0	0	0	0.0026	0.01823
0.01302	0.01042	0.05729	0.07292	0.07552	0.11198	0.09896	0.11198	0.11198	0.0651	0.0625	0.04948
0.05208	0.02865	0.02083	0.01042	0.01042	0.0026	0.0026	0.00521	0.0026	0.0026	0	0
0	0	0	0	0	0	0					
1999	1	2	0	0	-384	0	0	0	0	0.0026	0.01823
0.01302	0.01042	0.05729	0.07292	0.07552	0.11198	0.09896	0.11198	0.11198	0.0651	0.0625	0.04948
0.05208	0.02865	0.02083	0.01042	0.01042	0.0026	0.0026	0.00521	0.0026	0.0026	0	0
0	0	0	0	0	0	0					
2000	1	2	0	0	384	0	0	0	0	0.0026	0.01823
0.01302	0.01042	0.05729	0.07292	0.07552	0.11198	0.09896	0.11198	0.11198	0.0651	0.0625	0.04948
0.05208	0.02865	0.02083	0.01042	0.01042	0.0026	0.0026	0.00521	0.0026	0.0026	0	0
0	0	0	0	0	0	0					
2000	1	2	0	0	-9998	0	0	0	0	0.0026	0.01823
0.01302	0.01042	0.05729	0.07292	0.07552	0.11198	0.09896	0.11198	0.11198	0.0651	0.0625	0.04948
0.05208	0.02865	0.02083	0.01042	0.01042	0.0026	0.0026	0.00521	0.0026	0.0026	0	0
0	0	0	0	0	0	0					
2001	1	2	0	0	103	0	0	0	0.00971	0.03883	0.17476
0.18447	0.09709	0.12621	0.02913	0.01942	0.02913	0.05825	0.05825	0.03883	0.03883	0.01942	0.02913

0.00971	0.00971	0.00971	0.01942	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0					
1978	1	3	0	0	120	0	0	0	0	0.04167	0.025
0.08333	0.025	0.03333	0.05	0.00833	0.05	0.04167	0.05	0.025	0.01667	0.04167	0.00833
0.05	0.1	0.03333	0.05	0.03333	0.10833	0.04167	0.03333	0.03333	0.01667	0	0
0	0	0	0	0	0	0	#	120			
1979	1	3	0	0	106	0	0	0	0.01887	0.00943	0.0283
0.01887	0.03774	0.06604	0.0283	0.0283	0.00943	0.0283	0.0283	0.01887	0.03774	0.04717	0.10377
0.06604	0.13208	0.12264	0.03774	0.04717	0.04717	0.01887	0.00943	0.00943	0	0	0
0	0	0	0	0	0	0	#	106			
1980	1	3	0	0	-9999	0	0	0	0	0.00862	0.01724
0.0431	0.06034	0.07759	0.06034	0.06034	0.06897	0.03448	0.11207	0.0431	0.06034	0.07759	0.03448
0.01724	0.0431	0.0431	0.02586	0.03448	0.02586	0.00862	0.00862	0.00862	0.01724	0	0.00862
0	0	0	0	0	0	0	#	combine	80-83		
1981	1	3	0	0	-29	0	0	0	0	0.00862	0.01724
0.0431	0.06034	0.07759	0.06034	0.06034	0.06897	0.03448	0.11207	0.0431	0.06034	0.07759	0.03448
0.01724	0.0431	0.0431	0.02586	0.03448	0.02586	0.00862	0.00862	0.00862	0.01724	0	0.00862
0	0	0	0	0	0	0	#	combine	80-83		
1982	1	3	0	0	116	0	0	0	0	0.00862	0.01724
0.0431	0.06034	0.07759	0.06034	0.06034	0.06897	0.03448	0.11207	0.0431	0.06034	0.07759	0.03448
0.01724	0.0431	0.0431	0.02586	0.03448	0.02586	0.00862	0.00862	0.00862	0.01724	0	0.00862
0	0	0	0	0	0	0	#	combine	80-83		
1983	1	3	0	0	-9998	0	0	0	0	0.00862	0.01724
0.0431	0.06034	0.07759	0.06034	0.06034	0.06897	0.03448	0.11207	0.0431	0.06034	0.07759	0.03448
0.01724	0.0431	0.0431	0.02586	0.03448	0.02586	0.00862	0.00862	0.00862	0.01724	0	0.00862
0	0	0	0	0	0	0	#	combine	80-83		
1984	1	3	0	0	200	0	0	0	0.00804	0.00804	0.04021
0.03217	0.08043	0.09115	0.08043	0.09651	0.08847	0.07239	0.05094	0.04826	0.04021	0.01609	0.0429
0.03217	0.00804	0.03217	0.05362	0.03485	0.01877	0.00536	0.00536	0.00536	0.00268	0.00536	0
0	0	0	0	0	0	0	#	161	373		
1985	1	3	0	0	200	0	0	0	0	0.0045	0.02703
0.04054	0.02252	0.07207	0.03153	0.1036	0.05405	0.04955	0.08108	0.04505	0.07207	0.03153	0.05405
0.03153	0.04505	0.07207	0.03604	0.04054	0.02252	0.02703	0.02252	0.00901	0.0045	0	0
0	0	0	0	0	0	0	#	98	222		
1986	1	3	0	0	177	0	0.0113	0.00565	0.00565	0	0.01695
0.0113	0.0452	0.0565	0.0565	0.10169	0.03955	0.0678	0.03955	0.07345	0.03955	0.01695	0.0452
0.06215	0.0452	0.0565	0.0565	0.0339	0.0565	0.0113	0.01695	0.0113	0.01695	0	0
0	0	0	0	0	0	0	#	37	177		
1987	1	3	0	0	163	0	0.01227	0	0.00613	0.0184	0.04908
0.01227	0.02454	0.07362	0.03067	0.07975	0.04908	0.04294	0.07362	0.04908	0.04294	0.04294	0.04294
0.06135	0.02454	0.07975	0.03681	0.05521	0.04294	0.0184	0.01227	0.01227	0	0	0
0	0.00613	0	0	0	0	0	#	40	163		
1988	1	3	0	0	38	0	0	0	0	0	0
0.13158	0.02632	0.10526	0.02632	0.05263	0.05263	0.07895	0.18421	0.05263	0.05263	0.05263	0
0.02632	0.07895	0.05263	0	0.02632	0	0	0	0	0	0	0
0	0	0	0	0	0	0	#	38	38		
1989	1	3	0	0	112	0	0.00893	0.03571	0.01786	0.01786	0.04464
0.01786	0.08036	0.0625	0.02679	0.08929	0.08036	0.08929	0.0625	0.07143	0.03571	0.07143	0.05357
0.00893	0.01786	0.01786	0.03571	0	0.00893	0.01786	0.00893	0	0.00893	0	0
0	0	0.00893	0	0	0	0	#	80	112		
1993	1	3	0	0	163	0	0.00613	0	0	0.00613	0.06135
0.07975	0.11656	0.09202	0.12883	0.10429	0.06135	0.02454	0.04294	0.02454	0.02454	0.04294	0.0184
0.0184	0.03067	0.04294	0.0184	0.00613	0.02454	0	0.01227	0.00613	0	0	0
0	0	0	0	0.00613	0	0	#	163	163		
1994	1	3	0	0	151	0	0	0.00662	0	0.01325	0.01987
0.06623	0.10596	0.09272	0.15232	0.07285	0.12583	0.0596	0.04636	0.03311	0.03974	0.04636	0.03974

0.01325	0.03311	0.00662	0	0.00662	0.00662	0.01325	0	0	0	0	0
0	0	0	0	0	0	0	#	151	151		
1995	1	3	0	0	110	0	0	0	0.00909	0.02727	0
0.03636	0.08182	0.07273	0.13636	0.1	0.07273	0.06364	0.02727	0.07273	0.02727	0.06364	0.03636
0.03636	0.01818	0.02727	0.05455	0.00909	0.00909	0.01818	0	0	0	0	0
0	0	0	0	0	0	0	#	110	110		
1996	1	3	0	0	73	0	0	0	0.0137	0.0137	0.0411
0.0274	0.0411	0.12329	0.10959	0.12329	0.17808	0.05479	0.09589	0.0411	0.0274	0.0137	0.0274
0	0.0137	0.0137	0.0137	0.0274	0	0	0	0	0	0	0
0	0	0	0	0	0	0	#	73	73		
1997	1	3	0	0	99	0	0	0.0101	0.0101	0.0101	0.0303
0.0404	0.07071	0.07071	0.09091	0.09091	0.14141	0.06061	0.12121	0.0404	0.0202	0.06061	0.0303
0.05051	0	0.0101	0.0101	0.0101	0.0101	0.0101	0	0	0	0	0
0	0	0	0	0	0	0	#	99	99		
1998	1	3	0	0	147	0	0	0	0	0	0.02041
0.02721	0.04082	0.04762	0.14286	0.13605	0.10204	0.12245	0.09524	0.07483	0.03401	0.05442	0.01361
0.02041	0.02721	0.02041	0	0.01361	0.0068	0	0	0	0	0	0
0	0	0	0	0	0	0	#	147	147		
1999	1	3	0	0	200	0	0	0.00407	0	0.00407	0.00813
0.03252	0.05285	0.06504	0.10976	0.15041	0.09756	0.10569	0.07724	0.07724	0.04065	0.05691	0.03252
0.00813	0.02846	0.01626	0.01626	0.0122	0.00407	0	0	0	0	0	0
0	0	0	0	0	0	0	#	246	246		
2000	1	3	0	0	62	0	0	0	0	0	0
0.04839	0.04839	0.08065	0.06452	0.09677	0.16129	0.17742	0.06452	0.03226	0.06452	0	0.04839
0.03226	0.03226	0	0.03226	0.01613	0	0	0	0	0	0	0
0	0	0	0	0	0	0	#	62	62		
2001	1	3	0	0	200	0	0	0	0.00272	0.00815	0.01359
0.02174	0.02989	0.04076	0.05163	0.05707	0.09511	0.08424	0.10326	0.10054	0.09783	0.05707	0.07337
0.04891	0.03533	0.02446	0.0163	0.00272	0.01087	0.00815	0.00543	0.00815	0	0	0.00272
0	0	0	0	0	0	0	#				
2002	1	3	0	0	200	0	0	0	0.00446	0.00893	0.00893
0.01786	0.02679	0.03348	0.05134	0.08036	0.07589	0.09152	0.09598	0.11607	0.10045	0.09152	0.04464
0.04464	0.03125	0.01563	0.01339	0.02009	0.01563	0.00446	0.00446	0.00223	0	0	0
0	0	0	0	0	0	0	#				
2003	1	3	0	0	200	0	0.00204	0	0.00612	0.0102	0.0102
0.02449	0.0102	0.04082	0.03061	0.0551	0.06531	0.06735	0.07755	0.08571	0.09592	0.10816	0.06327
0.08367	0.05102	0.02857	0.01837	0.02041	0.01429	0.00816	0.01429	0.00408	0.00204	0.00204	0
0	0	0	0	0	0	0	#				
1995	1	4	0	0	98	0	0	0	0	0	0
0	0.02041	0.02041	0.08163	0.07143	0.13265	0.04082	0.06122	0.10204	0.08163	0.08163	0.08163
0.04082	0.02041	0.05102	0.05102	0.04082	0.02041	0	0	0	0	0	0
0	0	0	0	0	0	0					
1996	1	4	0	0	161	0	0	0	0	0	0
0	0.01242	0.03106	0.08696	0.07453	0.13665	0.09317	0.09938	0.08696	0.03727	0.04348	0.02484
0.06211	0.02484	0.03106	0.02484	0.04348	0.01242	0.01242	0.02484	0.00621	0.00621	0.00621	0.01242
0.00621	0	0	0	0	0	0					
1997	1	4	0	0	200	0	0	0.00391	0	0	0
0.00391	0.01562	0.03906	0.06641	0.11328	0.13281	0.13672	0.125	0.07812	0.05859	0.05859	0.02734
0.03516	0.02734	0.02734	0.00781	0.01562	0.01172	0	0.01172	0	0.00391	0	0
0	0	0	0	0	0	0					
1998	1	4	0	0	170	0	0	0	0	0	0
0.02941	0.00588	0.01765	0.01765	0.06471	0.08824	0.19412	0.07647	0.17647	0.10588	0.05882	0.04706
0.00588	0.02941	0.01765	0.02941	0.01176	0.00588	0.00588	0.00588	0.00588	0	0	0
0	0	0	0	0	0	0					
1999	1	4	0	0	200	0	0	0	0	0	0
0	0	0.01376	0.01376	0.0367	0.06422	0.11009	0.08716	0.11009	0.11009	0.11009	0.08716
0.05505	0.06881	0.0367	0.02752	0.02294	0.02294	0.00459	0.00459	0.00459	0	0.00459	0.00459
0	0	0	0	0	0	0					
2000	1	4	0	0	175	0	0	0	0	0	0
0.01143	0.01143	0.02857	0.06286	0.14286	0.11429	0.11429	0.11429	0.05714	0.10857	0.05714	0.04571

0.05714	0.01714	0.01714	0.00571	0	0.01143	0.01143	0	0.00571	0.00571	0	0
0	0	0	0	0	0	0					
2001	1	4	0	0	200	0	0	0	0	0	0.01736
0.06597	0.07639	0.05208	0.06944	0.04861	0.14931	0.10069	0.0625	0.08333	0.06597	0.05208	0.03125
0.03125	0.01042	0.02083	0.02431	0.00694	0.01736	0.00694	0	0.00694	0	0	0
0	0	0	0	0	0	0					
1980	1	5	0	0	-9999	0	0	0	0	0.01138	0.02987
0.06543	0.07539	0.11522	0.0825	0.09388	0.0441	0.03841	0.02703	0.03129	0.04694	0.0128	0.02418
0.05405	0.02987	0.05974	0.01991	0.01991	0.01422	0.01849	0.00711	0.03129	0.01138	0.00711	0.00569
0.00569	0.00569	0	0.00569	0.00569	0	0	#	combine	80-88	111	
1981	1	5	0	0	-29	0	0	0	0	0.01138	0.02987
0.06543	0.07539	0.11522	0.0825	0.09388	0.0441	0.03841	0.02703	0.03129	0.04694	0.0128	0.02418
0.05405	0.02987	0.05974	0.01991	0.01991	0.01422	0.01849	0.00711	0.03129	0.01138	0.00711	0.00569
0.00569	0.00569	0	0.00569	0.00569	0	0	#	combine	80-88		
1982	1	5	0	0	-29	0	0	0	0	0.01138	0.02987
0.06543	0.07539	0.11522	0.0825	0.09388	0.0441	0.03841	0.02703	0.03129	0.04694	0.0128	0.02418
0.05405	0.02987	0.05974	0.01991	0.01991	0.01422	0.01849	0.00711	0.03129	0.01138	0.00711	0.00569
0.00569	0.00569	0	0.00569	0.00569	0	0	#	combine	80-88		
1983	1	5	0	0	-29	0	0	0	0	0.01138	0.02987
0.06543	0.07539	0.11522	0.0825	0.09388	0.0441	0.03841	0.02703	0.03129	0.04694	0.0128	0.02418
0.05405	0.02987	0.05974	0.01991	0.01991	0.01422	0.01849	0.00711	0.03129	0.01138	0.00711	0.00569
0.00569	0.00569	0	0.00569	0.00569	0	0	#	combine	80-88		
1984	1	5	0	0	-29	0	0	0	0	0.01138	0.02987
0.06543	0.07539	0.11522	0.0825	0.09388	0.0441	0.03841	0.02703	0.03129	0.04694	0.0128	0.02418
0.05405	0.02987	0.05974	0.01991	0.01991	0.01422	0.01849	0.00711	0.03129	0.01138	0.00711	0.00569
0.00569	0.00569	0	0.00569	0.00569	0	0	#	combine	80-88		
1985	1	5	0	0	-29	0	0	0	0	0.01138	0.02987
0.06543	0.07539	0.11522	0.0825	0.09388	0.0441	0.03841	0.02703	0.03129	0.04694	0.0128	0.02418
0.05405	0.02987	0.05974	0.01991	0.01991	0.01422	0.01849	0.00711	0.03129	0.01138	0.00711	0.00569
0.00569	0.00569	0	0.00569	0.00569	0	0	#	combine	80-88		
1986	1	5	0	0	-29	0	0	0	0	0.01138	0.02987
0.06543	0.07539	0.11522	0.0825	0.09388	0.0441	0.03841	0.02703	0.03129	0.04694	0.0128	0.02418
0.05405	0.02987	0.05974	0.01991	0.01991	0.01422	0.01849	0.00711	0.03129	0.01138	0.00711	0.00569
0.00569	0.00569	0	0.00569	0.00569	0	0	#	combine	80-88		
1987	1	5	0	0	259	0	0	0	0	0.01138	0.02987
0.06543	0.07539	0.11522	0.0825	0.09388	0.0441	0.03841	0.02703	0.03129	0.04694	0.0128	0.02418
0.05405	0.02987	0.05974	0.01991	0.01991	0.01422	0.01849	0.00711	0.03129	0.01138	0.00711	0.00569
0.00569	0.00569	0	0.00569	0.00569	0	0	#	combine	80-88		
1988	1	5	0	0	-9998	0	0	0	0	0.01138	0.02987
0.06543	0.07539	0.11522	0.0825	0.09388	0.0441	0.03841	0.02703	0.03129	0.04694	0.0128	0.02418
0.05405	0.02987	0.05974	0.01991	0.01991	0.01422	0.01849	0.00711	0.03129	0.01138	0.00711	0.00569
0.00569	0.00569	0	0.00569	0.00569	0	0	#	combine	80-88		
1995	1	5	0	0	-9999	0	0	0	0	0	0
0.30435	0.04348	0.08696	0.08696	0.08696	0.04348	0.08696	0.04348	0.04348	0	0.04348	0
0	0	0	0	0	0	0	0	0.04348	0	0.04348	0.04348
0	0	0	0	0	0	0	#	combine	95-96		
1995	1	5	0	0	-11	0	0	0	0	0	0
0.30435	0.04348	0.08696	0.08696	0.08696	0.04348	0.08696	0.04348	0.04348	0	0.04348	0
0	0	0	0	0	0	0	0	0.04348	0	0.04348	0.04348
0	0	0	0	0	0	0	#	combine	95-96		
1996	1	5	0	0	23	0	0	0	0	0	0
0.30435	0.04348	0.08696	0.08696	0.08696	0.04348	0.08696	0.04348	0.04348	0	0.04348	0
0	0	0	0	0	0	0	0	0.04348	0	0.04348	0.04348
0	0	0	0	0	0	0	#	combine	95-96		
1996	1	5	0	0	-9998	0	0	0	0	0	0
0.30435	0.04348	0.08696	0.08696	0.08696	0.04348	0.08696	0.04348	0.04348	0	0.04348	0
0	0	0	0	0	0	0	0	0.04348	0	0.04348	0.04348
0	0	0	0	0	0	0	#	combine	95-96		

1998	1	5	0	0	48	0	0	0	0	0	0
0.02083	0	0	0.04167	0.0625	0.125	0	0.16667	0.04167	0.08333	0.0625	0
0.04167	0.04167	0.10417	0.02083	0.0625	0.02083	0.02083	0.04167	0.02083	0	0	0
0	0.02083	0	0	0	0	0	#	48	48		
1999	1	5	0	0	96	0	0	0	0	0	0
0	0	0.05208	0.02083	0.03125	0.09375	0.08333	0.08333	0.03125	0.0625	0.04167	0.01042
0.07292	0.0625	0.05208	0.10417	0.03125	0.10417	0.04167	0.01042	0.01042	0	0	0
0	0	0	0	0	0	0	#	96	96		
2000	1	5	0	0	189	0	0	0	0	0	0
0.00529	0.01587	0.02116	0.04762	0.04762	0.06878	0.08995	0.07407	0.06349	0.09524	0.06349	0.0582
0.06349	0.06349	0.04762	0.04762	0.03704	0.03704	0.03704	0.01058	0.00529	0	0	0
0	0	0	0	0	0	0	#	189	189		
2001	1	5	0	0	101	0	0	0	0	0	0
0.0099	0.0099	0.0099	0.0099	0.0297	0.07921	0.08911	0.09901	0.07921	0.09901	0.0495	0.05941
0.06931	0.05941	0.07921	0.0495	0.05941	0.0198	0.0198	0	0	0.0099	0.0099	0
0	0	0	0	0	0	0	#	101	101		

1996	1	6	0	0	200	0	0	0	0	0	0.00752
0.00376	0.03008	0.04135	0.04511	0.05639	0.10526	0.1015	0.10526	0.07143	0.05263	0.02256	0.03759
0.03383	0.03759	0.04135	0.03383	0.04511	0.05639	0.04887	0.01504	0.00376	0	0	0.00376
0	0	0	0	0	0	0					
1997	1	6	0	0	117	0	0	0	0	0	0
0.00855	0.01709	0.04274	0.06838	0.07692	0.10256	0.11966	0.15385	0.12821	0.05983	0.06838	0.01709
0.02564	0.02564	0.02564	0	0.01709	0.01709	0.01709	0.00855	0	0	0	0
0	0	0	0	0	0	0					

1998	1	6	0	0	-9999	0	0	0	0	0	0.01961
0.02941	0.0098	0.02941	0.06863	0	0.04902	0.06863	0.09804	0.09804	0.04902	0.08824	0.03922
0.07843	0.07843	0.02941	0.02941	0	0.04902	0.02941	0.02941	0	0.01961	0	0.0098
0	0	0	0	0	0	0					
1999	1	6	0	0	102	0	0	0	0	0	0.01961
0.02941	0.0098	0.02941	0.06863	0	0.04902	0.06863	0.09804	0.09804	0.04902	0.08824	0.03922
0.07843	0.07843	0.02941	0.02941	0	0.04902	0.02941	0.02941	0	0.01961	0	0.0098
0	0	0	0	0	0	0					
2000	1	6	0	0	-9998	0	0	0	0	0	0.01961
0.02941	0.0098	0.02941	0.06863	0	0.04902	0.06863	0.09804	0.09804	0.04902	0.08824	0.03922
0.07843	0.07843	0.02941	0.02941	0	0.04902	0.02941	0.02941	0	0.01961	0	0.0098
0	0	0	0	0	0	0					

2002	1	6	0	0	-9999	0	0	0	0	0.03077	0.01538
0.01538	0.01538	0	0	0	0	0.03077	0.03077	0.07692	0.04615	0.01538	0.04615
0.03077	0.04615	0.07692	0.01538	0.03077	0.16923	0.13846	0.10769	0.03077	0.01538	0.01538	0
0	0	0	0	0	0	0					
2003	1	6	0	0	65	0	0	0	0	0.03077	0.01538
0.01538	0.01538	0	0	0	0	0.03077	0.03077	0.07692	0.04615	0.01538	0.04615
0.03077	0.04615	0.07692	0.01538	0.03077	0.16923	0.13846	0.10769	0.03077	0.01538	0.01538	0
0	0	0	0	0	0	0					
2004	1	6	0	0	-9998	0	0	0	0	0.03077	0.01538
0.01538	0.01538	0	0	0	0	0.03077	0.03077	0.07692	0.04615	0.01538	0.04615
0.03077	0.04615	0.07692	0.01538	0.03077	0.16923	0.13846	0.10769	0.03077	0.01538	0.01538	0
0	0	0	0	0	0	0					

2000	1	7	0	0	200	0	0	0	0	0	0
0	0	0.00585	0.00292	0.00877	0.01462	0.03509	0.09357	0.10234	0.14035	0.10526	0.09064
0.09357	0.07602	0.08187	0.0614	0.03801	0.01462	0.02047	0.01462	0	0	0	0
0	0	0	0	0	0	0					
2001	1	7	0	0	200	0	0	0	0	0	0
0	0	0	0.00183	0.00183	0.01282	0.02015	0.05861	0.07509	0.13553	0.15385	0.14103
0.09524	0.09524	0.08242	0.04945	0.02747	0.0293	0.01099	0.00549	0.00366	0	0	0
0	0	0	0	0	0	0					
2002	1	7	0	0	91	0	0	0	0	0	0
0	0	0	0.01099	0.03297	0.05495	0.07692	0.05495	0.10989	0.0989	0.14286	0.15385

	0.12088	0.02198	0.04396	0.02198	0.01099	0	0.01099	0	0	0.01099	0.02198	0
	0	0	0	0	0	0	0					
2003		1	7	0	0	5	0	0	0	0	0	0
	0	0	0	0	0.2	0	0.2	0.2	0.2	0	0.2	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0					
2004		1	7	0	0	24	0	0	0	0	0	0
	0	0	0	0	0	0	0.04167	0.04167	0.16667	0.125	0.16667	0.16667
	0.20833	0.04167	0.04167	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0					
#IPHC												
2002		1	12	0	0	141	0	0	0	0	0	0
	0	0	0	0.00709	0.00709	0.02128	0.06383	0.06383	0.14184	0.13475	0.12766	0.09929
	0.07092	0.07092	0.07092	0.04965	0.02837	0.00709	0.00709	0.02837	0	0	0	0
	0	0	0	0	0	0	0	#	2002	IPHC		
2003		1	12	0	0	200	0	0	0	0	0	0
	0	0	0.00631	0	0.01262	0.01577	0.03785	0.07256	0.09464	0.09779	0.11672	0.07886
	0.08517	0.08202	0.07571	0.0694	0.05994	0.05994	0.02524	0	0.00946	0	0	0
	0	0	0	0	0	0	0	#	2003	IPHC		
2004		1	12	0	0	174	0	0	0	0	0	0
	0	0	0	0	0.00571	0	0.01143	0.08	0.11429	0.12	0.13143	0.12
	0.10286	0.10857	0.05714	0.05714	0.03429	0.02857	0.02857	0	0	0	0	0
	0	0	0	0	0	0	0	#	2004	IPHC		
2005		1	12	0	0	155	0	0	0	0	0	0
	0	0	0	0	0.00641	0.00641	0.04487	0.03846	0.07051	0.11538	0.10897	0.07051
	0.12821	0.05769	0.12179	0.07051	0.0641	0.05769	0.01282	0.01282	0.01282	0	0	0
	0	0	0	0	0	0	0	#	2005	IPHC		
2006		1	12	0	0	70	0	0	0	0	0	0
	0	0	0	0	0	0	0.04286	0.01429	0.07143	0.05714	0.11429	0.17143
	0.07143	0.17143	0.02857	0.05714	0.04286	0.04286	0.04286	0	0.01429	0.04286	0.01429	0
	0	0	0	0	0	0	0					
36	#	N	age'	bins								
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	35	40	45	50	55	60	65	
1	#	number	of	unique	ageing	error	matrices	to	generate			
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	46.5	47.5	48.5
	49.5	50.5	51.5	52.5	53.5	54.5	55.5	56.5	57.5	58.5	59.5	60.5
	61.5	62.5	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	#71.5	72.5
	73.5	74.5	75.5	76.5	77.5	78.5	79.5	80.5	81.5	82.5	83.5	84.5
	85.5	86.5	87.5	88.5	89.5	90.5						
#SS1		Age	Error	Vector1.5	1.53	1.57	1.6	1.64	1.67	1.71	1.74	1.78
	1.81	1.85	1.88	1.92	1.95	1.99	2.02	2.06	2.09	2.13	2.16	2.2
	2.23	2.27	2.3	2.33	2.37	2.4	2.44	2.47	2.51	2.54	2.58	2.61
	2.65	2.68	2.72	2.75	2.79	2.82	2.86	2.89	2.93	2.96	3	3.03
	3.07	3.1	3.13	3.17	3.2	3.24	3.27	3.31	3.34	3.38	3.41	3.45
	3.48	3.52	3.55	3.59	3.62	3.66	3.69	3.73	3.76	3.8	3.83	3.87
	3.9	3.93	#3.97	4	4.04	4.07	4.11	4.14	4.18	4.21	4.25	4.28
	4.32	4.35	4.39	4.42	4.46	4.49	4.53	4.56	4.6	4.63		
#1.01		1.06	1.1	1.14	1.19	1.23	1.27	1.31	1.36	1.4	1.44	1.49
	1.53	1.57	1.62	1.66	1.7	1.75	1.79	1.83	1.87	1.92	1.96	2

```
2.05 2.09 2.13 2.18 2.22 2.26 2.31 2.35 2.39 2.44 2.48 2.52
2.56 2.61 2.65 2.69 2.74 2.78 2.82 2.87 2.91 2.95 3 3.04
3.08 3.12 3.17 3.21 3.25 3.3 3.34 3.38 3.43 3.47 3.51 3.56
3.6 3.64 3.69 3.73 3.77 3.81 3.86 3.9 3.94 4 3.93 #3.97
4 4.04 4.07 4.11 4.14 4.18 4.21 4.25 4.28 4.32 4.35 4.39
4.42 4.46 4.49 4.53 4.56 4.6 4.63
2.41775 2.39845 2.37915 2.35985 2.34055 2.32125 2.30195 2.28265 2.26335 2.24405 2.22475 2.20545
2.18615 2.16685 2.14755 2.12825 2.10895 2.08965 2.07035 2.05105 2.03175 2.01245 1.99315 1.97385
1.95455 1.93525 1.91595 1.89665 1.87735 1.85805 1.83875 1.81945 1.80015 1.78085 1.76155 1.74225
1.72295 1.70365 1.68435 1.66505 1.64575 1.62645 1.60715 1.58785 1.56855 1.54925 1.52995 1.51065
1.49135 1.47205 1.45275 1.43345 1.41415 1.39485 1.37555 1.35625 1.33695 1.31765 1.29835 1.27905
1.25975 1.24045 1.22115 1.20185 1.18255 1.16325 1.14395 1.12465 1.10535 1.08605 1.06675 #1.04745
1.02815 1.00885 0.98955 0.97025 0.95095 0.93165 0.91235 0.89305 0.87375 0.85445 0.83515 0.81585
0.79655 0.77725 0.75795 0.73865 0.71935 0.70005 0.68075

#SS1

#3 "1=%CORRECT," "2=C.V.," "3=%AGREE," 4=READ %AGREE @AGE
#0.31 0.1 0.95 '%AGREE @ 1 (MIN)' 0 70 0 0
0 ! 82 NO PICK 0 -1 0
#0.11 0.1 0.9 '%AGREE @70 (MAX)' 0 70 0 0 0
! 83 NO PICK 0 -1 0
#1 0.001 4 'POWER ' 0 70 0 0 0 ! 84 NO
PICK 0 -1 0
#0.04 0.01 0.3 'OLD DISCOUNT ' 0 70 0 0 0
! 85 NO PICK 0 -1 0
#0 0.001 0.1 '%MIS-SEXED ' 0 70 0 0 0 ! 86
NO PICK 0 -1 0


33 # N age observations (need to count and enter value here)

#Year Seas Type Gender Partitn ageerr LbinLo LbinHi Nsamp 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 35 40 45 50 55 60 65
1980 1 1 0 0 1 1 -1 -9999 0.01471 0 0
0.04412 0.04412 0.02941 0.07353 0.01471 0.07353 0.10294 0.07353 0.02941 0.02941 0 0.01471
0.01471 0 0 0.02941 0.02941 0 0.01471 0 0.02941 0.01471 0 0
0.04412 0.05882 0.05882 0 0.05882 0.04412 0 0.01471 0.04412 # combines 80-82
Super Years
1981 1 1 0 0 1 1 -1 68 0.01471 0 0
0.04412 0.04412 0.02941 0.07353 0.01471 0.07353 0.10294 0.07353 0.02941 0.02941 0 0.01471
0.01471 0 0 0.02941 0.02941 0 0.01471 0 0.02941 0.01471 0 0
0.04412 0.05882 0.05882 0 0.05882 0.04412 0 0.01471 0.04412 # combines 80-82
Super Years
1982 1 1 0 0 1 1 -1 -9998 0.01471 0 0
0.04412 0.04412 0.02941 0.07353 0.01471 0.07353 0.10294 0.07353 0.02941 0.02941 0 0.01471
0.01471 0 0 0.02941 0.02941 0 0.01471 0 0.02941 0.01471 0 0
0.04412 0.05882 0.05882 0 0.05882 0.04412 0 0.01471 0.04412 # combines 80-82
Super Years

1980 1 2 0 0 1 1 -1 -9999 0 0 0.05051
0.05051 0.05051 0.05051 0.05051 0 0.05051 0 0 0.10101 0 0.05051 0.10101
0.10101 0.05051 0 0 0.05051 0.10101 0 0 0.05051 0 0 0
0 0 0.0202 0.0101 0.0101 0 0.0101 0 0.0404
1981 1 2 0 0 1 1 -1 -27 0 0 0.05051
0.05051 0.05051 0.05051 0.05051 0 0.05051 0 0 0.10101 0 0.05051 0.10101
0.10101 0.05051 0 0 0.05051 0.10101 0 0 0.05051 0 0 0
0 0 0.0202 0.0101 0.0101 0 0.0101 0 0.0404
1982 1 2 0 0 1 1 -1 27 0 0 0.05051
0.05051 0.05051 0.05051 0.05051 0 0.05051 0 0 0.10101 0 0.05051 0.10101
```

0.10101	0.05051	0	0	0.05051	0.10101	0	0	0.05051	0	0	0
0	0	0.0202	0.0101	0.0101	0	0.0101	0	0.0404			
1983	1	2	0	0	1	1	-1	-9998	0	0	0.05051
0.05051	0.05051	0.05051	0.05051	0	0.05051	0	0	0.10101	0	0.05051	0.10101
0.10101	0.05051	0	0	0.05051	0.10101	0	0	0.05051	0	0	0
0	0	0.0202	0.0101	0.0101	0	0.0101	0	0.0404			
1984	1	2	0	0	1	1	-1	-9999	0	0	0
0.05208	0	0.10417	0.05208	0.05208	0.05208	0.10417	0	0.10417	0	0.05208	0
0.05208	0.10417	0	0.05208	0.05208	0	0	0	0	0.10417	0	0
0	0.01042	0.01042	0.01042	0.01042	0	0	0	0.02083			
1985	1	2	0	0	1	1	-1	24	0	0	0
0.05208	0	0.10417	0.05208	0.05208	0.05208	0.10417	0	0.10417	0	0.05208	0
0.05208	0.10417	0	0.05208	0.05208	0	0	0	0	0.10417	0	0
0	0.01042	0.01042	0.01042	0.01042	0	0	0	0.02083			
1986	1	2	0	0	1	1	-1	-9998	0	0	0
0.05208	0	0.10417	0.05208	0.05208	0.05208	0.10417	0	0.10417	0	0.05208	0
0.05208	0.10417	0	0.05208	0.05208	0	0	0	0	0.10417	0	0
0	0.01042	0.01042	0.01042	0.01042	0	0	0	0.02083			
1978	1	3	0	0	1	1	-1	120	0	0.00833	0.05
0.08333	0.075	0.03333	0.06667	0.03333	0.05	0.00833	0.00833	0.01667	0.025	0	0.00833
0.01667	0.025	0.00833	0.01667	0	0	0.04167	0.01667	0.03333	0.00833	0	0.00833
0.08333	0.06667	0.05	0.03333	0.025	0.06667	0.01667	0	0.01667	#	120	120
1979	1	3	0	0	1	1	-1	169	0	0.00592	0.02367
0.01183	0.08284	0.06509	0.01775	0.04734	0.01775	0.01775	0.01183	0.00592	0.01183	0.01775	0.01183
0.01775	0.05325	0.04142	0.02367	0.0355	0.01183	0.02959	0.0355	0.0355	0.04734	0.01183	0.01775
0.10651	0.05325	0.02367	0.02367	0	0.04734	0.00592	0.00592	0.02367	#	169	169
1984	1	3	0	0	1	1	-1	200	0	0	0.0082
0.0123	0.04918	0.09836	0.13525	0.04098	0.06148	0.14344	0.04918	0.04918	0.03279	0.03279	0.0123
0.03279	0.0123	0.0082	0.0123	0.0082	0.0123	0.0123	0	0	0.0041	0.0082	0.0041
0.02459	0.04098	0.02459	0.0082	0.0041	0.0041	0.0041	0.0123	0.03689	#	244	244
1985	1	3	0	0	1	1	-1	124	0	0.00806	0
0.00806	0.00806	0.01613	0.04839	0.02419	0.02419	0.02419	0.12903	0.03226	0.06452	0.04839	0.04032
0.02419	0	0	0	0.00806	0.01613	0.00806	0.02419	0.03226	0.00806	0	0.01613
0.06452	0.12097	0.03226	0.02419	0.00806	0	0.04032	0.01613	0.08065	#	124	124
1986	1	3	0	0	1	1	-1	140	0	0.00714	0.02857
0.01429	0.01429	0.03571	0.07143	0.06429	0.09286	0.05	0.05	0.05714	0.01429	0.03571	0.02143
0.02143	0.00714	0	0.01429	0	0	0.02143	0.00714	0.00714	0	0.00714	0
0.02857	0.07143	0.04286	0.03571	0.01429	0.03571	0.02143	0.01429	0.09286	#	140	140
1987	1	3	0	0	1	1	-1	123	0	0.02439	0.03252
0	0.04065	0	0.04065	0.06504	0.07317	0.04878	0.05691	0.03252	0.04065	0.02439	0.03252
0.04065	0.01626	0.01626	0.02439	0.01626	0.00813	0.01626	0.01626	0.00813	0.00813	0.00813	0
0.01626	0.09756	0.04878	0.01626	0.00813	0.00813	0.04878	0.01626	0.04878	#	123	123
1989	1	3	0	0	1	1	-1	32	0	0	0.03125
0.03125	0.0625	0.15625	0.03125	0.15625	0.03125	0.03125	0.125	0.03125	0	0.03125	0.0625
0.03125	0	0.03125	0	0	0	0	0.03125	0.03125	0	0	0.03125
0	0	0	0	0	0	0	0	0.0625	#	32	32
2001	1	3	0	0	1	1	-1	86	0	0	0.01163
0	0.01163	0.02326	0	0.03488	0.02326	0.06977	0.15116	0.11628	0.06977	0.0814	0.0814
0.03488	0.05814	0.0814	0.01163	0.01163	0	0	0.01163	0	0	0	0.01163
0.01163	0.01163	0.01163	0.02326	0.01163	0	0.01163	0.01163	0.01163	#	86	86
2002	1	3	0	0	1	1	-1	73	0	0	0
0	0	0	0.0137	0.0137	0.0274	0.08219	0.06849	0.0274	0.06849	0.13699	0.0411

0.06849	0.08219	0.10959	0.05479	0.0274	0.0274	0	0	0	0.0137	0	0
0.0137	0.0411	0	0.0274	0.0137	0	0	0.0137	0.0274	#	73	fish
1998	1	5	0	0	1	1	-1	-9999	0	0	0
0	0	0	0.00833	0.03333	0.04167	0.06667	0.05	0.10833	0.05	0.06667	0.06667
0.01667	0.00833	0.00833	0.00833	0.00833	0.01667	0.01667	0.04167	0.01667	0.01667	0.01667	0.01667
0.04167	0.025	0.05	0.08333	0.05	0.00833	0.01667	0.00833	0.03333	#	combine	98-99
Super	Years										
1998	1	5	0	0	1	1	-1	-60	0	0	0
0	0	0	0.00833	0.03333	0.04167	0.06667	0.05	0.10833	0.05	0.06667	0.06667
0.01667	0.00833	0.00833	0.00833	0.00833	0.01667	0.01667	0.04167	0.01667	0.01667	0.01667	0.01667
0.04167	0.025	0.05	0.08333	0.05	0.00833	0.01667	0.00833	0.03333	#	combine	98-99
Super	Years										
1999	1	5	0	0	1	1	-1	240	0	0	0
0	0	0	0.00833	0.03333	0.04167	0.06667	0.05	0.10833	0.05	0.06667	0.06667
0.01667	0.00833	0.00833	0.00833	0.00833	0.01667	0.01667	0.04167	0.01667	0.01667	0.01667	0.01667
0.04167	0.025	0.05	0.08333	0.05	0.00833	0.01667	0.00833	0.03333	#	combine	98-99
Super	Years										
1999	1	5	0	0	1	1	-1	-9998	0	0	0
0	0	0	0.00833	0.03333	0.04167	0.06667	0.05	0.10833	0.05	0.06667	0.06667
0.01667	0.00833	0.00833	0.00833	0.00833	0.01667	0.01667	0.04167	0.01667	0.01667	0.01667	0.01667
0.04167	0.025	0.05	0.08333	0.05	0.00833	0.01667	0.00833	0.03333	#	combine	98-99
Super	Years										
2000	1	5	0	0	1	1	-1	189	0	0	0
0	0.00529	0.00529	0	0.01058	0.02646	0.04233	0.02646	0.04233	0.04233	0.08466	0.08466
0.03175	0.06349	0.01587	0.03704	0.01587	0.01058	0.01058	0.02646	0.04762	0.02646	0.03704	0.03175
0.11111	0.01587	0.05291	0.03175	0.02116	0.01058	0.01587	0.01058	0.00529	#	189	189
2001	1	5	0	0	1	1	-1	96	0	0	0
0	0	0.01042	0	0.02083	0.03125	0.03125	0.02083	0.04167	0.08333	0.09375	0.05208
0.07292	0.05208	0.05208	0.03125	0.02083	0.03125	0.01042	0.02083	0	0.02083	0	0.01042
0.01042	0.0625	0.05208	0.03125	0.02083	0.01042	0.01042	0.02083	0.07292	#	was	101
in	last	assessment									
2002	1	6	0	0	1	1	-1	-9999	0.03049	0	0.03049
0.03049	0.03049	0	0.06098	0.03049	0	0.03049	0.03049	0	0.06098	0.03049	0.03049
0.15244	0.06098	0.06098	0.03049	0.06098	0.03049	0	0	0	0	0	0
0	0.02439	0.0122	0.0061	0	0.02439	0.0122	0.01829	0.10976			
2003	1	6	0	0	1	1	-1	60	0.03049	0	0.03049
0.03049	0.03049	0	0.06098	0.03049	0	0.03049	0.03049	0	0.06098	0.03049	0.03049
0.15244	0.06098	0.06098	0.03049	0.06098	0.03049	0	0	0	0	0	0
0	0.02439	0.0122	0.0061	0	0.02439	0.0122	0.01829	0.10976			
2004	1	6	0	0	1	1	-1	-9998	0.03049	0	0.03049
0.03049	0.03049	0	0.06098	0.03049	0	0.03049	0.03049	0	0.06098	0.03049	0.03049
0.15244	0.06098	0.06098	0.03049	0.06098	0.03049	0	0	0	0	0	0
0	0.02439	0.0122	0.0061	0	0.02439	0.0122	0.01829	0.10976			
2006	1	6	0	0	1	1	-1	30	0	0	0
0	0	0	0	0	0	0.04717	0	0.04717	0.14151	0.04717	0.04717
0	0.04717	0.14151	0.09434	0.04717	0	0.09434	0	0	0	0.04717	0
0.09434	0.0283	0.01887	0.00943	0.0283	0	0.01887	0	0			
2001	1	7	0	0	1	1	-1	200	0	0	0
0	0	0	0	0	0	0.01497	0.01497	0.01497	0.03992	0.05489	0.06487
0.09481	0.07485	0.06986	0.08483	0.0998	0.03992	0.05489	0.03493	0.01497	0.03493	0.02495	0.04491
0.05988	0.03393	0.00599	0.002	0.00599	0.00399	0.00399	0.00299	0.00299			
2002	1	7	0	0	1	1	-1	91	0	0	0
0	0	0	0	0	0.02387	0.01193	0.01193	0.0358	0.05967	0.04773	0.0358

0.08353	0.1432	0.19093	0.09547	0.0716	0.05967	0	0.0358	0	0.0358	0.02387	0
0.01193	0.00955	0.00239	0	0	0	0.00239	0	0.00716			
2004	1	7	0	0	1	1	-1	24	0	0	0
0	0	0	0	0	0	0	0	0.0431	0	0.0431	0.0431
0.0431	0.08621	0.08621	0	0.0431	0.21552	0.08621	0.17241	0	0.0431	0.0431	0
0.0431	0	0.00862	0	0	0	0	0	0			
2006	1	7	0	0	1	1	-1	37	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0.03185
0.03185	0.03185	0.03185	0.09554	0.03185	0.19108	0.03185	0.25478	0.12739	0.09554	0	0
0	0.01911	0.01274	0	0	0.00637	0	0	0.00637			
#IPHC											
#2002	1	12	0	0	1	1	-1	141	0	0	0
0	0	0	0	0	0	0	0	0	0.00709	0.01418	0.03546
0.02837	0.04255	0.06383	0.04965	0.05674	0.04255	0.02837	0.02128	0.04965	0.04965	0.02128	0.05674
0.02128	0.14184	0.04255	0.01418	0.04255	0.05674	0.03546	0.00709	0.07092	#	IPHC	
#2003	1	12	0	0	1	1	-1	200	0	0	0
0	0	0	0.00318	0	0	0.00318	0	0.00637	0.00637	0.00955	0.03185
0.0414	0.03503	0.05414	0.03822	0.05414	0.03185	0.03185	0.02548	0.01274	0.04777	0.03822	0.0414
0.03503	0.13057	0.04777	0.02548	0.05732	0.03822	0.02229	0.02229	0.10828	#	IPHC	
#2004	1	12	0	0	1	1	-1	175	0	0	0
0	0	0	0	0	0	0	0.00575	0.01149	0.00575	0	0.03448
0.04598	0.04598	0.03448	0.08046	0.06322	0.07471	0.04023	0.03448	0.02299	0.01724	0.01149	0.02299
0.00575	0.14368	0.03448	0.02874	0.05747	0.04023	0.05747	0.01149	0.06897	#	IPHC	
#2005	1	12	0	0	1	1	-1	175	0	0	0
0	0	0	0	0	0	0	0.00575	0.01149	0.00575	0	0.03448
0.04598	0.04598	0.03448	0.08046	0.06322	0.07471	0.04023	0.03448	0.02299	0.01724	0.01149	0.02299
0.00575	0.14368	0.03448	0.02874	0.05747	0.04023	0.05747	0.01149	0.06897	#	IPHC	
5	#_N_MeanSize-at-Age_obs										
#YrSeas	Flt/Svy	Gender	Part	Ageerr	Ignore	datavector(female-male)					
# samplesize(female-male)											
#Below	were	what	was	used	in	SS1	data	file			
#2000	1	1	0	0	1	2	30	30	30	35.2	32.4
34.8	37.1	37.3	37.4	41.2	41	43.4	43.6	44.8	43.5	43.9	46.7
48.6	48	51.8	53	53.8	52.9	53.2	54.8	56.7	56.5	57	56.6
62.2	61.7	64.2	64.1	64.4	63.8	65.7	1	1	1	5	10
9	11	15	29	29	21	30	21	29	29	14	15
6	13	9	8	9	12	15	13	10	7	30	15
23	22	16	7	5	6	14					
#2000	1	2	0	0	1	2	30	30	30	35.2	32.4
34.8	37.1	37.3	37.4	41.2	41	43.4	43.6	44.8	43.5	43.9	46.7
48.6	48	51.8	53	53.8	52.9	53.2	54.8	56.7	56.5	57	56.6
62.2	61.7	64.2	64.1	64.4	63.8	65.7	1	1	1	5	10
9	11	15	29	29	21	30	21	29	29	14	15
6	13	9	8	9	12	15	13	10	7	30	15
23	22	16	7	5	6	14					
#2000	1	3	0	0	1	2	30	30	30	35.2	32.4
34.8	37.1	37.3	37.4	41.2	41	43.4	43.6	44.8	43.5	43.9	46.7
48.6	48	51.8	53	53.8	52.9	53.2	54.8	56.7	56.5	57	56.6
62.2	61.7	64.2	64.1	64.4	63.8	65.7	1	1	1	5	10
9	11	15	29	29	21	30	21	29	29	14	15
6	13	9	8	9	12	15	13	10	7	30	15
23	22	16	7	5	6	14					
#2000	1	5	0	0	1	2	30	30	30	35.2	32.4
34.8	37.1	37.3	37.4	41.2	41	43.4	43.6	44.8	43.5	43.9	46.7
48.6	48	51.8	53	53.8	52.9	53.2	54.8	56.7	56.5	57	56.6
62.2	61.7	64.2	64.1	64.4	63.8	65.7	1	1	1	5	10
9	11	15	29	29	21	30	21	29	29	14	15

6	13	9	8	9	12	15	13	10	7	30	15
23	22	16	7	5	6	14					
#2000	1	7	0	0	1	2	30	30	30	35.2	32.4
34.8	37.1	37.3	37.4	41.2	41	43.4	43.6	44.8	43.5	43.9	46.7
48.6	48	51.8	53	53.8	52.9	53.2	54.8	56.7	56.5	57	56.6
62.2	61.7	64.2	64.1	64.4	63.8	65.7	1	1	1	5	10
9	11	15	29	29	21	30	21	29	29	14	15
6	13	9	8	9	12	15	13	10	7	30	15
23	22	16	7	5	6	14					

#Year	Season	Fleet	Gender	Partitn	ageerr	Ignore					
1981	1	1	0	0	1	74	24	24.8	26	35.3	36.3
33.5	40.2	40	38.6	38.7	43.6	41.5	45	44	42	44	45
48	50	53	53	53	53	53	64	59	60	61.3	53.6
61.5	62	62.6	64	63	62	65.3	1	0	0	3	3
2	5	1	5	7	5	2	2	0	1	1	0
0	3	2	0	1	0	2	1	1	0	3	7
4	0	5	3	0	1	3	#80-82	California		Sport	
1986	1	2	0	0	1	86	24	24.8	26	30	29.8
35.4	32.7	38	38	46.7	40	43	45.5	52	48	45	45
48	47.5	54.7	53.3	56.7	50.5	53	53.8	60	58	56.2	57.5
62.3	61.2	66	61	65	64.5	64	0	0	1	1	5
5	3	1	2	6	2	3	2	2	2	1	3
2	2	3	3	3	2	1	4	1	0	5	2
4	6	1	1	1	2	4	#80-86	California		Com	

1986	1	3	0	0	1	200	24	24.8	30.2	23.6	27.9
27.7	30.9	37.2	36.7	36.4	39.1	40.1	40.9	44.4	45.9	45.6	46
38.8	44.5	49.6	52.5	54.1	51.6	53.9	54	51.5	39.8	57.4	57.9
56.5	59.8	62.4	58.7	60.4	63.2	62.8	0	5	11	7	22
36	55	35	41	52	46	29	23	23	17	20	6
5	8	5	6	9	7	7	3	4	4	20	47
22	12	5	7	15	9	40	#84-87	Oregon	Sport		
2000	1	5	0	0	1	200	24	24.8	26	28	30
35	36	38.8	37.9	40.5	40.8	43.7	43.7	44.6	44.6	46.3	47.8
51	47.7	49.5	52.3	54.2	53.9	54	55.1	55.2	56.7	56.3	59.8
62	62.2	64.9	65.3	64.4	63	65.9	0	0	0	0	1
2	1	8	13	19	13	26	23	34	30	15	18
9	12	6	7	5	12	12	9	9	9	32	11
20	18	12	3	8	5	10	#98	-	4	Washington	
Sport											
2000	1	7	0	0	1	200	24	24.8	26	28	30
33	36	38	39.5	42	46.3	43.4	46.3	47	47.5	48.4	48.6
48.7	50.9	51.1	50.4	52.3	51	54.3	53.4	56	54.1	56.2	56
64	62.5	62.7	65	65	67	71	0	0	0	0	0
0	0	0	2	4	4	9	12	13	14	22	25
30	20	22	18	9	13	3	8	6	8	36	10
1	4	6	3	3	0	3	#00	-	4	Washington	
Line											

#IPHC											
#2002	1	12	0	0	1	141	24	24.8	26	28	30
33	36	38	39.5	42	46.3	40.1	46	46.5	41.4	45.3	46.8
45	46.1	48.5	45.8	47	48.7	50.7	49.9	50	51	53.1	53.4
60.5	56.5	58.5	58	58	65.7	62.9	0	0	0	0	0
0	0	0	0	0	0	0	1	2	5	4	6
9	7	8	6	4	3	7	7	3	8	20	9
2	4	8	7	1	3	7	#	2002	IPHC		
#2003	1	12	0	0	1	200	24	24.8	30.2	23.6	27.9
27.7	35	37.2	36.7	39	39.1	42	45	41.3	46.6	44.8	46.3
47.1	47.1	48.4	48.2	50.5	50.1	52.5	53.2	53.2	51.7	53.9	55.8
57.4	60.2	59.8	61.9	62.7	59.6	62.6	0	0	0	0	0

	0	1	0	0	1	0	2	2	3	10	13	11
	17	12	17	10	10	8	4	15	12	13	48	16
	11	12	16	9	6	5	30	#	2003	IPHC		
#2004		1	12	0	0	1	174	24	24.8	26	28	30
	33	36	38	39.5	42	46.3	55.5	56	44.4	50.5	52.3	50.1
	48.2	49.1	50.2	51.2	49.1	49.2	53	55.7	53.5	51.8	52.7	55.8
	47	55.3	57.2	55.6	61	54.7	59.5	0	0	0	0	0
	0	0	0	0	0	1	2	1	0	6	8	8
	6	14	11	13	7	6	4	3	2	4	23	9
	1	12	6	9	5	3	10	#	2004	IPHC		
#2005		1	12	0	0	1	134	24	24.8	30.2	23.6	27.9
	27.7	30.9	37.2	36.7	36.4	42	40.1	40.9	44.4	47	49	44.5
	49.5	46.6	47.8	50.7	50.3	50.8	54.2	53	54.3	53	54.9	57.1
	55.7	60.8	61.5	61.4	58.8	65	63.8	0	0	0	0	0
	0	0	0	0	0	1	0	0	0	2	1	2
	4	5	11	6	12	9	5	3	3	3	15	15
	3	4	6	5	6	2	11	#	2005	IPHC		

0 #N environmental variables

0 #_N_environ_obs

999

#ENDDATA