Status of Cabezon (*Scorpaenichthys marmoratus*) in California and Oregon Waters as Assessed in 2009

by

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26 August 2009

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Acronyms Used in the Document

ABC – Allowable Biological Catch
AIC – Akaike Information Criterion
BB – Beach/bank recreational mode
BCER – Big Creek Ecological Reserve
CalCOFI - California Cooperative Oceanic Fisheries Investigation
CALCOM - California Commercial Cooperative Groundfish Program
CAS – California sub-stock
CDFG – California Department of Fish and Game
CFIS – Commercial Fisheries Information System
CI – Confidence interval
CMASTR – Master Commercial Fisheries Database for CDFG
CPFV – Commercial Passenger Fishing Vessel
CPUE – Catch per unit of effort
CRFS – California Recreational Fisheries Survey
CV – Coefficient of variation
EEZ – Exclusive Economic Zone
ENSO – El Niño Southern Oscillation
FMP – Groundfish Fishery Management Plan
GLM – Generalized Linear Model
IRI – Index of Relative Importance
MM – Man-made recreational mode
MLMA – Marine Life Management Act
MLML- Moss Landing Marine Laboratories
MPA – Marine Protected Area
MPD – Maximum of the posterior density function
MRFSS - Marine Recreational Fisheries Statistics Survey
MSY – Maximum Sustainable Yield
mt – Metric tons
NCS – Northern California Sub-stock
NFMP – Nearshore Fishery Management Plan
NWFSC – Northwest Fisheries Science Center
ODFW – Oregon Department of Fish and Wildlife
OFL – Overfishing Limit
ORBS – Ocean Recreational Boat Survey
ORS – Oregon sub-stock
OY- Optimum Yield
PBR – Private Boat and Rental recreational mode
PFEL – Pacific Fisheries Environmental Laboratory
PFMC – Pacific Fishery Management Council
PISCO - Partnership for Interdisciplinary Studies of Coastal Oceans
PSMFC – Pacific States Marine Fisheries Commission
RCA – Rockfish Conservation Area
RecFIN – Recreational Fisheries Information Network
SCS – Southern California sub-stock
SLOSEA – San Luis Obispo Science and Ecosystem Alliance
SMURF - Standard Monitoring Units for the Recruitment of (temperate reef) Fishes
SoCAL – Southern California
SS – Stock Synthesis
STAR – Stock Assessment Review (panel)
STAT – Stock Assessment Team
SWFSC – Southwest Fishery Science Center
TOR – Terms of Reference
WCGOP – West Coast Groundfish Observer Program

Executive Summary

Stock

This is the third full assessment of the population status of cabezon (*Scorpaenichthys marmoratus* [Ayres]) off the west coast of the United States. The first assessment was for a state-wide California cabezon stock in the year 2003 (Cope *et al.* 2004). The second assessment (Cope and Punt 2006) considered two sub-stocks (the northern California sub-stock (NCS) and the southern California sub-stock (SCS)), demarcated at Point Conception, CA. The current assessment retains the two California sub-stocks, also evaluating the population as a coast-wide California stock (CAS), and extends the assessment to a third sub-stock for cabezon in the waters off of Oregon (ORS). Separation of these spatial sub-stocks is based on distinguishing localized population dynamics, preliminary population genetics results, and is supported by spatial differences in the fishery (the NCS has been the primary area from which removals have occurred), the ecology of nearshore groundfish species, and is consistent with current state management needs.

Catches

Cabezon removals were assigned to six fleets in California (two commercial and four recreational) and four fleets in Oregon (two commercial and two recreational) for each sub-stock because each of these fleets targets a different component of the population (Figures E-1–E-3; Table E-1). The California time series begins in 1916, with the onset of commercial landings, while Oregon begins in 1973, with the start of the recreational fishery. Historical recreational removals for California were based on the reconstruction used in Cope and Punt (2006), while the staff of the Oregon Department of Fish and Wildlife supplied the historical Oregon recreational time series. Historically, vessel-based recreational catch (PBR (private) and CPFV (charter)) has been the primary reported source of biomass removals of cabezon. Commercial catch has become a major source of removals in the last 15 years because of the developing live-fish fishery in both California and southern Oregon. The sensitivity of the assessment results to the magnitude of historical recreational catch is explored as part of the assessment. Commercial discard mortality, assumed negligible in the last assessment, is included in this assessment. Because cabezon are caught primarily in the nearshore fishery and are believed to not suffer from barotrauma, discard mortality is assumed to be low. The sensitivity of model outputs to assumptions of discard mortality is explored.

Catch histories used in the current assessment differ slightly from the former assessment (Figure E-4). Whereas the commercial removals are very similar, the recreational sector is different from 1980 onward. These years are mostly dependent on RecFIN data extractions, which showed both changes in mean weights and numbers of catch, resulting in minor but noticeable differences. The largest difference is found in 1980, where the RecFIN PBR value in southern California (SCS) was determined to be unreasonably high and set instead to the average of values for years 1981-1989.

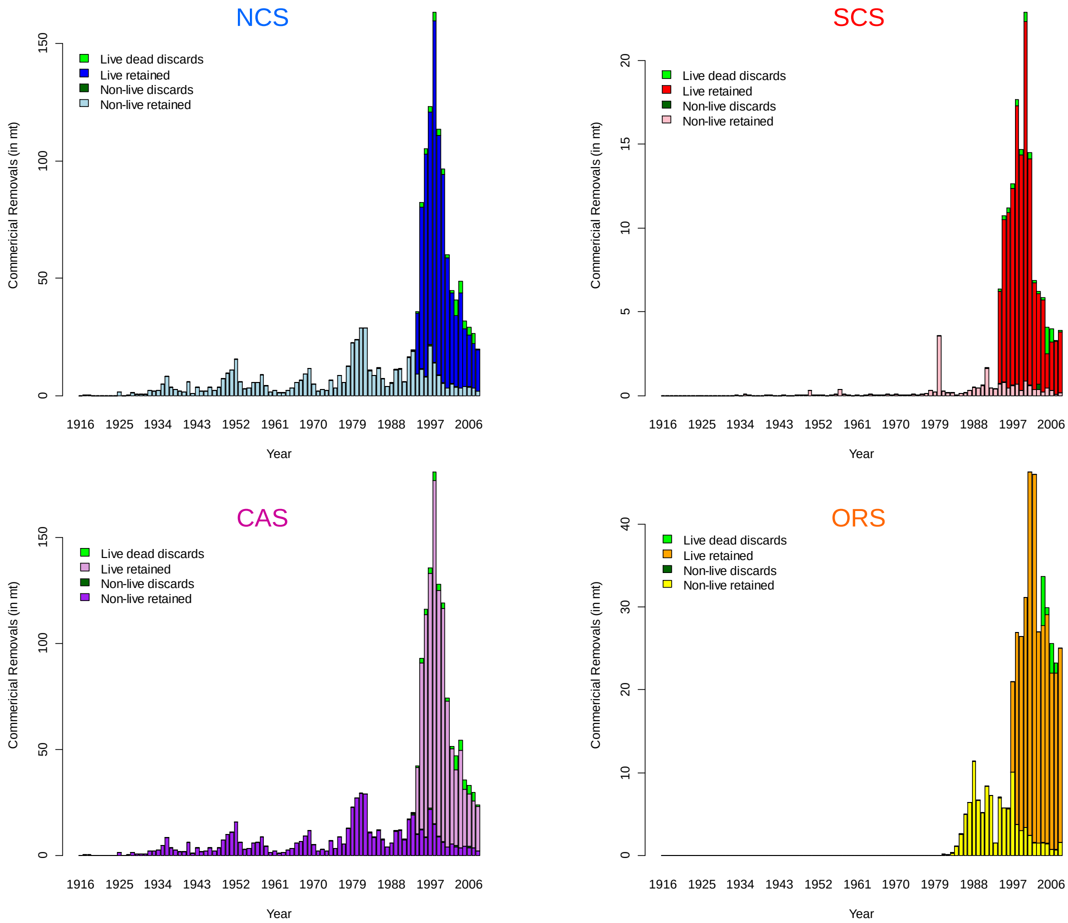

Figure E-1. Commercial fishery cabezon removals (in mt) by fleet and sub-stock.

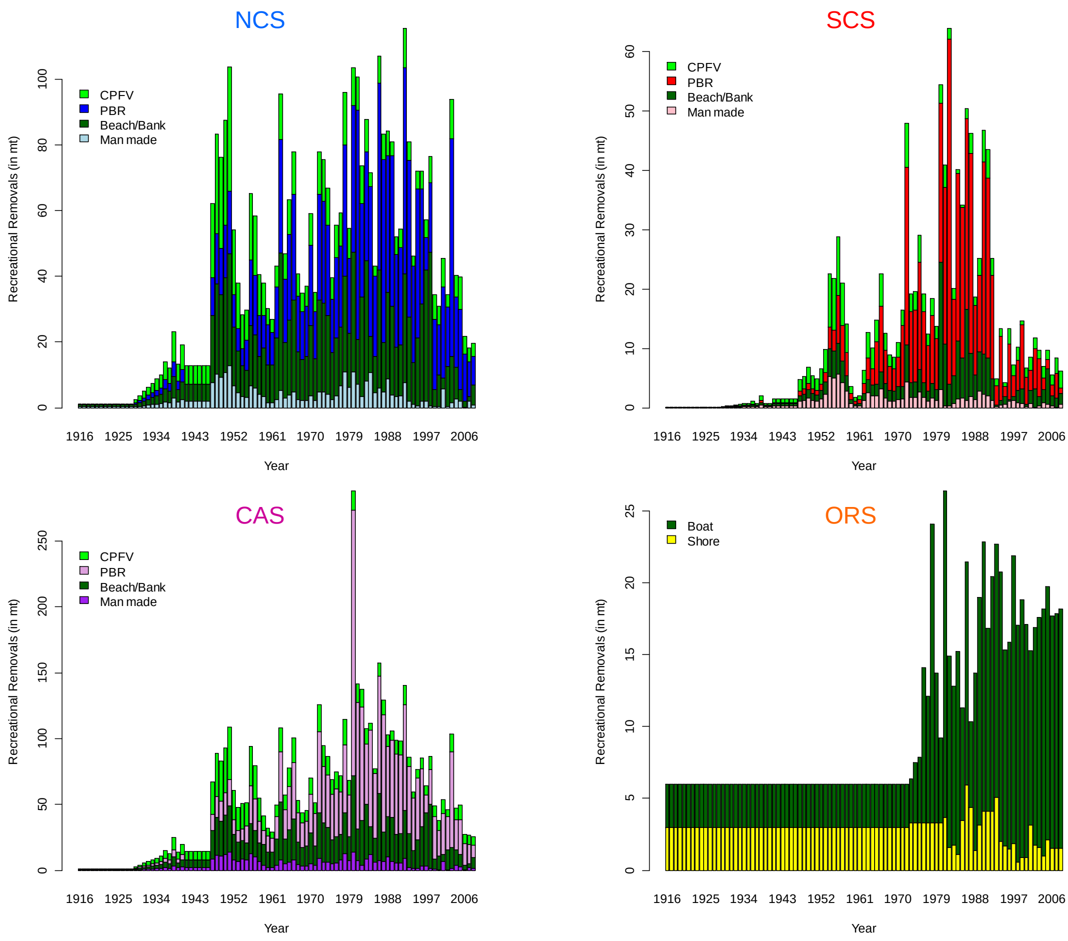

Figure E-2. Recreational fishery cabezon removals (in mt) by fleet and sub-stock.

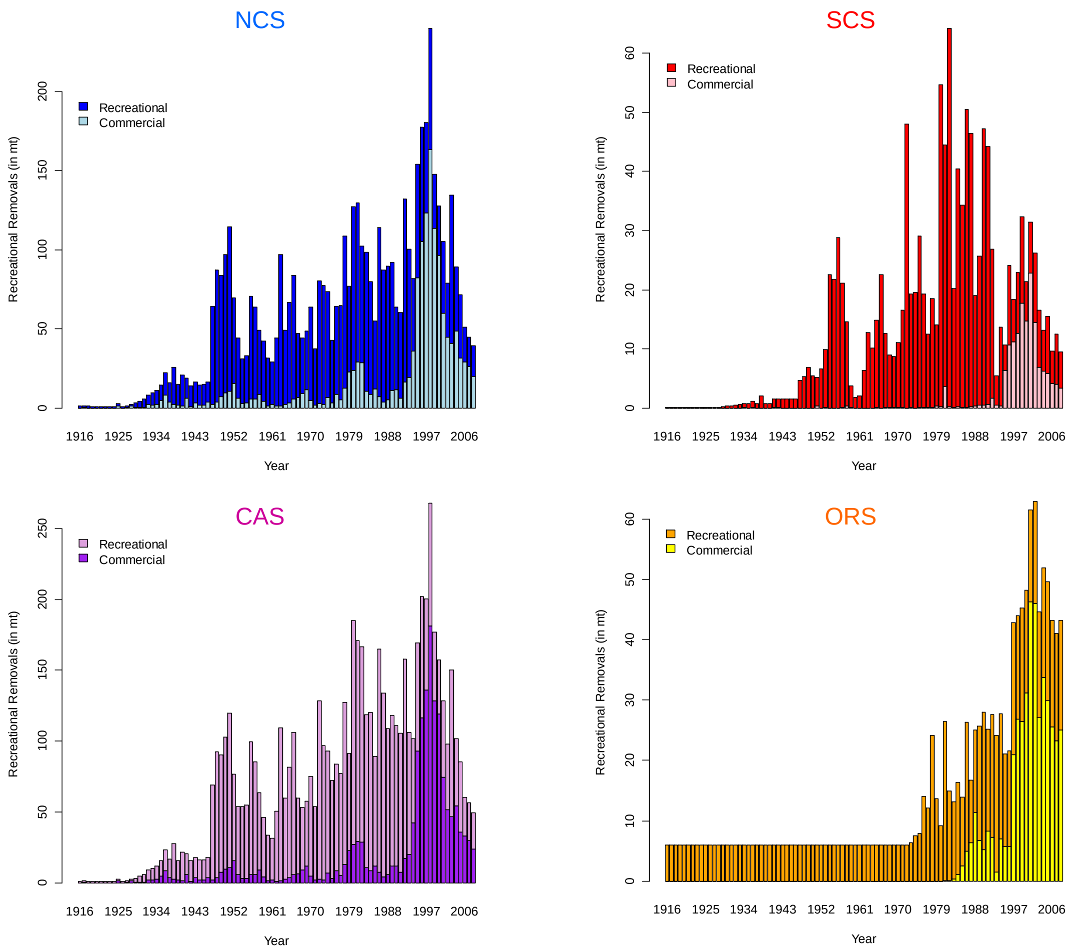

Figure E-3. Total removals of cabezon (in mt) by major fishery and sub-stock.

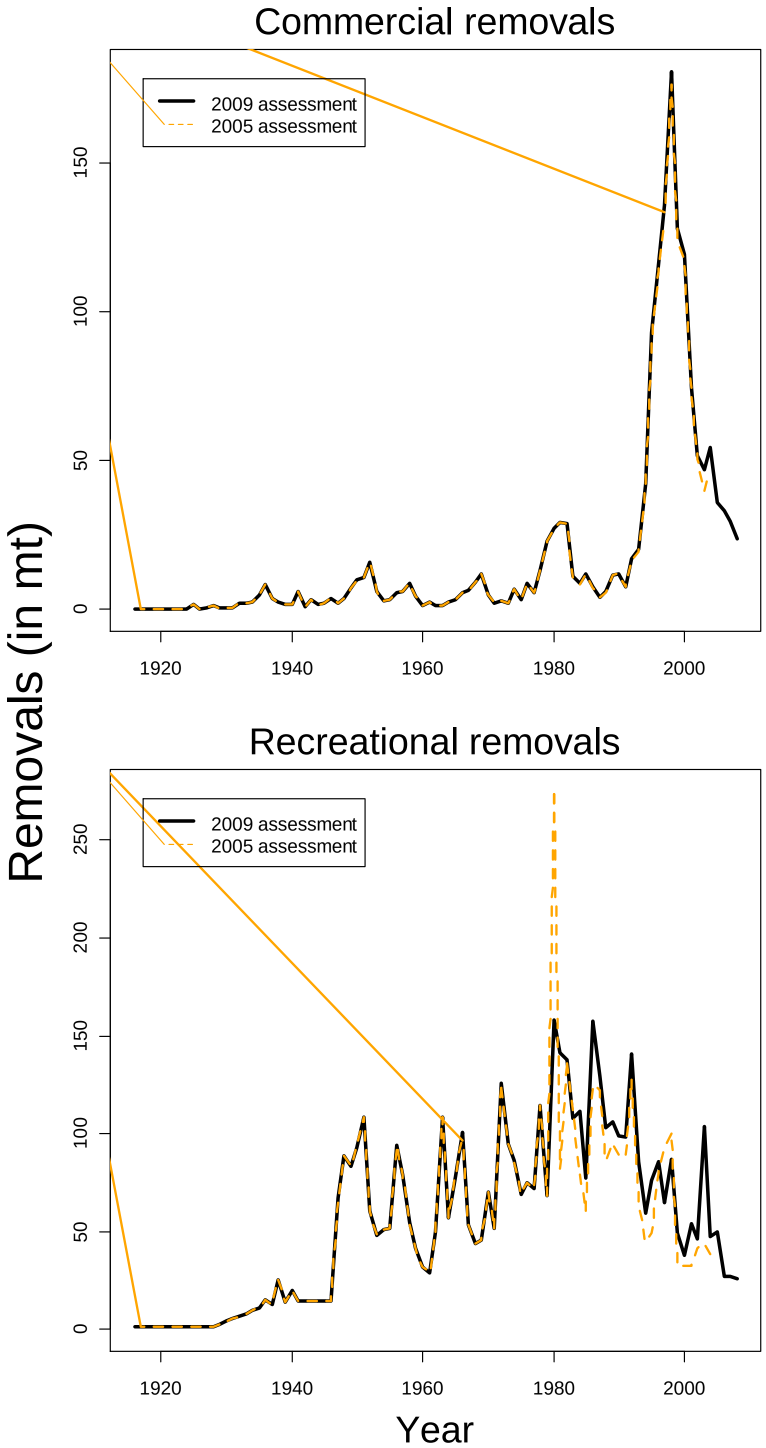

Figure E-4. Comparison between the 2009 and 2005 assessment inputs of total removals for the commercial (top panel) and recreational (bottom panel) fishery sectors.

Table E-1. Recent landings (mt) of cabezon by assessment sub-stock and fleet.

	NCS						SCS					
	Commercial		Recreational				Commercial		Recreational			
YEAR	Nonlive	Live	Man-Made	Shore	PBR	CPFV	Nonlive	Live	Man-Made	Shore	PBR	CPFV
1998	14.3	149.0	0.7	46.7	21.2	7.9	0.7	17.0	0.8	2.2	5.1	2.2
1999	8.8	104.7	0.5	5.2	21.3	7.4	0.3	14.4	0.8	2.5	10.8	0.6
2000	5.5	91.1	0.3	9.8	15.2	5.7	0.9	22.0	0.2	0.4	4.5	1.6
2001	3.3	56.7	5.9	3.1	27.8	8.7	0.6	13.9	0.7	2.3	3.3	2.2
2002	5.1	39.6	0.5	12.1	18.0	3.7	0.4	6.5	0.1	3.1	6.8	1.8
2003	3.9	36.8	1.5	14.1	66.2	12.1	0.7	5.5	0.3	1.6	6.4	1.3
2004	3.2	45.4	2.8	9.5	21.4	6.7	0.2	5.7	0.9	2.2	1.9	1.9
2005	3.8	27.8	2.0	3.5	24.5	9.9	0.4	3.6	0.5	6.0	1.6	1.5
2006	3.9	25.3	0.3	1.7	14.4	5.3	0.3	3.7	0.4	1.6	1.8	1.7
2007	3.4	23.0	1.9	1.5	10.7	4.2	0.1	3.2	0.0	1.6	4.2	2.6
2008	2.0	17.8	0.8	6.3	8.5	4.1	0.2	3.7	0.6	1.8	0.9	2.9

	CAS						ORS			
	Commercial		Recreational				Commercial		Recreational	
YEAR	Nonlive	Live	Man-Made	Shore	PBR	CPFV	Nonlive	Live	Shore	Boat
1998	15.0	166.0	1.5	48.8	26.3	10.1	3.7	23.2	0.6	16.5
1999	9.1	119.1	1.3	7.6	32.2	8.0	3.0	23.5	0.9	17.9
2000	6.4	113.0	0.5	10.2	19.7	7.2	3.4	27.8	0.9	16.2
2001	3.9	70.5	6.6	5.4	31.1	10.9	2.4	43.9	3.2	12.1
2002	5.4	46.1	0.6	15.2	24.8	5.5	1.5	44.5	1.8	15.1
2003	4.6	42.3	1.8	15.7	72.6	13.4	1.5	25.5	1.6	16.0
2004	3.4	51.1	3.6	11.8	23.3	8.6	1.5	32.2	1.0	17.2
2005	4.3	31.5	2.5	9.6	26.1	11.4	1.5	28.4	2.1	17.6
2006	4.2	28.9	0.7	3.3	16.2	7.0	0.8	24.9	1.6	16.1
2007	3.4	26.2	2.0	3.0	14.9	6.9	0.8	22.5	1.6	16.3
2008	2.2	21.6	1.4	8.1	9.4	6.9	1.6	23.5	1.6	16.6

Data and assessment

Each sub-stock assessment uses data on size (mean weight and length compositions) and indices of abundance to inform the population dynamics, as was the case in the 2005 assessment. Additionally, these assessments incorporate conditional age-at-length data for the first time to estimate growth parameters internal to the model (previous assessments used growth parameters derived from externally fitted growth curves). All sub-stock assessments use Stock Synthesis 3.03A as the modeling environment.

Several potential indices of abundance are formally considered for the California sub-stocks: 1) Fishery-dependent CPFV logbook CPUE, a CDFG hook-and-line survey, and PSMFC dockside and onboard surveys, 2) Fishery-independent adult surveys (TENERA and PISCO), and 3) recruitment surveys (CalCOFI, Southern California Edison Impingement, PISCO SMURFS, SLO SMURFS). There is also one index of abundance for the Oregon sub-stock based on the Ocean Recreational Boat Survey (ORBS) sampling program. Changes in bag and size limits in California also necessitated the separation of the CPFV data into two series: 1960-99 and 2000-08. This approach differs from the previous assessment, which used a continuous index from 1960-2004. Sensitivity of model output to this assumption is investigated.

Each index of abundance is developed by fitting generalized linear models (GLMs) to the proportion of non-zero records and the catch-rate given that the catch was non-zero, and taking the product of the resultant year effects. Only the CPFV logbook index is used in the base model for the California sub-stocks, because of its area-wide coverage. Small-scale resolution, large uncertainty, short time series, and potential bias in SCUBA surveys for cryptic species like cabezon, as well as the low occurrence of cabezon in sampling protocols ruled out including the other indices in the base case. The Oregon sub-stock base case included the ORBS survey.

Additional modifications were made to the specification of this year's assessment models, relative to the previous assessment. Changes in regulations necessitated the implementation of time blocks on the selectivities of the commercial live-fish fishery and boat-based recreational fleets for all sub-stocks. Additional variance was applied to the perceived variability of the candidate abundance indices in order to address the underestimation of variability in the delta GLM-based models. The models were also tuned to balance the input of recruitment variability (σ_R) and sample sizes of length and age compositions with model output estimates of these same values. This resulted in σ_R values less than those used in the last assessment.

Stock biomass

Cabezon were lightly exploited until the 1940s in California, particularly in northern California. Catches began to increase in southern California in the 1960s. This increase in catch caused a relatively large decline in spawning biomass. In Oregon, the take of cabezon did not begin until the 1970s, which in turn has also caused a decline in spawning biomass (Figures E-5 and E-6). The estimated depletion levels for NCS and SCS are 45% (± 7%) and 60% (± 14%), respectively. Estimated depletion for the CAS and ORS sub-stocks are 34% (± 6%) and 52% (± 10%), respectively. Greatest uncertainty is found in the smaller SCS and ORS sub-stocks.

The model-derived initial and terminal female spawning biomass estimates corresponding to the above depletion measures are 1036 (± 60) and 469 (± 97) mt for the NCS, 262 (± 23) and 158 (± 48) mt for the SCS, 1207 (±61) and 410 (± 85) mt for the CAS and 409 (±57) and 214 (±69) for the ORS. Overall, spawning biomass has increased in California in recent years but not in Oregon. Recent trends in spawning biomass and depletion for each sub-stock can be seen in Tables E-2 and E-9.

Total unfished cabezon spawning output, as a sum of the two California sub-stocks, is estimated at 1298 mt compared to 1361 mt for the 2005 assessment. The CA state-wide estimates of spawning output are 1207 mt for the 2009 assessment and 1268 mt for the 2005 assessment (Table E-3). Current total cabezon spawning output, summed from the two sub-stock models is 627 mt, compared with 410 mt for the one stock state-wide model. Median depletion in the 2005 assessment versus the 2005 depletion estimate from the current assessment is more similar to the results obtained from summing the two sub-stock models than for the one stock state-wide model.

Though much of the declines in cabezon populations correspond to removals by the recreational fishery sectors, the added impact of the live-fish fishery is also witnessed in declines through the mid- to late-1990s in all sub-stocks.

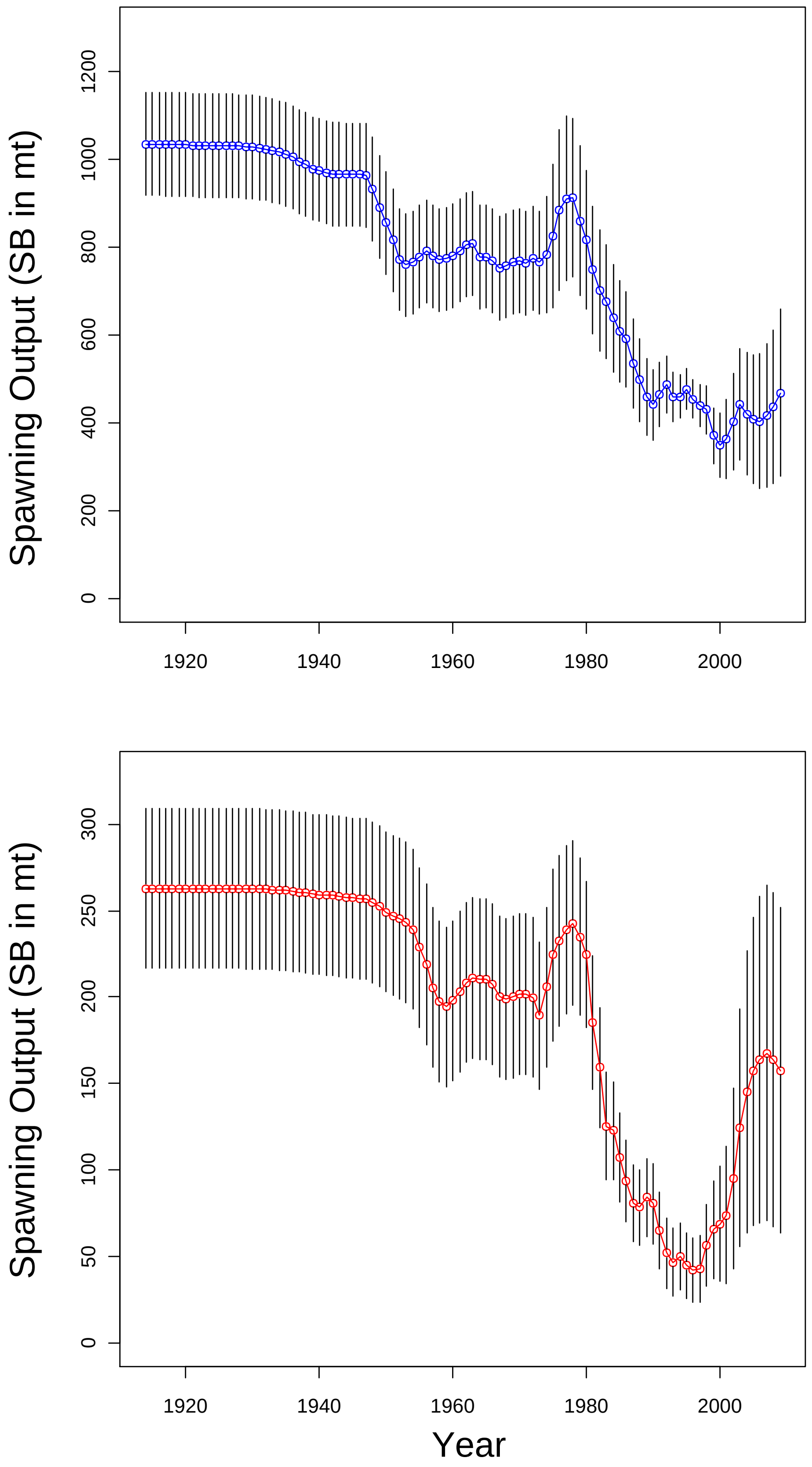

Figure E-5. Spawning output for the northern (NCS, top) and southern (SCS, bottom) California sub-stocks. Black bars indicate 2 standard deviations of uncertainty.

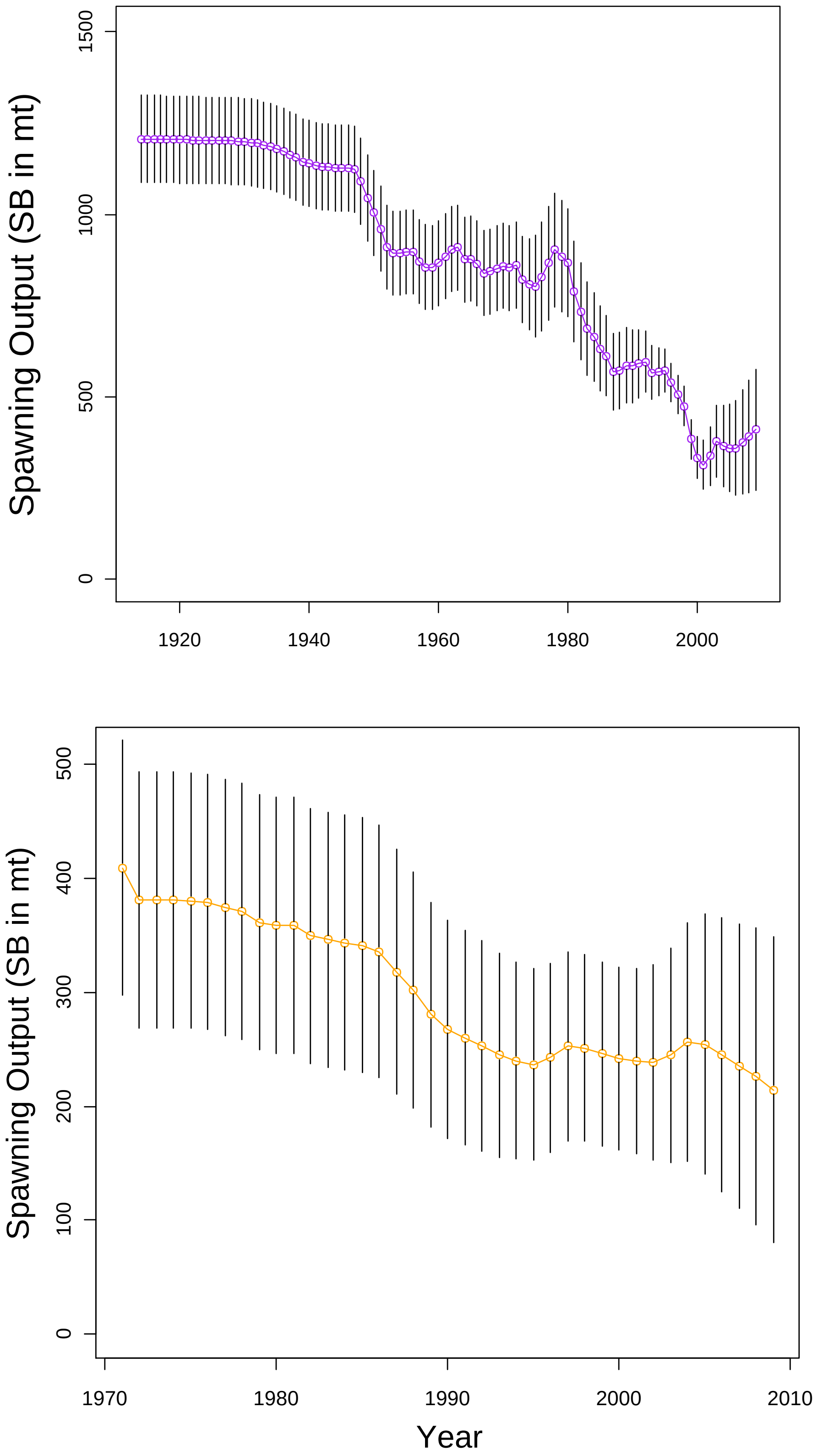

Figure E-6. Spawning output trajectories for the California (CAS, top) and Oregon (ORS, bottom) sub-stocks. Black bars indicate 2 standard deviations of uncertainty.

Table E-2. Recent trend in estimated cabezon female spawning biomass and relative depletion for each sub-stock.

NCS

Year	Spawning output (mt)	~95% C.I.	Estimated depletion	~95% C.I.
2000	351	278-425	33.9%	0.29-0.39
2001	364	275-453	35.1%	0.29-0.42
2002	405	295-515	39.0%	0.31-0.47
2003	443	315-571	42.7%	0.33-0.52
2004	421	282-561	40.7%	0.30-0.51
2005	410	263-556	39.5%	0.29-0.51
2006	404	250-558	39.0%	0.27-0.51
2007	417	253-582	40.3%	0.28-0.53
2008	438	262-614	42.2%	0.29-0.55
2009	469	279-659	45.2%	0.31-0.59

CAS

Year	Spawning output (mt)	~95% C.I.	Estimated depletion	~95% C.I.
2000	333	275-391	27.6%	0.24-0.32
2001	313	247-380	26.0%	0.21-0.31
2002	338	257-419	28.0%	0.22-0.33
2003	379	281-476	31.4%	0.25-0.38
2004	366	255-477	30.3%	0.23-0.38
2005	360	240-480	29.8%	0.22-0.38
2006	359	229-489	29.7%	0.21-0.39
2007	376	234-519	31.2%	0.21-0.41
2008	392	238-547	32.5%	0.22-0.43
2009	410	244-576	34.0%	0.23-0.45

SCS

Year	Spawning output (mt)	~95% C.I.	Estimated depletion	~95% C.I.
2000	69	36-102	26.3%	0.17-0.36
2001	74	34-114	28.2%	0.16-0.40
2002	95	43-147	36.2%	0.21-0.51
2003	124	56-193	47.4%	0.27-0.67
2004	145	64-227	55.2%	0.31-0.79
2005	157	68-246	59.8%	0.34-0.86
2006	164	70-258	62.4%	0.35-0.90
2007	168	71-265	63.8%	0.36-0.92
2008	164	68-260	62.4%	0.35-0.90
2009	158	64-252	60.0%	0.33-0.87

ORS

Year	Spawning output (mt)	~95% C.I.	Estimated depletion	~95% C.I.
2000	242	161-322	59.0%	0.52-0.66
2001	239	158-320	58.5%	0.51-0.65
2002	238	153-324	58.2%	0.51-0.66
2003	245	150-339	59.8%	0.51-0.69
2004	256	151-361	62.6%	0.52-0.73
2005	254	140-368	62.1%	0.49-0.75
2006	245	125-366	60.0%	0.45-0.75
2007	235	110-360	57.4%	0.41-0.74
2008	226	96-356	55.2%	0.37-0.73
2009	214	80-349	52.4%	0.33-0.72

Table E-3. Total cabezon spawning output and depletion rates in California.

	Total California Cabezon Spawning Biomass (mt)				
Model	SB_{1916}	SB_{2005}	SB_{2005}/SB_{1916}	SB_{2009}	SB_{2009}/SB_{1916}
2009 Assessment					
NCS+SCS	1298	567	44%	627	48%
CAS	1207	360	30%	410	34%
2005 Assessment					
NCS+SCS	1361	516	37.9%		
CAS	1268	634	50.0%		

Recruitment

A Beverton-Holt equation with lognormal process error is used to characterize the spawner-recruitment relationship of all cabezon sub-populations. The steepness parameter is also set to 0.7 for all base models. Recruitment residuals are estimated for 1970–2006 for all California sub-stocks and 1980-2006 for the Oregon sub-stock. These series were defined by identifying the informative portion of recruitment deviations through declining asymptotic variances when the full time series of recruitment deviations are estimated. The last 10 years of recruitments for each sub-stock are found in Tables E-4 and E-9.

There are several notable recruitment events in and among the California stocks after 1980, but only one (in 2005) after 2000 (Figures E-7 and E-8). Distinct recruitment patterns are seen in both California sub-stocks. For the state-wide California model, all recruitments since 2000 are below the expectation of deterministic recruitments, contributing to the overall decline in recent years. The fact that depletion in the state-wide model is estimated to be lower than that of either individual sub-stock demonstrates how overall recruitment patterns can be altered by combining data from areas with different patterns. Such an approach can diminish or embellish recruitment deviations and result in emergent population dynamics unrepresentative of the individual areas (Figure E-9). The addition of more age-composition data would help resolve more fully the estimates of recruitment patterns in California.

Oregon recruitment is less dynamic than in California, but shows a similar trend of one large recruitment in the late 1990s (1999) and only one notable recruitment above expectation in the most recent years (2004). The relative uncertainty around recruitments in Oregon is also lower than in the California sub-stocks.

Table E-4. Recent trend in estimated cabezon recruitment (in 1000s) for each sub-stock.

NCS

Year	Estimated recruitment	~95% C.I.
2000	491	253-729
2001	421	157-686
2002	584	186-981
2003	733	240-1226
2004	552	130-974
2005	886	219-1554
2006	738	166-1310
2007	750	593-906
2008	764	606-923
2009	776	3-1549

SCS

Year	Estimated recruitment	~95% C.I.
2000	87	0-190
2001	128	0-281
2002	227	0-458
2003	152	0-308
2004	79	0-159
2005	92	1-182
2006	121	2-240
2007	192	140-244
2008	194	141-246
2009	192	0-460

CAS

Year	Estimated recruitment	~95% C.I.
2000	467	241-694
2001	341	132-550
2002	543	187-899
2003	732	277-1188
2004	425	121-728
2005	565	161-968
2006	559	144-974
2007	732	581-883
2008	750	595-906
2009	759	2-1516

ORS

Year	Estimated recruitment	~95% C.I.
2000	211	112-310
2001	188	101-276
2002	148	68-228
2003	131	56-207
2004	187	73-301
2005	137	31-242
2006	88	8-169
2007	141	0-284
2008	180	117-242
2009	178	0-363

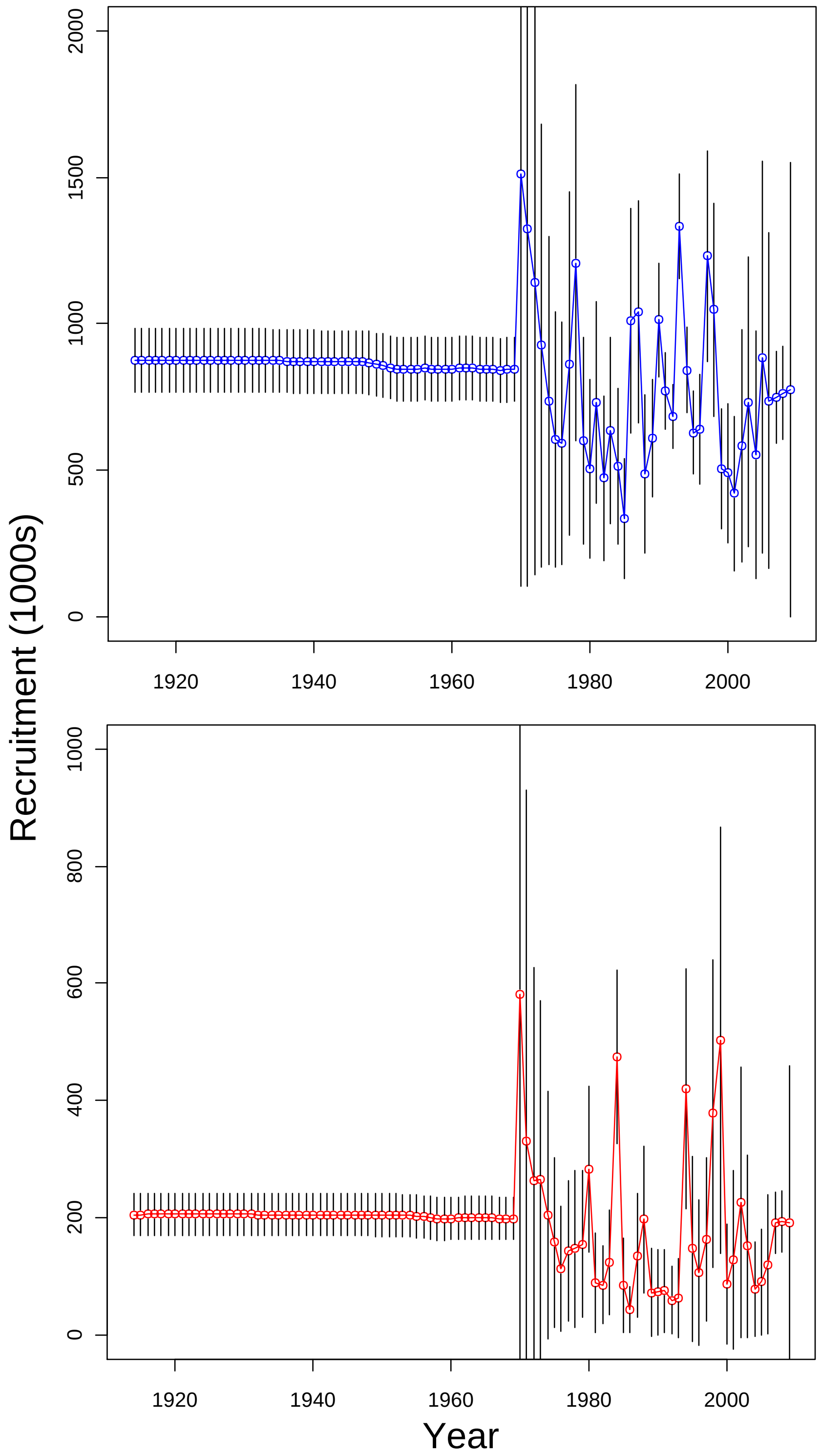

Figure E-7. Time-trajectories of recruitment (1000s) for the NCS and the SCS. Points are point estimates; vertical lines represent the approximate 95% confidence intervals.

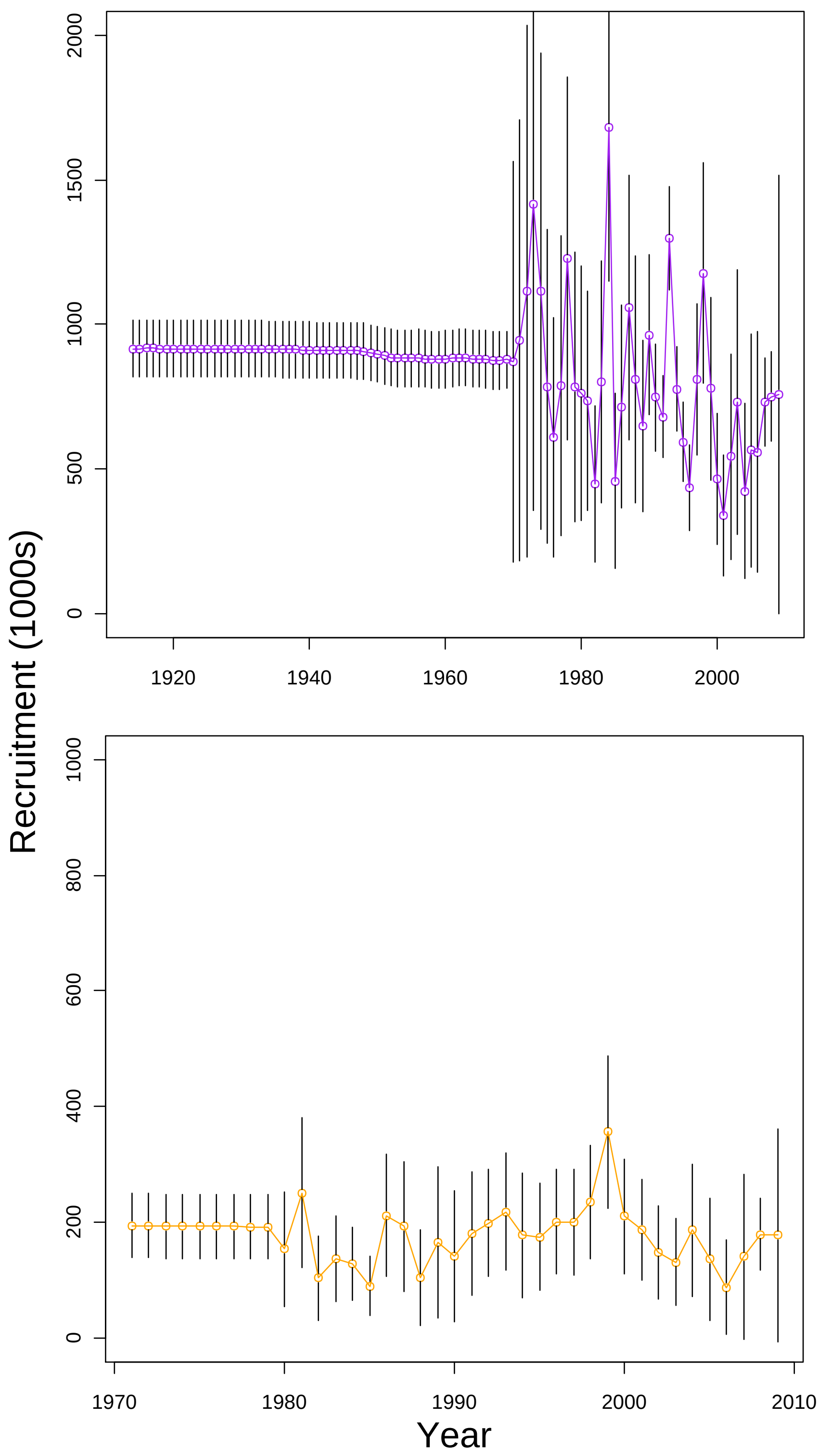

Figure E-8. Time-trajectories of recruitment (1000s) for the CAS and the ORS. Points are point estimates; vertical lines represent the approximate 95% confidence intervals.

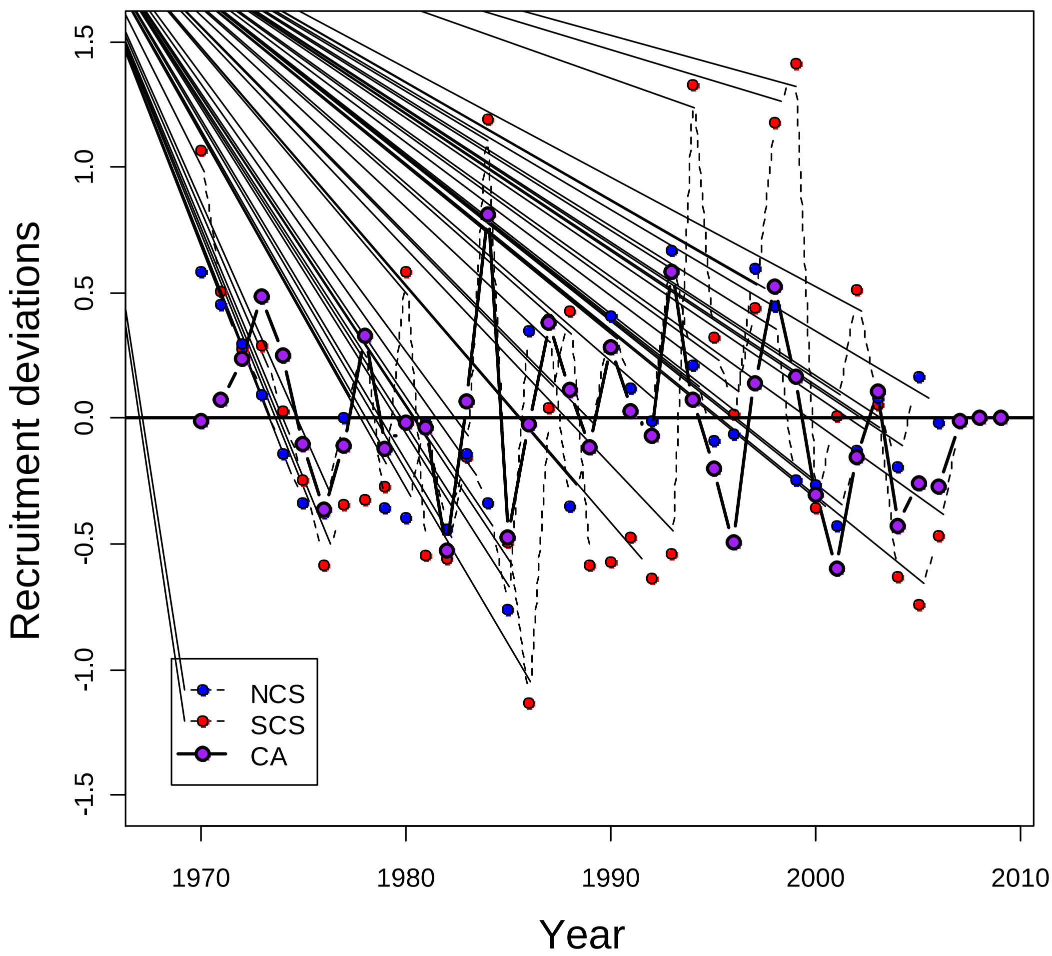

Figure E-9. Recruitment deviations for each of the California sub-stocks.

Reference points

The unfished spawning outputs of the northern and southern California cabezon sub-stocks are estimated to be 1036 (NCS) and 262 (SCS) mt, respectively, with estimated 2009 spawning outputs of 469 (NCS) and 158 (SCS) mt (Figure E-5). The unfished spawning outputs for the state-wide California and Oregon stocks are estimated at 1207 (CAS) and 409 (ORS) mt, respectively, with estimated 2009 spawning outputs of 410 (CAS) and 214 (ORS) mt (Figure E-6). Total unfished cabezon spawning output, as a sum of the two California sub-stocks, is estimated at 1298 mt. This compares to 1361 in the 2005 assessment and 1207 for the 2009 one CA sub-stock. Current total cabezon spawning output for the summed CA sub-stock models is 627 mt, compared with 410 mt for the one-stock model. Median depletion in 2005 versus the 2005 depletion estimate from the current assessment is more similar to the summed results of the two sub-stock models than the one-stock model.

The target reference point for cabezon is 40% of the spawning biomass ($SB_{40\%}$), with a limit reference point of 25% ($SB_{25\%}$). Allowable Biological Catch is set using an

F_{MSY}-proxy harvest rate of $SPR_{45\%}$ ($F_{45\%}$), with Optimum Yields reduced from that level, according to the 40-10 harvest policy, when the spawning biomass falls below the target level. An alternative set of reference points comes from the Nearshore Fishery Management Plan (NFMP) of California that suggests a 60-10 rule with $SPR_{50\%}$ ($F_{50\%}$). Under these scenarios, the reference points only changed when based on the SPR proxy for MSY. Due to the large number of reference points and associated yields relating to the four base case models in this assessment, refer to Table E-10 for each of the sub-stock-specific quantities. Population and fishing rates relative to target levels are given in Figures E-10 and E-11.

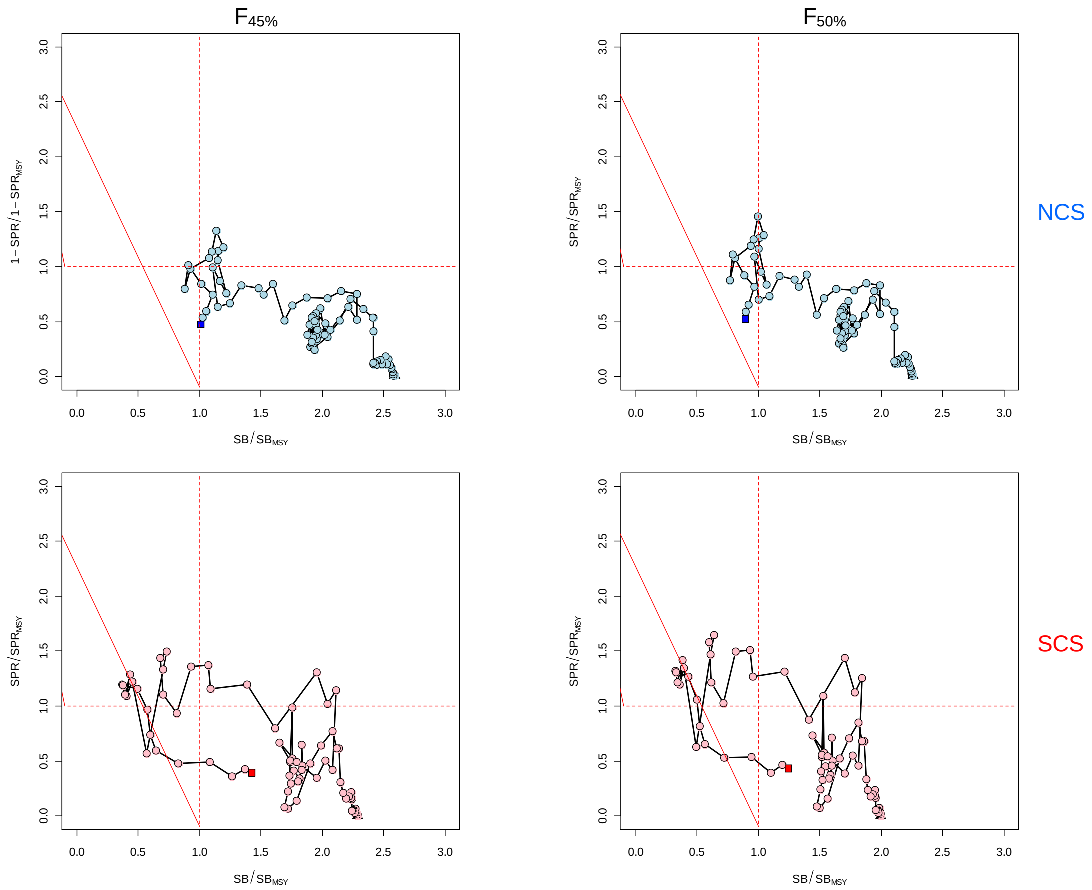

Figure E-10. Spawning biomass (x-axis) and exploitation rates (y-axis) relative to the target levels (at MSY) for each sub-stock (NCS top row; SCS bottom row) for each F_{MSY} proxy (columns). Solid triangles represent the start of the time period; solid squares represent the end of the time period.

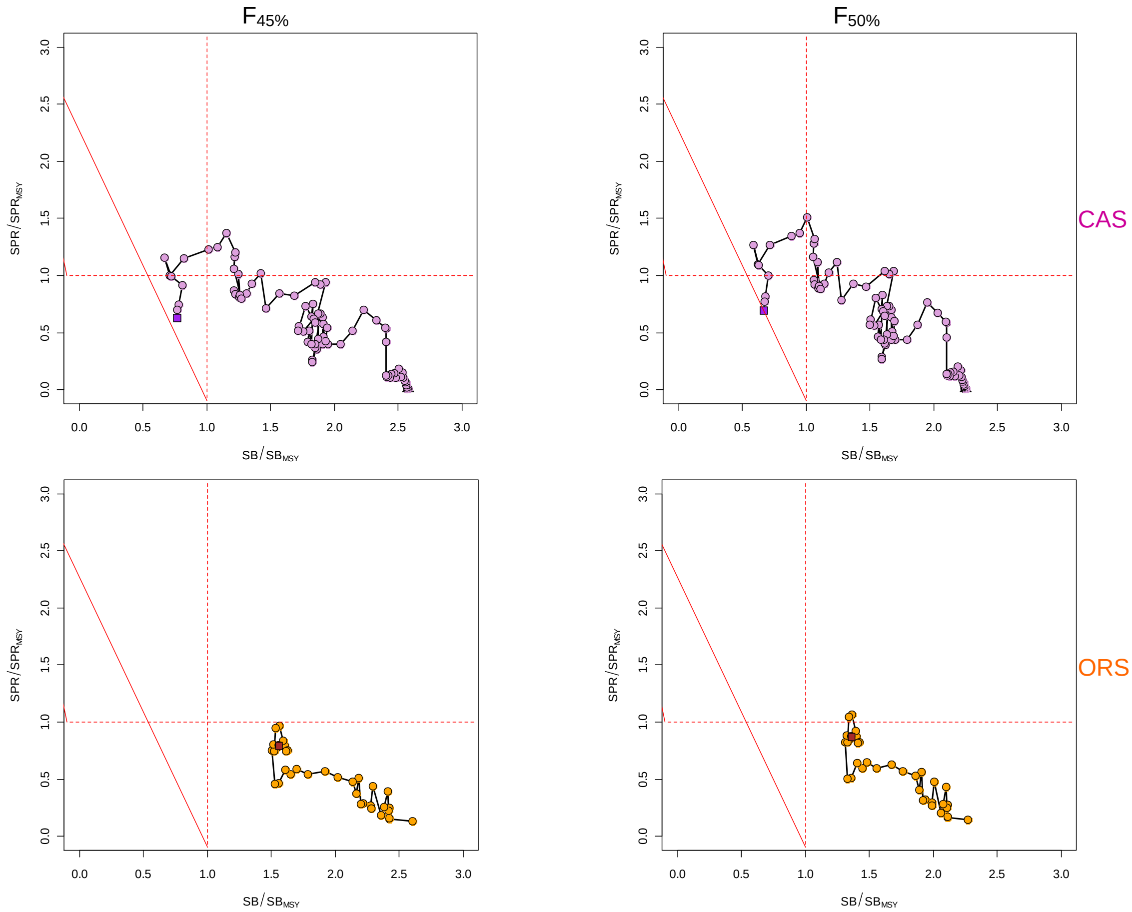

Figure E-11. Spawning biomass (x-axis) and exploitation rates (y-axis) relative to the target levels (at MSY) for each state sub-stock (CAS top row; ORS bottom row) for each F_{MSY} proxy (columns). Solid triangles represent the start of the time period; solid squares represent the end of the time period.

Exploitation status

The abundance of cabezon is estimated to have dropped below the $SB_{40\%}$ management target in 1998 (CAS), 1999 (NCS) and 1986 (SCS) in the California sub-stock base case models. Oregon has yet to fall below the target level. The state-wide California model approaches the overfished threshold ($SB_{25\%}$) in the year 2001 and the SCS falls below this threshold in the years 1991-1998 (Figure E-12). The current (2009) spawning output of the cabezon resource off California is estimated to be about 45% (NCS) and 60% (SCS) of the unfished level, both above the target level of 40% (Figure E-12). The state-wide California model is currently estimated at 34% of the unfished biomass, below the target but above the limit reference point. The Oregon base case estimate of depletion is at 52%, above the target level. The SCS model is the most dynamic, with large uncertainties in current biomass. While the uncertainty in the depletion level of the Oregon stock is generally low, uncertainty in the spawning biomass is high (Figure E-6).

Fishing mortality rates in excess of the current F-target for cabezon of $SPR_{45\%}$ are estimated to have begun in the 1980s in southern California and in the 1990s in northern California (Figure E-13), but have dropped in more recent years (Table E-5). Harvest rates for the Oregon stock have not exceeded this target level. In 2008, relative F (catch/biomass of age2+) is estimated at 0.04 (NCS), 0.03 (SCS), 0.06 (CAS) and 0.09 (ORS) for the sub-stocks.

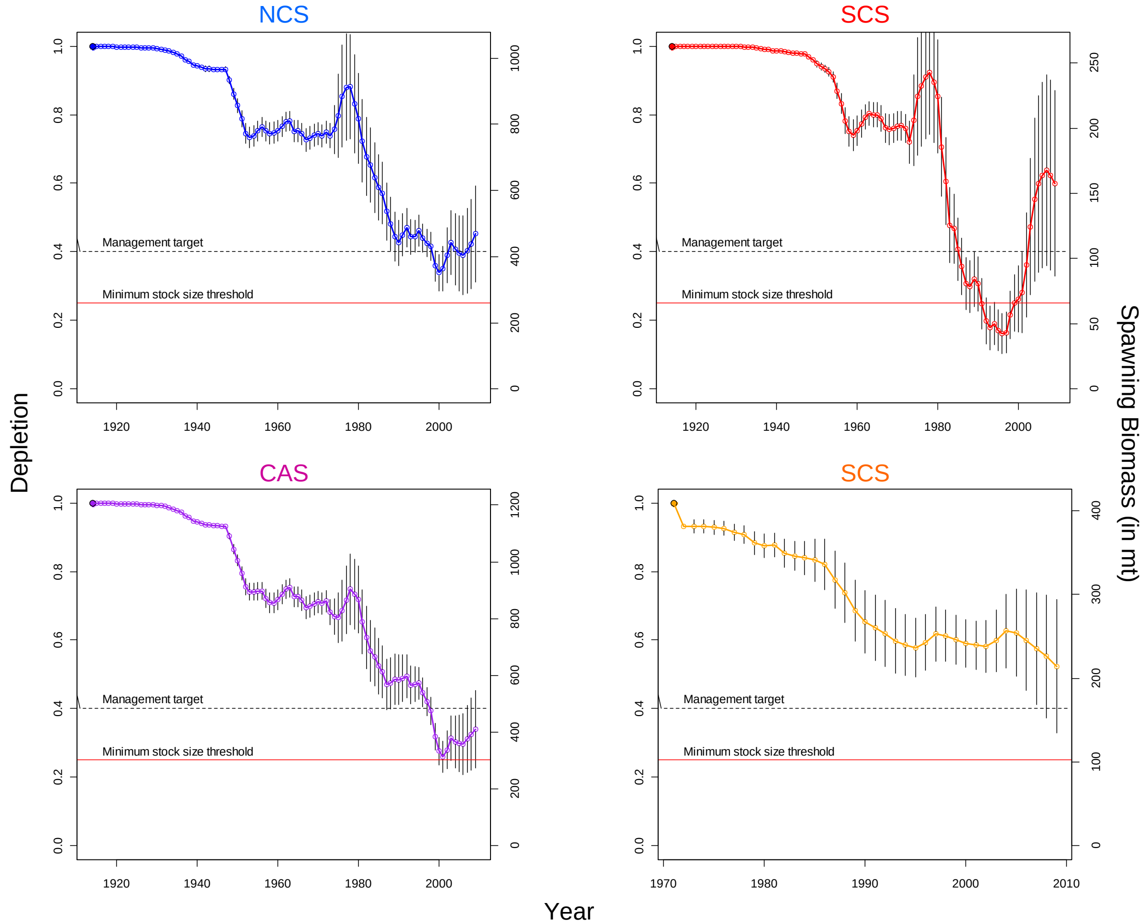

Figure E-12. Time trajectories of depletion and spawning output compared to the target and limit reference points for each cabezon sub-stock considered in this assessment.

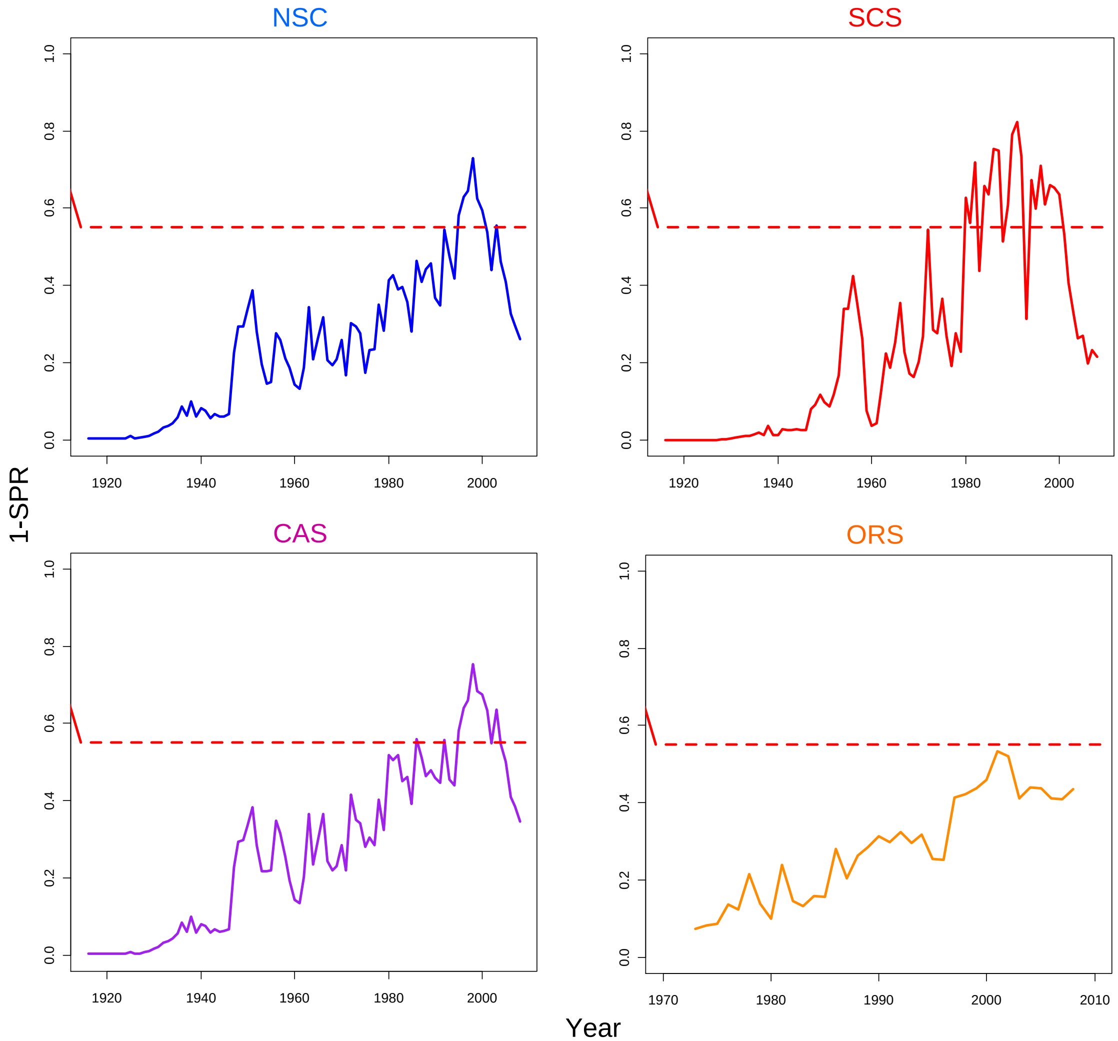

Figure E-13. Estimate of the spawning potential ratio (1-SPR) from each of the sub-stock base case models. Values above the red overfishing line indicate fishing above the MSY proxy harvest rate.

Table E-5. Recent trend in fishing rate as it relates to spawning potential ratio (1-SPR) and relative exploitation rate (catch/biomass of age-2+).

NCS

Year	Estimated 1-SPR (%)	~95% C.I.	Relative F
2000	0.59	0.53-0.65	0.13
2001	0.54	0.47-0.61	0.11
2002	0.44	0.37-0.51	0.08
2003	0.56	0.48-0.63	0.14
2004	0.46	0.37-0.55	0.10
2005	0.41	0.32-0.50	0.08
2006	0.33	0.24-0.41	0.06
2007	0.30	0.21-0.38	0.05
2008	0.26	0.18-0.34	0.04

SCS

Year	Estimated 1-SPR (%)	~95% C.I.	Relative F
2000	0.63	0.52-0.75	0.14
2001	0.53	0.39-0.67	0.08
2002	0.41	0.27-0.55	0.06
2003	0.33	0.20-0.45	0.05
2004	0.26	0.15-0.38	0.04
2005	0.27	0.15-0.39	0.04
2006	0.20	0.11-0.29	0.03
2007	0.23	0.13-0.34	0.04
2008	0.22	0.12-0.31	0.03

CAS

Year	Estimated 1-SPR (%)	~95% C.I.	Relative F
2000	0.67	0.63-0.72	0.18
2001	0.63	0.58-0.69	0.15
2002	0.55	0.48-0.62	0.11
2003	0.64	0.57-0.70	0.18
2004	0.55	0.46-0.63	0.13
2005	0.50	0.41-0.59	0.11
2006	0.41	0.32-0.50	0.08
2007	0.39	0.29-0.48	0.07
2008	0.35	0.25-0.44	0.06

ORS

Year	Estimated 1-SPR (%)	~95% C.I.	Relative F
2000	0.46	0.37-0.55	0.08
2001	0.53	0.43-0.63	0.10
2002	0.52	0.41-0.63	0.10
2003	0.41	0.30-0.52	0.07
2004	0.44	0.33-0.56	0.09
2005	0.44	0.31-0.56	0.09
2006	0.41	0.28-0.55	0.08
2007	0.41	0.27-0.55	0.08
2008	0.44	0.28-0.60	0.09

Management performance

Currently, cabezon has a 15 inch size limit in California for both the commercial and recreational fisheries. Since 2005, there has been a one fish bag limit for recreational anglers. Cabezon experienced emergency commercial closures for some portion of the year from 2001-2005 once the OY had been exceeded. Since then, cumulative trip limits have been reduced from 900 pounds to 200-300 pounds (inseason adjustment) so the commercial fishery could remain open year-round and not exceed the state-wide OY of 69 mt (Table E-6). Even though the 2005 assessment of cabezon was split into two sub-stocks, resulting in depletion levels of 40% (NCS) and 28% (SCS), the State of California continued to manage cabezon on a state-wide level.

Oregon established a 16 inch size limit for cabezon in 2004. Currently, there is a six fish bag limit for the "rockfish et al" complex combined that includes cabezon. From 2004-2008, inseason changes were made where cabezon were prohibited to be taken by boats during portions of the year. This is the first of assessment of cabezon in Oregon, so ABCs have not been previously set for cabezon to evaluate management performance.

Figures E-10 and E-11 indicate reference points based on the federal (the 40-10 control rule with a $F_{45\%}$ F_{MSY} proxy) and state (the 60-20 control rule with a $F_{50\%}$ F_{MSY} proxy) guidelines for each sub-stock. The SCS assessments demonstrates a sub-stock that was historically overfished and undergoing overfishing, based on the current harvest rate proxies. For the SCS, these thresholds were exceeded from the 1980s through the 1990s (Figure E-13). The NCS and CAS experienced potential overfishing during the late 1990s (attributable to the increase in live-fish landings), but never exceeded harvest to a level to be considered overfished (Figure E-13). The ORS base case infers that no level of overfishing has occurred, though exploitation rates have been at their highest historical levels in the most recent years (Figure E-13).

Table E-6. Recent trend in estimated total cabezon catch and commercial landings (mt) relative to management guidelines. [N/A because cabezon have been managed using state-wide OY (CAS) or first time assessment (ORS).] The NCS has recently landed around 80% of California's state-wide cabezon take, SCS around 20%.

NCS

Year	ABC (mtons)	OY (mtons)	Commercial Landings (mtons)	Total Removals (mtons)
1999	N/A	N/A	113.5	147.8
2000	N/A	N/A	96.5	127.5
2001	N/A	N/A	60.0	105.4
2002	N/A	N/A	44.7	79.1
2003	N/A	N/A	40.7	134.5
2004	N/A	N/A	48.7	89.0
2005	N/A	N/A	31.7	71.6
2006	N/A	N/A	29.2	50.9
2007	N/A	N/A	26.3	44.7
2008	N/A	N/A	19.8	39.5

SCS

Year	ABC (mtons)	OY (mtons)	Commercial Landings (mtons)	Total Removals (mtons)
1999	N/A	N/A	14.7	29.3
2000	N/A	N/A	22.9	29.5
2001	N/A	N/A	14.5	23.0
2002	N/A	N/A	6.9	18.6
2003	N/A	N/A	6.2	15.9
2004	N/A	N/A	5.9	12.8
2005	N/A	N/A	4.1	13.8
2006	N/A	N/A	4.0	9.5
2007	N/A	N/A	3.3	11.7
2008	N/A	N/A	3.9	10.1

CAS

Year	ABC (mtons)	OY * (mtons)	Commercial Landings (mtons)	Total Removals (mtons)
1999	N/A	N/A	128.2	177.2
2000	N/A	72	119.4	157.1
2001	N/A	72	74.5	128.5
2002	N/A	81	51.6	97.7
2003	N/A	88	46.9	150.4
2004	N/A	69	54.5	101.8
2005	103	69	35.8	85.4
2006	108	69	33.2	60.4
2007	94	69	29.7	56.4
2008	94	69	23.7	49.6

ORS

Year	ABC (mtons)	OY (mtons)	Commercial Landings (mtons)	Total Removals (mtons)
1999	N/A	N/A	26.5	45.3
2000	N/A	N/A	31.2	48.3
2001	N/A	N/A	46.3	61.6
2002	N/A	N/A	46.0	62.9
2003	N/A	N/A	27.0	44.6
2004	N/A	N/A	33.7	51.9
2005	N/A	N/A	29.9	49.6
2006	N/A	N/A	25.6	43.3
2007	N/A	N/A	23.2	41.1
2008	N/A	N/A	25.1	43.2

* State-wide OYs in California (CAS) prior to 2005 were put into place by the Fish and Game Commission.

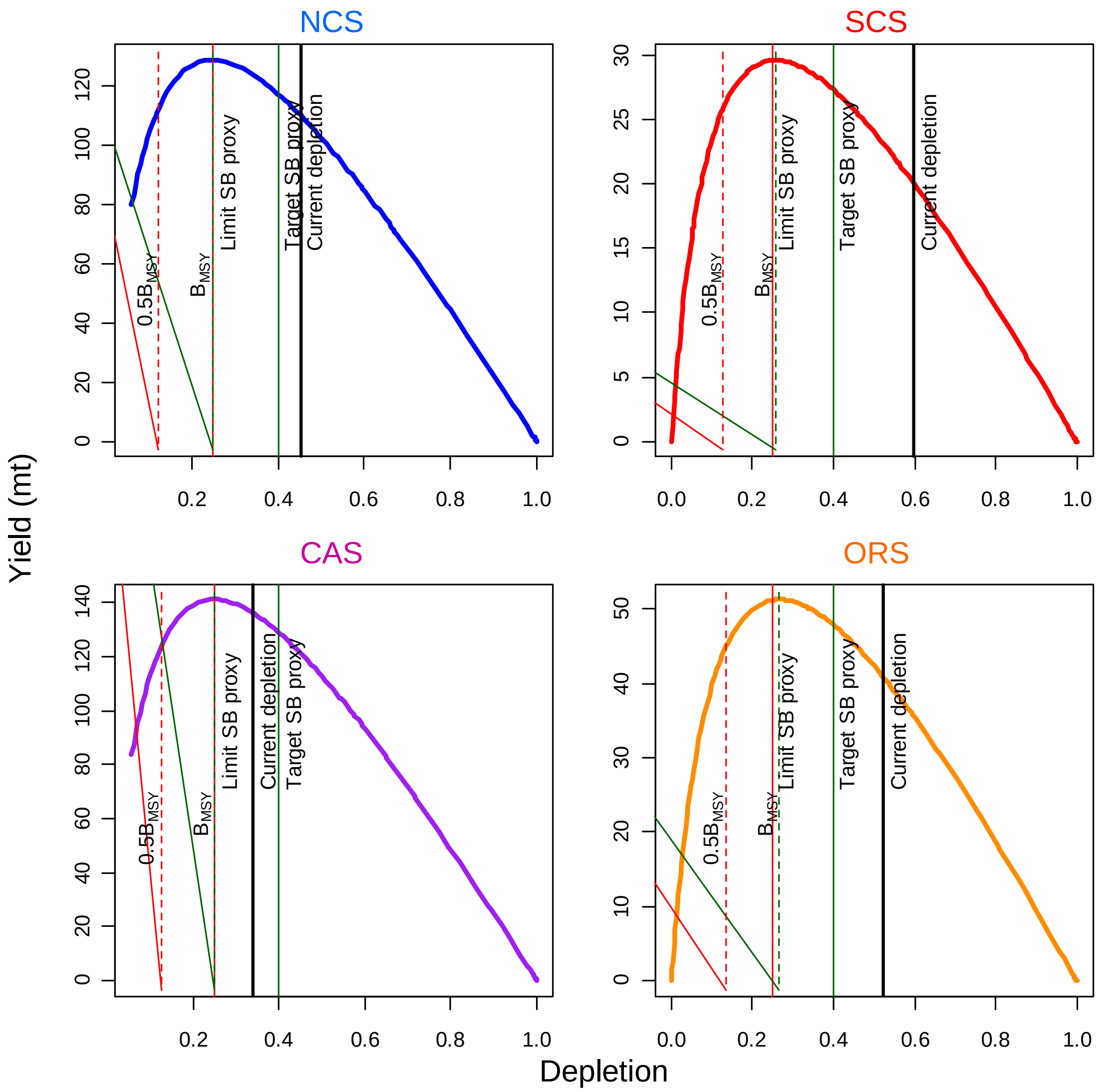

Figure E-14. Equilibrium yield curves for each sub-stock base case model. Reference points and current stock status are indicated by the vertical lines.

Regional Management

The results of these assessments provide the scientific basis for cabezon to be managed regionally using the California Department of Fish and Game northern/central and southern California management areas and/or across the entire states of California and Oregon. They also provide a basis by which state-wide management can still be informed by regional dynamics. Given important differences in population dynamics between the two California sub-stocks, summing the biomass across sub-stocks results in state-wide biomass estimates that incorporate regional differences in dynamics. This approach is not equivalent to the one stock state-wide model that ignores regional dynamics.

More work and sampling effort is needed to evaluate whether cabezon among these areas differ biologically (growth, maturity, etc.), but the results of this assessment indicate that the center of cabezon biomass resides within central/northern California. The possibility of additional cabezon sub-populations can not be ruled out. Regional management is an important consideration in relatively sedentary nearshore reef species such as cabezon and future assessments should continue to provide scientific analyses on increasingly finer spatial scales.

Unresolved problems and major uncertainties

Several sources of uncertainty were recognized and explored using sensitivity analyses. Results for all California sub-stock assessments are insensitive to the systematic inclusion or exclusion of each data source. In the previous assessment, the NCS was sensitive to the inclusion of the TENERA adult survey, causing the population to show a greater decline compared to the base case. Sensitivity to the TENERA adult survey is not a characteristic of the current assessment. The 2005 assessment of the SCS was highly sensitive to the inclusion of the 2000 man-made recreational fleet mean weight data. This behavior is also not seen in the current implementation of the assessment. The model was not sensitive the choice of breaking the CPFV time series into two series because of management changes affecting the interpretation of the continuous time series.

Other major uncertainties relate to the values assumed for natural mortality (M) for each sex, the assumption of male growth patterns, the choice of the stock-recruit relationship (Beverton-Holt vs. Ricker), and values assumed for recruitment compensation (steepness (h)). Most uncertainty was seen in the absolute biomass measures. Overall, all California models are less sensitive than in the previous assessments and population depletion in most sensitivity trials was either above or near the target depletion levels.

The Oregon model was robust to almost all data and parameter manipulation trials accept the removal of the ORBS survey. Removal of the only abundance index causes the population to drop sharply below the overfished level and absolute biomass to be much smaller than in the base case.

Forecasts

Twelve-year forward projections of yield are conducted for each sub-stock under two alternatives based on federal and state ABC control rule definitions (based on F_{MSY} proxies of $F_{45\%}$ and $F_{50\%}$, respectively) and federal and state OY threshold harvest control rules (40-10 or 60-20, respectively). The standard PFMC OY control rule for groundfish such as cabezon is based on $F_{45\%}$ with a 40-10 adjustment for stocks below the target level of 40% of the unfished reproductive output. The California Nearshore Fishery Management Plan proposes the use of a F_{MSY} proxy of $F_{50\%}$ and a 60-20 adjustment for stocks below 60% of the unfished reproductive output. The first two years of the catch stream (2009-2010) assume a 39%/69% split between commercial and recreational fisheries for catch levels set by each state, with fleet-specific allocations assumed as the average over the past three years (2006-2008). Catch levels post 2010 are determined by the control rule. The relative proportion of all fleets in future harvests is assumed to be the same as the last year (2008) in the model. Results of the projections are given in

Table E-7. Overfishing limits (OFLs) are provided in this table because they will be used in the 2011-12 management cycle.

Table E-7. Projection of potential cabezon ABC, OY, spawning biomass and depletion for each substock base case models, based on the SPR=45% and 50% targets and appropriate control rule.

NCS	40:10 and $F_{45\%}$					60:20 and $F_{50\%}$				
Year	**ABC (mtons)**	**OY (mtons)**	**Age 2+ biomass (mtons)**	**Spawning biomass (mtons)**	**Depletion**	**ABC (mtons)**	**OY (mtons)**	**Age 2+ biomass (mtons)**	**Spawning biomass (mtons)**	**Depletion**
2009	137	55	1049	469	45%	114	55	1049	469	45%
2010	144	63	1090	495	48%	119	63	1090	495	48%
2011	150	150	1124	516	50%	124	111	1124	516	50%
2012	142	142	1085	485	47%	123	109	1116	508	49%
2013	137	137	1058	462	45%	122	107	1112	502	48%
2014	133	133	1039	446	43%	121	106	1111	498	48%
2015	130	130	1025	435	42%	121	106	1111	497	48%
2016	128	128	1015	429	41%	121	106	1111	497	48%
2017	127	127	1006	424	41%	121	106	1112	497	48%
2018	126	126	999	420	41%	121	106	1112	497	48%
2019	125	125	992	417	40%	121	106	1113	497	48%
2020	124	124	987	414	40%	121	106	1113	497	48%

SCS	40:10 and $F_{45\%}$					60:20 and $F_{50\%}$				
Year	**ABC (mtons)**	**OY (mtons)**	**Age 2+ biomass (mtons)**	**Spawning biomass (mtons)**	**Depletion**	**ABC (mtons)**	**OY (mtons)**	**Age 2+ biomass (mtons)**	**Spawning biomass (mtons)**	**Depletion**
2009	39	14	293	158	60%	33	14	293	158	60%
2010	38	16	294	150	57%	32	16	294	150	57%
2011	37	37	297	145	55%	31	30	297	145	55%
2012	34	34	282	131	50%	30	27	289	136	52%
2013	33	33	273	123	47%	29	26	285	131	50%
2014	32	32	267	118	45%	29	25	284	129	49%
2015	31	31	263	115	44%	28	25	283	129	49%
2016	30	30	259	113	43%	28	25	282	128	49%
2017	30	30	256	111	42%	28	25	282	128	49%
2018	30	30	253	109	42%	28	25	282	128	49%
2019	29	29	251	108	41%	28	25	281	128	49%
2020	29	29	249	107	41%	28	25	281	127	48%

Table E-7 (Continued).

CAS			40:10 and $F_{45\%}$					60:20 and $F_{50\%}$		
Year	**ABC (mtons)**	**OY (mtons)**	**Age 2+ biomass (mtons)**	**Spawning biomass (mtons)**	**Depletion**	**ABC (mtons)**	**OY (mtons)**	**Age 2+ biomass (mtons)**	**Spawning biomass (mtons)**	**Depletion**
2009	115	69	877	410	34%	95	69	877	410	34%
2010	117	79	917	418	35%	97	79	917	418	35%
2011	120	115	954	428	35%	100	65	954	428	35%
2012	120	114	965	426	35%	105	74	1005	455	38%
2013	121	116	980	430	36%	110	82	1048	480	40%
2014	123	119	994	437	36%	115	90	1083	502	42%
2015	125	121	1006	443	37%	119	95	1112	519	43%
2016	126	123	1016	449	37%	122	100	1134	532	44%
2017	128	125	1024	453	38%	124	103	1152	542	45%
2018	129	126	1030	456	38%	126	106	1167	550	46%
2019	129	127	1034	458	38%	128	108	1178	556	46%
2020	130	128	1038	460	38%	129	110	1187	561	46%

ORS			40:10 and $F_{45\%}$					60:20 and $F_{50\%}$		
Year	**ABC (mtons)**	**OY (mtons)**	**Age 2+ biomass (mtons)**	**Spawning biomass (mtons)**	**Depletion**	**ABC (mtons)**	**OY (mtons)**	**Age 2+ biomass (mtons)**	**Spawning biomass (mtons)**	**Depletion**
2009	60	47	455	214	52%	51	47	455	214	52%
2010	55	47	437	197	48%	47	47	437	197	48%
2011	52	52	426	181	44%	44	36	426	181	44%
2012	50	50	416	169	41%	44	36	431	177	43%
2013	49	49	413	164	40%	45	37	439	180	44%
2014	49	49	412	162	40%	46	38	447	184	45%
2015	49	49	411	162	40%	47	40	453	188	46%
2016	49	49	410	162	40%	48	41	458	190	46%
2017	49	49	410	161	39%	48	41	462	192	47%
2018	49	49	409	161	39%	48	42	464	193	47%
2019	49	49	408	161	39%	49	42	466	194	48%
2020	49	49	408	160	39%	49	43	468	195	48%

Decision table

Decision table projections based on alternative states of nature (columns in the decision tables) for 3 of the 4 sub-stocks were explored to capture uncertainty in population conditions (Table E-8) and control rules (40-10,$F_{45\%}$ and 60-20,$F_{50\%}$). The STAR panel agreed with the STAT that state-wide management was most appropriately determined from the combined NCS and SCS models, not the CAS model. A decision table for the CAS is therefore not presented. For the NCS, SCS, and ORS sub-stocks, the low and high *M* scenarios refer to different assumptions about sex-specific natural mortality (the greatest source of uncertainty in all sub-stock models) and were retained from the last assessment. The low scenario assumes M = 0.2/yr and 0.25/yr for females and males respectively, while the high scenario assumes 0.3/yr and 0.35/yr respectively. Catch histories (rows in the decision tables) were based on three proposed catch scenarios: 1) catch series based on the specified control rule (either 40-10 or 60-20) derived from the low *M* state of nature (low *M* catch scenario); 2) catch series based on the specified control rule (either 40-10 or 60-20) derived from the base case *M* state of nature (base case *M* scenario); and 3) catch series based on the specified control rule (either 40-10 or 60-20) derived from the high *M* state of nature (high *M* catch scenario).

All sub-stocks demonstrated spawning output depletion below limit reference points when the low *M* scenario was subjected to the base case and high catch scenarios. This also occurred when the base case *M* scenario was subjected to the high catch scenario. All other scenarios demonstrated depletion near or above the target reference points at the end of each projection period. Relative to biomass and depletion estimates, the 60-20 rule was much more conservative than the 40-10 rule.

Table E-8. Decision analysis of spawning output depletion based on different states of nature (columns) under different catch histories (rows) and control rules for each cabezon sub-stock. For the 40-10 rule, 0.40 and 0.25 are the target and limit reference points, respectively. For the 60-20 rule, 0.60 and 0.30 are the target and limit reference points, respectively. At or above the target reference point is indicated by green; between the target and limit reference points is indicated by yellow; below the limit reference point is indicated by red. Catches for 2009-2010 were provided by California and Oregon and reflect current catch targets. Control rules are implemented after 2010.

NCS: 40-10, $F_{45\%}$

		Removals			State of Nature		
					Low *M* (F= 0.2/M=0.25)	Base Case *M* (F=0.25/M=0.3)	High *M* (F=0.3/M=0.35)
	Year	Comm.	Rec.	Total	p = 0.25	p = 0.5	p = 0.25
Low *M* catches	2009	21	34	55	0.34	0.45	0.53
	2010	25	38	63	0.37	0.48	0.56
	2011	48	47	94	0.38	0.50	0.58
	2012	48	47	95	0.38	0.50	0.58
	2013	47	47	94	0.38	0.50	0.59
	2014	47	47	94	0.38	0.50	0.59
	2015	47	47	94	0.38	0.51	0.60
	2016	48	47	95	0.38	0.51	0.61
	2017	48	47	95	0.38	0.51	0.62
	2018	48	47	95	0.38	0.51	0.62
	2019	48	47	95	0.38	0.52	0.63
	2020	48	47	96	0.39	0.52	0.63
Base case *M* catches	2009	21	34	55	0.34	0.45	0.53
	2010	25	38	63	0.37	0.48	0.56
	2011	76	74	150	0.38	0.50	0.58
	2012	72	70	142	0.35	0.47	0.55
	2013	70	67	137	0.33	0.45	0.54
	2014	68	64	133	0.31	0.43	0.53
	2015	67	63	130	0.29	0.42	0.53
	2016	66	62	128	0.28	0.41	0.53
	2017	66	61	127	0.27	0.41	0.53
	2018	65	60	126	0.26	0.41	0.53
	2019	65	60	125	0.26	0.40	0.53
	2020	65	59	124	0.25	0.40	0.54
High *M* catches	2009	21	34	55	0.34	0.45	0.53
	2010	25	38	63	0.37	0.48	0.56
	2011	116	112	228	0.38	0.50	0.58
	2012	106	99	206	0.31	0.42	0.51
	2013	100	91	192	0.25	0.37	0.47
	2014	97	86	183	0.21	0.34	0.45
	2015	95	83	178	0.18	0.31	0.43
	2016	93	81	175	0.16	0.29	0.42
	2017	92	80	172	0.14	0.28	0.42
	2018	91	79	170	0.12	0.26	0.41
	2019	90	78	168	0.09	0.25	0.41
	2020	89	77	166	0.07	0.24	0.40

Table E-8 (Continued).

NCS: 60-20, $F_{50\%}$

		Removals			State of Nature		
					Low *M* (F= 0.2/M=0.25)	Base Case *M* (F=0.25/M=0.3)	High *M* (F=0.3/M=0.35)
	Year	Comm.	Rec.	Total	p = 0.25	p = 0.5	p = 0.25
Low *M* catches	2009	21	34	55	0.34	0.45	0.53
	2010	25	38	63	0.37	0.48	0.56
	2011	29	28	57	0.38	0.50	0.58
	2012	32	31	63	0.40	0.52	0.60
	2013	34	34	68	0.42	0.54	0.62
	2014	35	36	71	0.43	0.55	0.64
	2015	37	37	74	0.44	0.56	0.65
	2016	38	38	76	0.45	0.57	0.66
	2017	38	39	78	0.45	0.58	0.67
	2018	39	40	79	0.46	0.58	0.68
	2019	40	41	81	0.46	0.59	0.68
	2020	40	41	82	0.47	0.59	0.69
Base case *M* catches	2009	21	34	55	0.34	0.45	0.53
	2010	25	38	63	0.37	0.48	0.56
	2011	56	55	111	0.38	0.50	0.58
	2012	55	54	109	0.37	0.49	0.57
	2013	54	53	107	0.37	0.48	0.57
	2014	54	52	106	0.36	0.48	0.58
	2015	54	52	106	0.35	0.48	0.58
	2016	54	52	106	0.35	0.48	0.59
	2017	54	52	106	0.35	0.48	0.59
	2018	54	52	106	0.35	0.48	0.59
	2019	54	52	106	0.34	0.48	0.60
	2020	54	52	106	0.34	0.48	0.60
High *M* catches	2009	21	34	55	0.34	0.45	0.53
	2010	25	38	63	0.37	0.48	0.56
	2011	94	90	184	0.38	0.50	0.58
	2012	85	80	166	0.33	0.45	0.53
	2013	80	75	155	0.30	0.42	0.51
	2014	78	71	149	0.27	0.39	0.50
	2015	77	70	147	0.25	0.38	0.49
	2016	76	69	146	0.24	0.37	0.49
	2017	76	69	145	0.22	0.36	0.49
	2018	76	68	144	0.21	0.35	0.49
	2019	75	68	143	0.19	0.34	0.48
	2020	75	68	143	0.18	0.34	0.48

Table E-8 (Continued).

SCS: 40-10, $F_{45\%}$

		Removals			State of Nature		
					Low *M* (F= 0.2/M=0.25)	Base Case *M* (F=0.25/M=0.3)	High *M* (F=0.3/M=0.35)
	Year	Comm.	Rec.	Total	p = 0.25	p = 0.5	p = 0.25
Low *M* catches	2009	5	9	14	0.33	0.60	0.90
	2010	6	10	16	0.32	0.57	0.83
	2011	6	11	17	0.31	0.55	0.79
	2012	6	11	17	0.31	0.54	0.76
	2013	6	11	18	0.32	0.55	0.75
	2014	7	12	19	0.33	0.55	0.75
	2015	7	12	19	0.34	0.56	0.74
	2016	7	13	20	0.35	0.57	0.74
	2017	7	13	20	0.36	0.57	0.74
	2018	8	13	21	0.36	0.57	0.73
	2019	8	13	21	0.37	0.57	0.73
	2020	8	14	21	0.37	0.57	0.73
Base case *M* catches	2009	5	9	14	0.33	0.60	0.90
	2010	6	10	16	0.32	0.57	0.83
	2011	13	24	37	0.31	0.55	0.79
	2012	12	22	34	0.27	0.50	0.72
	2013	12	21	33	0.25	0.47	0.68
	2014	11	20	32	0.23	0.45	0.66
	2015	11	20	31	0.22	0.44	0.64
	2016	11	19	30	0.21	0.43	0.63
	2017	11	19	30	0.20	0.42	0.62
	2018	11	19	30	0.19	0.42	0.61
	2019	11	19	29	0.18	0.41	0.61
	2020	11	18	29	0.17	0.41	0.60
High *M* catches	2009	5	9	14	0.33	0.60	0.90
	2010	6	10	16	0.32	0.57	0.83
	2011	25	44	68	0.31	0.55	0.79
	2012	21	38	59	0.21	0.43	0.66
	2013	19	34	53	0.14	0.35	0.58
	2014	18	32	50	0.10	0.30	0.53
	2015	17	30	47	0.06	0.27	0.49
	2016	16	29	45	0.04	0.24	0.47
	2017	16	28	44	0.02	0.22	0.45
	2018	16	27	43	0.01	0.20	0.44
	2019	15	27	42	0.00	0.18	0.43
	2020	15	26	41	0.00	0.17	0.42

Table E-8 (Continued).

SCS: 60-20, $F_{50\%}$

		Removals			State of Nature		
					Low *M* (F= 0.2/M=0.25)	Base Case *M* (F=0.25/M=0.3)	High *M* (F=0.3/M=0.35)
	Year	Comm.	Rec.	Total	p = 0.25	p = 0.5	p = 0.25
Low *M* catches	2009	5	9	14	0.33	0.60	0.90
	2010	6	10	16	0.32	0.57	0.83
	2011	3	5	8	0.31	0.55	0.79
	2012	4	6	10	0.33	0.56	0.78
	2013	4	7	11	0.35	0.58	0.78
	2014	5	8	13	0.38	0.60	0.79
	2015	5	9	14	0.40	0.61	0.79
	2016	6	10	15	0.41	0.63	0.79
	2017	6	10	16	0.42	0.63	0.79
	2018	6	11	17	0.44	0.64	0.79
	2019	7	11	18	0.44	0.64	0.78
	2020	7	12	18	0.45	0.64	0.78
Base case *M* catches	2009	5	9	14	0.33	0.60	0.90
	2010	6	10	16	0.32	0.57	0.83
	2011	11	19	30	0.31	0.55	0.79
	2012	10	17	27	0.29	0.52	0.74
	2013	9	17	26	0.28	0.50	0.71
	2014	9	16	25	0.27	0.49	0.69
	2015	9	16	25	0.27	0.49	0.68
	2016	9	16	25	0.27	0.49	0.68
	2017	9	16	25	0.27	0.49	0.67
	2018	9	16	25	0.27	0.49	0.67
	2019	9	16	25	0.27	0.49	0.66
	2020	9	16	25	0.27	0.48	0.66
High *M* catches	2009	5	9	14	0.33	0.60	0.90
	2010	6	10	16	0.32	0.57	0.83
	2011	21	37	57	0.31	0.55	0.79
	2012	18	33	51	0.23	0.45	0.68
	2013	17	30	47	0.18	0.39	0.61
	2014	15	28	43	0.14	0.35	0.57
	2015	15	26	40	0.11	0.32	0.54
	2016	14	25	39	0.09	0.31	0.52
	2017	14	24	37	0.07	0.29	0.51
	2018	13	23	37	0.05	0.28	0.51
	2019	13	23	36	0.03	0.27	0.50
	2020	13	23	35	0.02	0.26	0.50

Table E-8 (Continued).

ORS: 40-10, $F_{45\%}$

		Removals			State of Nature		
					Low *M* (F= 0.2/M=0.25)	Base Case *M* (F=0.25/M=0.3)	High *M* (F=0.3/M=0.35)
	Year	Comm.	Rec.	Total	p = 0.25	p = 0.5	p = 0.25
Low *M* catches	2009	31	16	47	0.37	0.52	0.69
	2010	31	16	47	0.33	0.48	0.65
	2011	14	10	24	0.29	0.44	0.61
	2012	15	10	25	0.29	0.45	0.61
	2013	16	11	27	0.31	0.47	0.63
	2014	17	12	29	0.32	0.49	0.66
	2015	18	13	30	0.34	0.51	0.68
	2016	18	13	31	0.35	0.52	0.69
	2017	19	13	32	0.35	0.54	0.71
	2018	19	14	33	0.36	0.55	0.72
	2019	20	14	34	0.36	0.55	0.72
	2020	20	14	34	0.37	0.56	0.73
Base case *M* catches	2009	31	16	47	0.37	0.52	0.69
	2010	31	16	47	0.33	0.48	0.65
	2011	30	22	52	0.29	0.44	0.61
	2012	29	21	50	0.25	0.41	0.59
	2013	29	20	49	0.23	0.40	0.58
	2014	29	20	49	0.22	0.40	0.59
	2015	29	20	49	0.21	0.40	0.60
	2016	29	20	49	0.20	0.40	0.60
	2017	29	20	49	0.18	0.40	0.61
	2018	29	20	49	0.17	0.39	0.61
	2019	29	20	49	0.16	0.39	0.62
	2020	29	20	49	0.14	0.39	0.62
High *M* catches	2009	31	16	47	0.37	0.52	0.69
	2010	31	16	47	0.33	0.48	0.65
	2011	61	45	106	0.29	0.44	0.61
	2012	56	40	96	0.18	0.34	0.53
	2013	54	37	91	0.10	0.28	0.49
	2014	52	36	88	0.04	0.23	0.46
	2015	51	35	86	0.01	0.19	0.45
	2016	51	34	85	0.01	0.16	0.44
	2017	50	34	83	0.00	0.14	0.43
	2018	49	33	82	0.00	0.11	0.42
	2019	49	33	81	0.00	0.08	0.41
	2020	48	32	80	0.00	0.05	0.41

Table E-8 (Continued).

ORS: 60-20, $F_{50\%}$

		Removals			State of Nature		
					Low *M* (F= 0.2/M=0.25)	Base Case *M* (F=0.25/M=0.3)	High *M* (F=0.3/M=0.35)
	Year	Comm.	Rec.	Total	p = 0.25	p = 0.5	p = 0.25
Low *M* catches	2009	31	16	47	0.37	0.52	0.69
	2010	31	16	47	0.33	0.48	0.65
	2011	6	5	11	0.29	0.44	0.61
	2012	8	6	14	0.31	0.47	0.63
	2013	10	7	17	0.34	0.50	0.66
	2014	12	9	20	0.37	0.53	0.69
	2015	13	10	23	0.39	0.56	0.71
	2016	14	10	25	0.41	0.58	0.73
	2017	15	11	26	0.43	0.59	0.75
	2018	16	12	28	0.44	0.61	0.76
	2019	17	12	29	0.45	0.62	0.76
	2020	17	12	29	0.45	0.62	0.77
Base case *M* catches	2009	31	16	47	0.37	0.52	0.69
	2010	31	16	47	0.33	0.48	0.65
	2011	21	15	36	0.29	0.44	0.61
	2012	21	15	36	0.28	0.43	0.60
	2013	22	15	37	0.28	0.44	0.61
	2014	23	16	38	0.28	0.45	0.63
	2015	23	16	40	0.28	0.46	0.64
	2016	24	17	41	0.28	0.47	0.65
	2017	24	17	42	0.28	0.47	0.66
	2018	25	17	42	0.27	0.47	0.67
	2019	25	18	42	0.27	0.48	0.67
	2020	25	18	43	0.26	0.48	0.68
High *M* catches	2009	31	16	47	0.37	0.52	0.69
	2010	31	16	47	0.33	0.48	0.65
	2011	52	38	90	0.29	0.44	0.61
	2012	47	33	79	0.20	0.36	0.55
	2013	44	31	75	0.14	0.32	0.52
	2014	43	30	73	0.10	0.29	0.51
	2015	43	29	72	0.07	0.27	0.50
	2016	42	29	71	0.03	0.25	0.50
	2017	42	29	71	0.01	0.23	0.49
	2018	42	28	70	0.01	0.21	0.49
	2019	41	28	70	0.00	0.19	0.49
	2020	41	28	69	0.00	0.18	0.49

Table E-9. Summary of recent trends in estimated cabezon exploitation and stock levels from the base case models for each sub-stock. All values reported at the beginning of the year.

NCS

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Commercial landings (mt)	97	60	45	41	49	32	29	26	20	N/A
Total catch (mt)	128	105	79	135	89	72	51	45	39	N/A
ABC (mt)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OY	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1-SPR	0.59	0.54	0.44	0.56	0.46	0.41	0.33	0.30	0.26	0.55
Exploitation rate (catch/age 2+ biomass)	0.13	0.11	0.08	0.14	0.10	0.08	0.06	0.05	0.04	0.13
Age 2+ biomass (mt)	970	970	965	950	897	893	892	943	994	1,049
Spawning biomass (mt)	351	364	405	443	421	410	404	417	438	469
~95% Confidence interval	278-425	275-453	295-515	315-571	282-561	263-556	250-558	253-582	262-614	279-659
Range of states of nature										
Recruitment (1000s)	491	421	584	733	552	886	738	750	764	776
~95% Confidence interval	253-729	157-686	186-981	240-1226	130-974	219-1554	166-1310	593-906	606-923	3-1549
Range of states of nature										
Depletion	33.9%	35.1%	39.0%	42.7%	40.7%	39.5%	39.0%	40.3%	42.2%	45.2%
~95% Confidence interval	0.29-0.39	0.29-0.42	0.31-0.47	0.33-0.52	0.30-0.51	0.29-0.51	0.27-0.51	0.28-0.53	0.29-0.55	0.31-0.59
Range of states of nature										

SCS

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Commercial landings (mt)	23	14	7	6	6	4	4	3	4	N/A
Total catch (mt)	30	23	19	16	13	14	10	12	10	N/A
ABC (mt)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OY	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1-SPR	0.63	0.53	0.41	0.33	0.26	0.27	0.20	0.23	0.22	0.55
Exploitation rate (catch/age 2+ biomass)	0.14	0.08	0.06	0.05	0.04	0.04	0.03	0.04	0.03	0.13
Age 2+ biomass (mt)	216	282	297	307	325	331	319	306	293	293
Spawning biomass (mt)	69	74	95	124	145	157	164	168	164	158
~95% Confidence interval	36-102	34-114	43-147	56-193	64-227	68-246	70-258	71-265	68-260	64-252
Range of states of nature										
Recruitment (1000s)	87	128	227	152	79	92	121	192	194	192
~95% Confidence interval	0-190	0-281	0-458	0-308	0-159	1-182	2-240	140-244	141-246	0-460
Range of states of nature										
Depletion	26.3%	28.2%	36.2%	47.4%	55.2%	59.8%	62.4%	63.8%	62.4%	60.0%
~95% Confidence interval	0.17-0.36	0.16-0.40	0.21-0.51	0.27-0.67	0.31-0.79	0.34-0.86	0.35-0.90	0.36-0.92	0.35-0.90	0.33-0.87
Range of states of nature										

Table E-9 (Continued)

CAS

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Commercial landings (mt)	119	74	52	47	55	36	33	30	24	N/A
Total catch (mt)	157	128	98	150	102	85	60	56	50	N/A
ABC (mt)										
OY	72	72	81	88	54	69	69	69	69	
1-SPR	0.67	0.63	0.55	0.64	0.55	0.50	0.41	0.39	0.35	0.53
Exploitation rate										
(catch/age 2+ biomass)	0.18	0.15	0.11	0.18	0.13	0.11	0.08	0.07	0.06	0.12
Age 2+ biomass (mt)	855	865	861	845	796	804	793	811	831	877
Spawning biomass (mt)	333	313	338	379	366	360	359	376	392	410
~95% Confidence interval	275-391	247-380	257-419	281-476	255-477	240-480	229-489	234-519	238-547	244-576
Range of states of nature										
Recruitment (1000s)	467	341	543	732	425	565	559	732	750	759
~95% Confidence interval	241-694	132-550	187-899	277-1188	121-728	161-968	144-974	581-883	595-906	2-1516
Range of states of nature										
Depletion	27.6%	26.0%	28.0%	31.4%	30.3%	29.8%	29.7%	31.2%	32.5%	34.0%
~95% Confidence interval	0.24-0.32	0.21-0.31	0.22-0.33	0.25-0.38	0.23-0.38	0.22-0.38	0.21-0.39	0.21-0.41	0.22-0.43	0.23-0.45
Range of states of nature										

ORS

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Commercial landings (mt)	26	31	46	46	27	34	30	26	23	N/A
Total catch (mt)	45	48	62	63	45	52	50	43	41	N/A
ABC (mt)										
OY										
1-SPR	0.46	0.53	0.52	0.41	0.44	0.44	0.41	0.41	0.44	0.55
Exploitation rate										
(catch/age 2+ biomass)	0.08	0.10	0.10	0.07	0.09	0.09	0.08	0.08	0.09	0.13
Age 2+ biomass (mt)	562	599	602	593	584	557	538	516	483	455
Spawning biomass (mt)	242	239	238	245	256	254	245	235	226	214
~95% Confidence interval	161-322	158-320	153-324	150-339	151-361	140-368	125-366	110-360	96-356	80-349
Range of states of nature										
Recruitment (1000s)	211	188	148	131	187	137	88	141	180	178
~95% Confidence interval	112-310	101-276	68-228	56-207	73-301	31-242	8-169	0-284	117-242	0-363
Range of states of nature										
Depletion	59.0%	58.5%	58.2%	59.8%	62.6%	62.1%	60.0%	57.4%	55.2%	52.4%
~95% Confidence interval	0.52-0.66	0.51-0.65	0.51-0.66	0.51-0.69	0.52-0.73	0.49-0.75	0.45-0.75	0.41-0.74	0.37-0.73	0.33-0.72
Range of states of nature										

Table E-10. Summary of cabezon reference points from each sub-stock base case model. Values are based on 2008 fishery selectivity and allocation. $F_{45\%}$ with 40:10 and $F_{50\%}$ with 60:20 are provided. for each sub-stock.

	NCS				SCS			
	40:10 and $F_{45\%}$		60:20 and $F_{50\%}$		40:10 and $F_{45\%}$		60:20 and $F_{50\%}$	
Quantity	Estimate	~95% Confidence interval	Estimate	~95% Confidence interval	Estimate	~95% Confidence interval	Estimate	~95% Confidence interval
Unfished spawning stock biomass (SB_0, mt)	1036	976-1097	1036	976-1097	263	239-287	263	239-287
Unfished 2+ biomass (mt)	1835	1730-1940	1835	1730-1940	470	428-512	470	428-512
Unfished recruitment (R_0, thousands)	876	820-931	876	820-931	206	187-225	206	187-225
Reference points based on SB $_{40\%}$								
MSY Proxy Spawning Stock Biomass ($SB_{40\%}$)	415	390-439	415	390-439	105	96-115	105	96-115
SPR resulting in $SB_{40\%}$ ($SPR_{SB40\%}$)	46.4%	-	46.4%	-	46.4%	-	46.4%	-
Exploitation rate resulting in $SB_{40\%}$	0.119	0.117-0.122	0.119	0.117-0.122	0.110	0.111-0.112	0.110	0.111-0.112
Yield with $SPR_{SB40\%}$ at $SB_{40\%}$ (mt)	118	110-125	118	110-125	27	25-30	27	25-30
Reference points based on SPR proxy for MSY								
Spawning Stock Biomass at SPR (SB_{SPR})(mt)	398	375-421	456	430-483	100	92-110	116	105-126
$SPR_{MSY\text{-}proxy}$	45.0%	-	50.0%	-	45.0%	-	50.0%	-
Exploitation rate corresponding to SPR	0.125	0.12-0.13	0.106	0.10-0.11	0.116	0.116-0.117	0.099	0.099-0.100
Yield with $SPR_{MSY\text{-}proxy}$ at SB_{SPR} (mt)	119	112-127	112	105-119	28	25-30	30	27-32
Reference points based on estimated MSY values								
Spawning Stock Biomass at *MSY* (SB_{MSY}) (mt)	257	242-272	257	242-272	67	61-74	67	61-74
SPR_{MSY}	32.8%	32.7-32.9%	32.7%	32.7-33.0%	33.6%	33.5-33.8%	33.6%	33.5-33.8%
Exploitation Rate corresponding to SPR_{MSY}	0.181	0.18-0.19	0.181	0.18-0.19	0.165	0.164-0.167	0.165	0.164-0.167
MSY (mt)	129	121-137	129	121-137	30	27-32	30	27-32

	California				Oregon			
	40:10 and $F_{45\%}$		60:20 and $F_{50\%}$		40:10 and $F_{45\%}$		60:20 and $F_{50\%}$	
Quantity	Estimate	~95% Confidence interval	Estimate	~95% Confidence interval	Estimate	~95% Confidence interval	Estimate	~95% Confidence interval
Unfished spawning stock biomass (SB_0, mt)	1207	1147-1268	1207	1147-1268	409	352-466	409	352-466
Unfished 2+ biomass (mt)	2040	1942-2138	2040	1942-2138	803	689-917	803	689-917
Unfished recruitment (R_0, thousands)	917	867-967	917	867-967	195	167-223	195	167-223
Reference points based on SB $_{40\%}$								
MSY Proxy Spawning Stock Biomass ($SB_{40\%}$)	483	459-507	483	459-507	164	141-187	164	141-187
SPR resulting in $SB_{40\%}$ ($SPR_{SB40\%}$)	46.4%	-	46.4%	-	46.4%	-	46.4%	-
Exploitation rate resulting in $SB_{40\%}$	0.119	0.116-0.123	0.119	0.116-0.123	0.116	0.114-0.117	0.116	0.114-0.117
Yield with $SPR_{SB40\%}$ at $SB_{40\%}$ (mt)	129	122-136	129	122-136	48	41-55	48	41-55
Reference points based on SPR proxy for MSY								
Spawning Stock Biomass at SPR (SB_{SPR})(mt)	464	440-487	531	505-558	157	135-179	180	155-205
$SPR_{MSY\text{-}proxy}$	45.0%	-	50.0%	-	45.0%	-	50.0%	-
Exploitation rate corresponding to SPR	0.125	0.122-0.129	0.106	0.104-0.110	0.121	0.119-0.122	0.104	0.1-0.11
Yield with $SPR_{MSY\text{-}proxy}$ at SB_{SPR} (mt)	131	124-138	123	116-130	49	41-56	46	39-53
Reference points based on estimated MSY values								
Spawning Stock Biomass at *MSY* (SB_{MSY}) (mt)	300	285-316	300	285-316	109	94-124	109	94-124
SPR_{MSY}	32.9%	32.7-33.2%	32.9%	32.7-33.2%	34.5%	34.3-34.6%	34.5%	34.3-34.6%
Exploitation Rate corresponding to SPR_{MSY}	0.182	0.178-0.187	0.18	0.178-0.187	0.165	0.162-0.167	0.165	0.162-0.167
MSY (mt)	141	133-149	141	133-149	51	44-59	51	44-59

Research Recommendations

1. Improve estimates of natural mortality: All sub-stocks show significant sensitivity to natural mortality, a parameter not estimated in the model and assumed known. Estimates of natural mortality may be derived from tag-recapture studies or the comparison of length compositions inside and outside marine protected areas. There are two studies currently attempting to gather this information for future use in stock assessments. One is being conducted in the northern Channel Islands (J. Wilson, UCSB, pers. comm.) and the other is being conducted in the Morro Bay area (R. Nakamura and D. Wendt, CalPOLY, pers. comm.). These studies, and other like them, need to be encouraged.

2. Age and growth determination: The large discrepancy in estimated male growth parameters between Oregon and California deserve further attention to confirm this relationship. Further attention to ageing cabezon in California is needed to increase our spatial understanding of cabezon growth along the coast. Age samples from each fishery would also help to define growth and selectivity, while informing recruitment patterns and helping decrease the uncertainty in the scale (absolute abundance) of each sub-stock.

3. Fishery-independent surveys: Continued support and development of current fishery-independent nearshore surveys (like those initiated in Morro Bay and Monterey) is needed to extend the time series and increase spatial coverage. Both are required to increase the power of such indices in statistical catch-at-age models.

4. Defining the stock structure of cabezon: Current work on cabezon stock structure needs continued attention to better understand the connectivity between cabezon subpopulations. This would help focus or inform future sampling design to provide data for assessment purposes.

5. Alternative assessment procedures: The need for greater spatial resolution in the management of nearshore fisheries also increases the amount of data required to perform traditional stock assessments. Alternative assessment procedures that are less data-hungry, but still provide relevant management outputs should be encouraged. This assessment provides examples of some approaches as applied to cabezon. Such side-by-side comparisons of simplified assessment approaches to the statistical catch-at-age model outputs are useful in understanding the relationship of alternative to traditional assessment methods in hopes of developing the best available scientific advice for management under data-limited situations.

6. Re-defining "spawning biomass": The nest-guarding behavior of cabezon males gives added reproductive importance to their abundance, relative to most other groundfish species. A metric other than female spawning biomass may be needed to incorporate the status of the male portion of the population into reference points. Further investigation is needed to identify appropriate ways in which the role of males in reproductive success can be incorporated into metrics for evaluating population status.

7. Changes in batch fecundity with age: Batch fecundity in cabezon is recognized, but it is not understood how and if batch fecundity changes with age. Understanding

whether the number of batches increases with age will help specify the fecundity relationship in the assessment model.

8. The effects of climate on cabezon population dynamics: The recruitment patterns of the California sub-stocks suggest a possible link between environmental forcing and population dynamics. Specifically, strong ENSOs conditions (especially in southern California) may be a pre-cursor to significant recruitment events. This link should be explored further to help increase the understanding of spatially-explicit recruitment responses and inform future recruitment events.

Purpose

This is the third assessment of the population status of cabezon (*Scorpaenichthys marmoratus* [Ayres]) off the California coast and the first to include Oregon waters (Figure 1). Available data sources remain insufficient to form the basis for a reliable assessment of cabezon in Washington. The current assessment is intended to provide information that will be of use by managers at both the state and federal levels. This document follows, to the extent possible given the available information, the Terms of Reference (TOR) for stock assessments established by the PFMC Scientific and Statistical Committee.

Three objectives are addressed in this document. First, the life history of cabezon is described and all the available data sources that were considered for use in the assessment models are explained. Second, the document describes the results of modeling cabezon populations at different spatial scales while attempting to incorporate and represent the uncertainty contained in both the model and its derived outputs. Including spatially-structure sub-stocks addresses the biological reality that cabezon populations are not continuously connect along the long California coastline. Outlining specific points wherein the model is both uncertain and sensitive should identify areas of future research needed to improve our understanding of cabezon population dynamics. Thirdly, although this model uses the traditional west coast approach of incorporating likelihood theory into statistical catch at age models (specifically, Stock Synthesis (Methot 2009), we also explore some alternative assessment methods useful for either rapidly assessing many species or assessing species with limited traditional stock assessment data.

This assessment is notable from many other west coast groundfish species because there is no fishery-independent index of abundance that covers the range of the assessed stocks. It consequently relies on indices of abundance based on recreational CPUE and spatially-restricted fishery-independent data, and information about larval and recruit abundance. Although no state- or federally-funded biomass indices are currently available for this species and private entities (e.g. SLOSEA in the Morro Bay area) are still developing an adequate time series of abundance, these alternative data sources can, in the meantime, inform estimation of the parameters of a population dynamics model. Much uncertainty remains in regard to the assumption that changes in recreational CPUE are linearly proportional to changes in population size. There is also no information on the age-structure of catches to inform selectivity, just aged samples for the purpose of estimating growth parameters. Therefore, although the model is age-structured, it is fit to mean weights and length-composition data by converting the model-predicted catch age-compositions to catch size-compositions using growth curves and weight-length relationships.

Introduction

The cabezon (*Scorpaenichthys marmoratus*) is the largest member (up to 99 cm) of the family Cottidae (commonly referred to as sculpins) found in the waters along the Northeast Pacific. Cabezon are desired by both commercial and recreational fishers because of their great size, physical attractiveness, and tasty flesh. Knowledge of cabezon life history has improved, but remains sparse relative too many other groundfishes. Current understanding is based on information collected from a limited extent of the ecological distribution and over limited time periods. The population status of cabezon in California waters was last assessed in 2005, and the spawning output was estimated to be near 40% of the unfished spawning output for the northern California sub-stock and near 28% for the southern California sub-stock, but there was considerable uncertainty, especially for the southern California sub-stock (Cope and Punt 2006). Cabezon are currently managed as part of a nearshore complex of fishes that include several species of rockfishes and greenlings.

This is the third quantitative assessment of the population status of cabezon. Spatial differences in biomass trends were included by recognizing two putative populations (“sub-stocks”) of cabezon in California, demarcated at Point Conception, CA and one sub-stock in Oregon (Figure 1). Available data from coastal Washington waters remain insufficient to form the basis for a reliable stock assessment.

Stock Structure

The need for increased spatial resolution in the assessment of cabezon was recognized during the STAR panel review of the first cabezon assessment (STAR Panel 2004). This need was addressed in the second assessment by distinguishing two stocks in California waters, to the north and south of Point Conception (Figure 1): the northern (NCS) and southern (SCS) California sub-stocks. This designation was based on distinct fishing histories, the distribution of fishing effort, patchy and discrete habitat, and perceived low dispersal and movement of cabezon in all life stages. Specifically, the live-fish fishery for cabezon is active primarily north of Point Conception while, historically, the recreational take of cabezon has been greatest in central California, with the removals off southern Californian being fairly low. Cabezon are a cooler-water species, and are more abundant in the central and northern Californian nearshore areas. Additionally, cabezon and their habitat are often spatially discrete, increasing susceptibility to serial depletion (Oresanz *et al.* 1998, Perry *et al.* 1999)—the systematic depletion of small populations in discrete areas. Recognizing and avoiding serial depletion underscores the need to examine population trends at decreasing spatial scales. The extent to which assessments can be conducted at small spatial scales is, however, often limited by data availability, resources needed to develop and review additional assessments, and management’s capacity for implementing finer-scale regulations and enforcement. It nevertheless is important to balance these trade offs to provide the most informed assessment for resource management (Cope 2008).

Two lines of evidence support maintaining at least two cabezon sub-stocks for assessment purposes in California and one sub-stock in Oregon. Villablanca and Nakamura (2008), investigating both mitochondria DNA and microsatellite genetic markers, distinguished 6 cabezon subpopulations in California (3 north and 3 south of Point Conception; Figure 2). They also found differences between these populations and those sampled in Oregon.

Additional insight into cabezon population structure in California comes from investigating spatial population dynamics. We applied the two-step clustering method of Cope and Punt (2009*)* to CPUE data from the Commercial Passenger Fishing Vessel fishery (see *CPFV CPUE indices* in the 'Indices of Abundance' section for data details) to detect areas with similar population dynamics. Twenty-one fishing locations along the California coast (Figure 3) were considered in the analysis. Only locations (18 of the 21) with common years were included in the analysis, so there is a trade-off between the numbers of years and locations used in the analysis (Figure 4A). Four different location/year combinations were considered (Figure 4B) to look for consistent location groupings. The average coefficient of variation (CV) of each location varied among locations and data sets (Figure 5). Large CVs (>1) can obscure the results of the cluster analysis and need to be interpreted with this in mind.

The cluster analysis supports the minimum designation of sub-stocks at Point Conception when all data sets and caveats are considered (Figure 6). This designation is consistent with the California Department of Fish and Game's central and northern management areas (Figure 1). Further investigation separating the NCS and SCS data sets and re-clustering each sub-stock data set separately indicates an additional subpopulation designation north and south of Monterey. Southern California locations did not demonstrate strong differentiation among locations. Though this additional structure in California is consistent with the genetic data, data and management limitations advise maintaining just two sub-stocks of cabezon in California at this time.

In addition to consider the cabezon resource as multiple sub-stocks in California, this assessment also explores the implications of assessing the entire cabezon resource off California (CAS) as a single homogeneous resource to compare some of the impacts of allowing for spatial resolution. In all scenarios, Oregon (ORS) remains separate from the California sub-stock(s). There was no available evidence of stock structure in Oregon waters, so all populations in Oregon are treated as one stock.

Life History

Distribution

Cabezon is distributed along the entire west coast of the continental United States. It ranges from central Baja California north to Sitka, Alaska (Quast 1968; Miller and Lea 1972; Love *et al*. 2005). Cabezon are primarily a nearshore species found intertidally, among jetty rocks, and in and around kelp forests and rocky reefs out to depths of greater than 110 m (Miller and Lea 1972; Love *et al*. 2005). The majority of the commercial and recreational catch is taken inside of 15–20fm (and approximately 99% within 30fm; Feder *et al.* 1974) and along the central California coast up through Oregon, with the Morro Bay area in California supporting a major cabezon fishery. The nearshore distribution of this species makes it accessible to a greater portion of coastal populations and users marine resources. This proximity to land also makes cabezon habitat susceptible to terrestrial land use outfalls.

Species Associations
Cabezon is a member of a nearshore assemblage of fishes that includes several *Sebastes* species (*e.g. S. atrovirens, S. auriculatus, S. carnarus, S. caurinus, S. chrysomelas, S. dallii, S. maliger, S. melanops, S. mystinus, S. nebulosus*, *S. rastrelliger*, *S. serranoides*, and *S. serriceps*), kelp (*Hexagrammos decagrammus*) and rock greenling (*H. lagocephlaus*), monkeyface prickleback (*Cebidichthys violaceus*), California scorpionfish (*Scorpaena guttata*), and California sheephead (*Semicossyphus pulcher*). These 19 fishes are included in California's Nearshore Fishery Management Plan (CDFG 2002), an FMP required by mandate of the 1999 Marine Life Management Act. Cabezon is also included in the Oregon interim nearshore fishery management plan (ODFW 2002). Though often considered data poor relative to many other assessed groundfishes, decades of recreational removals and the increase of the live-fish fishery has increased management attention on nearshore fishes and facilitated the allocation of state and federal resources to perform stock assessments for nearshore fishes. Presently, cabezon, California sheephead (Alonzo *et al*. 2004), black rockfish (Sampson 2008, Wallace *et al*. 2008), blue rockfish (Key *et al*. 2008), gopher rockfish (Key *et al.* 2006), kelp greenling (Cope and MacCall 2006), and California scorpionfish (Maunder 2006) have been assessed.

Spawning and Early Life History
Cabezon are known to spawn in recesses of natural and manmade objects, and males demonstrate nest-guarding behavior (Garrison and Miller 1982). Spawning is protracted, and there appears to be a seasonal progression of spawning that begins off California in winter and proceeds northward to Washington by spring. Spawning off California peaks in January and February (O'Connell 1953) while spawning in Puget Sound (Washington State) occurs for up to 10 months (November-August), peaking in March–April (Lauth 1987). Laid eggs are sticky and adhere to the surface where deposited. After hatching, the young of the year spend 3–4 months as pelagic larvae and juveniles. Settlement takes place after the young fish have attained 3–5 cm in length (O'Connell; 1953; Lauth 1987). It is apparent that females lay multiple batches in different nests (often of different colors), but whether these eggs are temporally distinct enough to qualify for separate spawning events is not understood (O'Connell 1953; Lauth 1987).

The number of eggs spawned appears to increase with fish size (weight or length) (O'Connell 1953; Lauth 1988). However, the actual relationship between age / size and number of eggs spawned is uncertain because of the possibility of multiple spawnings per year. For the purposes of this assessment, reproductive output is defined to be proportional to the product of maturity-at-age and body weight at the start of the year. Unless number of batches changes by age (of which we have no information or way of parameterizing the effects), this assumption seems robust.

Maturity ogives (Table 1; Figure 7) for all California sub-stocks were estimated using the California Department of Fish and Game (CDFG) visual inspection codes and the data used by Grebel (2003). Females with gonads that had early-yolk-stage eggs were assumed to be mature, although it is possible that some of these fish were maturing, but not yet mature. This will lead to a more optimistic interpretation of the rate at which cabezon mature (younger and at smaller size).

Oregon maturity curves (Table 1; Figure 7) were estimated using samples obtained from the ports of Newport, Depoe Bay, and Port Orford. Methods and details of the data collection and maturity determination are found in Hannah *et al.* 2009.

Age and Size relationships

Cabezon are among the largest of the cottids, attaining a length of nearly 1m and a weight in excess of 11 kg (Feder *et al.* 1974). Female cabezon are larger than males of the same age. O'Connell (1953) provided the first estimates of cabezon age and growth using whole otoliths from specimens from central and southern California. Lauth (1987) provided another estimate of cabezon growth from the Puget Sound (WA) using several ageing structures (whole otoliths, sectioned fin rays). Most recently, Grebel (2003) conducted a large study (almost 700 individuals collected over 6 years) on age and growth of cabezon from California using several age structures (sectioned otoliths, pectoral fin rays, dorsal fin rays, dorsal spines, and vertebrae). Her results using a thin-section of the saggital otolith form the basis for estimating growth for California cabezon in this assessment. Ages from Grebel (2003) were all standardized to a 1 January birthdate to avoid bias caused by rapid growth during the first years of life. Lastly, Oregon Department of Fish and Wildlife (J. Thompson, pers. comm.) provided age-at-length measurements from 2005-08 to provide data for the only estimates of cabezon growth in Oregon (Figure 8).

Growth curves based on the von Bertalanffy growth function incorporating multiple age reads via the random effects model developed by Cope and Punt (2007) were fit to the resulting age-length data for each state (Table 1; Figure 8). Incorporation of multiple age reads in the growth curve fitting better incorporates uncertainty in the age-length relationship via ageing error, which can be substantial. Individuals of both sexes obtained greater lengths at lower growth rates in Oregon (Figures 8 & 9).

Partial "validation" of growth curves is possible by comparing tag-recapture data from fish of known length and age. Tagging data from California (courtesy of J. Grebel) compare reasonably well with the externally fit growth curves (Figure 10). Because Grebel (2003) found no biologically significant differences between the age-at-length relationships among regions (northern, central, and southern) in California, her sex-specific results are used for both sub-stocks in this assessment. The growth curves obtained by Grebel (2003) differed statistically from that of O'Connell's (1953), who had much larger individuals in his samples. Whether these differences in estimated age-length relationships derive from an ageing disparity between whole (used by O'Connell) and sectioned (used by Grebel) otoliths, or they represent real differences caused by changes in the population structure (possibly due to fishing and/or the environment) is purely speculative at present. We consider model sensitivity to alternative growth assumptions by including a trial model run using the O'Connell estimates of growth (see *Sensitivity analysis* section).

Growth curves for Oregon age and growth data, for areas north and south of Cape Blanco (Figure 1), were also fit to investigate spatial trends in growth (Figure 11). No significant growth trends were apparent, so only one growth morph is considered for Oregon.

Weight-length relationships for cabezon are provided in O'Connell (1953; central California), Lauth (1987; Puget Sound, WA), and Lea *et al.* (1999; central California) for both sexes combined. Lea *et al*. (1999) also provide relationships for females and males separately, in central California only. Raw length-weight data used in Grebel (2003) provide sub-stock- and sex-specific length-weight information with larger sample sizes than the earlier studies, and these data are used for the present assessment (length in cm and weight in kg; Table 1). Sampling effort covered the years 1993–2002 for the NCS and 2002 for the SCS. Lacking data specific to Oregon, the California data were also used to define the weight-length relationship in Oregon waters.

Natural Mortality (*M*)
Little is known about the natural mortality rate of cabezon, so empirical methods using life history traits (growth rate (k), age-at-maturity (a_M), maximum age (ω)) were used to estimate natural mortality for each sub-stock. Four general methods for estimating M (O. Hamel, NWFSC, pers. comm., which combines Hoenig 1983 and Pauly 1980; Chen and Watanabe 1989; Jensen 1996) were applied to data for each sex, and the results averaged to obtain sex-specific natural mortality rates (Table 2). The means of these approaches imply natural mortality rates of approximately 0.25/yr for females and 0.3/yr for males, but these methods may produce highly uncertain values of M (Pascual and Iribarne 1993). Therefore, sensitivity of the assessment model to the assumed values of M is explored and summarized.

Fisheries History

Historically, the recreational sector has been the main source of cabezon removals. Cabezon have been a very minor component of the catch in commercial fisheries for more than a century (Jordan and Everman 1898). The earliest modern commercial fishery information (O'Connell 1953) indicates that a small amount of cabezon was being sold in fish markets in the San Francisco area by the 1930s with incidental take recorded back to 1916. However, it was not until the 1990s that a truly directed commercial fishery for cabezon was established in the waters of California and Oregon.

The most significant change in the fishery for cabezon has been the development of the live-fish/premium commercial fishery that, in addition to cabezon, targets several other nearshore fishes (CDFG 2002). This fishery started in southern California in the late 1980s and spread northward during the late 1990s to Oregon (Starr *et al.* 2002). Fishermen routinely obtain much higher prices for fish brought back to markets alive. Cabezon are not subject to barotrauma because they lack a swim bladder and are usually found in shallow nearshore waters accessible to many fishers. These traits make cabezon an ideal target for both the live-fish and recreational fisheries. Gears that take cabezon include hook and line and pot/trap type gears, as they are successful at bringing up fish with relatively little damage. Cabezon continues to be an important component of the live-fish fishery, even with increased restrictions on the live-fish catch, especially as the allowable catches of other marketable groundfish species have been reduced.

Fisheries Management
The Pacific Fishery Management Council (PFMC) and NOAA Fisheries have management responsibility for the groundfish species included in the Groundfish

Fishery Management Plan (FMP) out to the boundary of the 200-mile Exclusive Economic Zone (EEZ). Many nearshore species, such as cabezon, that fall primarily within the 3-mile limit of states' waters are also included in state-specific Nearshore Fishery Management Plans (NFMP). NFMPs are currently being developed and implemented in California and Oregon in response to the increased commercial take of the live-fish fishery (CDFG 2002).

No management regulations existed for cabezon in California before 1982 when a size limit (12-inches) was set for recreationally and commercially caught cabezon (see Appendix A for a complete list of California regulations). This limit was raised to 14-inches in 1999 for the commercial fishery, and extended to include recreationally retained fish in 2000. It was increased further to 15-inches in 2001 for both the commercial and recreational fisheries. Recreational bag limits have been 10fish/day in California since 2002, however changed from 10 to 3 in different areas of the coast in 2004 and 2005, with one inseason change. In 2005, the bag limit was changed to 1 and is still today. Cabezon are currently included in the California recreational regulatory complex Rockfish, Cabezon, and Greenlings (the RCG complex) and subject to seasonal closures for recreational fishers.

Historically, commercial landings of cabezon were monitored as part of a mixed group called "Other Fish". This group of species includes sharks, skates, rays, grenadiers and other groundfish. This group has been defined historically as groundfish species that do not have directed or economically important fisheries. The coastwise ABC for this entire group of species was 14,700mt during 1999–2002 (5,200mt for the Eureka, Monterey and Conception INPFC areas and 9,500mt for the Columbia and Vancouver INPFC areas). In California, the cabezon fishery is currently independently monitored and regulated by analyzing two-month cumulative trip limits within the Cabezon, Greenlings and California sheephead (CGS) complex. From 2001-2005 there were emergency closures for cabezon, but more recently, the fishery has been open all year, with cumulative trip limits reduced from 900 pounds down to 200 or 300 pounds (see Appendix A).

In Oregon, some general regulations since 1983 pertaining to hook and line gears are as follows: 1) it is unlawful to use more than one rod or one line when angling for any fish in the nearshore environment and 2) no more than three hooks may be used while angling for species other than Pacific halibut (*Hippoglossus stenolepis*). Furthermore, there are three areas that are closed to the take of marine fish in certain times of the year, including Whale Cove habitat refuge (May 1-Aug. 31), Pyramid Rock (May 1-Aug. 31) and Three Arch Rocks (May 1- Sept. 15). Specific to cabezon, Oregon imposed a 15 inch size limit in 2003, which was increased to a 16 inch size limit in 2004 and is still today. Initially, bag limits for cabezon began in 1978 with a 15 fish limit for the rockfish, cabezon and greenling complex. Currently, Oregon has a 6 fish per day bag limit for the "rockfish et al" complex combined. In the years 2004-2008, inseason changes were made where cabezon were prohibited to be taken by boats. Regulations affecting cabezon in the waters off Oregon can be seen in Appendix B.

Assessment Data Sources

Data for species managed by NOAA Fisheries and the Pacific Fishery Management Council are collected by both federal (and/or quasi-federal) and state agencies. This can complicate analysis because several agencies may collect the same types of data. Where this occurs, the analyses below are based on those data that are most likely to be informative regarding changes in population size.

Removals

Whenever possible, removals are characterized as landed catch plus fish released and presumed dead. Historical catches (prior to 1980) are reconstructed from historical documents, and reported and inferred relationships among fishing sectors. Different estimation procedures are used for California and Oregon.

Recreational Fishing History in California

Recreational fishing in California became popular in the late 1890s, but was limited to mostly big game fishes (tuna, marlin, and swordfish) and wealthy participants (Holder 1914). Recreational fishing opportunities in California for most people were quite limited before 1920. Private boat access to nearshore fishes increased after 1920 (Croaker 1939), but it was not until Commercial Passenger Fishing Vessels (CPFVs) began operating in earnest off southern California in 1928 that the general public gained extensive access to many nearshore fishes (Scofield 1928; Young 1969). Both barges – large, flat, open-spaced ships – and more traditional CPFV boats comprised the fleet. There were 15 barges and 20–30 boats off southern California in 1928 (Scofield 1928). The period 1929–39 saw a rapid increase in the popularity of CPFVs (Croaker 1939), which also spread northward to central and northern California. By 1932, sportfishing in Monterey was very popular, with cabezon a major target species (Classic 1932). Pier and shore fishing modes also provided major recreational fishing outlets during this time of increased CPFV activity (Scofield 1928; Croaker 1938; Baxter & Young 1953; Young 1969). In all modes, most fishing occurred during the summer and autumn months, with some fishing extending into spring (Fry 1932; Baxter & Young 1953). CPFV captains have been required to submit logbooks detailing catches since 1936 (Croaker 1939; Baxter & Young 1953; Young 1969), although compliance rates were and are not 100%. In 1937, the sportfishing catch exceeded the commercial catch for many species (Conner 1937).

The popularity of CPFV fishing continued to increase until the war years of 1942–46 when CPFV activity was considerably reduced (Calhoun 1950). The CPFV fleet underwent a period of rapid re-establishment, reinvention, and growth after 1946 (Young 1969). Fleets, boat size, and passenger interest all increased throughout California. This expansion continued into the 1970s with the fleet peaking in 1973 (Baxter & Young 1953; Young 1969; Hill & Schneider 1999). A concomitant increase in private boat, shorefishing, and pier/jetty modes also occurred during this time, particularly in central California (especially in Monterey and Morro Bay), where cabezon are well represented, during the 1950s (Baxter & Young 1953).

Reconstructing Recreational Removals

This assessment uses the same methods as the 2005 assessment (Cope and Punt 2006) for reconstructing catch history back to 1916 for both cabezon sub-stocks. The catches for the state-wide California stock (CAS) is the sum of the NCS and SCS catches. The initial year was selected because of the availability of commercial catches back to 1916 (see *Reconstructing Commercial Removals* below). There was very little recreational catch, if any, before 1916 so the fishing mortalities before 1916 are set to zero when conducting the assessment.

Four recreational fishing modes are distinguished in California: 1) Man-made (piers/jetties), 2) beach/bank, 3) Private Boat and Rental (PBR), and 4) CPFV. These modes were distinguished for analysis and modeling purposes because of differences in selectivities and the length-frequency of the catch: the man-made and beach/bank modes generally catch smaller individuals than the PBR and CPFV modes. Most cabezon are taken from jetties in the man-made mode (Pinkas *et al.* 1967).

Information on the activities of recreational fishermen has been collected by both state (California Recreational Fisheries Survey (CRFS); CDFG) and federal (Marine Recreational Fisheries Statistic Survey (MRFSS); PSMFC) programs. From 1980-2003 (excluding the years 1990–92), the MRFSS program (available via the RecFIN database: **http://www.recfin.org/**) provides effort information from a random-digit dialing protocol and catch/trip information from intercept interviews. These data can be used to calculate total catches by mode. In 2004, the CDFG, in cooperation with the Pacific States Marine Fisheries Commission (PSMFC), started the California Recreational Fisheries Survey (CRFS) program to replace the MRFSS sampling program in California for all modes. This program aims to increase sampling effort for better catch and effort estimation, to increase spatial resolution of catches, and to identify targeted species. Before the CRFS was implemented, CDFG only collected logbook catches from the CPFV fishery. Very few estimates of the removals by the man-made, beach/bank, and PBR modes are available for the years before 1980. The CPFV fleet therefore provides the longest time-series of measured catches (1936-present) and is used to reconstruct the removals by the other three modes for the years prior to 1980.

Total recreational removals for each cabezon sub-stock for each recreational mode were reconstructed in three steps: 1) the historical CPFV removals (in numbers) were reconstructed, 2) the CPFV removals were used to estimate the removals (in numbers) by the other three modes, and 3) the average weights per mode were used to estimate total removals in kg., which were then converted to metric tons (mt).

1. Historical CPFV removals

The historical CPFV catch (1916–2008) was reconstructed as follows:

- **Years 2004-2008**: CRFS, extracted from RecFIN 13 March, 2009.
- **Years 1957–78; 1980–2008**: Hill and Schneider (1999) performed a data recovery exercise to extract catch, effort, block (CDFG designated 10 x 10 nautical mile statistical areas), and month information from the California CPFV logbooks. This information provides area-specific catches (in numbers) for each cabezon sub-stock for 1957–2008, excluding 1979 (the data for this year are lost). This data set was obtained March 2009.
- **Year 1979:** Oliphant *et al.* (1990) report the total catch of cabezon by the CPFV fleet for 1979. This total is allocated to sub-stock using the geometric mean of the ratio Catch_{NCS}:Catch_{SCS} for 1976–78 and 1980–82.
- **Years 1936–40; 1947–56**: Hill and Schneider (1999) provide CPFV catches for the SCS only. The total California CPFV catches for these years are found

in Best (1963). The difference between total California catches and the catches from the SCS give the catches from the NCS.

- **Years 1941–46:** O'Connell (1953) provides the catch by the CPFV fleet in 1946 for each sub-stock. No data are available for 1941–45; the catches during these years have been assumed equal to that for 1946.
- **Years 1928(SCS)/1929(NCS)–1935:** No data on catches are available for these years. Scofield (1928) identified the major start of the CPFV fleet in southern California to be 1928, which then moved into central and northern California in 1929 (Young 1969). These start years reflect the beginning of the CPFV time-series for the SCS and NCS, respectively. A linear increase in catch from the start year through 1935 is assumed because the CPFV fleet is known to have increased rapidly during these years (Fry 1932; Young 1969),
- **Years 1916–27(SCS)/–1928(NCS):** The catches by the CPFV fleet were assumed to be zero for these years.

Heimann & Carlisle (1970) reported that cabezon are rarely discarded in the CPFV fishery because of their large size and trophy status. Furthermore, discarded cabezon have a higher probability of survival because they are not affected by barotrauma. Even though a size limit has been imposed in recent years (see Appendix A), the analyses of this document assume that there is no discard mortality by the recreational sector.

It was recognized early in the CPFV reporting process (Croaker 1938; Baxter & Young 1953) that logbook records may be inaccurate for two main reasons: 1) mis-reporting of catches (either over- or under-reporting; Karpov *et al.* 1995), and 2) less than 100% reporting compliance rates (Hill & Barnes 1998). Baxter & Young (1953) investigated these inaccuracies in CPFV catch and concluded that cabezon catch rates reported by the CPFV fleet are accurate and reliable. Reported CPFV removals are therefore not adjusted for mis-reporting. Since 1936, compliance rates have always been less than 100% though, and necessitate the adjustment of raw CPFV removals. Compliance rates (as reported from several sources) are provided in Table 3 and were assumed to be the same for the NCS and the SCS fleets. The reported compliance rates were then used to interpolate compliance rates for the years for which rates were not available, and CPFV removals in numbers were expanded to correct for lack of reporting compliance. There are no compliance rates for the period 1962–1980. Values used for these years were semi-arbitrarily set to account for the expanding fleet during the 1960s and 1970s.

The assumption of compliance rates being the same in the north and south may not be valid; however, we have no data to make this adjustment. During the 1940s-60s, there was full time staff at the CDFG in southern California devoted to working on CPFV logbook compliance, and it is believed that these efforts increased compliance rates in this region during this time period (S. Crooke, CDFG, pers. comm.).

<u>2. Estimating removals for the man-made, beach/bank, and PBR modes via CPFV ratios</u>

Removals (in numbers) for the other three recreational modes (man-made, beach/bank, and PBR) were determined in two ways: 1) based on surveys of the modes, and 2) based on an estimate of the ratio of the catch by the mode to the catch by the CPFV mode multiplied by the catch by the CPFV mode. Surveys are available for only a small numbers of years:

a) The RecFIN database contains estimates of removals for the years 1980–89 and 1993–2008. This data was extracted 13 March, 2009.
b) Miller & Gotshall (1965) provide estimates of NCS removals for the period 1957–61.

The ratios of the CPFV catches to the catches by the other modes from RecFIN were used to estimate removals when data were missing for the years 1980–2008 (Tables 4 & 5). The work of Miller & Gotshall (1965) and Pinkas *et al.* (1968) provide ratios for the years of their study (Tables 4 & 5). These ratios were used to make inferences about the ratios for the years for which no data are available. The PBR fishery was assumed to start in the same year as the CPFV fishery. The man-made and beach/bank modes began before the CPFV fishery, so the estimated catch in these modes for the years before the CPFV fishery began were projected back to 1916.

<u>3. Calculating removals in kg</u>

The average annual weight of the removals (in kg) for each mode are given in Tables 4 and 5 for the NCS and SCS respectively, with shaded values indicating mean weights that were reported. The true reported weights (not converted from lengths) for 1980–2008 were downloaded from RecFIN. The reported weights for the NCS for the years before 1980 are: 1) 1947–51: Baxter & Young (1953) and 2) 1957–61: Miller and Gotshall (1965), while the reported values for the SCS for 1964–66 were taken from Pinkas *et al.* (1968). The weights for all remaining years are assumed values, based on these sources, averaged RecFIN weights, or a mid-point of the two (Tables 4 & 5). The weights for the PBR mode for the years prior to 1980 are set to those for the CPFV mode because these fisheries catch similar sized fish. The removals in the NCS by mode are heavier on average than those in the SCS. Removals (in kg) were calculated by multiplying numbers by average weights then converted to metric tons before being included in the assessment model. The total removals (in mt) of the recreational sector by mode are shown in Figure 12.

Removals are considered known without error in the assessment, so Cope and Punt (2006) provided two sensitivity tests to examine the implications of uncertainty in the pre-1980 catch reconstruction time period. Also, the original recreational removal in the SCS for 1980 (185 mt) was identified as extraordinarily high. This high value is attributed primarily to the catch by the PBR mode (157 mt). Further investigation revealed that RecFIN waves (*i.e.* bi-monthly totals) 1, 2, 3, and 5 had notably higher removals in 1980 than during 1981–89, but that average wave weights were not markedly different among years (Figure 13). Comparing the relative RecFIN removals of other species in the 1980s also shows that the year 1980 comprises an unusually high proportion of the total removals for the decade (Figure 14). This systematic result across species can be explained either by a massive, but correctly estimated, increase in recreational take from the PBR recreational mode in 1980 south of Point Conception or an overexpansion of catch estimates. Anecdotal evidence suggests that effort during 1980, the first of the MRFSS program, was likely misapplied. The STAR panel agreed with the STAT team that the 1980 value was too high, so the value for the PBR was taken to be the average of the RecFIN removals for that mode from 1981-1989. This value corresponded very closely to the value in

1981. This adjusted 1980 value is included in Figure 12. Sensitivity to using the RecFIN extracted 1980 SCS PBR recreational removal is explored.

Reconstructing Recreational Removals in Oregon

The Oregon recreational fishery was broken into shore-based (man-made and beach/bank) and boat-based (PBR and CPFVs) modes for the purposes of this assessment. Figure 12 illustrates the total recreational removals (in mt). The shore-based catches were downloaded from RecFIN for 1980-2008. The average value of 1989 and 1993 was used for 1990-1992 (MRFSS sampling hiatus). The 1980 value was used back to 1973, the starting year for the Oregon catch history series. The boat-based catch estimates were provided by ODFW. Estimates of the numbers of cabezon harvested for the years 1973-1992 were obtained from various data sources. The following outline explains the historical catch estimation procedure for cabezon landed by boat-based recreational anglers fishing in open ocean areas for differing time periods.

- **Years 1973-77**: Estimated numbers of landed miscellaneous fish (category including cabezon) were obtained from handwritten summaries, provided by Don Bodenmiller. They then applied the average of annual proportion cabezon in miscellaneous category from 1979-1983 (5 yr. average) from ODFW historical species catch estimate database (Table 6).
- **Year 1978**: Estimated numbers of miscellaneous fish were obtained from printouts of estimates in ODFW storage loft. The same proportion cabezon as above was applied (Table 6).
- **Years 1979-89**: Estimated number of cabezon landed were obtained from ODFW historical species catch estimate database. Expansion factors were applied to adjust for each port that was not sampled during sampling time frame based on geographic distribution of catch from the closest time period where that port was sampled. Additional expansion factors were applied for the unsampled portion of year based on the temporal distribution of catch from the 1999-2000 year-round-sampling study. The start and stop dates of sampling at each port was subjectively analyzed to approximate start and stop dates of coast-wide sampling for each year (Table 7).
- **Years 1990-92**: Annual estimates of number of cabezon landed were obtained from historical reconstruction of annual catches completed by D. Bodenmiller, L. Zumbrunnen and E. Schindler (ODFW) in 2001. This reconstruction also provided the basis for Oregon RecFIN estimates from 1993-2000 (Table 7).
- **1993-2008**: Estimates of landed cabezon (in mt) were provided from the Oregon Recreational Boat Survey (ORBS) program

The estimation of average weight for conversion of numbers to metric tons in Oregon is as follows. There were no data on size from 1973-79, so the average of the 1980-82 average weights (obtained from RecFIN) were used, which is not the same as simply averaging weights of all sampled fish. Year specific average weights (also obtained from RecFIN) were used from 1980-89. No data on size is available from RecFIN for 1990-92, so an average weight was interpolated from the 1989 point estimate to 1993 point estimate.

Commercial Catches

Several sources of California commercial landings are available to reconstruct commercial cabezon landings by sub-stock back to 1916 (the first year of required reporting in the commercial fishery):

- **Years 1931–2008**: The CALCOM database provides annual landings (in pounds) by gear. Methodology can be seen in Ralston *et al* (in review). Data was extracted on 9 June, 2009. Additional allocation of landings to the live-fish fishery was available using the price per pound filed in the CFIS-CMASTR database. This analysis was provided by Bob Leos (CDFG).
- **Years 1930**: The Pacific Fisheries Environmental Laboratory (PFEL) live access server (http://las.pfeg.noaa.gov:8080/las_fish1/servlets/dataset) provide electronic summaries of CDFG fish ticket receipts originally reported in the Fish Bulletin series (available electronically at: http://ceo.ucsd.edu/fishbull/).
- **Years 1916–29:** The publication *California Fish and Game* (vols 1–16) are the original source of landing reports before the Fish Bulletin series and are used for this time period. During 1916–29, cabezon was included in the category "sculpin" which included California scorpionfish. Given the limited northern range of the scorpionfish (Love *et al*. 1987), 100% of the "sculpin" catch from Monterey north was assumed to be cabezon. Fish Bulletins 74 (CDFG 1949) and 149 (Heimann and Carlisle 1970) provide summarized commercial cabezon landings for 1916–47 and 1916–69, respectively, and were used to cross-compare cabezon catches from the *California Fish and Game* volumes. Both sources provided the same estimates of total cabezon landings.
- **Years 1916–30 adjusted**: Due to the spatial resolution of landings during this time period, an adjustment was made. Landings for the port complex "Santa Barbara" (including Morro Bay of the NCS and Santa Barbara of the SCS) were allocated to the appropriate sub-stock using the geometric mean of the ratio of the Morro Bay to Santa Barbara landings for the years 1978–82 from CALCOM.

Commercial landings are reported in pounds and were converted to metric tons for this assessment. Two fleets are modeled within the assessment: 1) vessels landing dead fish (non-live fishery), and 2) vessels landing live fish (live-fish fishery). Cabezon are caught commercially using a variety of gears-types, but have been taken almost exclusively by hook-and-line and pots since the 1990s. All catches are assumed to be taken using a single gear-type for the purposes of this assessment

California landings of cabezon were low until the early- to mid-1990s when the live-fish/premium finfish fishery began targeting cabezon. Commercial cabezon landings reached a peak of over 150mt in 1998 and averaged more than 80mt since the mid-1990s, most of which came from the NCS. Figure 15 shows the commercial landings by the two fleets.

There have also been spatial and temporal patterns in cabezon commercial landings. Historically, much of the landings were reported in the late winter/early spring months, but much of the catch has been taken in the summer and fall months since the start of the live-fish fishery. All catch is assumed to be taken in the middle of the year for the purposes of the assessment.

Oregon commercial landings estimates were taken directly from PacFIN (23 June, 2009). Similar to California, the live-fish fishery began in the late 1990s with a peak of around 45 mt in 2001-2002 (Figure 15).

Commercial Discards in California and Oregon
Commercial discard mortality estimates are provided by the West Coast Groundfish Observer Program (WCGOP; E. Heery, pers. comm.) and rates of mortality for discarded cabezon are assumed to be 100% for all trawl-related gear and 7% for the live-fish fishery (Figures 16 & 17). Cabezon are not as susceptible to discard mortality as many other fish because they live in shallow habitat, do not have swim bladders, and do not appreciably suffer from barotrauma. Recent information (beginning in 2003) regarding discards in the nearshore live-fish fishery were provided by the WCGOP. Prior to this, the harmonic mean discard ratio was applied back to 1983 in California. Estimated commercial landings and discards for each sub-stock are given in Table 8. Sensitivities to model assumption of discard rates are also considered in the tests of sensitivity.

Total Removals
Figure 18 illustrates the historical pattern of total cabezon removals in California and Oregon. Due to updates and changes in some data sources since the last assessment, a comparison of the two assessments historical catch reconstruction is made (Figure 19). Where the commercial fishery estimates did not change, differences can be seen in the recreational fishery since the 1980s, mainly due to changes in the mean weights used to calculate removals (described below).

Size Compositions
Cabezon otoliths and other ageing structures have not been collected routinely during port sampling. Therefore, the only information on the biological structure of the catch is from length and weight measurements. Sex is not recorded when sampling for length or weight, so all of the catch length-compositions considered in this assessment are sex-aggregated. Catch length-compositions were developed for each sub-stock, fishery sector, and fleet (Table 9; Figures 20-27).

The catch length compositions for each state and year for the recreational fisheries were obtained from RecFIN (extracted on 16 March, 2009). RecFIN expands the sampled length proportions by port, fishing fleet (mode), and wave (bi-monthly period) to estimate the proportions-at-length for the entire year. In the 2005 assessment, not all lengths retrieved from RecFIN were used because they were not true lengths, they were either converted from weights or another measurement of length (i.e. RecFIN converts total lengths (TL) into fork lengths (FL) for user downloads). For this reason, we used the sample lengths (in TL) where no conversions from weight were made. This increased samples substantially, especially in the 1980s. Comparison between the sampled and expanded length compositions showed no significant differences; using the sample data increased the number of measured fish that were otherwise disregarded due to sample strata.

Additional sources of length composition from two northern California CPFV studies were evaluated for use in this assessment. The first was a CDFG CPFV onboard observer program from 1987-98 that monitored catch north of Point Conception. The second was a more recent study in the Morro Bay area (CalPOLY) from 2003-08.

Even though samples for cabezon were low in these studies, the composition data were still used to help support more recent evaluation of the CPFV fishery. In the past, the CPFV fishery has not been sampled as much as the other recreational fishing modes; however, the CRFS program has made efforts to increase this effort since 2004.

Regarding SCS, information from two CDFG CPFV studies in southern California was also included in that model, representing the time periods from 1975-78 and 1986-89. Lastly, information from the Groundfish Disaster Relief Program in southern California from 2002-05 was used. Fish from this study were caught by hook and line on chartered CPFVs. Table 10 includes sample sizes for all length compositions used in each sub-stock assessment.

Mean weights from RecFIN were extracted for all recreational modes of fishing. In a similar situation, many weights were converted from lengths so we used the actual sampled weights to determine mean weights (Table 11). Using the sample weights also provided a source to calculate a coefficient of variation so as to fit the mean weight data in the assessment model using a likelihood function.

The commercial length-compositions for California were extracted on 29 March, 2009 from the CALCOM database. Commercial length samples are expanded using the standard routine at the port-gear-month level and then aggregated for the state. Oregon length compositions came from PacFIN biological database (extracted by J. Wallace, NOAA/NWFSC on 3 June, 2009).. The ORS is the only assessment containing sex-specific length compositions. No body weights are available for any of the commercial fleet.

Other sources of size-composition data and tagging information were considered for this assessment, representing different areas within California. Because of the sparse representation of cabezon in the data, the investigators of the projects were unsure if the data would be useful at this time, but were excited about the potential uses of this information in the future. Most of these studies were designed to evaluate the impacts of Marine Protected Areas (MPAs). The following sources should be considered in future assessments:

- San Luis Obispo Science and Ecosystem Alliance (SLOSEA) in Morro Bay, 2004-08 (R. Nakamura, CalPOLY pers. comm.)
- California Collaborative Fisheries Research Program (CCFRP) in central California, 2007-08 (R. Starr, CA Sea Grant, pers. comm.)
- CDFG tagging project in Carmel Bay (2008; D. Haas, CDFG, pers. comm.)
- Northern Channel Islands tagging project (2008; J. Wilson, UCSB, pers. comm.)

In the 2005 assessment, the following sources of length-composition and mean weight data were investigated for the SCS but cabezon did not occur in any of these databases frequently enough to provide additional information for the assessment of the SCS and were not used.

- CDFG southern California commercial fishery sampling program (1993–2001)
- Los Angeles County Sanitation Department trawl survey (1972–present)

- City of Los Angeles Sanitation Department trawl and rig surveys (1987–present)
- Orange County Sanitation Department trawl survey (1970–present)
- San Diego County Sanitation Department trawl survey (1991–present)
- Southern California Coastal Water Research Program (1994,1998)

Indices of Abundance

There is no standardized survey designed to provide biomass indices for cabezon along the U.S. west coast. All surveys presently used to provide biomass indices for groundfish populations are conducted at depths that are largely outside the depth preference of cabezon. Cabezon are caught so infrequently in the standardized trawl surveys that those data sources are not considered further in this assessment. A nearshore trap survey, designed to monitor cabezon abundance in the Morro Bay area (D. Wendt, CalPOLY, pers. comm.), is still in its infancy, though it may prove to be valuable for future cabezon assessments (and possibly those for other nearshore fishes). In lieu of an index designed specifically for cabezon abundance estimation, this assessment considers a wide variety of potential abundance indices. These include fishery dependent recreational data, adult SCUBA surveys, and egg/larval/juvenile surveys.

Potential indices of abundance are developed for each sub-stock by fitting generalized linear models (GLMs) to the proportion of zero and non-zero records, and then to the non-zero catch rates (or whatever quantity was being measured, such as number of larvae impinged). This approach is known as the "delta method" and is described in detail elsewhere (Lo *et al.* 1992; Vignaux 1994; Maunder & Punt 2004). The product of the year effects from each GLM (which can conveniently be based on different error structures) yields the index of abundance. Table 12 lists the data sources considered in this assessment for each sub-stock, the years for which data are available, the number of data points, the number of non-zero records for each data source, and the percentage of the data points for which the catch rate is non-zero.

The proportion of non-zero records was modeled as a binomial random variable; both gamma and lognormal error structures were explored for the positive records. Only main-factor models were considered and, initially, no interaction terms were explored, though year-area interactions, if present, can seriously compromise the development of abundance indices (Maunder & Punt 2004). A variety of alternative fixed-effects models were explored, and the final fixed-effects model for each choice of error model was selected using AIC (Burnham & Anderson 1998). Table 13 lists the fixed-effects models considered and the associated AIC values, and Tables 14-16 list the index values for each data source. The results of the analyses for the CPFV indices of all California sub-stocks and the Oregon ORBS survey index are illustrated by plots of the results of the gamma and lognormal models along with non-GLM derived indices produced using the geometric mean of positive catch rates (Figure 28). The CVs in Tables 14-16 were calculated by bootstrapping or jackknifing the best fitting model. Given inadequacies in spatial or sampling coverage, all resultant CVs should be viewed as under-estimates of the true variation of the index about the trend in the population. Additional variance (equivalent to 3 times the average yearly CV of the time series) was added to each index in order to more adequately capture the inherent uncertainty of each index (Tables 14-16; Figure 29). Sensitivity of derived model outputs to assuming the original CVs was also considered.

California: CPFV CPUE indices

The CPFV logbooks contain information on effort from 1947 for the southern California fleet and from 1957 for the central/northern California fleet (Hill & Schneider 1999). Effort was recorded as angler days prior to 1959 and as angler hours from 1962. Effort was recorded in angler hours and angler days in 1960 and 1961. Young (1969) estimated a conversion factor to relate the two measures of effort and estimated angler hours for 1947–59, the assumption being made that conditions in the CPFV fleet did not change over this period. Unfortunately, this was one of the most dynamic periods during the history of the CPFV fleet (Young 1969; see also *Recreational Fishing History in California*), so this assumption may not be valid. The previous assessment (Cope and Punt 2006) showed little sensitivity to the starting year of the index, so we consider the CPFV index beginning in 1960 to consistently use angler hour as the measure of effort. Changes in recreational regulations (size limitd, Figure 30; bag limits, Figure 31) were recognized as sufficient to divide the CPFV into two time periods: 1) 1960-99 and 2) 2000-08, based on RecFIN length composition data and bag limit analysis. Further scrutiny of changing size and bag limits rendered the 2000-08 time series for the NCS inadequate to consider in a base case. Sensitivities to including this time series and using the full time series (1960-2008) were investigated.

Factors considered in the CPFV GLM were year, month, and location. Instead of using CDFG blocks to define location, blocks were collapsed into groups based on major fishing ports or areas. The final fixed-effects model chosen for each sub-stock included all factors (Table 13). Both lognormal and gamma error structures were considered, but the lognormal model was ultimately selected for each base case. Dick (2004) also found the lognormal error model appropriate for California CPFV indices. Sensitivity to the choice of error model when standardizing the catch and effort data was not explored because the lognormal and gamma indices were similar in trends (Figure 28). Diagnostic plots for the base case CPFV indices are provided in Figures 32-34.

The STAR panel emphasized the difference in index trends between the geometric average and the delta-GLM derived index values for the NCS. Such a difference underscores a significant effect of the included factors (year, month, or location) on the resultant index (Figure 35). Investigation of interaction terms revealed significant interactions between location and year (specifically, the Santa Cruz location) and month and year (mostly for years in the 1960s and 1970s that were ultimately not fit well in the base model). The year-location interaction is not inconsistent with the emerging stock structure seen in the index clustering and genetic investigations (Figures 2 and 6). Given data constraints to only two areas in California, the index data was not broken up any further. The STAR panel recognized the need for future research to better reconcile these spatial interactions, but agreed the current formulation of the NCS is the most appropriate.

Further description of the spatial nature of catch rates along the California coast was explored using the percent index of relative importance (%IRI; Pinkas *et al*. 1971; Cortes 1999). Defined using numbers of cabezon, weight of cabezon catch, and frequency of cabezon occurrence, the %IRI was used to summarize the contribution of each fishing location (Figure 36) to the CPFV fishery through time. For the NCS, Princeton/Halfmoon Bay and Morro Bay comprised a large percentage of the IRI in the early years, but more northerly ports have since increased in contribution (Figure 36). In the south, most of the IRI is contributed by the northern-most locations through the whole time period (Figure 36), though it is clear cabezon are most encountered in the central and northern CPFV fisheries.

In the future, evaluating the CDFG logbook database in CFIS (1980-present) and compared to the historical database is recommended. Using the data in this format allows for better spatial resolution and the opportunity to subset the data into nearshore targeted trips, though at the expense of a shorter time series. If comparisons between the two data sets show little difference, the historical database should be retained for further considerations.

An index from the central California CPFV onboard observer program (1987–98), operated by CDFG, was also considered during the first cabezon assessment. The CPFV logbook and CPFV observer series exhibit similar trends (Cope *et al*. 2004). The index developed from the observer data was not used in this assessment because the information is not independent from the information contained in the CPFV logbooks and the indices based on the logbook data represent the longer time series.

ORBS Survey

The Ocean Recreational Boat Survey began development in 1979 to sample the catch and effort of ocean-going anglers off the Oregon coast. The most reliable data for development of an abundance index for cabezon is taken strictly from bottom-fishing trips. The most reliable time series runs from 2001-08 and was not affected by recreational regulations (T. Buell, ODFW, pers. comm.), so the full index is retained (Figure 39). Diagnostic plots for this index are found in Figure 37. This is the only survey available for the Oregon sub-stock.

Adult SCUBA Surveys

Two fishery-independent SCUBA surveys were investigated for potential use (Table 12) in the California sub-stocks. The first is a nearshore benthic survey of adult fishes, conducted from 1977–2008 by TENERA Environmental (an environmental consulting firm in San Luis Obispo, CA) at one site just south of Point Buchon (Figure 1), and this is only relevant to the NCS. Transects were 50m in length in depths from 3–10 m along high to moderate relief rocky reefs and kelp forests. Abundance indices were developed using the factors year and month (Table 13). The second is the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) adult survey (1999-2008), particularly for the Monterey region. Since 2007, they have extended their survey area monitoring inside and outside MPAs in central and southern California.

These two indices were not included in any of the California base case models for two reasons: 1) SCUBA surveys may not provide reliable abundance indices for cryptic species such as cabezon; and 2) the spatial coverage of these surveys, which is limited, is such that abundance indices based on them may not be representative of state-wide trends (Cope and Punt 2006). Despite not including either of these adult surveys in the base case, sensitivity of the results of the assessment to their inclusion is examined.

CDFG hook-and-line, PSMFC dockside, and PSMFC onboard surveys
Three additional surveys applicable to the NCS were provided by Tom Wadsworth (MLML, pers.comm) for the STAR panel. Details of the data available and development of each survey into an index can be found in Wadsworth (2009). The CDFG hook-and-line survey runs from years 1979-82 and 1995-98 and cover represent the Big Creek Ecological Reserve (BCER) only. The PSMFC dockside runs from years 1981-89 and 1993-07 and covers the whole NCS. The PSMFC observer time series is 1999-07 and represents the whole NCS. These data series were not retained in the final base model because they had little influence on the results (see Sensitivity section for results).

Recruitment surveys
CalCOFI
The Southwest Fisheries Science Center (SWFSC) has conducted larval tows off California since 1950. Tows are generally made at stations from the Mexican border to roughly 36°N, so these data relate primarily to southern California. Surface (manta) tows made south of 31°N during June-September and west of 122°W are also excluded from the analyses due to few positive tows. Additionally, data for the years 1977, 1979, 1982 and 1983 are excluded because of changes in survey methodology. The factors considered in the analyses were: day and night (day: between 6AM and 6PM), latitude (north and south of 34°N), longitude (east and west of 121°W), and month. Since surface tows are the focus of consideration and have low numbers of positive tows (Table 12), this data source is not considered further in this assessment.

Power-plant Impingement
An index of recruitment was created using impingement data obtained from the Edison power plants in California (Table 12). These data (catch in numbers per standardized flow volume) come from only the extreme southern California Bight (33-34°N) and are consequently reflecting only the SCS. The factors considered when developing this index were: station (some stations had multiple intake areas), and season (Dec-Feb, Mar-May, Jun-Aug, and Sept-Nov). This index is considered to pertain to recruitment rather than to reproductive output because the lengths of the fish impinged were primarily those of fish aged 0 and 1 years.

SMURFS
PISCO and CalPOLY (San Luis Obispo) have both collected recruitment information on nearshore fishes in California. The description of these standard monitoring units for the recruitment of temperate reef fishes (SMURFS) and the methodology can be found in Ammann (2004). This method may be a good index for some nearshore fish, however there was not much information available for cabezon (Table 12).

All indices considered either in the base case or in sensitivities are shown in Figures 38 and 39. Tables 14-16 provide all values and CVs of these indices.

Indices not considered
RecFIN

The catch and effort data for the man-made, beach/bank and PBR modes contain few records with cabezon. As was the case in the former (2005) assessment, an abundance index based on RecFIN was not considered further in this assessment. A portion of this data is included in the PSMFC dockside survey provided by T. Wadsworth (MLML, pers. comm.).

Monterey Adult Survey
The survey is a visual count of adult fish among nearshore rocky reefs in the Monterey area during 1993–98. As the former assessment found no influence of this index on assessment results, its limited representation of the assessment area, and lack of additional years, this survey was not considered in any model trials.

Additional dive surveys are being conducted in the waters off California, who seek volunteers to help with their surveys. Where these surveys are not particularly good indicators of abundance for cryptic species such as cabezon, they could be evaluated for other nearshore species. We are listing some of these programs here so divers are aware of these volunteer opportunities in the future.

- Reef Check California aims to build a network of informed and involved citizens who support the sustainable use and conservation of our nearshore marine resources. (http://www.reefcheck.org/)
- Channel Islands Kelp Forest Monitoring Program through National Parks Service began in 1982. (http://www.nps.gov/chis/)
- Reef Environmental Education Foundation (REEF) began in 1990. (http://www.reef.org/)

Ichthyoplankton Indices
Cabezon larvae are initially neustonic and available (and readily identifiable) to planktonic sampling gears. The SWFSC has conducted ichthyoplankton surveys off the west coast and developed databases with information on the abundance of cabezon larvae. Generally the size of fish collected during these studies is <15mm (pre-settlement) and therefore not thought to correlate well with recruitment to age-1. However, the abundance of this size group may relate (in a linearly proportional way) to the amount of reproductive output the year before the year of sampling. The possibility of developing an index using the Santa Cruz mid-water juvenile rockfish survey was investigated. However, cabezon are only a very small component of the catch in this survey (S. Ralston, SWFSC, pers. comm.) so no attempt was made to develop an index of pre-settlement of cabezon using these data.

Southern California Sanitation Districts Fish Surveys
The sanitation districts of Los Angeles, Orange, and San Diego Counties and the City of Los Angeles conduct fish surveys every year to monitor the effects of sewage outfall on nearshore communities. This data sources provided insufficient information to develop indices of abundance for cabezon.

Data Input Files
The SS3 input files for each sub-stock are provided in Appendices C-1 (NCS) and D-1 (SCS), E-1 (CAS) and F-1 (ORS).

Assessment

Assessment Model

This is the third assessment of the cabezon resource off the California coast. It differs in several key ways from the past assessment (Cope and Punt 2006). This assessment uses the newest version of stock synthesis (SS 3.03A; Methot 2009), a flexible length- and age-based population dynamics modeling environment. Previous work (not shown here) replicated the old assessment derived outputs in this new version of SS to make certain new model outputs were not sensitive to the use of the new SS version.

This assessment includes several differences in the data and thier treatment compared to the former assessment. Catch histories, mostly in the recreational fishery, differed due to changes in the weight and numbers of fish reported in each fishery mode (Figure 19). The treatment of discards also differed between the previous and current assessments. While discards were not considered in the last assessment (partially due to the lack of commercial information on discards and to the basic biology and fishery behavior causing low impact on cabezon when discarded), the new assessment was able to use multiple years of data from the WCGOP. The 2005 assessment did not use any RecFIN lengths prior to 1993 because the lengths were derived from weights. This assessment has recovered the measured lengths of those samples and now includes the full time series of RecFIN length compositions for all modes in each of the sub-stocks. Finally, age-at-length data were treated conditionally so as to allow the estimation of growth parameters internal to the model rather than being externally fit as before.

On a technical note, all tuning was based on average effective sample sizes by fleet rather than tuning each year of each fleet. Finally, the addition of an Oregon sub-stock is new to this assessment.

The population dynamics model

The base case assessment for each sub-stock is based on the following assumptions:

1. There are two fishery sectors (commercial and recreational). The commercial sector consists of two fleets and the recreational sector consists of four fleets.
    - Fleet 1: Commercial non-live-fish fishery
    - Fleet 2: Commercial live-fish fishery
    - Fleet 3: Recreational mode: Man-made (MM)
    - Fleet 4: Recreational mode: Beach/bank (BB)
    - Fleet 5: Recreational mode: Private boat and rentals (PBR)
    - Fleet 6: Recreational mode: Commercial Passenger Fishing Vessel (CPFV).

Fleet distinctions imply different length-specific selectivity patterns. The Oregon sub-stock did not have enough data or data resolution for all four recreational fleets, so fleets 3 and 4 were combined into a ‘shore’ mode and fleets 5 and 6 were combined into ‘boat’ mode.

2. Selectivity is assumed to be dome-shaped for the commercial live-fish fishery and the man-made and beach/bank fleets in the recreational fishery because each of these fleets tends not to land the larger sized fishes. Selectivity is assumed to be asymptotic for the remaining fleets (all fleets, though, use selectivity option 24 to allow for sensitivity testing of estimating a dome-shaped selectivity curve). Changes in management regulations have affected selectivities in each sub-stock, so time blocks were used to allow estimation of

separate selectivities per block (Tables 17 & 18). For the CAS and NCS, additional selectivity curves were estimated for blocks based on changes in size limits (1999-08) in the commercial live-fish fishery and size and bag limits (2000-04; 2005-08) for the PBR and CPFV recreational modes. In the SCS, blocked selectivities also correspond to the commercial live-fish fishery (1999-08) and the PBR and CPFV recreational modes (2000-08). Blocking in the Oregon sub-stock model differed, with two blocks in the commercial fishery due to size limit changes (2000-03; 2004-08) and one block for the recreational boat fishery (2003-08). All yearly selectivities within a block are assumed to be constant over time. The sensitivity of the results of the assessment to alternative specifications related to selectivity and time-blocking is examined in the tests of sensitivity. The selectivity patterns for the non-live commercial fleet in the assessment of the SCS are set to those for the non-live commercial fleet in the NCS owing to a lack of size composition data for the commercial fleets in the SCS.

3. There is one fishing season each year and the removals are taken instantaneously in the middle of the year after half of the natural mortality.
4. The estimates of removals-in-mass are known with negligible error.
5. Recruitment is related to reproductive output by means of a Beverton-Holt stock-recruitment relationship with log-normally distributed process error.
6. Length-at-age is normally distributed about its expected value.
7. There is no connection between any of the sub-stocks of cabezon, either through recruitment or migration. This assumption as it pertains to the NCS and SCS is explored through sensitivities.

Parameter estimation

The population dynamics model includes many parameters. The values for some of these parameters are based on auxiliary information, while others are estimated by fitting the model to the data (Tables 17 & 18). The base-case value for steepness (*h*) is assumed to be 0.7, based on a recommendation from the past assessment review (Cope and Punt 2006). The implications of this choice of steepness are evaluated using a likelihood profile. Recruitment variation, σ_R, is initially set equal to 1.0, then tuned to match the residual mean square error of recruitment deviations derived from the fitted model. The base-case values for the instantaneous rate of natural mortality are set to 0.25yr^{-1} for females and 0.3yr^{-1} for males (Table 2). Given the considerable uncertainty associated with the (assumed) base-case values for *M*, sensitivity tests examine the consequences of changing this parameter value for each sex.

For the purposes of this stock assessment, data were prepared as conditional ages by length bin so as to internally estimate the growth parameters and perpetuate uncertainty in those estimates through the model fitting process. This is an improvement upon the former assessment that used the externally fit growth parameters and assumption of CVs about length at age. Growth parameter values estimated external to the assessment model are compared with those derived from estimation within the assessment to diagnose whether the realization of growth differs in each approach (Figure 74).

No attempt is made to estimate recruitment deviations for the first year of the assessment period (1916), nor those for some of the subsequent years, because the data are completely uninformative regarding the values for some of the early (and most recent) recruitment deviations. Observing the behavior of the asymptotic standard error estimates of recruitment deviations can help to inform the choice of the first year for which recruitment deviations are estimated. The base-case models for each sub-stock were run estimating recruitment deviations for all years to determine the first year for which recruitment deviations could be estimated with reasonable precision (Figure 40). A decrease in these standard deviations may indicate when estimation of recruitment deviations should begin because the data provide some information about the recruitment deviations. For all California sub-stocks models, 1970 was chosen as the first year for which a recruitment deviation is estimated. For the Oregon sub-stock, 1980 was determined the best year to begin estimating recruitments. The final year of the estimated recruitment time series is set to 2006 for all sub-stocks to account for the lack of informative data for estimating recruitments in the final years of the model. Additionally, it is recommended that the bias correction carry through the most informative period of the recruitment time series. This period where recruitments are bias-corrected for lognormal error was defined as 1980-2004 for all sub-stocks. The sensitivity of each sub-stock assessment to the choice of years for estimating recruitment deviations is considered in tests of sensitivity.

Selectivity as a function of length was estimated for all fleets for which mean weight or length-composition data were available. Dome-shaped selectivity was modeled using a six parameter double normal curve for the commercial live-fish and recreational man-made and beach/bank fleets. All parameters were estimated except for selectivity at the first size bin (<6 cm), which was assumed to be near 0 (Tables 17 & 18). Length selectivities for the non-live commercial and recreational PBR and CPFV fleets were also described using the six parameter double normal function, with three of the parameters (the width of the descending limb, selectivity at the first size bin (<6 cm), and selectivity of the final length bin (>92 cm)) set to mimic logistic selectivity. There are no length-frequency data for the non-live commercial fleet or the first selectivity block of the live-fish fishery for the SCS, so the selectivity patterns for these fleet mirrors the estimate for the NCS. The selectivity pattern for the CPFV abundance index mirrors that of its corresponding CPFV fleet. Likewise, the ORBS survey mirrors the boat mode selectivity in the Oregon sub-stock. All recruitment surveys were set to estimate age 0 recruitment (selectivity option 33 in SS v. 3.03A).

Likelihood components

The following six components comprised the objective function that was minimized to estimate the free parameters of the model:

1. Abundance Index (assumed log-normally distributed).
2. Mean Weight (assumed normally distributed).
3. Length Composition (assumed multinomially distributed).
4. Conditional age at length (assumed multinomially distributed).
5. Recruitment Deviations.
6. Parameter Priors (penalties on deviations from the prior distribution; generally very small for these model parameterizations).

Coefficients of variation (CV) about the abundance indices derived from bootstrapping or jackknifing techniques may greatly underestimate the true uncertainty regarding the relationship between these indices and biomass. Additional variance (equivalent to 3 times the average yearly CV of the time series) was added to each index in order to more adequately capture the inherent uncertainty (Tables 14-16). The sensitivity of the results to setting the CVs to the values obtained from the bootstrap procedure (Tables 14-16) is explored in the tests of sensitivity.

The mean weight data (Table 11) were assumed to be normally distributed with CVs based on the raw data when these data were included in the objective function. The CVs for the estimates of mean weight for the CPFV fleet for 1947–51 for the NCS and CAS were set to 0.5 (larger than observed for RecFIN) to avoid over-weighting these early data.

The catch length-composition data were pooled into 44 length-classes (up to 92 cm), each of width 2cm, except the first, which includes 0–5.9cm. Although the length compositions can be based on hundreds or thousands of measurements, fits to length-frequency data usually exhibit substantial overdispersion relative to a multinomial distribution where the sample sizes are set to the number of animals measured. Therefore, for the purposes of the present analyses, the sample sizes are compared to the "effective" number of animals measured each year using the approach developed by McAllister and Ianelli (1997). Sample sizes are then iteratively changed by adjusting yearly sample sizes so that the mean inputted sample sizes by fleet approach the model-derived mean effective sample sizes by fleet. Such an approach is termed 'tuning'. Model sensitivity to using the originally assumed sample sizes (a 'non-tuned' model) was explored in the tests of sensitivity.

Recruitment deviation and parameter priors were calculated assuming lognormal and normal error structures, respectively. The variances for all of the estimated parameters were set very high to minimize the influence of the prior on the results.

Parameter (Control) Input Files
The SS3 files for the assessments of each sub-stock are provided in Appendices C-2 (NCS) and D-2 (SCS), E-2 (CAS) and F-2 (ORS).

Model diagnostics (base models)
Abundance surveys
Figures 41 and 42 show the fits to the base-case indices of abundance for all sub-stock models. As seen in the previous assessments, the California models tracks the changes in the CPFV indices qualitatively, but there are considerable differences between the model-estimates and the data for some years. These differences are, for the most part, consistent with the very wide confidence intervals assumed for the data. The fit of the CPFV index for the SCS (Figure 41) is particularly poor in the mid 1980s to the early 1990s, but fit the most recent years well. The former assessment had trouble fitting the most recent years. Blocking the time series for this assessment seems to have improved the fit. The NCS (Figure 41) and CAS (Figure 42) models not surprisingly fit similarly to their respective time series. The Oregon sub-stock model has trouble fitting the earliest and lowest index value, but does track the rest of the index values. Weaker fits to the index data in each of the sub-stocks is generally attributable to the fact that the age, length and weight data drive population dynamics rather than the abundance index information.

Mean weights

Figures 43-46 show the fits to the mean weight data for all sub-stocks. The confidence intervals for the mean weights are wide (as expected given the CVs in Table 11), which implies that the model is not constrained to a substantial extent by these data. Model fits to the data are generally good and do not indicate any notable divergence of these data from the conclusions of the overall maximum of the posterior density (MPD). Improved fits to the mean weight are seen in the current stock assessment versus the previous assessment, indicating more coherence of data sources. The past SCS assessment showed major sensitivity to the mean weight for the man-made fleet (fleet 3) in 2000, a sensitivity not seen in the current assessment (see trial when mean weights are removed, Table 21B and the trial when the low value in 2000 is removed, Table 23). This low mean weight is still visible in the data and is interpreted as a recruitment event, though it does not well fit (Figure 44). Despite the lack of fit to the 2000 data point, the population still demonstrates the large recruitment, indicating information in other data sources (e.g. later year mean weights and length compositions) contribute independent information supporting the 1999 recruitment event.

Length composition data
The base-case fits and diagnostics to the length-composition data for each sub-stock are given in Figures 47-52 (NSC), 53-57 (SCS), 58-63 (CAS), and 64-69 (ORS). When interpreting these figures, it should be noted that the observed and model-predicted lengths are “plussed” at low and high sizes. This has little impact on the results at high size, but can give a misleading impression at low size (e.g. the fit to the data for 1999 and 2000 for the non-live-fish fleets in the NCS and CAS base case models (Figures 47 and 58)).

Overall, fits to the length compositions for all sub-stocks across all fleets was good. The strongest fits in the NCS (Figures 47-52) were found in the live-fish fishery and PBR mode samples (Figures 48 and 51). No severe misfits, residual patterns, or unbalanced inputs were detected in any of the fleets for any of the sub-stocks. Low sample sizes in the commercial live-fish fleet and shore-based modes (MM, BB) of the SCS (Figures 53-55) rendered them the weakest contributor to the length composition likelihood for that sub-stock. Fits were best in the PBR recreational mode (Figure 56). The CAS was similarly driven by live-fish fishery (Figure 59) and PBR (Figure 62) compositions and samples, the beach/bank mode contributed earlier in the time series (Figure 61). Similar to the California sub-stocks, the Oregon sub-stock gained much of its length composition information from the live-fish commercial (Figure 66) and boat-based recreational fishing modes (Figure 69).

Conditional age-at-length data
Fits to the conditional age-at-length data are provided for each sub-stock in Figures 70-73. These fits to ages conditioned on length produced estimates of growth similar to those derived by externally fitting the same age and length data with ageing error (Figure 74; Cope and Punt 2007).

Results
Base case results: NCS
Figure 75 shows the MPD estimates of the time-trajectories of spawning output (in absolute terms) and recruitment, along with their asymptotic 95% confidence intervals. There is considerable inter-annual variation in recruitment. The time series

of spawning biomass and recruitment are found in Table 19. The estimates of recruitment are most precise before 1980 because no recruitment deviations are estimated for these years and the estimates of recruitment consequently reflect expectations based on the stock-recruitment relationship (Figure 75, bottom panel). In contrast, the estimates of reproductive output are most precise during the late 1980s and early 1990s (Figure 75, top panel). The NCS is estimated to have been at 45% of its virgin level (1036 mt) at the start of 2009 (469 mt; Figure 76). These current estimates are generally consistent with probable scales of biomass and trajectories found in the 2005 assessment (Figure 77). A large bump in the biomass is seen in the late 1970s due to a major recruitment event in the early 1970s. Sensitivity to the start of the recruitment time series is investigated to observe whether the derived outputs are sensitive to this recruitment event. Other major recruitment events are seen in the 1990s. Figure 78 shows the estimated spawner-recruit relationship along with the asymptotic standard deviations of estimated recruitments demonstrating when the data begin to inform estimated recruitments (seen as a drop in the asymptotic standard deviation below the specified recruitment variation) Appendix G lists the MPD estimates of the numbers-at-age matrix for each sex (also plotted in Figure 79).

Figure 80 shows the length-specific selectivity ogives for each fleet. The live-fish fishery (fleet 2) is greatly dome-shaped with respect to length in the most recent (1999-2008) selectivity block. Selectivity for the beach bank fleet (fleet 4) also declines with size. The selectivity ogives suggest that immature fish are not completely excluded from the current and historical catch, especially in the man-made and beach/bank recreational modes.

Harvest rates for each fleet are given in Figure 81. The onset of the live-fish fishery in the late 1990s shows a dramatic peak in harvest rate by this fleet. Only the PBR recreational fishery fleets show harvest rates of the same magnitude. Harvest rates since the 1980s for the PBR recreational modes represent a major source of cabezon removals from the NCS. The combination of the expanding live-fish fishery and high recreational removals caused harvest to exceed the MSY-proxy harvest rate currently calculated for this sub-stock in the late 1990s (Figure 82).

Despite the fact that catches in the late 1990s exceeded the currently estimated MSY-proxy harvest rate, the NCS depletion level has since increased from the precautionary zone to a level above the target spawing biomass (Figures 76 & 83).

Base case results: SCS

Figure 84 shows the MPD estimates of the time-trajectories of spawning output (in absolute terms) and recruitment, along with their asymptotic standard errors. The historical values of spawning biomass and recruitment can be seen in Table 19. The time-trajectory of reproductive output drops dramatically after 1980, stays low until the early 2000s, and then increases substantially. The increase in reproductive output occurs because of the 1999 year-class, the largest in the time-series. Additional large recruitments were seen in 1984 and 1994. All three of these large recruitments followed on the heels of notable El Niño Southern Oscillation events (ENSOs) of 1982/1983, 1991/1992, and 1997/1998. This correlation with environmental conditions along with smaller relative biomass compared to conspecifics of the NCS may indicate that the SCS is a more dynamic subpopulation. This is also consistent with the higher recruitment variation (σ_R) estimated for the SCS (0.7) versus all other cabezon sub-stocks (0.5). Major recruitment events for the SCS are also consistently lagged 1 year compared to the NCS. The SCS reproductive output is estimated very precisely during the 1990s and is estimated, with much greater uncertainty, to have been at 60% of its virgin level (263 mt) at the start of 2009 (158 mt) (Figure 85). Though the relative and absolute level of the population trajectory is similar to the last assessment (Figure 77). Despite the increase in biomass scale, the biomass of cabezon off southern California remains much smaller than that off central / northern California. Figure 86 shows the estimated spawner-recruit relationship, along with the asymptotic standard error estimates around each estimated recruitment. The model is moderately informed regarding recruitments. Appendix H and Figure 87 give the MPD estimates of the numbers-at-age matrix.

Figure 88 shows the length-specific selectivity ogives for each fleet. The selectivity patterns for the non-live-fish fishery are inestimable because of the lack of length compositions and are therefore assumed equal to the selectivity for the non-live-fish fleet in the NCS. The live-fish fishery shows a very strong dome-shaped pattern that changes as size-limits affected fishery retention. The selectivity patterns for the man-made and beach/bank fleets decline more rapidly with length for the SCS than is the case for the NCS. These selectivity patterns suggest that immature fish are not completely excluded from the current and historical catch, especially in the man-made recreational fishery.

Harvest rates for each fleet are given in Figure 89. There are two significant periods of removals: 1) the 1980s when harvest rates increased dramatically because of the increase in recreational fishing, particularly by the PBR (fleet 5) recreational mode; and 2) the late 1990s when the live-fish fishery (fleet 2) took large catches. The first of these periods of harvest, along with the lack of strong recruitment events, led to the large reduction in reproductive output during the early 1980s (Figure 84). Through much of the 1980s and up until recently, catch of the SCS exceeded the currently estimated MSY-proxy harvest rate for that sub-stock (Figure 82). Large reductions in removals coupled with a major recruitment in the late 1990s has allowed the moderately growing cabezon to increase from 25% of the unfished level in 1999 to more than 60% since 2007 (Figures 83 and 85).

Base case results: CAS

Figure 90 shows MPD estimates of the time-trajectories of spawning output (in absolute terms) and recruitment, along with their asymptotic standard errors for the state-wide (i.e. treated as a single homogenous population) California assessment of cabezon. The historical values of spawning biomass and recruitment can be seen in Table 19. The time-trajectory of spawning output for the combined assessment is qualitatively most similar to that for the NCS, although, as expected, biomass levels are higher. In this base case, all data for each fleet is combined so as to create the same six fleets combining the data from the SCS and NCS. Despite both of the area-specific sub-stocks being above the target reference points, the depletion of the combined model is 34%, below the 40% target (410 mt compared to an unfished spawning biomass of 1,207 mt; Figure 91). The terminal year estimate of biomass is also smaller than the NCS estimate. Figure 92 shows the estimated spawner-recruit relationship along with the asymptotic standard errors estimates around each estimated recruitment. The model is well informed regarding recruitments. Appendix I and Figure 93 give the MPD estimates of the numbers-at-age matrix.

Comparison of the current state-wide base case to alternative ways of estimating state-wide California estimates of cabezon spawning output and recruitment are provided in Table 20 and Figure 94. The summation of the SCS and NCS leads to the highest spawning output and retains consistency with the stock status estimated for each individual-area assessment. It is also most consistent with state-wide results from the 2005 assessment that used different fleet designations to distinguish spatial-explicit fisheries (Table 20; Figure 77). Thus one can alternatively specify the current state-wide model using area-specific fleets (1 for each fleet in each area = 12 total fleets), as was done for the state-wide assessment in 2005. Such an approach gives you a depletion value (35%) closer to the state-wide model without spatial fleet designations and still less than either of the area-specific assessments. These seemingly incongruent results (deriving a state-wide depletion value less than either of the sub-stock models) can be attributed to combining divergent area-specific population dynamics to explain one synthetic overall pattern. This is seen most clearly when comparing recruitment deviations (Figure 95). The NCS and SCS have distinctive recruitment patterns. These area-specific patterns get obscured when the data have to explain just one best-fit recruitment pattern, causing much weaker recruitment in the last 10 years and thus, in this particular case, reducing the ability for the population to compensate for the combined removals. Allowing selectivities to vary by area (via area-specific fleet specification) does little to reduce this effect (Figure 95).

A final consideration to a state-wide model specification was the two-area (north and south) model with connected recruitment via a constant recruitment distribution ratio (Figure 94). This allowed for the two sub-stocks to be modeled with connectivity in the early life stage (as opposed to the base case assumption of no connectivity), with total recruitment being redistributed via an estimated recruitment ratio. Such an approach results in the largest combine biomass and least depleted state-wide stock (Table 23C). This formulation is based on the assumption of a well-estimated constant recruitment distribution, which is unlikely given the varying dynamics in each sub-stock.

Figure 96 shows the length-specific selectivity ogives for each fleet in the state-wide base case. The state-wide selectivities are heavily influenced by the NCS data and appropriately reflect this relationship.

Harvest rates for each fleet modeled in the CAS are given in Figure 97. Similar to the NSC and SCS, the 1980s and early 2000s PBR removals and the late 1990s commercial live-fish fishery removals are the major periods of harvest. These relatively large removals are reflected in exploitation rates at or surpassing currently estimated MSY-proxy harvest rates for much of that period (Figure 82). Large reductions in removals coupled have occurred in recent years, but without the kind of major recruitment event observed in the sub-area models, depletion has not rebounded to exceed the target level (Figures 83 and 91).

Base case results: ORS

Figure 98 shows MPD estimates of the time-trajectories of spawning output (in absolute terms) and recruitment, along with the asymptotic standard errors for the Oregon sub-stock. The historical values of spawning biomass and recruitment can be seen in Table 19. There is much uncertainty about the absolute scale of the population, though less uncertainty about the recruitment. Uncertainty in the spawning output under initial conditions is similar to that of the terminal year spawning output. The depletion of the ORS is 52% (214 mt compared to an unfished spawning biomass of 409 mt; Figure 99). Given the high uncertainty in both the initial and terminal conditions, certainty in the depletion is unsurprisingly higher, with only a small portion of the 95% distribution around mean depletion below the target reference point. In general, the scale of biomass off Oregon is greater than the SCS, but lower than the NCS. Figure 100 shows the estimated spawner-recruit relationship along with the asymptotic standard error estimates around each estimated recruitment. The model is generally well informed regarding recruitments. Appendix J and Figure 101 give the MPD estimates of the numbers-at-age matrix.

Figure 102 shows the length-specific selectivity ogives for each fleet in the ORS base case. Distinct dome-shaped selectivities are found in the live-fish fishery, with changes in the shape due to size regulations. The affects of size regulations on the recreational boat-based modes is less apparent.

Harvest rates for each fleet modeled in the ORS are given in Figure 103. Removal levels are much below those seen in any of the California sub-stocks, with the live fish fishery (fleet 2) being the highest. Only under the highest removals from the live-fish fishery did the population approach the MSY-proxy harvest rate (Figure 82). The base case MPD for the ORS suggests the current stock status is well above the target reference points (Figures 83 and 99).

Sensitivity analyses

Sensitivity tests were conducted to evaluate how derived model outputs may change due to our uncertainty in the data sources or model specification. The first set of sensitivities considered the affect of removing data sources on the derived outputs of initial spawning output (SB_0), terminal year spawning output (SB_{2009}), depletion and MSY. The results of these sensitivity analyses are provided in Table 21.

The NCS (Table 21A) was most sensitive to the removal of the CPFV abundance index (Trial 11), which dropped the depletion estimate below the target level, but still well above the overfished limit. The model was also sensitive to the removal of all length composition data (Trial 19), a result seen with all sub-stocks, but that is as expected when the primary information informing selectivity and recruitment deviations are the length compositions. Both spawning output measures were the most and similarly sensitive, whereas depletion and MSY (which ranged between 125 mt and 140 mt for most trials) were the most robust.

The SCS (Table 21B) demonstrated low sensitivity to all practical trials (removing all the lengths (Trial 14) is not considered a practical trial as it removes the primary information to estimate selectivity, but included for completeness), none of which dropped the stock status below the target level. Removal of the abundance indices (Trial 7) resulted in a less depleted stock, opposite the affect found in the NCS. MSY was again very robust, ranging between 25 mt and 35 mt.

The CAS (Table 21C) was similarly insensitive to most data trials, again showing the most sensitivity to removal of the CPFV abundance index (Trial 10). All practical trials were above the limit reference point with several raising the stock status above the target reference point. These trials included using one continuous CPFV time series, removing the live-fish length compositions, removing the beach/bank length compositions, and removing the conditional age-at-length data. These results did not mimic the results in the NCS, thus showing emergent behavior in the state-wide approach. MSY generally ranged from 140 mt to 155 mt.

The ORS (Table 21D), though generally robust to removing data, was highly sensitive to the removal of the ORBS survey (Trial1). Removing this piece of information caused the population to drop below the limit reference point. MSY was the relatively least certain amongst all sub-stocks, generally ranging from 30 mt to 50 mt.

Natural mortality (*M*) and steepness (*h*) were unknown and treated as fixed parameters in each of the sub-stock assessments. To investigate the sensitivity of model derived outputs to the values assumed for these parameters and whether the current data are informative to the value of these parameters, likelihood profiles of *M* and *h* were conducted for each sub-stock.

Steepness estimates proved uninformative in each of the sub-stocks (Figure 104) as it tended to either approach the upper (in the SCS and ORS) or lower (in the NCS and CAS) bound. The biggest change in behavior in each case occurred when steepness was above or below 0.4. Current spawning output is more sensitive than initial spawning output in all California sub-stocks, causing both depletion and MSY (which is expected) to approach zero as steepness approaches the minimum (Figures 105 & 106). The overfished state is reached in the NCS and SCS if steepness is less than 0.4. In the CAS base case, the overfished state is reached with steepness less than 0.5. The ORS was less sensitive to the assumption of steepness with the current spawning output being the least sensitive derived output. In no trial did the base case ORS fall below the overfished threshold.

The models also lacked information as to the value of *M*, though very different behaviors are obtained among the sub-stocks (Table 22; Figure 107). Information contained in the sub-stock data sets were most consistent with different levels of natural mortality across areas. The NCS and CAS tended to find better fits at the lower bounds of M, especially for females, whereas the ORS tended to fit better at the higher bounds (Figure 107). All sub-stocks dropped below the overfished level at the lowest values of M. Generally, values less than 0.2 led to overfished status. The values of M explored gave widely varying values for all derived outputs for the SCS and ORS. The NCS and CAS, while showing relatively more stability, still demonstrated disperate derived outputs depending on natural mortality. As was the case in the previous assessment, natural mortality is the most sensitive assumption in all models.

Additional sensitivities were run using a variety of model specifications to better understand the behavior of each assessment model to changes in key assumptions. Such sensitivities included alternative treatments of variance in abundance indices, retrospective analyses of the marginal contribution of data from recent yeears, and assumptions regarding catch histories, the time series of recruitment deviations and spawner-recruit relationships, selectivity specifications, and age and growth. The latter assumed either no ageing error or that male growth in California is more like that of Oregon males (Figure 9) or past estimates in California (O'Connell 1953).

Results to these sensitivities are found in Table 23. Assuming a Ricker spawner-recruit relationship caused a major decline in all California sub-stocks, though no evidence exists to support this relationship. Estimating natural mortality also caused major declines in the NCS and CAS. The SCS showed particular sensitivity to the assumption of the male growth parameters, where slower growing males with larger terminal size led to greatly depressed stock status. Oregon showed little sensitivity to any of the trials. These trials emphasize the importance of gaining further understanding of the growth and mortality rates for all sub-stocks.

Retrospective patterns, identified through the progressive removal of data back to a certain year, give further insight into the replicability of the current spawning output trajectories and estimated stock status (Table 23 and Figure 108). The California sub-stocks show consistent patterns and scales of spawning output for most retrospective analyses. The greatest difference is produced when 10 years of data are removed. This is expected given most of the conditional ages used to estimate growth and the length samples from the live-fish fishery to estimate selectivity are removed. The ORS shows much more unstable behavior, demonstrating again how the depletion status is robust to model specification, but the uncertainty about scale is very large. Removing 10 years of data essentially takes most of the data out of the assessment, thus causing an unrealistic decline in the population.

Projection and decision analysis

Twelve-year forward yield projections are conducted for each sub-stock under two alternative ABC control rules (based on F_{MSY} proxies of $F_{45\%}$ and $F_{50\%}$) and two OY threshold control rules (40-10 or 60-20). The standard PFMC OY control rule for groundfish such as cabezon is based on $F_{45\%}$ with a 40-10 adjustment for stocks below the target level of 40% of the unfished reproductive output. The California NFMP proposes the use of a F_{MSY} proxy of $F_{50\%}$ and a 60-20 adjustment for stocks below 60% of the unfished reproductive output. The first two years of the catch stream (2009-2010) assume a 39%/69% split between commercial and recreational fisheries for catch levels set by each state, with fleet-specific allocations assumed as the average over the past three years (2006-2008). Catch levels post 2010 are determined by the control rule. The relative proportion of the six fleets in future harvests is assumed to be the same as the last year (2008) in the model.

The results in Table 24 suggest that sub-stocks (NCS, SCS, and ORS) above the target reference level of $SB_{40\%}$ would see a reduction in population size converging on the target reference point near the end of the projection period under the 40-10 control rule. The CAS would increase toward the target reference point during the same period. The extent of this increase is greatest for the most conservative OY control rule ($F_{50\%}$ with a 60-20 adjustment) and least for the less conservative control rule ($F_{45\%}$ with a 40-10 adjustment). Most increases under the 60-20 rule increased populations near the 50% virgin biomass level.

Decision table projections based on alternative states of nature (columns in the decision tables) for 3 of the 4 sub-stocks were explored to capture uncertainty in population conditions (Table 25) and control rules (40-10,$F_{45\%}$ and 60-20,$F_{50\%}$). The STAR panel agreed with the STAT that state-wide management was most appropriately determined from the combined NCS and SCS models, not the CAS model. A decision table for the CAS is therefore not presented. For the NCS, SCS, and ORS sub-stocks, the low and high *M* scenarios refer to different assumptions about sex-specific natural mortality (the greatest source of uncertainty in all sub-stock models) and were retained from the last assessment. The low scenario assumes *M* = 0.2/yr and 0.25/yr for females and males respectively, while the high scenario assumes 0.3/yr and 0.35/yr for females and males respectively. Catch histories (rows in the decision tables) were based on three proposed catch scenarios: 1) catch series based on the specified control rule (either 40-10 or 60-20) derived from the low *M* state of nature (low *M* catch scenario); 2) catch series based on the specified control rule (either 40-10 or 60-20) derived from the base case *M* state of nature (base case *M* scenario); and 3) catch series based on the specified control rule (either 40-10 or 60-20) derived from the high *M* state of nature (high *M* catch scenario).

All sub-stocks demonstrated spawning output depletion below limit reference points when the low *M* scenario was subjected to the base case and high catch scenarios. This also occurred when the base case *M* scenario was subjected to the high catch scenario. All other scenarios demonstrated depletion near or above the target reference points at the end of each projection period. Relative to biomass and depletion estimates, the 60-20 rule was much more conservative than the 40-10 rule.

Alternative Assessment Approaches

Given the large number of species needing stock assessments and the lack of resources (e.g. data, time, etc.), simplified metrics or rapid assessment approaches that relate to stock status are needed. Here we report on three approaches that use minimal data and simplifying assumptions and compare their outputs (as applicable) to those of the current assessment.

Productivity-Susceptibility Analysis

Measuring the vulnerability of a stock (defined as the combination of stock productivity and susceptibility to fishing) relates directly to the goals of the US National Standard 1 guideline to maintain optimal yield without overfishing. Specifically, vulnerability determination may help determine whether a species is “in the fishery”, identify species complexes for management, and create additional buffers for management consideration.

Productivity-Susceptibility Analysis was recently presented by Patrick *et al.* (*in press*) as a formal means by which to define vulnerability. It defines the two axis of vulnerability (x-axis = productivity and y-axis = susceptibility) based on multiple attributes describing the life histories and functional relationship to fishing practices, respectively (see Patrick *et al.* for details). The attributes scores are then combined to give an overall productivity and susceptibility score. Vulnerability is then defined as the Euclidean distance of the coordinate productivity and susceptibility scores. Composite scores of 1 indicate the lowest productivity or lowest susceptibility, whereas scores of 3 indicate the highest of each. Vulnerability scores, therefore, are lowest at 0 and highest at 2.83.

Cabezon scores (1 score provided for the whole species) are as follows: productivity = 1.9; susceptibility = 2.1; vulnerability = 1.42. These scores indicates cabezon are both moderately productive and susceptible, thus have moderate vulnerability. Comparing this score to other groundfish species, cabezon are relatively less vulnerable and score near other species that are either near or above target biomass levels (Figure 109; Field *et al. in press*). These results are not inconsistent with the results of this stock assessment for any of the sub-stocks.

Length-based reference points

Froese (2004) suggested a way to assess potential fishery impacts on population dynamics by measuring three simple metrics (generically referred to as P_x) from catch length compositions: 1) proportion of mature individuals (P_{mat}), 2) proportion of fish at the size which the highest yield from a cohort occurs (P_{opt}), and 3) proportion of large, mature individuals (P_{mega}). Cope and Punt (*in press*) extended this analysis by adding a fourth metric (P_{obj}; the sum of all Froese (2004) metrics) that identifies the general selectivity pattern of the fishery and thus allows the resultant P_x measures to be related to biomass without knowledge of historical conditions. The analysis also presented general guidelines for interpreting stock status from P_x values.

The approach of Cope and Punt (*in press*) was applied to each of the sub-stocks by considering the combined length compositions of all fisheries (Figures 110 & 111). For each sub-stock, the P_x measure relatable to the spawning biomass proxies of $SB_{40\%}$ and $SB_{25\%}$ are provided along with the relationship of depletion with P_{obj}. In the current presentation, the use of P_{mat} to inform stock status is consistent with the current assessment results from the SCS (Figure 110) and ORS (Figure 111). This approach is more precautionary than the stock assessment results in the NCS (Figure 110) and CAS (Figure 111), indicating below target biomass levels when the stock assessment indicates biomass levels above the target. Three of the four sub-stocks (all but the SCS) also indicate relationships between P_{obj} and biomass opposite to expectations (right columns in Figures 110 & 111). These discrepancies may be due to improper weighting of the length composition data (weighted only by sample, not by relative catch, in these examples) and need to be explored further. Overall, the terminal year values of P_{mat} are consistent with the stock status presented in each sub-stock assessment.

Preliminary work has shown that using P_{obj} as a predictor of biomass may be used as an effective control rule. Further exploration (via simulation testing) and application are needed to establish the broad applicability of this approach. Given the diversity in selectivity, fishery types, and spatial scales, cabezon seems a good candidate to explore further.

Depletion-corrected average catch

The depletion-corrected average catch (MacCall 2009) was also considered, which corrects the estimate of 'pretty good yield' based on average catch by accounting for the windfall catch typically seen early in resource fishery development. Though the correction factor become very small when natural mortality is above 0.2, we nevertheless explored this approach with cabezon. The DCAC was calculated over the following range of depletions: 0.2, 0.4, 0.6, and 0.8. The uncorrected catch averages are 58 mt (NCS), 14 mt (SCS), and 29 mt (ORS), whereas the range of DCAC values were 53 to 57 (NCS), 13 to 14 (SCS) and 24 to 27 (ORS). All of these values are about half that derived from the base cases MSY values (129 mt for the NCS, 30 mt for the SCS, and 51 mt for the ORS).

Response To Past Research Recommendations

1. Accurate accounting of removals, especially from the recreational and live-fish fisheries: The commercial live-fish fishery and recreational modes (especially the shore-based (man-made, beach/bank) and private boat modes) remain challenges to record accurate removals. Since 2003 the West Coast Observer Program has provided at-sea observations in the live-fish fishery. Programs such as these should grow and the challenge of obtaining accurate removals of recreationally taken fish should contain to receive attention.

2. A fishery-independent survey of cabezon population abundance: Since the 2005 assessment, cooperative fisheries investigations have started along the California coast and hold promise to provide fishery-independent surveys to nearshore fishes, as well as improving our understanding of critical biological parameters such as natural mortality. The small-scale (relative to the stock assessed areas) coverage of these surveys remains a challenge. Maintenance and expansion of such surveys will increase the usefulness of these data sources in future assessments.

3. A study of the stock structure of cabezon: This assessment provided further research in the stock structure of cabezon (Cope and Punt 2009; Villablanca and Nakamura 2008). Genetic investigations are ongoing for cabezon. With the addition of Oregon, further understanding of cabezon populations at small and large scales is encouraged.

4. Age validation/ age determination: Catch age-composition that represent fishery data remain unavailable to the assessments and no new ages were available for California outside the Grebel (2003) study. Recent age sample were available in Oregon, but only useful for age and growth estimation, not informative to selectivity or recruitment. The Oregon samples did provide ageing comparisons within lab, but given the large discrepancy in growth between male cabezon in California and Oregon, ongoing comparisons among readers would be useful. As suggested in the previous assessment, information on the age-structure of the catches for each fishery sector would substantially improve some aspects of the assessment.

5. A better understanding of the relationship between CPUE and population size: No new information was provided on the relationship between fishery-dependent CPUE indices and biomass. The results of the assessments in California were relatively insensitive to the inclusion of such abundance indices, but the Oregon assessment was highly sensitive, underscoring the need for increased understanding of the relationship of such CPUE-based abundance indices to biomass.

6. Alternative assessment procedures: Alternative assessment methods were presented in this assessment to demonstrate how such methods can be compared to traditional assessment approaches and the potential they may have in informing of stock status and/or future catch recommendations. Such methods may have great utility when attempting to rapidly assess many species of varying data and resource availability. This assessment does not address the issue of alternative metrics such as a spawning biomass measure that includes to nest-guarding males. Alternative model specifications could also address this issue, but were not explored here. This subject is

still very relevant to interpreting derived assessment outputs and appropriate proxies for stock status.

7. Effect of climate on cabezon: No new studies were done relating cabezon abundance to climate, though the results of these assessments (especially in the SCS) indicate there may be very strong relationship of recruitment to climate.

8. Sex-specific data: The correlation of color to sex in cabezon (O'Connell 1953; Lauth 1987; Grebel 2003) remains uncertain, but the collection of sex-specific information remains important to enhance future assessments. No additional sex information was provided in the Caliornia sub-stocks for this assessment.

Research Recommendations

1. Improve estimates of natural mortality: All sub-stocks show significant sensitivity to natural mortality, a parameter not estimated in the model and assumed known. Estimates of natural mortality may be derived from tag-recapture studies or the comparison of length compositions inside and outside marine protected areas. There are two studies currently attempting to gather this information for future use in stock assessments. One is representing the northern Channel Islands (J. Wilson, UCSB, pers. comm.) and the other is representing the Morro Bay area (R. Nakamura and D. Wendt, CalPOLY, pers. comm.). These studies, and other like them, need to be encouraged.

2. Age and growth determination: The large discrepancy in estimated male growth parameters between Oregon and California deserve further attention to confirm this relationship. Further attention to ageing cabezon in California is needed to increase our spatial understanding of cabezon growth along the coast. Age samples from each fishery would also help to define growth and selectivity, while informing recruitment patterns and helping decrease the uncertainty in the scale (absolute abundance) of each sub-stock.

3. Fishery-independent surveys: Continued support and development of current fishery-independent nearshore surveys (like those initiated in Morro Bay and Monterey) is needed to extend the time series and increase spatial coverage. Both are required to increase the power of such indices in statistical catch-at-age models.

4. Defining the stock structure of cabezon: Current work on cabezon stock structure needs continued attention to better understand the connectivity between cabezon subpopulations. This would help focus or inform future sampling design to provide data for assessment purposes.

5. Alternative assessment procedures: The need for greater spatial resolution in the management of nearshore fisheries also increases the amount of data required to perform traditional stock assessments. Alternative assessment procedures that are less data-hungry, but still provide relevant management outputs should be encouraged. This assessment provides examples of some approaches as applied to cabezon. Such side-by-side comparisons of simplified assessment approaches to the statistical catch-at-age model outputs are useful in understanding the relationship of alternative to

traditional assessment methods in hopes of developing the best available scientific advice for management under data-limited situations.

6. Re-defining “spawning biomass”: The nest-guarding behavior of cabezon males gives added reproductive importance to their abundance, relative to most other groundfish species. A metric other than female spawning biomass may be needed to incorporate the status of the male portion of the population into reference points. Further investigation is needed to identify appropriate ways in which the role of males in reproductive success can be incorporated into metrics for evaluating population status.

7. Changes in batch fecundity with age: Batch fecundity in cabezon is recognized, but it is not understood how and if batch fecundity changes with age. Understanding whether the number of batches increases with age will help specify the fecundity relationship in the assessment model.

8. The effects of climate on cabezon population dynamics: The recruitment patterns of the California sub-stocks suggest a possible link between environmental forcing and population dynamics. Specifically, strong ENSOs conditions (especially in southern California) may be a pre-cursor to significant recruitment events. This link should be explored further to help increase the understanding of spatially-explicit recruitment responses and inform future recruitment events.

Acknowledgements

We are very grateful to the following for contributing data sources to evaluate for this assessment or background information to inform the use of the data: D. Aseltine-Neilson, M. Bellman, W. Dunlap, D. Haas, E. Heery, K. Herbinson, K. Hill, B. Leos, D. Malone, R. Nakamura, S. Owen, R. Starr, B. Stenberg, A. Suntsov, F. Villablanca, T. Wadsworth, J. Wallace, and J. Wilson. We are particularly thankful to Troy Buell, Mark Freeman, and the staff of ODFW for organizing and providing Oregon data and management regulation histories. Joanna Grebel (CDFG) and Josie Thompson (ODFW) provided critical ageing information to this study. Joanna also compiled the management regulations for California. Thank you also to J. Hastie, S. Miller, J. DeVore, members of the STAR Panel (J. Grebel, J. Ianelli, J.J. McGuire, D. Platt, S. Smith, V. Wespestad), and all who have read through and provided comments and critiques of this work.

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TABLES

Table 1. Biological parameters for cabezon considered for the 2009 assessment.

A. Age and growth (VBGF) parameters. Length in cm.

	L_∞	k	t_0
Oregon			
Female	68.83	0.2	-2.26
Male	59.05	0.25	-1.26
California			
Female	58.97	0.21	-1.28
Male	41.5	0.5	-0.75

B. Age and length maturity function parameters

	a	b
Oregon		
age (years)	-1.28	3.86
length (cm)	-0.37	43.67
California		
age (years)	-1.58	4.10
length (cm)	-0.74	34.60

C. Weight (kg)-length (cm) relationship

	a	b	R^2	N
California/Oregon				
Female	0.00000918	3.188	0.99	377
Male	0.00001163	3.118	0.96	234
NCS				
Female	0.00000920	3.187	0.99	322
Male	0.00001163	3.118	0.96	227
SCS				
Female	0.00001236	3.113	0.95	55
Male	0.00001989	2.997	0.91	7

Table 2A. Natural mortality calculations used to obtain estimates of natural mortality (M) for female cabezon.

		Estiamte of natural mortality (M)					
		Oregon		California: NCA		California: SCS	
Method	Approach	Input values	Estimated M	Input values	Estimated M	Input values	Estimated M
Hamel (pers. comm)	Hoenig (1983) * Pauly (1980)	ω = 25 k =0.2 max weight = 14kg water temp = 13°C	-0.23	ω = 20 k =0.21 max weight = 14kg water temp = 13°C	-0.25	ω = 20 k =0.21 max weight = 14kg water temp = 18°C	-0.26
Chen and Watanabe (1989)	$M(t)=\begin{cases}\frac{k}{1-e^{-k(t-t_0)}}, & t \le t_M \\ \frac{k}{a_0+a_1(t-t_M)+a_2(t-t_M)^2}, & t \ge t_M\end{cases}$ $where$ $a_0 = 1-e^{-k(t_M-t_0)}$ $a_1 = ke^{-k(t_M-t_0)}$ $a_2 = -0.5k^2e^{-k(t_M-t_0)}$ $t_M = -\frac{1}{k}\ln(1-e^{kt_0})$		-0.23	k =0.21 t_0 = -1.28	-0.25	k =0.21 t_0 = -1.28	-0.25
Jensen (1996)	$M = 1.65/a_M$	a_M = 7	-0.24	a_M = 7	-0.24	a_M = 7	-0.24
Jensen (1996)	$M = 1.5k$ $or 1.6k$	k = 0.2	-0.31	k = 0.2	-0.33	k = 0.2	-0.33
		Average M estimate	-0.25 -0.23		-0.27 -0.25		-0.27 -0.25

Table 2B. Natural mortality calculations used to obtain estimates of natural mortality (*M*) for male cabezon.

		Estiamte of natural mortality (M)					
		Oregon		California: NCA		California: SCS	
Method	Approach	Input values	Estimated M	Input values	Estimated M	Input values	Estimated M
Hamel (pers. comm)	Hoenig (1983) * Pauly (1980)	ω = 25 k =0.2 max weight = 14kg water temp = 13°C	-0.25	ω = 20 k =0.5 max weight = 14kg water temp = 13°C	-0.33	ω = 20 k =0.5 max weight = 14kg water temp = 18°C	-0.37
Chen and Watanabe (1989)	$M(t)=\begin{cases}\frac{k}{1-e^{-k(t-t_0)}}, & t \le t_M \\ \frac{k}{a_0+a_1(t-t_M)+a_2(t-t_M)^2}, & t \ge t_M\end{cases}$ $where$ $a_0 = 1-e^{-k(t_M-t_0)}$ $a_1 = ke^{-k(t_M-t_0)}$ $a_2 = -0.5k^2e^{-k(t_M-t_0)}$ $t_M = -\frac{1}{k}\ln(1-e^{kt_0})$		-0.30	k =0.5 t_0 = -0.75	NA	k =0.5 t_0 = -0.75	NA
Jensen (1996)	$M = 1.65/a_M$	a_M = 6	-0.28	a_M = 6	-0.28	a_M = 6	-0.28
Jensen (1996)	$M = 1.5k$ or $1.6k$	k = 0.25	-0.39	k = 0.45	-0.78	k = 0.45	-0.78
		Average M estimate	-0.30 -0.27		-0.46 -0.31		-0.47 -0.32

Table 3. Reported and assumed CPFV compliance rates, and raw and subsequently expanded CPFV removals for each California cabezon sub-stock, 1916-1961. Reported rates for 1987–98 are for the NCS and are applied to the SCS.

		Catch (in numbers)				
		Northern California substock		Southern California substock		
Year	Compliance rates	Raw CPFV	expanded CPFV	Raw CPFV	Expanded CPFV	
1916		0	0	0	0	
1917		0	0	0	0	
1918		0	0	0	0	
1919		0	0	0	0	
1920		0	0	0	0	
1921		0	0	0	0	
1922		0	0	0	0	
1923		0	0	0	0	
1924		0	0	0	0	
1925		0	0	0	0	no expansion made (few CPFVs)
1926		0	0	0	0	
1927		0	0	0	0	
1928	1.00	0	0	39	39	
1929	1.00	432	432	78	78	
1930	1.00	647	647	117	117	
1931	1.00	862	862	157	157	
1932	1.00	1076	1076	196	196	
1933	1.00	1291	1291	235	235	
1934	1.00	1506	1506	274	274	
1935	1.00	1721	1721	314	314	
1936	0.80	1934	2418	353	441	
1937	0.90	1880	2089	263	292	Croaker 1938
1938	0.95	3794	3994	784	825	
1939	0.90	2045	2272	278	309	
1940	0.90	2986	3318	262	291	
1941	0.90	2272	2524	552	613	
1942	0.90	2272	2524	552	613	War years assumed to equal 1946 values
1943	0.90	2272	2524	552	613	(taken from O'Connell 1953)
1944	0.90	2272	2524	552	613	
1945	0.90	2272	2524	552	613	
1946	0.90	2272	2524	552	613	
1947	0.83	8304	10017	1563	1885	
1948	0.93	12531	13416	1982	2122	
1949	0.93	11406	12278	2567	2763	Baxter & Young 1953
1950	0.98	13749	14102	2099	2153	
1951	0.96	16053	16704	1899	1976	
1952	0.95	8272	8707	2526	2659	
1953	0.95	5821	6127	3756	3954	
1954	0.95	4333	4561	8584	9036	
1955	0.95	3851	4054	8277	8713	Assumed values from Miller and Gotshal
1956	0.95	8434	8878	9388	9882	(1965)
1957	0.95	7544	7941	6859	7220	
1958	0.95	5197	5471	4625	4868	
1959	0.95	4136	4354	1184	1246	
1960	0.95	1939	2041	567	597	Miller & Gotshall (1965)
1961	0.95	1900	2000	671	706	

Table 3 (Continued). Reported and assumed CPFV compliance rates, and raw and subsequently expanded CPFV removals for each California cabezon sub-stock, 1962-2008. Reported rates for 1987–98 are for the NCS and are applied to the SCS.

		Catch (in numbers)				
		Northern California substock		Southern California substock		
Year	Compliance rates	Raw CPFV	expanded CPFV	Raw CPFV	Expanded CPFV	
1962	0.85	2663	3133	1845	2171	
1963	0.85	5888	6927	3713	4368	
1964	0.85	3315	3900	2954	3475	
1965	0.85	4458	5245	3062	3602	
1966	0.85	5500	6471	4681	5507	
1967	0.85	2871	3378	2422	2849	
1968	0.85	2470	2906	1725	2029	
1969	0.85	2612	3073	1648	1939	
1970	0.80	3930	4913	1978	2473	
1971	0.80	2337	2921	2046	2558	Assumed values discounted for increasing in CPFV fleet through 60s & 70s
1972	0.80	5170	6463	5967	7459	
1973	0.80	5012	6265	2389	2986	
1974	0.80	4432	5540	2435	3044	
1975	0.80	2637	3296	3617	4521	
1976	0.80	3923	4904	2396	2995	
1977	0.80	3977	4971	1549	1936	
1978	0.80	6445	8056	2286	2858	
1979	0.80	2751	3439	2017	2521	
1980	0.65	4132	6357	1986	3055	
1981	0.65	3533	5435	2255	3469	
1982	0.65	3670	5646	1476	2271	
1983	0.65	2360	3631	1367	2103	Karpov *et al.* 1995
1984	0.65	1322	2034	415	638	
1985	0.65	1165	1792	578	889	
1986	0.65	2546	3917	1813	2789	
1987	0.71	2676	3763	1960	2756	
1988	0.76	3124	4105	2241	2945	
1989	0.80	3020	3775	3184	3980	
1990	0.91	2382	2627	4310	4754	
1991	0.63	1731	2743	2795	4430	
1992	0.62	3600	5815	1587	2564	D. Wilson-Vandenberg (CDF&G; pers. comm.)
1993	0.68	1851	2732	955	1410	
1994	0.62	1241	2001	644	1038	
1995	0.56	1103	1987	1017	1832	
1996	0.54	1679	3126	2099	3908	
1997	0.65	1732	2654	1679	2573	
1998	0.48	1845	3848	834	1739	
1999	0.65	2271	3494	774	1191	
2000	0.65	1735	2669	1652	2542	
2001	0.65	4685	7208	1313	2020	
2002	0.65	1180	1815	821	1263	Average from 1980-1998 values
2003	0.65	3295	5069	434	668	
2004	0.65	1964	3022	608	935	
2005	0.65	2423	3728	686	1055	
2006	0.65	1339	2060	725	1115	
2007	0.65	1196	1840	708	1089	
2008	0.65	1137	1749	836	1286	

Table 4. Numbers removed, average weights, removals in weight, CPFV ratios, and expanded removals (numbers) by year for each mode in the recreational fleet for the NCS, 1916-1961. Shaded values indicate reported values; non-shaded are assumed.

	CPFV			Man-Made				Shore-based				PBR			
Year	Removals (#s)	Avg. Wt (kg)	Removals (kg)	CPFV ratio	#s Expanded	Avg. Wt (kg)	Removals (kg)	CPFV ratio	#s Expanded	Avg. Wt (kg)	Removals (kg)	CPFV ratio	#s Expanded	Avg. Wt (kg)	Removals (kg)
1916	0		0		485	0.68	330		1728	0.41	707		0		0
1917	0		0		485	0.68	330		1728	0.41	707		0		0
1918	0		0		485	0.68	330		1728	0.41	707		0		0
1919	0		0		485	0.68	330		1728	0.41	707		0		0
1920	0		0		485	0.68	330		1728	0.41	707		0		0
1921	0		0		485	0.68	330		1728	0.41	707		0		0
1922	0		0		485	0.68	330		1728	0.41	707		0		0
1923	0		0		485	0.68	330		1728	0.41	707		0		0
1924	0		0		485	0.68	330		1728	0.41	707		0		0
1925	0		0		485	0.68	330		1728	0.41	707		0		0
1926	0		0		485	0.68	330		1728	0.41	707		0		0
1927	0		0		485	0.68	330		1728	0.41	707		0		0
1928	0		0		485	0.68	330		1728	0.41	707		0		0
1929	432	2.27	980	1.12	485	0.68	330	4.00	1728	0.41	707	0.50	216	2.27	490
1930	647	2.27	1467	1.12	727	0.68	494	4.00	2588	0.41	1059	0.50	324	2.27	734
1931	862	2.27	1955	1.12	968	0.68	658	4.00	3448	0.41	1411	0.50	431	2.27	977
1932	1076	2.27	2440	1.12	1208	0.68	822	4.00	4304	0.41	1761	0.50	538	2.27	1220
1933	1291	2.27	2928	1.12	1450	0.68	986	4.00	5164	0.41	2113	0.50	646	2.27	1464
1934	1506	2.27	3416	1.12	1691	0.68	1150	4.00	6024	0.41	2465	0.50	753	2.27	1708
1935	1721	2.27	3903	1.12	1933	0.68	1314	4.00	6884	0.41	2817	0.50	861	2.27	1952
1936	2418	2.27	5484	1.12	2715	0.68	1847	4.00	9672	0.41	3958	0.50	1209	2.27	2742
1937	2089	2.27	4738	1.12	2346	0.68	1595	4.00	8356	0.41	3420	0.50	1045	2.27	2369
1938	3994	2.27	9058	1.12	4485	0.68	3050	4.00	15976	0.41	6538	0.50	1997	2.27	4529
1939	2272	2.27	5153	1.12	2551	0.68	1735	4.00	9088	0.41	3719	0.50	1136	2.27	2576
1940	3318	2.27	7525	1.12	3726	0.68	2534	4.00	13272	0.41	5432	0.50	1659	2.27	3763
1941	2524	2.27	5724	1.12	2834	0.68	1927	5.00	12620	0.41	5165	0.00	0	2.27	0
1942	2524	2.27	5724	1.12	2834	0.68	1927	5.00	12620	0.41	5165	0.00	0	2.27	0
1943	2524	2.27	5724	1.12	2834	0.68	1927	5.00	12620	0.41	5165	0.00	0	2.27	0
1944	2524	2.27	5724	1.12	2834	0.68	1927	5.00	12620	0.41	5165	0.00	0	2.27	0
1945	2524	2.27	5724	1.12	2834	0.68	1927	5.00	12620	0.41	5165	0.00	0	2.27	0
1946	2524	2.27	5724	1.12	2834	0.68	1927	5.00	12620	0.41	5165	0.00	0	2.27	0
1947	10017	2.27	22718	1.12	11249	0.68	7649	5.00	50084	0.41	20498	0.50	5008	2.27	11359
1948	13416	2.27	30428	1.12	15067	0.68	10245	5.00	67082	0.41	27455	0.50	6708	2.27	15214
1949	12278	2.27	27845	1.12	13788	0.68	9376	5.00	61389	0.41	25124	0.50	6139	2.27	13923
1950	14102	2.27	31982	1.12	15836	0.68	10769	5.00	70508	0.41	28857	0.50	7051	2.27	15991
1951	16704	2.27	37885	1.12	18759	0.68	12756	5.00	83522	0.41	34183	0.50	8352	2.27	18943
1952	8707	2.27	19747	1.12	9778	0.68	6649	5.00	43535	0.41	17818	0.50	4354	2.27	9874
1953	6127	2.27	13896	1.12	6881	0.68	4679	5.00	30635	0.41	12538	0.50	3064	2.27	6948
1954	4561	2.27	10344	1.12	5122	0.68	3483	5.00	22805	0.41	9333	0.50	2281	2.27	5172
1955	4054	2.27	9194	1.12	4553	0.68	3096	5.00	20270	0.41	8296	1.00	4054	2.27	9194
1956	8878	2.27	20135	1.12	9970	0.68	6780	5.00	44390	0.41	18167	1.00	8878	2.27	20135
1957	7941	2.27	18010	1.12	8918	0.68	6064	5.00	39705	0.41	16250	1.00	7941	2.27	18010
1958	5471	2.27	12408	1.12	6144	0.68	4178	5.13	28051	0.41	11480	1.00	5471	2.27	12408
1959	4354	2.27	9875	1.12	4890	0.68	3325	8.40	36574	0.41	14968	1.00	4354	2.27	9875
1960	2041	2.42	4929	1.12	2292	0.68	1559	13.74	28051	0.41	11480	2.48	5066	2.42	12235
1961	2000	2.00	4000	1.12	2246	0.68	1527	8.40	28051	0.41	11480	2.48	4964	2.00	9928

Table 4 (Continued). Numbers removed, average weights, removals in weight, CPFV ratios, and expanded removals (numbers) by year for each mode in the recreational fleet for the NCS, 1962-2008. Shaded values indicate reported values; non-shaded are assumed.

	CPFV			Man-Made				Shore-based				PBR			
Year	Removals (#s)	Avg. Wt (kg)	Removals (kg)	CPFV ratio	#s Expanded	Avg. Wt (kg)	Removals (kg)	CPFV ratio	#s Expanded	Avg. Wt (kg)	Removals (kg)	CPFV ratio	#s Expanded	Avg. Wt (kg)	Removals (kg)
1962	3133	2.00	6266	1.12	3518	0.68	2393	8.40	26317	0.72	18948	2.48	7776	2.00	15553
1963	6927	2.00	13854	1.12	7779	0.68	5290	8.40	58187	0.72	41894	2.48	17194	2.00	34387
1964	3900	2.00	7800	1.12	4380	0.68	2978	6.00	23400	0.72	16848	2.48	9680	2.00	19361
1965	5245	2.00	10490	1.12	5890	0.68	4005	6.00	31470	0.72	22658	2.48	13019	2.00	26037
1966	6471	2.00	12942	1.12	7267	0.68	4942	6.00	38826	0.72	27955	2.48	16062	2.00	32124
1967	3378	2.00	6756	1.12	3794	0.68	2580	6.00	20268	0.72	14593	2.48	8385	2.00	16769
1968	2906	2.00	5812	1.12	3263	0.68	2219	6.00	17436	0.72	12554	2.48	7213	2.00	14426
1969	3073	2.00	6146	1.12	3451	0.68	2347	6.00	18438	0.72	13275	2.48	7628	2.00	15255
1970	4913	2.00	9826	1.12	5517	0.68	3752	6.00	29478	0.72	21224	2.48	12195	2.00	24389
1971	2921	2.00	5842	1.12	3280	0.68	2231	6.00	17526	0.72	12619	2.48	7250	2.00	14501
1972	6463	2.00	12926	1.12	7258	0.68	4935	6.00	38778	0.72	27920	2.48	16042	2.00	32084
1973	6265	2.00	12530	1.12	7036	0.68	4784	6.00	37590	0.72	27065	2.48	15550	2.00	31101
1974	5540	2.00	11080	1.12	6221	0.68	4231	6.00	33240	0.72	23933	2.48	13751	2.00	27502
1975	3296	2.00	6592	1.12	3701	0.68	2517	6.00	19776	0.72	14239	2.48	8181	2.00	16362
1976	4904	2.00	9808	1.12	5507	0.68	3745	5.00	24520	0.72	17654	2.48	12172	2.00	24345
1977	4971	2.00	9942	2.00	9942	0.68	6761	5.00	24855	0.72	17896	2.48	12339	2.00	24677
1978	8056	2.00	16112	2.00	16112	0.68	10956	5.00	40280	0.72	29002	2.48	19996	2.00	39992
1979	3439	2.00	6878	2.00	6878	0.68	4677	5.00	17195	0.72	12380	2.48	8536	2.00	17072
1980	6357	1.81	11522	2.07	13157	0.83	9349	4.97	31598	1.16	34458	4.04	25695	1.74	34458
1981	5435	1.85	10055	1.91	10365	0.71	7519	3.11	16893	0.80	12970	5.45	29635	2.35	12970
1982	5646	2.06	11616	0.83	4710	0.73	3167	4.88	27576	1.10	30039	2.89	16309	1.74	30039
1983	3631	2.70	9804	2.96	10762	0.75	8314	10.36	37627	0.98	36160	5.03	18254	1.81	36160
1984	2034	2.06	4185	4.71	9582	1.12	12692	5.24	10655	1.02	11610	14.62	29747	1.53	11610
1985	1792	1.70	3046	4.72	8466	0.56	4342	8.63	15465	0.71	10195	7.85	14066	1.73	10195
1986	3917	2.05	8022	1.69	6608	0.91	5983	5.02	19682	1.04	20447	9.72	38089	1.49	56884
1987	3763	2.06	7742	1.69	6349	0.78	4920	5.02	18908	0.67	12639	9.79	36834	1.51	55696
1988	4105	1.85	7594	1.69	6926	1.27	8778	5.02	20627	0.74	15264	6.39	26251	1.58	41489
1989	3775	1.13	4247	1.69	6369	0.63	3981	5.02	18968	0.98	18522	8.36	31567	1.45	45824
1990	2627	2.06	5405	1.69	4432	0.84	3709	5.02	13200	1.04	13757	6.20	16281	1.97	32023
1991	2743	2.06	5644	1.69	4628	0.84	3872	5.02	13783	1.04	14365	6.20	17000	1.97	33437
1992	5815	2.06	11964	1.69	9811	0.84	8209	5.02	29219	1.04	30452	6.20	36039	1.97	70884
1993	2732	2.06	5621	1.35	3685	0.55	1941	8.89	24290	1.06	26469	12.83	35061	1.36	26469
1994	2001	1.53	3067	0.64	1284	0.94	942	6.32	12648	1.00	13569	10.58	21164	1.38	13569
1995	1987	2.79	5549	1.31	2541	0.29	573	9.99	19345	1.06	20109	15.28	29591	1.53	20109
1996	3126	1.77	5535	1.21	3606	0.54	1879	10.28	30639	0.97	29744	7.96	23730	1.47	29744
1997	2654	2.06	5460	1.06	2777	0.74	1854	13.23	34765	1.15	40373	3.58	9399	1.05	40373
1998	3848	2.06	7917	0.25	961	0.69	557	10.64	40841	1.14	43044	3.54	13577	1.56	43044
1999	3494	2.11	7372	0.58	2035	0.23	439	1.71	5975	0.86	4456	4.25	14867	1.44	4456
2000	2669	2.12	5654	0.23	593	0.54	317	3.90	10272	0.95	9608	3.49	9180	1.66	9608
2001	7208	1.21	8691	0.73	5274	1.11	3674	0.45	3246	0.96	3901	2.11	15186	1.83	3901
2002	1815	2.06	3734	0.75	1351	0.35	943	5.48	9923	1.22	13256	4.95	8956	2.01	13256
2003	5069	2.38	12056	0.27	1349	1.11	1491	1.75	8712	1.62	11280	7.17	35607	1.86	11280
2004	3022	2.23	6724	0.49	1479	1.06	1569	1.57	4756	2.04	9708	2.37	7154	2.31	16522
2005	3728	2.66	9921	0.45	1665	1.20	2003	0.62	2316	1.56	3622	1.93	7202	2.36	16985
2006	2060	2.59	5330	0.11	220	0.66	144	0.25	523	1.89	987	1.67	3448	2.12	7313
2007	1840	2.29	4220	0.32	590	1.66	982	0.29	534	1.40	747	3.34	6136	2.24	13729
2008	1749	2.33	4077	0.34	593	0.62	370	1.17	2054	1.37	2822	4.69	8203	2.10	17214

Table 5. Numbers removed, averaged weights, removals in weight, CPFV ratios, and expanded removals (numbers) by year for each mode in the recreational fleet for the SCS 1916-1961. Shaded values indicate reported values; non-shaded are assumed.

	CPFV			Man-Made				Shore-based				PBR			
Year	Removals (#s)	Avg. Wt (kg)	Removals (kg)	CPFV ratio	#s Expanded	Avg. Wt (kg)	Removals (kg)	CPFV ratio	#s Expanded	Avg. Wt (kg)	Removals (kg)	CPFV ratio	#s Expanded	Avg. Wt (kg)	Removals (kg)
1916	0		0	1.16	45	0.50	23	0.61	24	0.85	20	0.00	0		0
1917	0		0	1.16	45	0.50	23	0.61	24	0.85	20	0.00	0		0
1918	0		0	1.16	45	0.50	23	0.61	24	0.85	20	0.00	0		0
1919	0		0	1.16	45	0.50	23	0.61	24	0.85	20	0.00	0		0
1920	0		0	1.16	45	0.50	23	0.61	24	0.85	20	0.00	0		0
1921	0		0	1.16	45	0.50	23	0.61	24	0.85	20	0.00	0		0
1922	0		0	1.16	45	0.50	23	0.61	24	0.85	20	0.00	0		0
1923	0		0	1.16	45	0.50	23	0.61	24	0.85	20	0.00	0		0
1924	0		0	1.16	45	0.50	23	0.61	24	0.85	20	0.00	0		0
1925	0		0	1.16	45	0.50	23	0.61	24	0.85	20	0.00	0		0
1926	0		0	1.16	45	0.50	23	0.61	24	0.85	20	0.00	0		0
1927	0		0	1.16	45	0.50	23	0.61	24	0.85	20	0.00	0		0
1928	39	1.00	39	1.16	45	0.50	23	0.61	24	0.85	20	0.40	16	1.00	16
1929	78	1.00	78	1.16	91	0.50	45	0.61	48	0.85	41	0.40	31	1.00	31
1930	117	1.00	117	1.16	136	0.50	68	0.61	72	0.85	61	0.40	47	1.00	47
1931	157	1.00	157	1.16	182	0.50	91	0.61	96	0.85	82	0.40	63	1.00	63
1932	196	1.00	196	1.16	228	0.50	114	0.61	120	0.85	102	0.40	78	1.00	78
1933	235	1.00	235	1.16	273	0.50	136	0.61	144	0.85	122	0.40	94	1.00	94
1934	274	1.00	274	1.16	318	0.50	159	0.61	168	0.85	143	0.40	110	1.00	110
1935	314	1.00	314	1.16	364	0.50	182	0.61	192	0.85	163	0.40	126	1.00	126
1936	441	1.00	441	1.16	512	0.50	256	0.61	270	0.85	229	0.40	176	1.00	176
1937	292	1.00	292	1.16	339	0.50	169	0.61	179	0.85	152	0.40	117	1.00	117
1938	825	1.00	825	1.16	958	0.50	479	0.61	505	0.85	429	0.40	330	1.00	330
1939	309	1.00	309	1.16	359	0.50	179	0.61	189	0.85	161	0.40	124	1.00	124
1940	291	1.00	291	1.16	338	0.50	169	0.61	178	0.85	151	0.40	116	1.00	116
1941	613	1.00	613	1.16	712	0.50	356	0.61	375	0.85	319	0.40	245	1.00	245
1942	613	1.00	613	1.16	712	0.50	356	0.61	375	0.85	319	0.40	245	1.00	245
1943	613	1.00	613	1.16	712	0.50	356	0.61	375	0.85	319	0.40	245	1.00	245
1944	613	1.00	613	1.16	712	0.50	356	0.61	375	0.85	319	0.40	245	1.00	245
1945	613	1.00	613	1.16	712	0.50	356	0.61	375	0.85	319	0.40	245	1.00	245
1946	613	1.00	613	1.16	712	0.50	356	0.61	375	0.85	319	0.40	245	1.00	245
1947	1885	1.00	1885	1.16	2188	0.50	1094	0.61	1154	0.85	981	0.40	754	1.00	754
1948	2122	1.00	2122	1.16	2463	0.50	1232	0.61	1299	0.85	1104	0.40	849	1.00	849
1949	2763	1.00	2763	1.16	3207	0.50	1604	0.61	1691	0.85	1437	0.40	1105	1.00	1105
1950	2153	1.00	2153	1.16	2499	0.50	1249	0.61	1317	0.85	1120	0.40	861	1.00	861
1951	1976	1.00	1976	1.16	2294	0.50	1147	0.61	1209	0.85	1028	0.40	790	1.00	790
1952	2659	1.00	2659	1.16	3086	0.50	1543	0.61	1627	0.85	1383	0.40	1064	1.00	1064
1953	3954	1.00	3954	1.16	4589	0.50	2295	0.61	2420	0.85	2057	0.40	1582	1.00	1582
1954	9036	1.00	9036	1.16	10488	0.50	5244	0.61	5529	0.85	4700	0.40	3614	1.00	3614
1955	8713	1.00	8713	1.16	10113	0.50	5057	0.61	5332	0.85	4532	0.40	3485	1.00	3485
1956	9882	1.00	9882	1.16	11470	0.50	5735	0.61	6047	0.85	5140	0.81	8051	1.00	8051
1957	7220	1.00	7220	1.16	8380	0.50	4190	0.61	4418	0.85	3755	0.81	5882	1.00	5882
1958	4868	1.00	4868	1.16	5650	0.50	2825	0.61	2979	0.85	2532	0.81	3966	1.00	3966
1959	1246	1.00	1246	1.16	1446	0.50	723	0.61	762	0.85	648	0.81	1015	1.00	1015
1960	597	1.00	597	1.16	693	0.50	346	0.61	365	0.85	311	0.81	486	1.00	486
1961	706	1.00	706	1.16	819	0.50	410	0.61	432	0.85	367	0.81	575	1.00	575

Table 5 (Continued). Numbers removed, average weights, removals in weight, CPFV ratios, and expanded removals (numbers) by year for each mode in the recreational fleet for the SCS 1962-2008. Shaded values indicate reported values; non-shaded are assumed. Gray cell indicates the modified 1980 PBR value (average of 1981-89).

	CPFV			Man-Made				Beach/Bank				PBR			
Year	Removals (#s)	Avg. Wt (kg)	Removals (kg)	CPFV ratio	#s Expanded	Avg. Wt (kg)	Removals (kg)	CPFV ratio	#s Expanded	Avg. Wt (kg)	Removals (kg)	CPFV ratio	#s Expanded	Avg. Wt (kg)	Removals (kg)
1962	2171	1.00	2171	1.16	2520	0.50	1260	0.61	1328	0.85	1129	0.81	1769	1.00	1769
1963	4368	1.00	4368	1.16	5070	0.50	2535	0.61	2673	0.85	2272	0.81	3559	1.00	3559
1964	3475	1.00	3475	1.16	4033	0.50	2017	0.61	2126	0.85	1807	0.81	2831	1.00	2831
1965	3602	1.00	3602	1.16	4181	0.50	2090	0.61	2204	0.85	1874	2.00	7204	1.00	7204
1966	5507	1.00	5507	1.16	6392	0.50	3196	0.61	3370	0.85	2864	2.00	11014	1.00	11014
1967	2849	1.00	2849	1.16	3307	0.50	1653	1.00	2849	0.85	2422	2.00	5698	1.00	5698
1968	2029	1.00	2029	1.16	2355	0.50	1178	1.00	2029	0.85	1725	2.00	4058	1.00	4058
1969	1939	1.00	1939	1.16	2251	0.50	1125	1.00	1939	0.85	1648	2.00	3878	1.00	3878
1970	2473	1.00	2473	1.16	2870	0.50	1435	1.00	2473	0.85	2102	2.00	4946	1.00	4946
1971	2558	1.00	2558	1.16	2969	0.50	1485	1.00	2558	0.85	2174	4.00	10232	1.00	10232
1972	7459	1.00	7459	1.16	8658	0.50	4329	1.00	7459	0.85	6340	4.00	29836	1.00	29836
1973	2986	1.00	2986	1.16	3466	0.50	1733	1.00	2986	0.85	2538	4.00	11944	1.00	11944
1974	3044	1.00	3044	1.16	3533	0.50	1767	1.00	3044	0.85	2587	4.00	12176	1.00	12176
1975	4521	1.00	4521	1.16	5248	0.50	2624	1.00	4521	0.85	3843	4.00	18084	1.00	18084
1976	2995	1.00	2995	1.16	3476	0.50	1738	1.00	2995	0.85	2546	4.00	11980	1.00	11980
1977	1936	1.00	1936	1.16	2247	0.50	1124	1.00	1936	0.85	1646	4.00	7744	1.00	7744
1978	2858	1.00	2858	1.16	3317	0.50	1659	1.00	2858	0.85	2429	4.00	11432	1.00	11432
1979	2521	1.00	2521	1.16	2926	0.50	1463	1.00	2521	0.85	2143	4.00	10084	1.00	10084
1980	3055	1.03	3131	2.07	6326	0.48	3036	5.76	17609	1.22	21466	6.24	19074	1.41	26821
1981	3469	1.09	3766	0.21	744	0.40	298	3.75	13023	0.80	10418	5.58	19359	1.36	26382
1982	2271	0.78	1766	0.35	790	0.48	375	1.93	4376	0.83	3626	22.64	51406	1.13	58146
1983	2103	0.82	1716	0.65	1373	0.58	801	2.92	6141	0.76	4650	7.24	15220	0.85	12901
1984	638	1.10	702	5.31	3389	0.43	1468	16.84	10746	0.91	9806	40.28	25698	1.10	28220
1985	889	0.55	489	6.34	5634	0.30	1690	9.25	8219	0.82	6740	23.03	20469	1.24	25290
1986	2789	0.59	1637	0.80	2231	0.59	1313	1.57	4379	0.93	4088	13.04	36371	0.88	32152
1987	2756	1.24	3422	0.80	2205	0.84	1852	1.57	4327	1.13	4883	10.63	29305	1.15	33615
1988	2945	0.50	1473	0.80	2356	0.59	1386	1.57	4624	1.20	5548	5.03	14799	0.79	11734
1989	3980	0.71	2819	0.80	3184	0.89	2839	1.57	6249	1.49	9328	2.75	10960	1.18	12950
1990	4754	1.10	5244	0.80	3803	0.59	2237	1.57	7464	0.91	6782	6.50	30901	1.05	32460
1991	4430	1.10	4887	0.80	3544	0.59	2085	1.57	6955	0.91	6320	6.50	28795	1.05	30248
1992	2564	1.10	2828	0.80	2051	0.59	1207	1.57	4025	0.91	3658	6.50	16666	1.05	17507
1993	1410	0.85	1199	0.19	262	0.59	154	0.24	343	0.98	335	4.34	6120	0.53	3256
1994	1038	1.23	1279	0.80	830	0.59	488	0.81	843	0.91	766	9.07	9414	1.14	10769
1995	1832	0.38	687	0.53	975	0.59	574	1.49	2734	0.49	1329	1.58	2903	0.59	1713
1996	3908	0.68	2638	0.64	2496	0.44	1106	0.13	512	0.58	299	2.52	9850	0.97	9540
1997	2573	0.68	1741	0.80	2058	0.59	1211	0.67	1721	0.37	628	1.15	2972	1.21	3596
1998	1739	1.28	2232	0.80	1391	0.59	818	1.22	2130	0.99	2114	3.65	6355	0.78	4963
1999	1191	0.49	580	2.13	2538	0.31	784	2.82	3357	0.73	2459	9.38	11166	0.97	10843
2000	2542	0.62	1576	0.97	2478	0.07	166	0.23	579	0.71	412	1.77	4512	1.00	4529
2001	2020	1.10	2228	0.59	1200	0.59	706	1.19	2409	0.96	2319	2.82	5687	0.58	3323
2002	1263	1.39	1757	0.18	230	0.59	135	1.72	2171	1.44	3127	6.20	7830	0.87	6789
2003	668	2.00	1337	0.88	585	0.59	344	2.64	1766	0.91	1605	9.28	6201	1.03	6385
2004	935	2.03	1895	0.64	600	1.00	600	2.14	2001	0.91	1819	1.22	1137	1.36	1548
2005	1055	1.42	1494	0.63	661	0.80	529	6.62	6980	0.83	5811	1.13	1195	1.28	1533
2006	1115	1.52	1696	1.47	1637	0.78	1280	6.62	7377	0.91	6704	4.13	4600	1.25	5757
2007	1089	2.42	2631	0.19	204	0.58	118	6.62	7205	0.91	6548	7.26	7909	1.35	10653
2008	1286	2.22	2850	1.81	2325	1.03	2403	6.62	8509	0.91	7732	1.99	2554	1.30	3322

Table 6. Expansion factors, proportion cabezon, and average weight used to estimate metric tons of cabezon landed by ocean boats in Oregon (ORS), 1973-78.

Year	Statewide sampling period	Estimated Misc. landings during sampled period	Expansion factor for unsampled ports during sampled period	Expansion factor for unsampled time period	Estimated annual Misc. landings	% cabezon (1979-1983 average)	Estimated annual cabezon landings	Average weight	Est mt cabezon
1973	Jun 15 - Sep 15	2727	0.96	0.59	4815	0.28	1348	2.31	3.1
1974	Jun 15 - Sep 15	3651	0.96	0.59	6446	0.28	1805	2.31	4.2
1975	Jun 15 - Sep 15	4031	0.96	0.59	7117	0.28	1993	2.31	4.6
1976	Jun 15 - Sep 15	8672	0.88	0.59	16703	0.28	4677	2.31	10.8
1977	Jun 15 - Sep 15	7300	0.91	0.59	13597	0.28	3807	2.31	8.8
1978	Jun 15 - Sep 15	18206	0.96	0.59	32143	0.28	9000	2.31	20.8

Table 7. Expansion factors and average weights used to estimate metric tons of cabezon landed by ocean boats in Oregon (ORS), 1979-92.
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Year	Statewide sampling starts	Statewide sampling ends	Estimated # of cabezon within sampled period	Proportion of coverage during sampling period	Proportion of annual landings in sampled period	Expanded annual estimate	Average weight**	Estimated MT landed by ocean boats
1979	mid-May	mid-Sept	3033	0.91	0.73	4522	2.31	10.4
1980	mid-May	mid-Sept	1898	0.91	0.73	2830	2.07	5.9
1981	mid-May	mid-Sept	5578	0.96	0.73	7903	2.87	22.7
1982	1-Jun	Labor Day	4140	0.96	0.65	6649	2	13.3
1983	mid-June	mid-Sept	4399	0.96	0.59	7793	1.42	11
1984	mid-June	Labor Day	4099	0.96	0.56	7650	1.85	14.1
1985	1-Jul	Labor Day	2163	0.96	0.47	4830	1.62	7.8
1986	mid-May	Labor Day	4505	0.96	0.7	6659	2.33	15.5
1987	early-June	mid-Sept	1750	0.96	0.68	2684	2.18	5.9
1988	1-May	mid-Sept	5535	0.96	0.79	7286	1.69	12.3
1989	1-May	mid-Sept	6742	0.93	0.79	9171	1.73	15.8
1990*	1-May	mid-Sept				9674	1.94	18.7
1991*	mid-May	Labor Day				5938	2.14	12.7
1992*	1-May	mid-Sept				6958	2.35	16.3

*Expansion to annual landings in numbers of fish completed in 2001 ODFW historical catch reconstruction
**RecFIN estimated average weight of examined catch (A) for Ocean Boats,1979 is 1980-1982 average, 1990-1992 interpolated

Table 8. Commercial landings, discards, and recreational catch (mt) of cabezon for the NCS from 1916-59.

	NSC							
	Commercial				Recreational			
Year	Nonlive	(discards)	Live	(discards)	Man-Made	Shore	PBR	CPFV
1916	0.03	0.00	0.00	0.00	0.33	0.71	0.00	0.00
1917	0.15	0.00	0.00	0.00	0.33	0.71	0.00	0.00
1918	0.08	0.00	0.00	0.00	0.33	0.71	0.00	0.00
1919	0.00	0.00	0.00	0.00	0.33	0.71	0.00	0.00
1920	0.00	0.00	0.00	0.00	0.33	0.71	0.00	0.00
1921	0.00	0.00	0.00	0.00	0.33	0.71	0.00	0.00
1922	0.00	0.00	0.00	0.00	0.33	0.71	0.00	0.00
1923	0.00	0.00	0.00	0.00	0.33	0.71	0.00	0.00
1924	0.00	0.00	0.00	0.00	0.33	0.71	0.00	0.00
1925	1.52	0.00	0.00	0.00	0.33	0.71	0.00	0.00
1926	0.00	0.00	0.00	0.00	0.33	0.71	0.00	0.00
1927	0.34	0.00	0.00	0.00	0.33	0.71	0.00	0.00
1928	1.19	0.00	0.00	0.00	0.33	0.71	0.00	0.00
1929	0.54	0.00	0.00	0.00	0.33	0.71	0.49	0.98
1930	0.47	0.00	0.00	0.00	0.49	1.06	0.73	1.47
1931	0.51	0.00	0.00	0.00	0.66	1.41	0.98	1.96
1932	2.12	0.00	0.00	0.00	0.82	1.76	1.22	2.44
1933	1.90	0.00	0.00	0.00	0.99	2.11	1.46	2.93
1934	2.37	0.00	0.00	0.00	1.15	2.47	1.71	3.42
1935	4.71	0.00	0.00	0.00	1.31	2.82	1.95	3.90
1936	8.33	0.00	0.00	0.00	1.85	3.96	2.74	5.48
1937	3.71	0.00	0.00	0.00	1.60	3.42	2.37	4.74
1938	2.46	0.00	0.00	0.00	3.05	6.54	4.53	9.06
1939	1.82	0.00	0.00	0.00	1.74	3.72	2.58	5.15
1940	1.51	0.00	0.00	0.00	2.53	5.43	3.76	7.53
1941	6.02	0.00	0.00	0.00	1.93	5.17	0.00	5.72
1942	1.04	0.00	0.00	0.00	1.93	5.17	0.00	5.72
1943	3.41	0.00	0.00	0.00	1.93	5.17	0.00	5.72
1944	1.75	0.00	0.00	0.00	1.93	5.17	0.00	5.72
1945	1.95	0.00	0.00	0.00	1.93	5.17	0.00	5.72
1946	3.54	0.00	0.00	0.00	1.93	5.17	0.00	5.72
1947	2.05	0.00	0.00	0.00	7.65	20.50	11.36	22.72
1948	3.71	0.00	0.00	0.00	10.25	27.46	15.22	30.43
1949	7.27	0.00	0.00	0.00	9.38	25.13	13.92	27.85
1950	9.54	0.00	0.00	0.00	10.77	28.86	15.99	31.98
1951	10.80	0.00	0.00	0.00	12.76	34.18	18.94	37.89
1952	15.60	0.00	0.00	0.00	6.65	17.82	9.87	19.75
1953	6.02	0.00	0.00	0.00	4.68	12.54	6.95	13.90
1954	2.82	0.00	0.00	0.00	3.48	9.33	5.17	10.34
1955	3.14	0.00	0.00	0.00	3.10	8.30	9.19	9.19
1956	5.57	0.00	0.00	0.00	6.78	18.17	20.14	20.14
1957	5.63	0.00	0.00	0.00	6.06	16.25	18.01	18.01
1958	8.79	0.00	0.00	0.00	4.18	11.48	12.41	12.41
1959	4.30	0.00	0.00	0.00	3.33	14.97	9.88	9.88

Table 8 (Continued). Commercial landings, discards, and recreational catch (mt) of cabezon for the NCS from 1960-2008.

	NSC							
	Commercial				Recreational			
Year	Nonlive	(discards)	Live	(discards)	Man-Made	Shore	PBR	CPFV
1960	1.39	0.00	0.00	0.00	1.56	11.48	12.24	4.93
1961	2.24	0.00	0.00	0.00	1.53	11.48	9.93	4.00
1962	1.12	0.00	0.00	0.00	2.39	18.95	15.55	6.27
1963	1.27	0.00	0.00	0.00	5.29	41.89	34.39	13.85
1964	2.33	0.00	0.00	0.00	2.98	16.85	19.36	7.80
1965	3.36	0.00	0.00	0.00	4.01	22.66	26.04	10.49
1966	5.66	0.00	0.00	0.00	4.94	27.96	32.12	12.94
1967	6.44	0.00	0.00	0.00	2.58	14.59	16.77	6.76
1968	9.06	0.00	0.00	0.00	2.22	12.55	14.43	5.81
1969	11.68	0.00	0.00	0.00	2.35	13.28	15.26	6.15
1970	4.76	0.00	0.00	0.00	3.75	21.22	24.39	9.83
1971	2.03	0.00	0.00	0.00	2.23	12.62	14.50	5.84
1972	2.62	0.00	0.00	0.00	4.94	27.92	32.08	12.93
1973	2.05	0.00	0.00	0.00	4.78	27.07	31.10	12.53
1974	6.69	0.00	0.00	0.00	4.23	23.93	27.50	11.08
1975	3.30	0.00	0.00	0.00	2.52	14.24	16.36	6.59
1976	8.60	0.00	0.00	0.00	3.75	17.65	24.35	9.81
1977	5.40	0.00	0.00	0.00	6.76	17.90	24.68	9.94
1978	12.57	0.00	0.00	0.00	10.96	29.00	39.99	16.11
1979	22.61	0.00	0.00	0.00	6.22	16.47	22.71	9.15
1980	23.66	0.00	0.00	0.00	10.87	36.54	44.59	11.52
1981	28.95	0.00	0.00	0.00	7.20	13.58	69.75	10.05
1982	28.79	0.00	0.00	0.00	3.45	30.33	28.34	11.62
1983	10.52	0.00	0.00	0.00	8.03	36.73	33.06	9.80
1984	8.42	0.00	0.00	0.00	10.77	10.88	45.59	4.18
1985	11.66	0.00	0.00	0.00	4.72	10.98	24.33	3.05
1986	7.18	0.00	0.00	0.00	5.98	36.00	56.88	8.02
1987	3.72	0.00	0.00	0.00	4.92	14.95	55.70	7.74
1988	5.29	0.00	0.00	0.00	8.78	26.42	41.49	7.59
1989	10.89	0.00	0.00	0.00	3.98	26.94	45.82	4.25
1990	11.17	0.00	0.00	0.00	3.50	14.94	28.31	5.40
1991	5.79	0.00	0.00	0.00	3.66	15.60	29.56	5.64
1992	16.21	0.00	0.00	0.00	7.74	33.05	62.63	11.96
1993	17.05	0.47	0.39	0.01	2.03	25.64	47.63	5.62
1994	4.70	0.23	26.73	0.65	1.20	12.59	29.26	3.07
1995	5.54	0.28	71.94	1.72	0.74	20.46	45.33	5.55
1996	4.32	0.20	96.03	2.37	1.96	29.64	34.96	5.53
1997	6.10	0.53	101.75	2.48	2.04	39.87	9.89	5.46
1998	6.61	0.35	145.25	3.63	0.66	46.66	21.23	7.92
1999	4.94	0.21	105.46	2.55	0.47	5.16	21.34	7.37
2000	3.08	0.13	90.76	2.22	0.32	9.80	15.22	5.65
2001	1.39	0.08	56.84	1.38	5.86	3.12	27.79	8.69
2002	1.62	0.04	41.98	0.97	0.47	12.12	18.03	3.73
2003	1.85	0.21	32.07	6.49	1.49	14.11	66.20	12.06
2004	1.18	0.00	42.61	4.79	2.75	9.54	21.37	6.72
2005	0.84	0.03	27.61	3.11	1.95	3.53	24.54	9.92
2006	0.70	0.55	24.37	3.51	0.25	1.74	14.38	5.33
2007	0.85	0.00	21.37	4.06	1.94	1.49	10.67	4.22
2008	0.48	0.05	18.82	0.43	0.77	6.27	8.51	4.08

Table 8 (Continued). Commercial landings, discards, and recreational catch (mt) of cabezon for the SCS from 1916-59.

	SCS							
	Commercial				Recreational			
Year	Nonlive	(discards)	Live	(discards)	Man-Made	Shore	PBR	CPFV
1916	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00
1917	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00
1918	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00
1919	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00
1920	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00
1921	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00
1922	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00
1923	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00
1924	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00
1925	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00
1926	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00
1927	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00
1928	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.04
1929	0.00	0.00	0.00	0.00	0.05	0.04	0.03	0.08
1930	0.00	0.00	0.00	0.00	0.07	0.06	0.05	0.12
1931	0.00	0.00	0.00	0.00	0.09	0.08	0.06	0.16
1932	0.00	0.00	0.00	0.00	0.11	0.10	0.08	0.20
1933	0.03	0.00	0.00	0.00	0.14	0.12	0.09	0.24
1934	0.00	0.00	0.00	0.00	0.16	0.14	0.11	0.27
1935	0.07	0.00	0.00	0.00	0.18	0.16	0.13	0.31
1936	0.01	0.00	0.00	0.00	0.26	0.23	0.18	0.44
1937	0.00	0.00	0.00	0.00	0.17	0.15	0.12	0.29
1938	0.00	0.00	0.00	0.00	0.48	0.43	0.33	0.83
1939	0.00	0.00	0.00	0.00	0.18	0.16	0.12	0.31
1940	0.03	0.00	0.00	0.00	0.17	0.15	0.12	0.29
1941	0.04	0.00	0.00	0.00	0.36	0.32	0.25	0.61
1942	0.00	0.00	0.00	0.00	0.36	0.32	0.25	0.61
1943	0.00	0.00	0.00	0.00	0.36	0.32	0.25	0.61
1944	0.02	0.00	0.00	0.00	0.36	0.32	0.25	0.61
1945	0.00	0.00	0.00	0.00	0.36	0.32	0.25	0.61
1946	0.00	0.00	0.00	0.00	0.36	0.32	0.25	0.61
1947	0.01	0.00	0.00	0.00	1.09	0.98	0.75	1.89
1948	0.01	0.00	0.00	0.00	1.23	1.10	0.85	2.12
1949	0.01	0.00	0.00	0.00	1.60	1.44	1.11	2.76
1950	0.29	0.00	0.00	0.00	1.25	1.12	0.86	2.15
1951	0.02	0.00	0.00	0.00	1.15	1.03	0.79	1.98
1952	0.05	0.00	0.00	0.00	1.54	1.38	1.06	2.66
1953	0.02	0.00	0.00	0.00	2.30	2.06	1.58	3.95
1954	0.00	0.00	0.00	0.00	5.24	4.70	3.61	9.04
1955	0.01	0.00	0.00	0.00	5.06	4.53	3.49	8.71
1956	0.06	0.00	0.00	0.00	5.74	5.14	8.05	9.88
1957	0.36	0.00	0.00	0.00	4.19	3.76	5.88	7.22
1958	0.07	0.00	0.00	0.00	2.83	2.53	3.97	4.87
1959	0.01	0.00	0.00	0.00	0.72	0.65	1.02	1.25

Table 8 (Continued). Commercial landings, discards, and recreational catch (mt) of cabezon for the SCS from 1960-2008.

	SCS							
	Commercial				Recreational			
Year	Nonlive	(discards)	Live	(discards)	Man-Made	Shore	PBR	CPFV
1960	0.00	0.00	0.00	0.00	0.35	0.31	0.49	0.60
1961	0.01	0.00	0.00	0.00	0.41	0.37	0.58	0.71
1962	0.00	0.00	0.00	0.00	1.26	1.13	1.77	2.17
1963	0.01	0.00	0.00	0.00	2.54	2.27	3.56	4.37
1964	0.07	0.00	0.00	0.00	2.02	1.81	2.83	3.48
1965	0.02	0.00	0.00	0.00	2.09	1.87	7.20	3.60
1966	0.05	0.00	0.00	0.00	3.20	2.86	11.01	5.51
1967	0.04	0.00	0.00	0.00	1.65	2.42	5.70	2.85
1968	0.06	0.00	0.00	0.00	1.18	1.73	4.06	2.03
1969	0.04	0.00	0.00	0.00	1.13	1.65	3.88	1.94
1970	0.09	0.00	0.00	0.00	1.44	2.10	4.95	2.47
1971	0.02	0.00	0.00	0.00	1.49	2.17	10.23	2.56
1972	0.04	0.00	0.00	0.00	4.33	6.34	29.84	7.46
1973	0.02	0.00	0.00	0.00	1.73	2.54	11.94	2.99
1974	0.07	0.00	0.00	0.00	1.77	2.59	12.18	3.04
1975	0.03	0.00	0.00	0.00	2.62	3.84	18.08	4.52
1976	0.09	0.00	0.00	0.00	1.74	2.55	11.98	3.00
1977	0.11	0.00	0.00	0.00	1.12	1.65	7.74	1.94
1978	0.32	0.00	0.00	0.00	1.66	2.43	11.43	2.86
1979	0.21	0.00	0.00	0.00	1.24	1.82	8.55	2.14
1980	3.57	0.00	0.00	0.00	3.04	21.47	26.82	3.13
1981	0.26	0.00	0.00	0.00	0.30	10.42	26.38	3.77
1982	0.15	0.00	0.00	0.00	0.38	3.63	58.15	1.77
1983	0.19	0.00	0.00	0.00	0.80	4.65	12.90	1.72
1984	0.05	0.00	0.00	0.00	1.47	9.81	28.22	0.70
1985	0.12	0.00	0.00	0.00	1.69	6.74	25.29	0.49
1986	0.19	0.00	0.00	0.00	1.31	15.32	32.15	1.64
1987	0.29	0.00	0.00	0.00	1.85	7.38	33.62	3.42
1988	0.49	0.00	0.00	0.00	1.39	4.16	11.73	1.47
1989	0.46	0.00	0.00	0.00	2.84	6.56	12.95	2.82
1990	0.61	0.00	0.00	0.00	2.24	6.78	32.46	5.24
1991	1.60	0.00	0.00	0.00	2.08	6.32	30.25	4.89
1992	0.46	0.00	0.00	0.00	1.21	3.66	17.51	2.83
1993	0.39	0.01	0.00	0.00	0.15	0.33	3.26	1.20
1994	0.70	0.02	5.48	0.14	0.49	0.77	10.77	1.28
1995	0.74	0.02	9.68	0.24	0.57	1.32	1.71	0.69
1996	0.45	0.01	10.43	0.26	1.09	0.29	9.38	2.64
1997	0.61	0.02	11.68	0.29	1.21	0.63	3.60	1.74
1998	0.67	0.02	16.58	0.41	0.83	2.15	5.05	2.23
1999	0.32	0.01	13.89	0.35	0.78	2.45	10.82	0.58
2000	0.85	0.02	21.39	0.54	0.17	0.41	4.52	1.58
2001	0.60	0.02	13.49	0.34	0.70	2.30	3.30	2.23
2002	0.36	0.00	6.35	0.16	0.13	3.11	6.76	1.76
2003	0.36	0.32	5.40	0.14	0.34	1.61	6.39	1.34
2004	0.21	0.00	5.50	0.14	0.87	2.24	1.94	1.89
2005	0.44	0.01	2.05	1.58	0.55	6.04	1.59	1.49
2006	0.31	0.00	2.89	0.79	0.40	1.59	1.81	1.70
2007	0.07	0.00	3.14	0.08	0.05	1.55	4.21	2.63
2008	0.05	0.00	3.65	0.09	0.64	1.83	0.89	2.85

Table 8 (Continued). Commercial landings, discards, and recreational catch (mt) of cabezon for the CAS from 1916-59.

	CAS							
	Commercial				Recreational			
Year	Nonlive	(discards)	Live	(discards)	Man-Made	Shore	PBR	CPFV
1916	0.03	0.00	0.00	0.00	0.35	0.73	0.00	0.00
1917	0.15	0.00	0.00	0.00	0.35	0.73	0.00	0.00
1918	0.08	0.00	0.00	0.00	0.35	0.73	0.00	0.00
1919	0.00	0.00	0.00	0.00	0.35	0.73	0.00	0.00
1920	0.00	0.00	0.00	0.00	0.35	0.73	0.00	0.00
1921	0.00	0.00	0.00	0.00	0.35	0.73	0.00	0.00
1922	0.00	0.00	0.00	0.00	0.35	0.73	0.00	0.00
1923	0.00	0.00	0.00	0.00	0.35	0.73	0.00	0.00
1924	0.00	0.00	0.00	0.00	0.35	0.73	0.00	0.00
1925	1.52	0.00	0.00	0.00	0.35	0.73	0.00	0.00
1926	0.00	0.00	0.00	0.00	0.35	0.73	0.00	0.00
1927	0.34	0.00	0.00	0.00	0.35	0.73	0.00	0.00
1928	1.19	0.00	0.00	0.00	0.35	0.73	0.02	0.04
1929	0.54	0.00	0.00	0.00	0.38	0.75	0.52	1.06
1930	0.47	0.00	0.00	0.00	0.56	1.12	0.78	1.58
1931	0.51	0.00	0.00	0.00	0.75	1.49	1.04	2.11
1932	2.12	0.00	0.00	0.00	0.94	1.86	1.30	2.64
1933	1.93	0.00	0.00	0.00	1.12	2.24	1.56	3.16
1934	2.37	0.00	0.00	0.00	1.31	2.61	1.82	3.69
1935	4.78	0.00	0.00	0.00	1.50	2.98	2.08	4.22
1936	8.34	0.00	0.00	0.00	2.10	4.19	2.92	5.93
1937	3.71	0.00	0.00	0.00	1.76	3.57	2.49	5.03
1938	2.46	0.00	0.00	0.00	3.53	6.97	4.86	9.88
1939	1.82	0.00	0.00	0.00	1.91	3.88	2.70	5.46
1940	1.54	0.00	0.00	0.00	2.70	5.58	3.88	7.82
1941	6.05	0.00	0.00	0.00	2.28	5.48	0.25	6.34
1942	1.04	0.00	0.00	0.00	2.28	5.48	0.25	6.34
1943	3.41	0.00	0.00	0.00	2.28	5.48	0.25	6.34
1944	1.77	0.00	0.00	0.00	2.28	5.48	0.25	6.34
1945	1.95	0.00	0.00	0.00	2.28	5.48	0.25	6.34
1946	3.54	0.00	0.00	0.00	2.28	5.48	0.25	6.34
1947	2.05	0.00	0.00	0.00	8.74	21.48	12.11	24.60
1948	3.72	0.00	0.00	0.00	11.48	28.56	16.06	32.55
1949	7.28	0.00	0.00	0.00	10.98	26.56	15.03	30.61
1950	9.83	0.00	0.00	0.00	12.02	29.98	16.85	34.14
1951	10.82	0.00	0.00	0.00	13.90	35.21	19.73	39.86
1952	15.65	0.00	0.00	0.00	8.19	19.20	10.94	22.41
1953	6.04	0.00	0.00	0.00	6.97	14.60	8.53	17.85
1954	2.82	0.00	0.00	0.00	8.73	14.03	8.79	19.38
1955	3.15	0.00	0.00	0.00	8.15	12.83	12.68	17.91
1956	5.62	0.00	0.00	0.00	12.52	23.31	28.19	30.02
1957	5.99	0.00	0.00	0.00	10.25	20.01	23.89	25.23
1958	8.85	0.00	0.00	0.00	7.00	14.01	16.37	17.28
1959	4.30	0.00	0.00	0.00	4.05	15.62	10.89	11.12

Table 8 (Continued). Commercial landings, discards, and recreational catch (mt) of cabezon for the CAS from 1960-2008.

	CAS							
	Commercial				Recreational			
Year	Nonlive	(discards)	Live	(discards)	Man-Made	Shore	PBR	CPFV
1960	1.39	0.00	0.00	0.00	1.91	11.79	12.72	5.53
1961	2.25	0.00	0.00	0.00	1.94	11.85	10.50	4.71
1962	1.12	0.00	0.00	0.00	3.65	20.08	17.32	8.44
1963	1.28	0.00	0.00	0.00	7.83	44.17	37.95	18.22
1964	2.40	0.00	0.00	0.00	5.00	18.66	22.19	11.28
1965	3.37	0.00	0.00	0.00	6.10	24.53	33.24	14.09
1966	5.72	0.00	0.00	0.00	8.14	30.82	43.14	18.45
1967	6.48	0.00	0.00	0.00	4.23	17.02	22.47	9.61
1968	9.12	0.00	0.00	0.00	3.40	14.28	18.48	7.84
1969	11.72	0.00	0.00	0.00	3.47	14.92	19.13	8.09
1970	4.85	0.00	0.00	0.00	5.19	23.33	29.34	12.30
1971	2.05	0.00	0.00	0.00	3.72	14.79	24.73	8.40
1972	2.66	0.00	0.00	0.00	9.26	34.26	61.92	20.39
1973	2.07	0.00	0.00	0.00	6.52	29.60	43.05	15.52
1974	6.76	0.00	0.00	0.00	6.00	26.52	39.68	14.12
1975	3.33	0.00	0.00	0.00	5.14	18.08	34.45	11.11
1976	8.69	0.00	0.00	0.00	5.48	20.20	36.33	12.80
1977	5.51	0.00	0.00	0.00	7.89	19.54	32.42	11.88
1978	12.89	0.00	0.00	0.00	12.62	31.43	51.42	18.97
1979	22.83	0.00	0.00	0.00	7.46	18.28	31.26	11.29
1980	27.23	0.00	0.00	0.00	13.90	58.01	71.41	14.65
1981	29.21	0.00	0.00	0.00	7.50	24.00	96.13	13.82
1982	28.94	0.00	0.00	0.00	3.82	33.96	86.49	13.38
1983	10.70	0.00	0.00	0.00	8.83	41.38	45.96	11.52
1984	8.47	0.00	0.00	0.00	12.24	20.69	73.81	4.89
1985	11.77	0.00	0.00	0.00	6.41	17.72	49.62	3.54
1986	7.36	0.00	0.00	0.00	7.30	51.31	89.04	9.66
1987	4.01	0.00	0.00	0.00	6.77	22.33	89.31	11.16
1988	5.78	0.00	0.00	0.00	10.16	30.58	53.22	9.07
1989	11.35	0.00	0.00	0.00	6.82	33.50	58.77	7.07
1990	11.78	0.00	0.00	0.00	5.74	21.72	60.77	10.65
1991	7.39	0.00	0.00	0.00	5.74	21.92	59.81	10.53
1992	16.67	0.00	0.00	0.00	8.95	36.71	80.14	14.79
1993	17.44	0.48	0.39	0.01	2.19	25.98	50.88	6.82
1994	5.40	0.24	32.21	0.78	1.69	13.36	40.02	4.35
1995	6.28	0.30	81.62	1.96	1.31	21.78	47.03	6.24
1996	4.77	0.21	106.46	2.63	3.04	29.94	44.33	8.17
1997	6.71	0.54	113.43	2.77	3.26	40.50	13.49	7.20
1998	7.28	0.37	161.83	4.05	1.49	48.81	26.28	10.15
1999	5.26	0.22	119.35	2.90	1.26	7.62	32.16	7.95
2000	3.93	0.15	112.15	2.76	0.49	10.21	19.75	7.23
2001	1.99	0.10	70.33	1.72	6.56	5.42	31.10	10.92
2002	1.98	0.04	48.33	1.13	0.61	15.23	24.79	5.49
2003	2.21	0.53	37.47	6.63	1.84	15.72	72.59	13.39
2004	1.39	0.00	48.11	4.93	3.62	11.77	23.31	8.62
2005	1.28	0.03	29.66	4.70	2.50	9.57	26.13	11.41
2006	1.01	0.55	27.26	4.30	0.66	3.33	16.20	7.03
2007	0.92	0.01	24.51	4.14	1.99	3.04	14.88	6.85
2008	0.53	0.05	22.47	0.53	1.41	8.11	9.40	6.93

Table 8 (Continued). Commercial landings, discards, and recreational catch (mt) of cabezon for the CAS from 1973-2008.

	Oregon					
	Commercial				Recreational	
Year	Nonlive	(discards)	Live	(discards)	Shored-based	Boat-based
1973	0.00	0.00	0.00	0.00	3.29	3.10
1974	0.00	0.00	0.00	0.00	3.29	4.20
1975	0.00	0.00	0.00	0.00	3.29	4.60
1976	0.00	0.00	0.00	0.00	3.29	10.80
1977	0.00	0.00	0.00	0.00	3.29	8.80
1978	0.00	0.00	0.00	0.00	3.29	20.80
1979	0.00	0.00	0.00	0.00	3.29	10.40
1980	0.00	0.00	0.00	0.00	3.29	5.90
1981	0.08	0.00	0.06	0.00	3.66	22.70
1982	0.03	0.00	0.03	0.00	1.57	13.30
1983	0.28	0.00	0.04	0.00	1.78	11.00
1984	1.09	0.00	0.05	0.00	1.12	14.10
1985	2.54	0.00	0.03	0.00	3.47	7.80
1986	4.92	0.00	0.05	0.00	5.91	15.50
1987	6.37	0.00	0.00	0.00	4.41	5.90
1988	11.33	0.00	0.00	0.00	1.39	12.30
1989	6.70	0.00	0.00	0.00	3.17	15.80
1990	5.16	0.00	0.00	0.00	4.11	18.70
1991	8.32	0.00	0.00	0.00	4.11	12.70
1992	7.23	0.00	0.00	0.00	4.11	16.30
1993	1.43	0.00	0.03	0.00	5.05	17.60
1994	6.99	0.00	0.04	0.00	2.03	18.70
1995	5.72	0.00	0.03	0.00	1.71	13.60
1996	5.65	0.00	0.06	0.00	1.48	14.40
1997	10.08	0.00	10.87	0.00	1.85	20.00
1998	3.70	0.00	23.19	0.00	0.56	16.50
1999	3.00	0.00	23.46	0.00	0.90	17.90
2000	3.39	0.00	27.80	0.00	0.87	16.20
2001	2.38	0.00	43.94	0.00	3.17	12.10
2002	1.51	0.03	44.50	0.00	1.77	15.10
2003	1.44	0.04	25.55	0.00	1.59	16.00
2004	1.51	0.03	26.21	5.96	0.98	17.20
2005	1.39	0.12	27.58	0.83	2.11	17.60
2006	0.75	0.00	21.29	3.58	1.56	16.10
2007	0.65	0.10	21.22	1.26	1.56	16.30
2008	1.56	0.00	23.50	0.00	1.56	16.60

Table 9. Catch length-compositions by sub-stock, fishery sector, and fleet. N = original length-composition sample sizes, either trips (recreational) or clusters (commercial). [A-NCS, B-SCS, C-CAS, D-ORS]

NCS			Length bin																																	
Sector	Year	N	6	8	10	12	14	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+
Commercial																																				
Non-live	1995	71	0	0	0	0	0	0	0	0	0	0	255	211	378	410	330	438	294	301	165	505	64	41	109	73	35	2	22	3	0	0	3	0	0	0
	1996	231	0	0	0	0	0	0	0	2	2	28	86	243	509	597	506	442	309	204	170	150	156	134	77	50	32	21	19	0	2	0	0	0	0	0
	1997	102	0	0	0	0	0	0	0	0	0	4	23	85	450	706	594	706	527	490	608	150	359	182	184	103	89	147	141	141	0	77	0	0	0	0
	1998	26	0	0	0	0	0	0	0	0	0	0	28	28	257	406	753	601	548	875	214	66	100	182	0	26	0	0	0	0	0	0	0	0	0	0
	1999	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	134	542	456	412	414	230	75	0	80	0	55	0	0	0	0	0	0	0	0	0
	2000	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	338	518	253	253	308	196	237	55	140	140	0	55	0	0	0	70	0	0	0
Live	1997	16	0	0	0	0	0	0	0	0	0	0	0	0	0	96	1440	1632	2496	1632	2112	864	960	576	576	288	192	96	192	0	96	0	0	0	0	0
	1998	111	0	0	0	0	0	0	0	0	0	0	476	2443	7430	10842	20456	23249	18562	12723	11932	4637	3847	2460	1442	666	954	815	312	133	0	0	0	0	0	0
	1999	174	0	0	0	0	0	0	0	0	0	48	0	65	26	281	2590	16100	15080	10976	8326	5929	3277	2809	1864	1327	1173	458	535	207	68	6	0	0	0	0
	2000	323	0	0	0	0	0	0	0	0	0	0	16	42	87	128	5872	13902	12400	10458	6570	5997	4051	2499	1541	1602	648	363	255	114	121	21	0	0	0	0
	2001	156	0	0	0	0	0	0	0	0	0	0	0	0	0	12	878	3910	9455	8455	6143	4749	2930	1664	845	833	285	246	160	48	0	12	0	0	0	0
	2002	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1934	4961	3071	2582	2326	2533	1369	1406	1075	580	451	360	202	0	64	0	0	0	0
	2003	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	408	662	234	152	226	10	614	610	1830	0	610	610	0	0	0	0	0	0
	2004	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	192	1375	2183	916	208	101	6	274	245	306	378	123	70	115	0	0	0	0	0
	2005	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	1472	885	1003	678	479	0	114	331	138	114	67	0	0	0	0	0	0	0
	2006	31	0	0	0	0	0	0	0	0	0	0	0	64	215	64	128	386	2401	2380	1236	1605	1279	606	388	572	194	486	325	0	0	0	0	32	0	0
	2007	50	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	97	663	756	393	239	285	130	120	173	108	210	101	67	45	0	31	10	0	0
	2008	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	0	628	657	878	594	287	91	135	68	92	69	23	23	0	0	0	0	0	0
Recreational																																				
Man-Made	1980	33	0	0	0	0	0	1	1	3	2	4	8	4	3	3	4	1	2	1	2	1	1	1	1	1	0	1	1	0	0	0	0	0	0	1
	1981	27	0	0	0	0	0	0	0	2	0	3	9	4	8	4	4	2	1	1	0	2	1	2	0	0	0	0	0	1	0	0	0	0	0	0
	1982	20	0	0	0	0	0	2	1	1	0	1	0	4	2	3	1	1	2	1	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0
	1983	24	0	0	0	0	0	1	0	2	0	6	4	2	2	3	4	3	0	2	2	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0
	1984	25	0	0	0	0	0	2	0	0	2	1	0	2	2	5	1	3	0	1	1	0	2	2	1	1	1	0	1	0	0	1	0	0	0	0
	1985	26	0	0	1	0	0	1	2	2	4	7	2	2	7	2	2	0	1	0	2	1	0	2	0	0	1	0	0	0	0	0	0	0	0	0
	1986	28	0	0	0	0	1	0	0	1	0	3	3	4	5	3	1	2	1	2	0	1	1	2	1	1	1	0	0	1	0	0	0	0	0	0
	1987	27	0	0	0	0	1	2	3	1	1	1	3	1	5	3	0	3	5	1	0	2	0	2	1	0	2	0	0	0	0	0	0	0	0	0
	1988	24	0	1	0	2	0	2	1	1	1	0	3	5	3	4	1	2	0	1	1	3	2	2	1	4	0	1	0	0	3	0	2	0	0	0
	1989	8	0	0	0	0	0	0	0	0	1	1	0	2	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	1993	20	0	0	0	1	0	2	0	5	2	2	4	2	2	4	0	2	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0
	1994	5	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
	1996	13	0	0	1	1	1	1	0	2	0	1	1	0	2	2	1	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1997	4	0	0	0	0	0	0	0	2	0	1	1	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	1998	3	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1999	4	0	0	1	0	0	0	0	3	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2000	2	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2001	7	0	0	0	0	0	1	2	2	1	2	2	1	4	1	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2002	5	0	0	0	1	0	0	1	0	1	0	1	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	2003	4	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	2004	12	0	0	0	0	0	0	0	2	1	3	0	2	2	1	1	0	1	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
	2005	18	0	0	0	0	0	0	1	0	2	1	1	2	3	1	0	1	2	5	1	0	0	1	3	1	0	0	0	0	0	0	0	0	0	0
	2006	6	0	0	0	0	0	0	0	0	0	1	2	2	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
	2007	11	0	0	0	0	0	0	1	1	1	1	2	0	1	0	0	0	0	0	0	1	2	0	0	0	0	0	1	0	0	0	0	0	0	0
	2008	16	0	0	0	0	0	0	0	1	1	2	3	3	3	1	0	0	1	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0

Table 9A (Continued). NCS

NCS			Length bin																																	
Sector	Year	N	6	8	10	12	14	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+
Shore	1980	29	0	0	0	0	1	1	0	0	0	0	3	3	2	5	2	5	1	3	5	3	3	1	2	0	1	2	0	0	0	0	0	0	1	1
	1981	28	0	0	0	0	0	0	0	0	2	2	0	7	5	7	5	9	4	2	2	3	1	0	1	1	0	0	0	0	0	0	0	0	0	0
	1982	45	0	0	0	0	1	0	0	1	3	3	5	3	4	5	5	4	5	3	6	5	4	3	1	2	0	0	0	2	1	0	1	0	0	0
	1983	53	0	0	0	0	0	0	0	2	2	2	6	5	3	11	8	20	10	16	6	6	3	3	2	0	2	1	0	1	0	0	0	0	0	0
	1984	22	0	0	0	0	0	0	1	0	1	2	1	1	3	1	1	4	2	2	2	1	1	2	0	3	0	0	0	0	0	0	0	0	0	0
	1985	26	0	0	2	0	2	0	0	3	1	3	1	2	3	5	8	5	1	2	4	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0
	1986	30	0	0	0	0	0	0	0	0	3	2	3	0	5	8	4	5	3	7	6	7	2	2	1	0	0	3	0	0	0	0	0	0	0	0
	1987	17	0	0	1	1	1	0	2	2	1	0	1	0	1	2	1	4	3	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
	1988	5	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1989	8	0	0	0	0	0	2	0	5	1	0	0	0	0	2	0	0	0	1	1	1	0	0	0	1	1	0	1	1	0	0	0	0	0	0
	1993	40	0	0	0	0	1	0	1	0	2	0	2	1	2	8	9	10	6	9	3	4	2	2	1	0	1	2	0	1	0	0	0	0	0	0
	1994	15	0	0	0	0	0	1	1	0	0	1	0	1	1	1	2	6	1	0	3	1	0	2	1	0	1	1	0	0	0	0	0	0	0	0
	1996	36	0	0	0	0	0	0	0	0	0	1	1	3	6	5	15	10	9	6	4	3	2	0	2	1	0	0	0	0	0	0	0	0	0	0
	1997	26	0	0	0	0	0	0	0	0	2	1	1	2	2	7	6	7	9	7	6	5	2	2	1	1	1	0	0	0	0	0	0	0	0	0
	1998	29	0	0	0	0	0	0	0	0	0	1	1	0	5	4	8	8	11	6	9	5	1	0	3	3	0	0	0	0	0	0	0	0	0	0
	1999	19	0	0	0	0	0	0	0	0	0	2	0	3	6	10	5	4	3	4	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0
	2000	13	0	0	0	0	0	0	1	0	0	0	1	2	0	1	6	1	2	3	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
	2001	8	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	2	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2002	9	0	0	0	0	0	0	0	1	0	1	0	0	0	1	2	0	3	3	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0
	2003	4	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	1	0	2	0	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0
	2004	13	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	3	4	1	2	2	0	2	4	0	1	0	0	0	0	0	0	0	0
	2005	10	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	2	2	2	0	2	0	0	1	0	1	0	0	0	0	0	0	0	0
	2006	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
	2007	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2008	8	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	2	1	2	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0
PBR	1980	46	0	0	0	0	0	0	0	0	0	0	1	4	0	2	2	3	4	3	7	12	6	6	6	1	3	2	5	2	2	1	1	0	0	0
	1981	27	0	0	0	0	0	1	0	0	0	0	0	1	2	0	1	3	5	3	3	2	4	4	6	6	3	2	3	2	2	0	1	1	0	2
	1982	26	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	3	4	5	3	5	2	0	1	3	3	2	0	0	0	0	0	0
	1983	29	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	4	4	3	2	6	1	3	1	6	4	2	2	3	0	1	0	0	0	0
	1984	43	0	0	0	0	0	0	0	0	1	0	0	0	1	1	2	12	11	8	6	4	7	11	5	5	6	2	3	0	1	0	0	0	0	0
	1985	26	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	1	7	1	6	4	4	2	3	2	4	2	1	0	0	0	0	0	0
	1986	51	0	0	0	0	0	0	0	0	0	0	0	0	1	4	7	7	5	6	10	6	4	5	7	4	4	1	2	1	1	0	0	0	0	0
	1987	37	0	0	0	0	0	0	0	0	1	0	0	0	1	0	3	4	5	8	4	8	8	2	2	3	3	2	2	1	0	1	0	0	0	0
	1988	25	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	4	3	7	5	4	2	5	1	2	3	2	0	0	0	1	1	0	0	0
	1989	29	0	0	0	1	0	0	0	0	0	0	1	3	3	3	3	4	4	6	5	7	3	4	2	4	1	5	1	0	1	1	1	0	0	0
	1993	85	0	0	0	0	0	0	0	2	0	1	3	0	2	7	12	10	27	23	23	8	3	6	6	8	2	3	0	0	1	0	0	0	0	0
	1994	40	0	0	0	0	0	0	0	0	0	0	2	1	0	3	5	10	7	8	5	4	6	0	0	2	1	3	2	2	0	0	0	0	0	0
	1996	56	0	0	0	0	0	0	0	0	1	2	0	1	7	9	9	4	14	8	12	8	8	6	5	6	4	2	2	0	2	0	1	0	0	0
	1997	16	0	0	0	0	0	0	0	0	0	0	1	2	0	3	4	0	4	2	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0
	1998	37	0	0	0	0	0	0	1	1	0	1	0	0	2	3	3	7	11	9	7	3	2	8	2	1	1	2	0	0	0	0	0	0	0	0
	1999	46	0	0	0	0	0	0	0	0	0	0	0	0	0	5	4	4	8	12	6	7	4	5	3	3	2	2	0	0	0	0	0	0	0	0
	2000	33	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	4	3	8	7	5	7	3	0	1	3	0	0	1	0	0	0	0	0
	2001	22	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	4	3	3	5	10	2	7	3	1	0	1	0	0	0	0	0	0	0
	2002	16	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3	4	3	6	3	2	1	3	0	1	0	1	1	1	0	1	0	0	0
	2003	62	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2	2	9	9	8	14	12	13	8	7	6	1	2	0	1	0	0	0	0	0
	2004	237	1	0	0	0	0	0	0	0	0	0	0	0	1	3	5	7	23	48	46	55	60	63	54	31	28	25	12	9	1	2	2	2	1	2
	2005	439	0	0	0	0	0	0	0	0	0	0	1	1	3	7	2	16	34	53	85	91	99	102	106	90	61	41	32	19	11	4	7	1	0	2
	2006	412	0	0	0	0	0	0	1	0	0	0	1	0	2	4	10	13	36	64	69	72	72	71	62	67	49	51	26	8	8	2	2	1	0	1
	2007	303	0	0	0	0	0	1	0	0	0	0	0	2	2	2	7	19	25	50	47	47	59	67	48	50	34	27	18	11	8	2	3	2	0	1
	2008	256	0	0	0	0	1	0	0	0	0	0	0	1	2	5	4	19	38	47	52	63	59	48	40	28	36	14	12	8	7	4	2	1	0	2

Table 9A (Continued). NCS

NCS			Length bin																																	
Sector	Year	N	6	8	10	12	14	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+
CPFV (Observer)	1987	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	2	3	2	5	3	3	2	2	5	0	1	0	0	0	0	0
	1988	21	0	0	0	0	0	0	0	0	0	0	1	2	2	0	1	3	4	6	6	8	16	4	5	10	2	2	4	0	1	2	1	0	0	0
	1989	21	0	0	0	0	0	0	0	0	0	0	0	1	1	2	3	8	2	8	8	3	8	7	8	4	4	4	1	1	0	1	0	0	0	0
	1990	6	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	1	1	1	1	1	0	0	1	0	1	0	0	0	0	0	0
	1991	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	2	1	2	1	0	1	1	3	1	0	0	0	0	0	0	0
	1992	16	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	6	1	5	4	2	2	2	2	0	1	0	0	1	0	0	0	0	0	0
	1993	12	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	2	4	6	3	3	1	3	2	2	0	1	0	0	0	0	0	0	0	0
	1994	16	0	0	0	0	0	0	0	0	0	0	0	0	2	0	6	7	2	4	5	4	4	1	0	2	2	0	0	1	0	1	0	0	0	0
	1995	18	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	6	3	7	3	6	1	2	3	0	1	0	1	0	0	0	0	0	0	0
	1996	31	0	0	0	0	0	0	0	0	1	0	0	1	6	14	10	11	13	10	8	7	7	7	6	3	0	1	0	1	1	0	0	0	0	0
	1997	30	0	0	0	0	0	0	0	0	0	1	0	0	0	1	5	16	6	9	6	1	9	1	0	2	0	1	0	1	0	0	0	0	0	0
	1998	23	0	0	0	0	0	0	0	0	0	0	1	0	1	1	3	7	6	8	2	5	4	2	1	0	0	0	0	0	0	0	0	0	0	0
CPFV (RecFIN)	1980	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	2	0	0	1	1	1	0	0	0	0	0	0	0	0
	1981	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0
	1982	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	1	0	0	0	0	0	0
	1983	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	1	0	0	0
	1985	8	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	2	0	2	0	2	1	2	2	2	0	0	0	0	0	0	0	0
	1986	9	0	0	0	0	0	0	0	1	0	1	1	0	0	0	2	0	5	2	1	3	2	2	1	3	2	1	1	0	3	0	1	0	0	1
	1987	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1988	6	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	1	0	1	0	3	3	0	0	0	2	0	0	0	0	0	0	1
	1989	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1994	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0	0	1	0	2	1	0	0	0	0	0	0	0	0	0	0
	1996	16	0	0	0	0	0	0	0	0	0	0	0	1	2	1	3	1	5	1	4	3	4	2	2	1	1	3	0	1	0	0	0	0	1	0
	1997	28	0	0	0	0	0	0	0	0	0	1	0	0	0	1	5	16	6	8	5	1	9	1	0	2	0	1	0	1	0	0	0	0	0	0
	1998	29	0	0	0	0	0	0	0	0	0	0	1	0	1	1	4	9	7	8	2	6	5	2	1	1	0	0	0	0	0	0	0	0	0	0
	1999	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2	1	0	0	0	1	1	0	0	0	0	0	0
	2000	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	1	0	2	2	3	1	1	1	0	0	0	0	0	0	0	0
	2001	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	9	8	11	4	12	11	7	3	5	2	0	0	0	0	0	0	0	0
	2002	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2	1	2	1	0	0	0	0	1	0	0	0	0	0	0	0
	2003	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	10	10	12	14	16	5	13	5	3	2	2	1	1	0	0	0	0	1
	2004	23	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	2	5	4	4	6	5	3	2	0	0	1	0	0	0	1	0	0	0
	2005	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	6	9	6	7	11	5	1	3	3	0	1	3	0	0	0	0
	2006	34	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3	5	7	7	8	9	6	6	4	0	3	1	0	0	0	0	0	0
	2007	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	6	3	7	3	9	7	4	7	5	3	3	0	1	0	0	0	0
	2008	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	7	9	6	3	5	3	7	2	0	1	2	1	0	0	0	0	1
CPFV (CalPOLY)	2003	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	1	2	0	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0
	2004	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	3	1	3	0	5	2	2	3	0	0	0	0	0	0	0	0	0
	2005	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	2	0	0	0	1	1	0	0	0	0	0
	2006	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	3	0	0	0	0	0	0	0	0
	2007	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0
	2008	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0

Table 9B (Continued). SCS

SCS			Length bin																															
Sector	Year	N	6	8	10	12	14	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+
Commercial																																		
Live	2002	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	228	57	57	57	171	114	0	57	57	57	0	0	0	0	0	0
	2003	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	159	264	201	393	21	255	21	0	0	117	0	117	0	0	0	0
	2005	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	195	156	78	39	0	39	39	39	39	0	0	0	0	0	0	0
	2006	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	880	560	560	240	240	160	0	0	0	0	0	0	0	0	0	0
	2008	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66	302	144	82	250	376	710	388	0	16	0	0	0	0	0	0	0
Recreational																																		
Man-made	1980	7	0	0	0	0	0	0	1	1	1	0	0	0	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1981	2	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1982	4	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	5	0	0	0	0	0	0	1	0	0	0	2	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	1984	8	0	0	1	0	1	1	0	0	1	0	0	3	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1985	5	0	0	0	1	1	1	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1986	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1987	6	0	0	0	0	0	0	0	0	0	0	1	2	1	0	1	1	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0
	1988	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1989	8	0	1	0	0	0	2	0	0	1	0	0	1	1	2	1	1	1	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0
	1993	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1996	2	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1999	5	0	0	0	0	1	0	0	1	1	2	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2000	2	0	0	2	4	3	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
	2002	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2003	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2004	4	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	2005	7	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	2006	6	0	0	0	0	0	0	0	1	0	0	1	0	0	0	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2007	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2008	5	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Shore	1980	6	0	0	0	0	0	0	0	0	1	1	0	1	1	1	0	0	0	0	2	1	1	1	1	0	0	0	0	0	0	0	0	0
	1981	8	0	0	0	0	0	0	0	0	0	2	0	0	0	1	4	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
	1982	5	0	0	0	0	0	0	0	0	0	0	0	0	2	1	2	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	1983	7	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	1984	8	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
	1985	10	0	0	0	0	0	0	0	0	0	0	1	4	1	2	1	3	3	2	2	0	0	0	0	0	1	0	0	0	0	0	0	0
	1986	12	0	0	0	0	0	0	1	0	0	1	1	1	3	1	4	3	2	1	0	2	0	1	0	0	0	0	0	0	0	0	1	0
	1987	5	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0
	1988	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
	1989	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	2	1	5	1	0	0	1	0	0	0	0	0	0	1	0
	1993	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
	1996	2	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1997	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1998	5	0	0	0	0	0	0	0	0	0	0	1	2	1	3	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
	1999	4	0	0	0	0	0	0	0	0	0	0	1	2	0	2	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2000	2	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2001	3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2002	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	2003	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2004	4	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2005	2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 9B (Continued). SCS

SCS			Length bin																													
Sector	Year	N	6	8	10	12	14	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
PBR	1980	60	0	0	0	0	0	0	0	0	0	2	5	6	10	8	19	17	9	11	9	15	12	6	10	13	6	6	8	1	1	0	0	0
	1981	25	0	0	0	0	0	0	0	0	0	0	1	0	2	6	3	3	3	4	3	5	4	1	0	1	4	0	1	2	0	0	0	0
	1982	24	0	0	0	0	0	0	0	0	0	1	3	5	3	2	5	3	3	3	2	4	0	2	2	4	3	0	0	0	0	0	0	0
	1983	28	0	0	0	0	0	0	0	0	1	1	0	4	10	3	6	5	2	2	2	2	2	0	1	0	0	0	1	0	0	0	0	0
	1984	34	0	0	0	0	0	0	0	0	2	0	0	2	2	5	7	5	5	6	6	2	3	2	4	2	0	0	0	0	0	0	0	0
	1985	18	0	0	0	0	0	0	0	0	0	0	4	3	1	0	2	2	5	2	4	1	1	0	0	2	2	0	1	0	0	0	0	1
	1986	20	0	0	0	0	0	0	0	0	3	5	3	4	2	4	2	2	1	4	1	3	1	1	1	2	1	0	0	0	0	0	0	0
	1987	10	0	0	0	0	0	0	0	0	0	0	1	3	1	2	1	1	0	1	2	0	0	1	1	1	1	0	1	0	0	0	0	0
	1988	9	0	0	0	0	0	0	0	0	0	0	0	1	4	1	0	3	2	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0
	1989	14	0	0	0	0	0	0	0	0	1	0	3	0	2	1	1	3	3	1	0	3	2	2	1	2	1	1	0	0	0	0	0	0
	1993	10	0	0	0	0	0	0	0	0	1	0	2	1	4	4	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	1994	13	0	0	0	0	0	0	0	0	0	0	1	1	2	3	3	1	0	2	0	1	0	2	0	0	1	1	0	2	0	0	0	0
	1996	11	0	0	0	0	0	0	0	0	0	1	1	3	6	5	1	0	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	1997	9	0	0	0	0	0	0	0	0	0	0	0	0	1	4	1	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
	1998	10	0	0	0	0	0	0	0	0	0	0	2	1	0	6	6	3	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
	1999	23	0	0	0	0	0	0	1	0	1	1	0	3	1	6	11	9	6	2	2	1	0	0	0	1	0	0	0	0	0	0	0	0
	2000	6	0	0	0	0	0	0	0	0	0	0	2	2	1	0	0	0	0	1	0	0	0	0	2	1	0	0	0	0	0	0	0	0
	2001	6	0	0	0	0	0	0	0	0	0	1	0	0	2	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2002	18	0	0	0	0	0	0	0	0	0	0	0	0	6	5	5	1	1	0	1	2	0	0	0	1	0	0	0	0	0	0	0	0
	2003	20	0	0	0	0	0	0	0	0	0	0	0	1	1	5	6	5	3	4	0	1	1	0	1	1	0	0	0	0	0	0	0	0
	2004	76	0	0	0	0	0	0	0	0	0	1	0	2	7	9	13	10	12	19	10	9	7	5	4	3	3	0	1	0	0	0	0	1
	2005	55	0	0	0	0	0	0	0	0	0	1	1	5	1	8	8	12	6	6	7	4	2	5	4	1	1	0	2	0	0	0	0	0
	2006	75	0	0	0	0	0	0	0	0	0	0	1	4	2	10	13	12	29	12	10	10	3	1	2	2	0	0	1	0	0	0	0	0
	2007	60	0	0	0	0	0	0	0	0	0	0	2	5	3	2	5	9	15	9	9	9	4	5	2	1	0	0	2	0	0	0	0	0
	2008	46	0	0	0	0	0	0	0	0	0	0	0	1	2	8	5	8	7	10	5	3	3	1	0	4	0	0	0	0	0	0	0	0
CPFV (Observer)	1975	32	0	0	0	0	0	0	1	0	1	2	7	6	11	13	7	10	3	6	4	2	2	2	0	1	0	0	1	0	0	0	0	0
	1976	63	0	0	0	1	0	0	0	1	1	5	6	11	18	9	6	8	5	8	3	4	2	2	4	0	1	1	0	0	0	0	0	0
	1977	44	0	0	0	0	1	0	0	0	0	5	9	10	11	5	7	7	4	3	4	1	3	3	0	1	1	0	0	0	1	0	0	0
	1978	51	0	0	0	1	0	0	2	1	0	5	5	7	12	8	11	8	5	9	8	3	3	4	0	4	4	0	1	0	0	0	0	0
	1986	60	0	0	0	0	0	0	1	1	6	15	13	16	14	4	3	3	3	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0
	1987	64	0	0	0	0	0	0	0	0	2	1	13	12	25	13	12	9	10	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	1988	40	0	0	0	0	0	0	0	0	1	4	3	5	8	10	8	6	8	10	1	1	0	0	1	0	0	0	0	0	0	0	0	0
	1989	63	0	0	0	0	0	1	0	2	6	15	15	8	9	8	6	8	3	1	3	1	1	4	2	0	0	0	0	0	0	0	0	0
CPFV (tagging)	2002	4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2003	50	0	0	0	0	0	0	0	0	2	1	6	2	5	9	10	23	21	25	14	15	4	6	4	3	0	1	1	0	0	0	0	0
	2004	20	0	0	0	0	0	0	1	0	0	0	2	2	1	3	5	2	7	7	4	6	8	4	6	5	3	1	1	0	0	0	0	0
	2005	31	0	0	0	0	0	0	0	0	0	0	1	7	9	4	6	6	3	3	2	4	7	2	0	0	0	0	0	0	0	0	0	0

Table 9B (Continued). SCS

SCS			Length bin																																
Sector	Year	N	6	8	10	12	14	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+
CPFV (RecFIN)	1980	13	0	0	0	0	0	0	0	0	0	0	2	0	5	0	1	0	3	0	0	1	0	0	2	1	0	0	0	0	0	0	0	0
	1981	14	0	0	0	0	0	0	0	0	1	0	0	1	1	0	2	1	2	0	0	3	1	1	0	1	0	0	0	0	0	0	0	0
	1982	9	0	0	0	0	0	0	0	0	0	0	1	4	1	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	1983	19	0	0	0	0	0	0	0	0	1	1	1	0	2	5	4	0	3	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0
	1984	8	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0
	1985	7	0	0	0	0	0	0	0	1	0	1	1	1	0	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1986	13	0	0	0	0	0	0	0	0	1	0	3	0	5	1	3	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1987	9	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	2	2	1	1	0	1	0	1	0	0	0	0	0	0	0
	1988	5	0	0	0	0	0	0	0	0	1	1	1	1	1	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1989	12	0	0	0	1	0	0	0	0	0	3	1	1	0	1	2	1	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
	1993	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	1994	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	1996	11	0	0	0	0	0	0	0	1	2	0	1	0	1	5	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
	1997	4	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1998	8	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	2	0	2	0	0	1	0	0	1	0	0	0	0	0	0	0	0
	1999	5	0	0	0	0	0	0	0	0	0	0	2	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	2000	4	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2001	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2002	7	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	1	2	1	0	0	0	0	0	0	0	0	1	0	0	0	0
	2003	7	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	0
	2004	14	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	1	1	3	1	2	1	3	0	2	1	0	0	0	0	0	0
	2005	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	0	1	0	1	0	0	0	0	0	0	0	0	0	0
	2006	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6	1	3	1	0	2	0	0	1	1	0	0	0	0	0	0
	2007	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	3	4	0	3	2	2	0	0	1	2	0	1	0	0
	2008	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	1	1	1	2	3	2	0	1	1	0	0	0	1	0	0

Table 9C (Continued). CAS

CAS			Length bin																																	
Sector	Year	N	6	8	10	12	14	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+
Commercial																																				
Non-live	1995	71	0	0	0	0	0	0	0	0	0	0	255	211	378	410	330	438	294	301	165	505	64	41	109	73	35	2	22	3	0	0	3	0	0	0
	1996	231	0	0	0	0	0	0	0	2	2	28	86	243	509	597	506	442	309	204	170	150	156	134	77	50	32	21	19	0	2	0	0	0	0	0
	1997	102	0	0	0	0	0	0	0	0	0	4	23	85	450	706	594	706	527	490	608	150	359	182	184	103	89	147	141	141	0	77	0	0	0	0
	1998	26	0	0	0	0	0	0	0	0	0	0	28	28	257	406	753	601	548	875	214	66	100	182	0	26	0	0	0	0	0	0	0	0	0	0
	1999	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	134	542	456	412	414	230	75	0	80	0	55	0	0	0	0	0	0	0	0	0
	2000	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	338	518	253	253	308	196	237	55	140	140	0	55	0	0	0	70	0	0	0
Live	1997	16	0	0	0	0	0	0	0	0	0	0	0	0	0	96	1440	1632	2496	1632	2112	864	960	576	576	288	192	96	192	0	96	0	0	0	0	0
	1998	111	0	0	0	0	0	0	0	0	0	0	476	2443	7430	10842	20456	23249	18562	12723	11932	4637	3847	2460	1442	666	954	815	312	133	0	0	0	0	0	0
	1999	174	0	0	0	0	0	0	0	0	0	48	0	65	26	281	2590	16100	15080	10976	8326	5929	3277	2809	1864	1327	1173	458	535	207	68	6	0	0	0	0
	2000	323	0	0	0	0	0	0	0	0	0	0	16	42	87	128	5872	13902	12400	10458	6570	5997	4051	2499	1541	1602	648	363	255	114	121	21	0	0	0	0
	2001	156	0	0	0	0	0	0	0	0	0	0	0	0	0	12	878	3910	9455	8455	6143	4749	2930	1664	845	833	285	246	160	48	0	12	0	0	0	0
	2002	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1934	5189	3128	2639	2383	2704	1483	1406	1132	637	508	360	202	0	64	0	0	0	0
	2003	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	567	926	435	545	247	265	635	610	1830	117	610	727	0	0	0	0	0	0
	2004	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	192	1375	2183	916	208	101	6	274	245	306	378	123	70	115	0	0	0	0	0
	2005	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	1667	1041	1081	717	479	39	153	370	177	114	67	0	0	0	0	0	0	0
	2006	34	0	0	0	0	0	0	0	0	0	0	0	64	215	64	128	466	3281	2940	1796	1845	1519	766	388	572	194	486	325	0	0	0	0	32	0	0
	2007	50	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	97	663	756	393	239	285	130	120	173	108	210	101	67	45	0	31	10	0	0
	2008	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	66	930	801	960	844	663	801	523	68	108	69	23	23	0	0	0	0	0	0
Recreational																																				
Man-Made	1980	40	0	0	0	0	0	1	2	4	3	4	8	4	4	5	4	2	2	1	2	1	1	1	1	1	0	1	1	0	0	0	0	0	0	1
	1981	29	0	0	0	0	0	0	0	2	1	3	9	4	8	5	4	2	1	1	0	2	1	2	0	0	0	0	0	1	0	0	0	0	0	0
	1982	24	0	0	0	0	0	2	1	1	0	2	0	5	2	5	1	1	2	1	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0
	1983	29	0	0	0	0	0	1	1	2	0	6	6	3	2	3	4	3	1	2	3	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0
	1984	33	0	0	1	0	1	3	0	0	3	1	0	5	3	6	1	4	0	1	1	0	2	2	1	1	1	0	1	0	0	1	0	0	0	0
	1985	31	0	0	1	1	1	2	2	2	4	8	4	2	7	2	2	0	1	0	2	1	0	2	0	0	1	0	0	0	0	0	0	0	0	0
	1986	29	0	0	0	0	1	0	0	1	0	3	4	4	5	3	1	2	1	2	0	1	1	2	1	1	1	0	0	1	0	0	0	0	0	0
	1987	33	0	0	0	0	1	2	3	1	1	1	4	3	6	3	1	4	6	2	0	3	0	3	1	0	2	0	0	0	0	0	0	0	0	0
	1988	25	0	1	0	2	0	2	1	1	1	0	3	5	3	5	1	2	0	1	1	3	2	2	1	4	0	1	0	0	3	0	2	0	0	0
	1989	16	0	1	0	0	0	2	0	0	2	1	0	3	1	3	1	2	1	2	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0
	1993	21	0	0	0	1	0	2	0	5	2	2	5	2	2	4	0	2	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0
	1994	5	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
	1996	15	0	0	1	1	1	1	0	3	0	2	1	1	2	2	1	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1997	4	0	0	0	0	0	0	0	2	0	1	1	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	1998	3	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1999	9	0	0	1	0	1	0	0	4	2	2	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2000	4	0	0	2	4	3	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2001	7	0	0	0	0	0	1	2	2	1	2	2	1	4	1	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2002	6	0	0	0	1	0	0	1	0	1	0	1	2	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	2003	5	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	2004	16	0	0	0	0	0	1	0	2	1	3	0	3	2	1	2	0	1	0	1	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0
	2005	25	0	0	0	0	0	0	1	0	3	1	2	3	4	2	1	1	2	5	1	0	1	1	3	1	0	0	0	0	0	0	0	0	0	0
	2006	12	0	0	0	0	0	0	0	1	0	1	3	2	0	0	3	1	2	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
	2007	13	0	0	0	0	0	0	1	1	1	1	2	0	1	2	0	0	0	0	0	1	2	0	0	0	0	0	1	0	0	0	0	0	0	0
	2008	21	0	0	0	0	0	0	0	1	1	2	3	3	5	2	0	0	2	0	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0

Table 9C (Continued). CAS

CAS Sector	Year	N	6	8	10	12	14	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+
			Length bin																																	
Shore	1980	35	0	0	0	0	1	1	0	0	1	1	3	4	3	6	2	5	1	3	7	4	4	2	3	0	1	2	0	0	0	0	0	0	1	1
	1981	36	0	0	0	0	0	0	0	0	2	4	0	7	5	8	9	9	4	2	3	3	2	0	1	1	0	0	0	0	0	0	0	0	0	0
	1982	50	0	0	0	0	1	0	0	1	3	3	5	3	6	6	7	5	5	3	6	5	4	3	2	2	0	0	0	2	1	0	1	0	0	0
	1983	60	0	0	0	0	0	0	1	2	2	2	7	5	3	11	9	22	10	16	7	7	3	3	2	0	2	1	0	1	0	0	0	0	0	0
	1984	30	0	0	0	0	0	0	1	0	1	2	1	1	3	2	4	5	3	2	4	1	1	2	0	3	0	0	0	0	0	0	0	0	0	0
	1985	36	0	0	2	0	2	0	0	3	1	3	2	6	4	7	9	8	4	4	6	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0
	1986	42	0	0	0	0	0	0	1	0	3	3	4	1	8	9	8	8	5	8	6	9	2	3	1	0	0	3	0	0	0	0	1	0	0	0
	1987	22	0	0	1	1	1	0	2	2	1	0	1	0	3	2	2	4	4	1	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0
	1988	7	0	0	0	0	0	0	1	0	0	0	0	1	0	1	1	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	1989	11	0	0	0	0	0	2	0	5	1	0	0	1	0	2	1	0	1	3	2	6	1	0	0	2	1	0	1	1	0	0	1	0	0	0
	1993	42	0	0	0	0	1	0	1	0	2	0	2	1	3	8	9	10	6	9	4	4	2	3	1	0	1	2	0	1	0	0	0	0	0	0
	1994	15	0	0	0	0	0	1	1	0	0	1	0	1	1	1	2	6	1	0	3	1	0	2	1	0	1	1	0	0	0	0	0	0	0	0
	1996	38	0	0	0	0	0	0	0	0	0	1	1	4	7	5	16	10	9	6	4	3	2	0	2	1	0	0	0	0	0	0	0	0	0	0
	1997	27	0	0	0	0	0	0	0	0	2	1	3	2	2	7	6	7	9	7	6	5	2	2	1	1	1	0	0	0	0	0	0	0	0	0
	1998	34	0	0	0	0	0	0	0	0	0	1	2	2	6	7	9	8	11	6	11	5	1	0	3	3	0	0	0	0	0	0	0	0	0	0
	1999	23	0	0	0	0	0	0	0	0	0	2	1	5	6	12	5	6	3	5	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0
	2000	15	0	0	0	0	0	0	1	0	1	0	2	2	0	1	6	2	2	4	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
	2001	11	0	0	0	0	0	0	0	0	0	2	0	1	1	1	0	3	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2002	11	0	0	0	0	0	0	0	1	0	1	0	0	0	1	3	0	4	3	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	2003	6	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1	1	0	2	0	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0
	2004	17	0	0	0	0	0	0	0	0	0	0	1	0	2	1	3	0	3	4	1	2	2	0	2	4	0	1	0	0	0	0	0	0	0	0
	2005	12	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	2	3	3	2	0	2	0	0	1	0	1	0	0	0	0	0	0	0	0
	2006	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
	2007	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2008	8	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	2	1	2	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0
PBR	1980	106	0	0	0	0	0	0	0	0	0	2	6	10	10	10	21	20	13	14	16	27	18	12	16	14	9	8	13	3	3	1	1	0	0	0
	1981	52	0	0	0	0	0	1	0	0	0	0	1	1	4	6	4	6	8	7	6	7	8	5	6	7	7	2	4	4	2	0	1	1	0	2
	1982	50	0	0	0	0	0	0	0	0	0	1	3	5	3	4	7	4	4	6	6	9	3	7	4	4	4	3	3	2	0	0	0	0	0	0
	1983	57	0	0	0	0	0	0	0	0	1	2	0	4	11	4	7	9	6	5	4	8	3	3	2	6	4	2	3	3	0	1	0	0	0	0
	1984	77	0	0	0	0	0	0	0	0	3	0	0	2	3	6	9	17	16	14	12	6	10	13	9	7	6	2	3	0	1	0	0	0	0	0
	1985	44	0	0	0	0	0	0	0	0	0	1	4	3	1	0	2	4	6	9	5	7	5	4	2	5	4	4	3	1	0	0	0	0	1	0
	1986	71	0	0	0	0	0	0	0	0	3	5	3	4	3	8	9	9	6	10	11	9	5	6	8	6	5	1	2	1	1	0	0	0	0	0
	1987	47	0	0	0	0	0	0	0	0	1	0	1	3	2	2	4	5	5	9	6	8	8	3	3	4	4	2	3	1	0	1	0	0	0	0
	1988	34	0	0	0	0	0	0	0	0	1	0	0	1	4	1	0	7	5	8	5	6	2	5	1	2	3	2	0	0	0	1	1	0	0	0
	1989	43	0	0	0	1	0	0	0	0	1	0	4	3	5	4	4	7	7	7	5	10	5	6	3	6	2	6	1	0	1	1	1	0	0	0
	1993	95	0	0	0	0	0	0	0	2	1	1	5	1	6	11	13	11	27	23	24	8	3	6	6	8	2	3	0	0	1	0	0	0	0	0
	1994	53	0	0	0	0	0	0	0	0	0	0	3	2	2	6	8	11	7	10	5	5	6	2	0	2	2	4	2	4	0	0	0	0	0	0
	1996	67	0	0	0	0	0	0	0	0	1	3	1	4	13	14	10	4	17	8	12	8	8	6	5	6	4	2	2	0	3	0	1	0	0	0
	1997	25	0	0	0	0	0	0	0	0	0	0	1	2	1	7	5	1	4	2	3	1	3	0	0	1	0	0	0	0	0	0	0	0	0	0
	1998	47	0	0	0	0	0	0	1	1	0	1	2	1	2	9	9	10	11	11	9	3	2	8	2	1	1	2	0	0	0	0	0	0	0	0
	1999	69	0	0	0	0	0	0	1	0	1	1	0	3	1	11	15	13	14	14	8	8	4	5	3	4	2	2	0	0	0	0	0	0	0	0
	2000	39	0	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	4	4	8	7	5	7	5	1	1	3	0	0	1	0	0	0	0	0
	2001	28	0	0	0	0	0	0	0	0	0	1	1	0	2	1	6	1	4	3	3	5	10	2	7	3	1	0	1	0	0	0	0	0	0	0
	2002	34	0	0	0	0	0	0	0	0	0	0	0	0	7	5	6	4	5	3	7	5	2	1	3	1	1	0	1	1	1	0	1	0	0	0
	2003	82	1	0	0	1	0	0	0	0	0	0	0	1	1	5	8	7	12	13	8	15	13	13	9	8	6	1	2	0	1	0	0	0	0	0
	2004	313	1	0	0	0	0	0	0	0	0	1	0	2	8	12	18	17	35	67	56	64	67	68	58	34	31	25	13	9	1	2	2	3	1	2
	2005	494	0	0	0	0	0	0	0	0	0	1	2	6	4	15	10	28	40	59	92	95	101	107	110	91	62	41	34	19	11	4	7	1	0	2
	2006	487	0	0	0	0	0	0	1	0	0	0	2	4	4	14	23	25	65	76	79	82	75	72	64	69	49	51	27	8	8	2	2	1	0	1
	2007	363	0	0	0	0	0	1	0	0	0	0	2	7	5	4	12	28	40	59	56	56	63	72	50	51	34	27	20	11	8	2	3	2	0	1
	2008	302	0	0	0	0	1	0	0	0	0	0	0	2	4	13	9	27	45	57	57	66	62	49	40	32	36	14	12	8	7	4	2	1	0	3

Table 9C (Continued). CAS

CAS			Length bin																													
Sector	Year	N	6	8	10	12	14	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
CPFV (Observer)	1975	32	0	0	0	0	0	0	1	0	1	2	7	6	11	13	7	10	3	6	4	2	2	2	0	1	0	0	1	0	0	0	0	0
	1976	63	0	0	0	1	0	0	0	1	1	5	6	11	18	9	6	8	5	8	3	4	2	2	4	0	1	1	0	0	0	0	0	0
	1977	44	0	0	0	0	1	0	0	0	0	5	9	10	11	5	7	7	4	3	4	1	3	3	0	1	1	0	0	0	1	0	0	0
	1978	51	0	0	0	1	0	0	2	1	0	5	5	7	12	8	11	8	5	9	8	3	3	4	0	4	4	0	1	0	0	0	0	0
	1986	60	0	0	0	0	0	0	1	1	6	15	13	16	14	4	3	3	3	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0
	1987	64	0	0	0	0	0	0	0	0	2	1	13	12	25	13	12	9	10	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	1988	40	0	0	0	0	0	0	0	0	1	4	3	5	8	10	8	6	8	10	1	1	0	0	1	0	0	0	0	0	0	0	0	0
	1989	63	0	0	0	0	0	1	0	2	6	15	15	8	9	8	6	8	3	1	3	1	1	4	2	0	0	0	0	0	0	0	0	0
CPFV (Observer)	1987	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	2	3	2	5	3	3	2	2	5	0	1	0	0	0
	1988	21	0	0	0	0	0	0	0	0	0	0	1	2	2	0	1	3	4	6	6	8	16	4	5	10	2	2	4	0	1	2	1	0
	1989	21	0	0	0	0	0	0	0	0	0	0	0	1	1	2	3	8	2	8	8	3	8	7	8	4	4	4	1	1	0	1	0	0
	1990	6	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	1	1	1	1	1	0	0	1	0	1	0	0	0	0
	1991	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	2	1	2	1	0	1	1	3	1	0	0	0	0	0
	1992	16	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	6	1	5	4	2	2	2	2	0	1	0	0	1	0	0	0	0
	1993	12	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	2	4	6	3	3	1	3	2	2	0	1	0	0	0	0	0	0
	1994	16	0	0	0	0	0	0	0	0	0	0	0	0	2	0	6	7	2	4	5	4	4	1	0	2	2	0	0	1	0	1	0	0
	1995	18	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	6	3	7	3	6	1	2	3	0	1	0	1	0	0	0	0	0
	1996	31	0	0	0	0	0	0	0	0	1	0	0	1	6	14	10	11	13	10	8	7	7	7	6	3	0	1	0	1	1	0	0	0
	1997	30	0	0	0	0	0	0	0	0	0	1	0	0	0	1	5	16	6	9	6	1	9	1	0	2	0	1	0	1	0	0	0	0
	1998	23	0	0	0	0	0	0	0	0	0	0	1	0	1	1	3	7	6	8	2	5	4	2	1	0	0	0	0	0	0	0	0	0
CPFV (CalPOLY)	2003	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	1	2	0	1	2	1	1	0	0	0	0	0	0	0	0	0
	2004	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	3	1	3	0	5	2	2	3	0	0	0	0	0	0	0
	2005	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	2	0	0	0	1	1	0	0	0
	2006	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	3	0	0	0	0	0	0
	2007	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	1	1	1	1	0	0	0	0	0	0	0	0
	2008	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	2	0	0	0	1	0	0	0	0
CPFV (tagging)	2002	4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2003	50	0	0	0	0	0	0	0	0	2	1	6	2	5	9	10	23	21	25	14	15	4	6	4	3	0	1	1	0	0	0	0	0
	2004	20	0	0	0	0	0	0	1	0	0	0	2	2	1	3	5	2	7	7	4	6	8	4	6	5	3	1	1	0	0	0	0	0
	2005	31	0	0	0	0	0	0	0	0	0	0	1	7	9	4	6	6	3	3	2	4	7	2	0	0	0	0	0	0	0	0	0	0

Table 9C (Continued). CAS

CAS			Length bin																																
Sector	Year	N	6	8	10	12	14	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
CPFV (RecFIN)	1980	18	0	0	0	0	0	0	0	0	0	0	2	0	5	0	1	0	3	1	2	1	2	0	2	2	1	1	0	0	0	0	0	0
	1981	16	0	0	0	0	0	0	0	0	1	0	0	1	1	0	2	1	2	0	1	4	1	1	0	2	1	0	0	0	0	0	0	0
	1982	10	0	0	0	0	0	0	0	0	0	0	1	4	1	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0
	1983	22	0	0	0	0	0	0	0	0	1	1	1	0	2	5	4	0	3	0	0	1	1	1	0	0	0	1	0	1	0	0	1	0
	1984	8	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0
	1985	15	0	0	0	0	0	0	0	1	0	1	2	1	0	0	3	1	1	3	0	2	0	2	1	2	2	2	0	0	0	0	0	0
	1986	22	0	0	0	0	0	0	0	1	1	1	4	0	5	1	5	2	5	3	1	3	2	2	1	3	2	1	1	0	3	0	1	0
	1987	10	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	2	2	2	1	0	1	0	1	0	0	0	0	0	0	0
	1988	11	0	0	0	0	0	0	1	0	1	1	1	1	2	1	2	0	0	2	0	1	0	3	3	0	0	0	2	0	0	0	0	0
	1989	14	0	0	0	1	0	0	0	0	0	3	1	1	0	2	2	1	1	0	3	1	0	0	1	0	0	0	0	0	0	0	0	0
	1993	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	1994	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	2	0	0	1	0	3	1	0	0	0	0	0	0	0	0
	1996	27	0	0	0	0	0	0	0	1	2	0	1	1	3	6	4	2	5	1	4	3	4	3	2	1	1	3	0	1	0	0	0	0
	1997	32	0	0	0	0	0	0	0	0	0	1	0	1	2	2	5	16	6	8	5	1	9	1	0	2	0	1	0	1	0	0	0	0
	1998	37	0	0	0	0	0	0	0	0	0	0	1	0	1	3	5	11	7	10	2	6	6	2	1	2	0	0	0	0	0	0	0	0
	1999	14	0	0	0	0	0	0	0	0	0	0	2	0	1	0	1	0	0	1	1	0	3	2	1	0	0	0	1	1	0	0	0	0
	2000	15	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	1	3	1	0	2	2	3	1	1	1	0	0	0	0	0	0
	2001	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	9	8	11	4	12	11	7	3	5	2	0	0	0	0	0	0
	2002	12	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	1	6	3	1	2	1	0	0	0	0	1	1	0	0	0	0
	2003	41	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	2	10	11	12	14	17	6	13	5	3	3	2	1	1	0	0	0
	2004	37	0	0	0	0	0	0	0	0	0	0	1	1	0	2	3	1	3	6	7	5	8	6	6	2	2	1	1	0	0	0	1	0
	2005	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	7	6	10	6	8	11	5	1	3	3	0	1	3	0	0
	2006	49	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	9	6	10	8	8	11	6	6	5	1	3	1	0	0	0	0
	2007	59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	8	6	11	3	12	9	6	7	5	4	5	0	2	0	0
	2008	55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	8	8	10	7	5	8	5	7	3	1	1	2	1	1	0	0

Table 9D (Continued). ORS

OREGON			Length bin																													
Sector	Year	N	6	8	10	12	14	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
Commercial																																	
Non-live																																	
Females	2001	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	413	0	0	140	25	0	0	0	0	0
	2003	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	11	4	0	0	0	0	17	0	0	0	3
	2005	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	3	0	0
Males	2001	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	400	671	0	0	0	0	0	0	0	0	0
	2003	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69	0	54	86	0	0	0	0	22	0	0	0	0	0	0
	2007	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	3	0	0
	2008	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	0	0
Unsexed	2000	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	117	31	0	164	3	87	0	0	14	0	0	0	0	0	0	0
	2001	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	101	0	0	0	0	0	0	40	0	0	0	0	0	0	0
	2002	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	16	11	0	0	0	0	0	0	0
	2003	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	399	176	149	271	61	225	141	0	5	0	0	5	23	0
	2004	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	184	0	0	0	0	3	0	0	0	0	14	0
	2005	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	7	0	0	0	0	0	0	0	0
	2006	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39	46	26	43	77	56	15	42	11	15	0	0	0	0	0
	2008	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0
Live																																	
Females	1999	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	67	55	77	60	32	0	0	0	0	0	0	0
	2000	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	362	206	307	263	110	119	185	104	259	192	76	48	69	29	32	47
	2001	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68	62	105	0	0	0	51	51	0	0	0	0	0	0	0	0	0
	2002	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	182	0	361	0	190	83	37	45	0	84	6	0	0	4	0	0
	2008	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	48	23	21	0	0	0
Males	1999	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	284	206	0	99	42	36	65	52	7	0	0	14	0	0	0
	2000	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1081	850	368	547	527	670	319	555	333	552	64	152	34	0	20	32
	2001	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	0	0	0	0	0	0	0	0	0	0	0	0	0
	2002	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	620	811	513	196	148	140	96	0	63	0	0	0	0	0	0	0
	2008	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	63	0	0	0	0	0	0	0	0	23
Unsexed	1998	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	506	1394	329	498	700	1048	151	291	166	163	0	61	0	0
	1999	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	94	77	37	62	56	0	23	0	0	0	0	0
	2000	75	0	0	0	0	0	0	0	0	0	0	0	0	0	192	1337	4462	4181	5534	7773	6290	5183	4614	2000	2018	1706	627	365	359	227	206	36
	2001	129	0	0	0	0	0	0	0	0	0	0	0	0	0	201	3460	11115	9058	13514	10543	11516	10382	7338	7737	6340	6824	4410	3323	1649	1780	461	425
	2002	164	0	0	0	0	0	0	0	0	0	0	0	0	45	75	640	16057	16778	18841	13315	9726	5949	5002	4824	2145	2152	1144	948	448	385	96	47
	2003	105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	92	0	917	7581	9380	9367	5463	3867	3334	1811	1178	832	774	338	314	101	54
	2004	142	0	0	0	0	0	0	0	0	0	0	0	0	0	98	327	68	1745	7490	6624	5519	4789	4237	2927	2286	2267	1533	1356	908	537	354	105
	2005	87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	77	178	8243	8254	6986	3796	2887	2295	1827	1046	992	640	426	346	204	137
	2006	128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66	731	3121	2472	2707	2079	2224	2703	2637	2356	2211	1129	1015	738	381	166
	2007	127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	86	70	1315	3547	5577	3350	5404	4294	5166	6011	3670	5568	3649	3214	1881	1012	902
	2008	91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90	84	1389	1811	2176	1992	1832	1234	802	967	1148	701	417	394	211	224

Table 9D (Continued). ORS

OREGON			Length bin																															
Sector	Year	N	6	8	10	12	14	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
Recreational																																		
Shore	1980	44	1	0	0	0	1	2	0	1	3	2	8	7	7	3	8	7	4	1	1	1	3	1	2	0	0	2	0	0	1	0	0	0
	1981	28	0	0	0	0	0	0	1	2	0	2	4	0	6	5	9	4	0	1	1	2	0	0	1	0	1	0	0	0	0	0	0	0
	1982	27	0	0	0	0	0	1	0	3	2	2	4	4	6	4	4	2	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0
	1983	23	0	0	0	0	0	0	0	1	0	2	1	4	4	6	3	2	1	1	3	0	1	0	1	1	0	0	0	0	0	0	0	0
	1984	18	0	0	0	0	1	2	0	2	1	0	1	2	1	2	1	2	1	4	1	0	1	0	1	0	0	0	0	0	0	0	0	0
	1985	48	0	0	0	0	2	1	5	5	6	1	2	1	3	6	6	3	5	4	0	2	3	3	1	1	0	0	0	0	0	0	0	0
	1986	55	0	0	0	0	0	0	0	3	5	3	5	4	5	4	6	4	6	9	1	6	2	1	0	0	1	1	0	0	0	0	0	0
	1987	28	0	0	0	0	0	0	2	7	3	3	2	6	3	3	3	1	3	2	2	0	0	1	0	0	0	0	0	0	1	0	0	0
	1988	21	0	0	0	0	0	0	1	3	2	4	2	2	4	4	4	2	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	1989	16	0	0	0	0	0	1	0	0	0	1	2	1	7	4	0	0	0	0	2	0	0	1	0	1	1	0	0	0	0	0	0	0
	1993	42	0	0	0	0	0	2	2	3	4	3	6	3	5	9	9	6	2	1	0	1	1	3	1	0	1	0	0	0	0	1	0	0
	1994	49	0	0	0	1	0	1	5	1	2	5	8	3	1	10	8	1	1	0	2	1	1	0	1	0	0	0	0	0	0	0	0	0
	1996	23	0	0	0	0	0	0	0	1	2	1	0	0	4	3	4	1	3	4	1	3	0	0	0	0	0	0	0	0	0	0	0	0
	1997	30	0	0	0	0	0	0	1	2	3	3	2	4	4	8	3	2	0	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0
	1998	6	0	0	0	0	0	0	0	0	1	2	1	1	2	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1999	8	0	0	0	0	0	0	1	0	0	0	1	0	1	1	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2000	13	0	0	0	0	0	0	0	0	0	1	2	2	4	0	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2001	9	0	0	1	0	0	0	0	0	1	0	1	2	1	2	0	1	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
	2002	15	0	0	0	0	0	0	1	0	1	0	0	2	2	1	4	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	2003	7	0	0	0	0	0	0	0	0	0	0	1	0	2	1	0	1	2	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
	2004	12	0	0	0	0	0	0	1	0	0	0	1	2	1	2	1	2	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0
	2005	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	1	1	0	1	0	1	0	1	1	0	0	0	0	0	0
Boat	1980	24	0	0	0	0	0	0	0	0	0	0	0	2	0	1	1	0	1	0	2	1	1	2	2	1	3	3	5	1	0	0	0	1
	1981	24	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	1	0	0	0	4	4	4	2	2	1	5	4	0	2	2	1	0
	1982	36	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1	1	1	4	7	10	1	3	4	5	2	4	2	3	0	2	1	0
	1983	19	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	2	1	3	2	0	3	6	1	1	0	3	1	0	0	1	0
	1984	35	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	1	0	8	5	5	7	8	5	3	6	2	2	4	1	1	0	0
	1985	48	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	2	5	8	3	9	5	5	10	8	8	9	5	6	1	0	1	0
	1986	35	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	1	5	1	2	0	4	8	13	10	9	6	2	3	1	1	0	0
	1987	47	0	0	0	0	0	0	0	0	3	1	0	0	2	1	0	3	4	2	7	6	10	6	18	14	6	9	6	3	3	2	0	1
	1988	91	0	0	0	0	0	0	0	0	0	2	3	3	2	3	4	5	6	7	8	9	19	14	10	13	11	19	4	5	3	0	2	1
	1989	36	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1	2	10	3	4	10	9	4	7	5	9	1	0	3	1	0	1
	1993	69	0	0	0	0	0	0	0	1	0	0	0	0	0	1	2	3	5	7	6	15	11	5	13	3	8	6	4	3	2	0	2	1
	1994	85	0	0	0	0	0	0	0	0	0	1	0	0	1	2	6	3	1	2	7	6	12	7	6	11	8	3	4	3	1	1	0	0
	1996	47	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	3	7	5	2	8	7	5	3	7	2	7	1	1	2	1	2	0
	1997	79	0	0	0	0	0	0	0	0	0	0	0	0	1	2	8	9	4	10	13	5	14	20	17	15	14	7	3	2	0	4	0	0
	1998	115	0	0	0	0	0	0	0	0	0	0	0	1	0	3	12	5	13	11	16	21	23	14	15	21	14	10	5	4	1	1	2	0
	1999	122	0	0	0	0	0	0	0	0	0	0	0	0	2	2	8	6	5	13	17	11	17	27	18	16	13	6	5	7	9	3	1	1
	2000	79	0	0	0	0	0	0	0	0	0	0	0	0	2	4	5	7	6	8	12	12	12	11	12	18	17	5	4	3	3	0	2	0
	2001	61	0	0	0	0	0	0	0	0	0	0	1	0	4	2	3	9	7	8	13	10	8	8	5	5	7	3	3	1	4	0	0	0
	2002	73	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	8	11	13	11	10	14	19	10	7	10	7	9	3	0	1	0	1
	2003	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	1	2	1	0	4	1	1	0	0	0	0	0	0
	2004	481	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	39	69	106	95	128	125	118	111	76	58	34	17	15	11	3
	2005	696	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	6	28	57	87	137	141	211	223	172	132	98	46	55	28	19	11
	2006	779	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	4	40	58	125	132	152	175	215	189	166	116	72	57	32	22	13
	2007	534	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	37	82	88	116	116	143	150	140	116	89	94	56	34	20	16
	2008	711	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	4	19	96	127	165	187	202	186	210	186	145	116	88	55	34	32	14

Table 10. Sample sizes and number of fish measured for all sub-stocks and fisheries. N is the number of trips (recreational modes) or clusters (commercial fisheries) and FISH is the number of fish actually measured. *Indicates expanded compositions. Recreational compositions came from RecFIN if not indicated otherwise.

A) NCS

Commercial

Non-live			
Year	N	FISH	FISH*
1995	71	186	3,639
1996	231	1,667	3,739
1997	102	745	5,766
1998	26	86	4,084
1999	8	31	2,398
2000	8	44	2,563

Live			
Year	N	FISH	FISH*
1997	16	138	13,248
1998	111	1,222	123,379
1999	174	1,417	71,145
2000	323	2,444	66,687
2001	156	1,062	40,625
2002	33	228	22,914
2003	9	55	5,966
2004	36	228	6,492
2005	28	112	5,340
2006	31	176	12,361
2007	50	275	3,434
2008	29	135	3,589

Recreational

	Man-Made		Shore		PBR		CPFV	
Year	N	FISH	N	FISH	N	FISH	N	FISH
1980	33	47	29	45	46	73	5	8
1981	27	44	28	51	27	57	2	4
1982	20	22	45	67	26	37	1	1
1983	24	35	53	109	29	46	3	4
1984	25	29	22	28	43	86		
1985	26	39	26	45	26	40	8	16
1986	28	34	30	61	51	75	9	33
1987	27	37	17	22	37	58	1	1
1988	24	46	5	5	25	41	6	14
1989	8	8	8	17	29	63	2	4
1993	20	30	40	67	85	147		
1994	5	6	15	24	40	61	3	8
1996	13	17	36	68	56	111	16	36
1997	4	7	26	62	16	22	28	57
1998	3	5	29	65	37	64	29	48
1999	4	6	19	41	46	65	9	9
2000	2	2	13	19	33	47	11	16
2001	7	20	8	9	22	44	24	74
2002	5	7	9	17	16	32	5	11
2003	4	4	4	11	62	96	34	97
2004	12	16	13	22	237	481	23	37
2005	18	25	10	14	439	868	37	62
2006	6	8	4	6	412	692	34	60
2007	11	11	4	4	303	532	40	61
2008	16	18	8	11	256	493	38	50

	CPFV (CDFG)	
Year	N	FISH
1987	4	32
1988	21	80
1989	21	74
1990	6	11
1991	13	18
1992	16	30
1993	12	32
1994	16	41
1995	18	37
1996	31	107
1997	30	59
1998	23	41

	CPFV (CalPOLY)	
Year	N	FISH
2003	11	13
2004	18	24
2005	5	7
2006	3	5
2007	3	7
2008	3	6

B) SCS

Commercial

Live		
Year	N	FISH*
2002	4	855
2003	2	1548
2005	1	624
2006	3	2720
2008	9	2334

Recreational

	Man-Made			Shore		PBR		CPFV	
Year	N	FISH		N	FISH	N	FISH	N	FISH
1980	7	7	#	6	11	60	174	13	15
1981	2	2	#	8	9	25	43	14	14
1982	4	4	#	5	7	24	45	9	9
1983	5	6	#	7	7	28	42	19	19
1984	8	10	#	8	8	34	53	8	8
1985	5	6	#	10	20	18	31	7	8
1986	1	1	#	12	22	20	40	13	16
1987	6	10	#	5	7	10	17	9	12
1988	1	1	#	2	2	9	14	5	8
1989	8	14	#	3	14	14	27	12	13
1993	1	1	#	2	3	10	15	2	2
1994			#			13	20	5	5
1996	2	3	#	2	3	11	21	11	13
1997			#	1	2	9	9	4	4
1998			#	5	10	10	22	8	9
1999	5	8	#	4	8	23	45	5	5
2000	2	10	#	2	4	6	9	4	4
2001			#	3	5	6	7	1	1
2002	1	1	#	2	3	18	22	7	8
2003	1	1	#	2	2	20	29	7	7
2004	4	4	#	4	4	76	116	14	19
2005	7	7	#	2	5	55	74	8	8
2006	6	7				75	112	15	16
2007	2	2				60	82	19	22
2008	5	5				46	57	17	19

	CPFV (CDFG)	
Year	N	FISH
1975	32	79
1976	63	96
1977	44	76
1978	51	101
1986	60	82
1987	64	101
1988	40	66
1989	63	93

	CPFV (GDRP)	
Year	N	FISH
2002	4	4
2003	50	152
2004	20	68
2005	31	54

Table 10 (Continued). Sample sizes and number of fish measured for all sub-stocks and fisheries. N is the number of trips (recreational) or clusters (commercial) and FISH is the number of fish actually measured. *Indicates expanded compositions. Recreational compositions came from RecFIN if not indicated otherwise.

C) CAS

Commercial

Non-live			
Year	N	FISH	FISH*
1995	71	186	3,639
1996	231	1,667	3,739
1997	102	745	5,766
1998	26	86	4,084
1999	8	31	2,398
2000	8	44	2,563

Live			
	N	FISH	FISH*
1997	16	138	13,248
1998	111	1,222	123,379
1999	174	1,417	71,145
2000	323	2,444	66,687
2001	156	1,062	40,625
2002	37	289	23,769
2003	11	83	7,514
2004	36	228	6,492
2005	29	128	5,964
2006	34	210	15,081
2007	50	275	3,434
2008	38	244	5,923

Recreational

	Man-Made		Shore		PBR		CPFV	
Year	N	FISH	N	FISH	N	FISH	N	FISH
1980	40	54	35	56	106	247	18	23
1981	29	46	36	60	52	100	16	18
1982	24	26	50	74	50	82	10	10
1983	29	41	60	116	57	88	22	23
1984	33	39	30	36	77	139	8	8
1985	31	45	36	65	44	71	15	24
1986	29	35	42	83	71	115	22	49
1987	33	47	22	29	47	75	10	13
1988	25	47	7	7	34	55	11	22
1989	16	22	11	31	43	90	14	17
1993	21	31	42	70	95	162	2	2
1994	5	6	15	24	53	81	8	13
1996	15	20	38	71	67	132	27	49
1997	4	7	27	64	25	31	32	61
1998	3	5	34	75	47	86	37	57
1999	9	14	23	49	69	110	14	14
2000	4	12	15	23	39	56	15	20
2001	7	20	11	14	28	51	25	75
2002	6	8	11	20	34	54	12	19
2003	5	5	6	13	82	125	41	104
2004	16	20	17	26	313	597	37	56
2005	25	32	12	19	494	942	45	70
2006	12	15	4	6	487	804	49	76
2007	13	13	4	4	363	614	59	84
2008	21	23	8	11	302	551	55	69

	CPFV (CDFG)	
Year	N	FISH
1975	32	79
1976	63	96
1977	44	76
1978	51	101
1986	60	82
1987	64	101
1988	40	66
1989	63	93
1987	4	32
1988	21	80
1989	21	74
1990	6	11
1991	13	18
1992	16	30
1993	12	32
1994	16	41
1995	18	37
1996	31	107
1997	30	59
1998	23	41

	CPFV (CalPOLY)	
Year	N	FISH
2003	11	13
2004	18	24
2005	5	7
2006	3	5
2007	3	7
2008	3	6

	CPFV (GDRP)	
Year	N	FISH
2002	4	4
2003	50	152
2004	20	68
2005	31	54

Table 10 (Continued). Sample sizes and number of fish measured for all sub-stocks and fisheries. N is the number of trips (recreational) or clusters (commercial) and FISH is the number of fish actually measured. *Indicates expanded compositions. Recreational compositions came from RecFIN if not indicated otherwise.

D) ORS	**Commercial**			**Recreational**				
		Non-live			Shore		Boat	
	Year	N	FISH*	**Year**	N	FISH	N	FISH
Females	**2001**	2	578	**1980**	44	66	24	29
	2003	3	61	**1981**	28	39	24	36
	2005	1	3	**1982**	27	36	36	55
Males	**2001**	1	1071	**1983**	23	31	19	28
	2003	1	231	**1984**	18	23	35	63
	2007	1	3	**1985**	48	60	48	88
	2008	2	8	**1986**	55	66	35	70
Unsexed	**2000**	4	416	**1987**	28	42	47	107
	2001	1	141	**1988**	21	31	91	155
	2002	2	43	**1989**	16	21	36	74
	2003	5	1455	**1993**	42	63	69	106
	2004	4	208	**1994**	49	52	85	85
	2005	1	15	**1996**	23	27	47	65
	2006	8	370	**1997**	30	36	79	150
	2008	1	4	**1998**	6	9	115	192
				1999	8	9	122	188
		Live		**2000**	13	14	79	143
	Year	N	FISH*	**2001**	9	12	61	101
Females	**1999**	4	325	**2002**	15	16	73	137
	2000	26	2444	**2003**	7	9	10	15
	2001	3	337	**2004**	12	13	481	1010
	2002	6	992	**2005**	4	9	696	1461
	2008	1	92	**2006**			779	1580
Males	**1999**	5	805	**2007**			534	1308
	2000	32	6119	**2008**			711	1877
	2001	2	75					
	2002	7	2587					
	2008	3	158					
Unsexed	**1998**	5	5382					
	1999	1	349					
	2000	75	47126					
	2001	129	110873					
	2002	164	98678					
	2003	105	45427					
	2004	142	43182					
	2005	87	38421					
	2006	128	26929					
	2007	127	55154					
	2008	91	15554					

Table 11. Annual mean body weights of cabezon by fleet in NCS and SCS.

NCS								SCS							
Fleet	Year	Mean weight (kg)	CV	Fleet	Year	Mean weight (kg)	CV	Fleet	Year	Mean weight (kg)	CV	Fleet	Year	Mean weight (kg)	CV
Man made	1980	0.83	1.45	PBR	1980	1.74	0.50	Man made	1980	0.48	0.56	PBR	1980	1.41	0.55
	1981	0.71	0.80		1981	2.35	0.96		1981	0.40	0.71		1981	1.36	0.57
	1982	0.73	0.83		1982	1.74	0.45		1982	0.48	0.32		1982	1.13	0.63
	1983	0.75	0.81		1983	1.81	0.49		1983	0.58	0.72		1983	0.85	0.60
	1984	1.12	0.85		1984	1.53	0.44		1984	0.43	0.61		1984	1.10	0.48
	1985	0.56	0.98		1985	1.73	0.43		1987	0.84	0.60		1985	1.24	0.82
	1986	0.91	0.83		1986	1.49	0.48		1989	0.89	0.92		1986	0.88	0.73
	1987	0.78	0.83		1987	1.51	0.49		1996	0.44	0.32		1987	1.15	0.71
	1988	1.27	0.91		1988	1.58	0.52		1999	0.31	0.60		1988	0.79	0.41
	1989	0.63	0.71		1989	1.45	0.60		2000	0.07	1.45		1989	1.18	0.61
	1993	0.55	0.98		1993	1.36	0.52		2004	1.00	0.85		1993	0.53	0.39
	1994	0.94	0.67		1994	1.38	0.65		2005	0.80	0.96		1994	1.14	0.52
	1995	0.29	0.41		1995	1.53	0.68		2006	0.78	0.51		1995	0.59	0.43
	1996	0.54	0.72		1996	1.47	0.60		2007	0.58	0.18		1996	0.97	1.03
	1997	0.74	0.89		1997	1.05	0.44		2008	1.03	0.90		1997	1.21	0.70
	1998	0.69	0.62		1998	1.56	0.50	Shore	1980	1.22	0.59		1998	0.78	0.39
	1999	0.23	1.20		1999	1.44	0.40		1981	0.80	0.56		1999	0.97	0.66
	2000	0.54	0.10		2000	1.66	0.33		1982	0.83	0.59		2000	1.00	1.00
	2001	1.11	0.57		2001	1.83	0.34		1983	0.76	0.61		2001	0.58	0.32
	2002	0.35	0.71		2002	2.01	0.59		1984	0.91	0.25		2002	0.87	0.64
	2003	1.11	0.90		2003	1.86	0.39		1985	0.82	0.56		2003	1.03	0.49
	2004	1.06	0.98		2004	2.31	0.49		1986	0.93	0.88		2004	1.36	0.84
	2005	1.20	0.72		2005	2.36	0.42		1987	1.13	0.61		2005	1.28	0.70
	2006	0.66	0.74		2006	2.12	0.44		1988	1.20	0.59		2006	1.25	0.55
	2007	1.66	0.99		2007	2.24	0.42		1989	1.49	0.61		2007	1.35	0.59
	2008	0.62	0.95		2008	2.10	0.48		1993	0.98	0.62		2008	1.30	0.56
Shore	1958	0.41	0.20	CPFV	1947	2.27	0.50		1995	0.49	0.68	CPFV	1980	1.03	0.65
	1960	0.41	0.20		1948	2.27	0.50		1996	0.58	0.22		1981	1.09	0.54
	1961	0.41	0.20		1949	2.27	0.50		1997	0.37	0.06		1982	0.78	0.92
	1980	1.16	0.84		1950	2.27	0.50		1998	0.99	0.44		1983	0.82	0.73
	1981	0.80	0.52		1951	2.27	0.50		1999	0.73	0.50		1984	1.10	0.52
	1982	1.10	0.77		1960	2.42	0.50		2000	0.71	0.73		1985	0.55	0.55
	1983	0.98	0.55		1980	1.81	0.35		2001	0.96	0.39		1986	0.59	0.38
	1984	1.02	0.64		1981	1.85	0.33		2002	1.44	0.75		1987	1.24	0.47
	1985	0.71	0.63		1983	2.70	0.50		2005	0.83	0.49		1988	0.50	0.62
	1986	1.04	0.57		1985	1.70	0.45						1989	0.71	0.73
	1987	0.67	0.77		1986	2.05	0.93						1993	0.85	0.90
	1988	0.74	0.74		1988	1.85	0.69						1994	1.23	0.49
	1989	0.98	1.11		1989	1.13	0.32						1995	0.38	0.28
	1993	1.06	0.68		1994	1.53	0.42						1996	0.68	0.55
	1994	1.00	0.78		1995	2.79	0.27						1997	0.68	0.41
	1995	1.06	0.69		1996	1.77	0.72						1998	1.28	0.59
	1996	0.97	0.47		1999	2.11	0.10						1999	0.49	0.51
	1997	1.15	0.50		2000	2.12	0.47						2000	0.62	0.28
	1998	1.14	0.44		2001	1.21	0.32						2002	1.39	0.97
	1999	0.86	0.47		2003	2.38	0.54						2003	2.00	0.75
	2000	0.95	0.68		2004	2.23	0.20						2004	2.03	0.52
	2001	0.96	0.48		2005	2.66	0.30						2005	1.42	0.27
	2002	1.22	0.58		2006	2.59	0.45						2006	1.52	0.50
	2003	1.62	0.49		2007	2.29	0.38						2007	2.42	0.52
	2004	2.04	0.40		2008	2.33	0.44						2008	2.22	0.52
	2005	1.56	0.62												
	2006	1.89	0.63												
	2007	1.40	0.21												
	2008	1.37	0.25												

Table 11 (Continued). Annual mean body weights of cabezon by fleet in CAS and ORS.

California								Oregon			
Fleet	Year	Mean weight (kg)	CV	Fleet	Year	Mean weight (kg)	CV	Fleet	Year	Mean weight (kg)	CV
Man made	1980	0.77	1.44	PBR	1980	1.50	0.54	SHORE	1980	0.81	0.97
	1981	0.69	0.81		1981	1.93	0.95		1981	0.71	0.75
	1982	0.69	0.82		1982	1.40	0.57		1982	0.51	0.73
	1983	0.72	0.81		1983	1.35	0.65		1983	0.75	0.67
	1984	0.96	0.92		1984	1.37	0.48		1984	0.70	0.75
	1985	0.54	0.98		1985	1.51	0.59		1985	0.73	0.79
	1986	0.89	0.84		1986	1.28	0.58		1986	0.83	0.68
	1987	0.79	0.78		1987	1.43	0.54		1987	0.55	1.19
	1988	1.25	0.92		1988	1.38	0.58		1988	0.48	0.67
	1989	0.79	0.88		1989	1.37	0.61		1989	0.78	0.89
	1993	0.54	0.99		1993	1.30	0.55		1993	0.73	1.05
	1994	0.94	0.67		1994	1.35	0.64		1994	0.54	0.69
	1995	0.29	0.41		1995	1.47	0.71		1995	0.64	0.59
	1996	0.52	0.68		1996	1.40	0.65		1996	0.79	0.52
	1997	0.74	0.89		1997	1.09	0.52		1997	0.58	0.68
	1998	0.69	0.62		1998	1.35	0.57		1998	0.54	0.65
	1999	0.29	0.70		1999	1.27	0.50		1999	0.64	0.44
	2000	0.15	1.40		2000	1.52	0.46		2000	0.53	0.44
	2001	1.11	0.57		2001	1.64	0.45		2001	0.75	0.82
	2002	0.35	0.71		2002	1.48	0.74		2002	0.70	0.37
	2003	1.04	0.69		2003	1.62	0.48		2003	1.30	0.81
	2004	1.05	0.92		2004	2.17	0.54		2004	0.80	0.65
	2005	1.12	0.76		2005	2.27	0.45		2005	1.73	0.51
	2006	0.72	0.59		2006	1.94	0.49	BOAT	1980	2.83	0.60
	2007	1.42	1.06		2007	2.11	0.46		1981	2.45	0.50
	2008	0.70	0.93		2008	2.01	0.51		1982	2.31	0.65
Shore	1980	1.17	0.78	CPFV	1980	1.29	0.58		1983	2.01	0.58
	1981	0.80	0.52		1981	1.26	0.53		1984	1.86	0.45
	1982	1.07	0.77		1982	1.04	1.03		1985	2.02	0.43
	1983	0.96	0.55		1983	1.14	0.90		1986	2.14	0.37
	1984	1.00	0.58		1984	1.10	0.52		1987	2.03	0.46
	1985	0.75	0.60		1985	1.32	0.64		1988	1.95	0.53
	1986	1.01	0.65		1986	1.57	1.08		1989	1.95	0.45
	1987	0.79	0.74		1987	1.26	0.45		1993	2.55	0.60
	1988	0.87	0.66		1988	1.36	0.90		1994	2.32	0.53
	1989	1.21	0.85		1989	0.81	0.62		1995	2.16	0.49
	1993	1.05	0.68		1993	0.85	0.90		1996	2.13	0.51
	1994	1.00	0.78		1994	1.42	0.44		1997	2.28	0.54
	1995	0.99	0.73		1995	2.31	0.52		1998	2.12	0.49
	1996	0.95	0.47		1996	1.53	0.80		1999	2.31	0.48
	1997	1.12	0.52		1997	0.68	0.41		2000	2.12	0.48
	1998	1.12	0.44		1998	1.25	0.57		2001	1.96	0.57
	1999	0.84	0.47		1999	1.30	0.70		2002	2.21	0.49
	2000	0.91	0.69		2000	1.52	0.71		2003	1.83	0.37
	2001	0.96	0.44		2001	1.14	0.35		2004	2.58	0.38
	2002	1.24	0.58		2002	1.39	0.97		2005	2.79	0.37
	2003	1.51	0.52		2003	2.32	0.56		2006	2.77	0.37
	2004	1.95	0.45		2004	2.10	0.41		2007	2.80	0.40
	2005	1.36	0.67		2005	2.28	0.40		2008	2.56	0.42
	2006	1.89	0.63		2006	1.75	0.54				
	2007	1.40	0.21		2007	2.36	0.46				
	2008	1.37	0.25		2008	2.29	0.46				

Table 12. Summary statistics for the data sources that were considered as the basis for abundance indices. Gray bars indicate data sources not included in the base case models.

Area	Data Source	Years	# Observations	# Positives	% Positive
ORS	ORBS	2001-2008	1529	1306	85.42%
CAS	CPFV Logbook CPUE	1960-2008	34570	12826	37.10%
	PISCO Adult survey	1999-2008	7305	383	5.24%
NCS	CPFV Logbook CPUE	1960-2008	20016	7359	36.77%
	TENERA Adult Survey	1977-2008	112	106	94.64%
	PISCO Adult survey	1999-2008	5779	367	6.35%
	PISCO SMURFS	1999-2008	4283	628	14.66%
	SLO SMURFS	2006-2008	294	76	25.85%
SCS	CPFV Logbook CPUE	1960-2008	14549	5462	37.54%
	PISCO Adult survey	1999-2008	1526	16	1.05%
	CalCOFI manta tow	1978,1980,1981, 1984-2008	8757	668	7.63%
	SoCal Edison Impingement	1972-2008	6967	1011	14.51%

Table 13. Model selection using AIC values for the different models considered when developing potential indices of abundance for each cabezon sub-stock.

NSC			
	Binomial	Lognormal	Gamma
Model	AIC	AIC	AIC
NCS CPFV			
Yr	21097	-41134	-39331
Yr+Loc	20305	-42193	-40530
Yr+Mo	20844	-41305	-39724
Yr+Mo+Loc	*19962*	*-42419*	-40883
TENERA			
Yr	74	55	46
Year + Mo	*84*	40	*38*
SMURFS			
Yr	329	229	241
Yr+Mo	240	227	235
Yr+St	306	223	230
Yr+SM	331	233	246
Yr+Kp	330	230	240
Yr+Mo+St	216	217	224
Yr+Mo+SM	238	230	240
Yr+Mo+Kp	235	228	235
Yr+St+SM	307	228	236
Yr+St+Kp	307	225	232
Yr+SM+Kp	332	234	245
Yr+Mo+St+SM	212	221	229
Yr+Mo+St+Kp	*212*	*219*	225
Yr+Mo+SM+Kp	232	232	239
Yr+St+SM+Kp	308	230	238
YR+Mo+St+SM+Kp	207	223	231
PISCO ADULTS			
Yr	*2728*	*-126*	-43
Yr+St	2604	-67	-17
Yr+Rs	2727	-125	-41
Yr+St+Rs	2603	-65	NA
PISCO SMURFS			
Yr	3250	-552	-447
Yr+Mo	3060	-556	-463
Yr+St	3248	-558	-456
Yr+Lv	3250	-549	-449
Yr+Mo+St	*3048*	*-562*	-472
Yr+Mo+Lv	3061	-555	-468
Yr+St+Lv	3247	-555	-457
Yr+Mo+St+Lv	3048	-561	-475

SCS			
	Binomial	Lognormal	Gamma
Model	AIC	AIC	AIC
SCS CPFV			
Yr	15416	-39359	-37549
Yr+Loc	14961	-40205	-38643
Yr+Mo	14864	-39509	-37847
Yr+Mo+Loc	*14355*	*-40395*	-38954
CalCOFI			
Yr	4593	-2130	# -1782
Yr+Mo	4098	-2148	-1840
Yr+St	3848	-2110	-1900
Yr+D/N	4399	-2151	-1820
Yr+Mo+St	3324	-2126	-1942
Yr+Mo+D/N	3897	-2175	-1885
Yr+St+D/N	3652	-2140	-1949
Yr+Mo+St+D/N	*3112*	-2162	*-1994*
SoCAL Edison Impingement			
Yr	5353	-10135	-9984
Yr+Mo	5348	-10142	-10002
Yr+Su	4098	-10143	-9984
Yr+Mo+Su	*4087*	*-10152*	-10002
PISCO ADULTS			
Yr	*164*	*2*	4
Yr+St	78	8	9
Yr+Rs	156	4	6

CAS			
	Binomial	Lognormal	Gamma
Model	AIC	AIC	AIC
CA CPFV			
Yr	36770	-79689	NA
Yr+Loc	35534	-81948	NA
Yr+Mo	36084	-79944	NA
Yr+Mo+Loc	*34655*	*-82309*	NA
PISCO ADULTS			
Yr	*2987*	*-136*	NA
Yr+St	2731	-68	NA
Yr+Rs	2987	-134	NA
Yr+St+Rs	2730	-66	NA

ORS			
	Binomial	Lognormal	Gamma
Model	AIC	AIC	AIC
ORBS			
Yr	1269	-3062	-2819
Yr+Mo	1228	-3060	-2852
Yr+Pt	905	-3451	-3424
Yr+Mo+Pt	*763*	-3487	*-3546*

Factor names

Kp: Kelp coverage	SM: SMURF
Lv: Level	St: Station
Loc: Location	Su: Survey
Mo: Month	Yr: Year
Pt: Port	
Rs: Reserve site	

Table 14. Fishery-dependent abundance indices considered in the 2009 cabezon stock assessment for the NCS. The CVs are derived from a bootstrap procedure. The +CV column refers to the inflated CVs used in the model fit.

	Fishery Dependent																	
	Northern California CPFV									CDFG hook-&-line			PSMFC dockside			PSMFC observer		
Year	Index	CV	+CV	Index	CV	+CV	Index	CV	+CV	Index	CV	+CV	Index	CV	+CV	Index	CV	+CV
1960	0.011	0.13	0.41				0.011	0.14	0.43									
1961	0.010	0.13	0.41				0.010	0.13	0.42									
1962	0.012	0.15	0.43				0.012	0.16	0.45									
1963	0.019	0.15	0.42				0.019	0.15	0.44									
1964	0.019	0.14	0.42				0.020	0.14	0.44									
1965	0.023	0.13	0.40				0.023	0.12	0.42									
1966	0.023	0.14	0.41				0.023	0.13	0.42									
1967	0.013	0.13	0.41				0.014	0.13	0.42									
1968	0.008	0.14	0.42				0.008	0.14	0.43									
1969	0.007	0.15	0.43				0.007	0.16	0.45									
1970	0.011	0.14	0.41				0.011	0.13	0.43									
1971	0.008	0.14	0.42				0.008	0.13	0.42									
1972	0.015	0.11	0.39				0.015	0.11	0.40									
1973	0.013	0.11	0.39				0.013	0.11	0.40									
1974	0.012	0.11	0.39				0.012	0.11	0.40									
1975	0.007	0.11	0.39				0.007	0.11	0.40									
1976	0.009	0.12	0.40				0.009	0.11	0.41									
1977	0.008	0.14	0.41				0.009	0.13	0.43									
1978	0.016	0.12	0.39				0.016	0.11	0.40	0.32	0.89	0.89						
1979										1.17	0.03	0.03						
1980	0.012	0.12	0.40				0.012	0.12	0.41	0.37	0.58	0.58	0.0048	0.22	0.22			
1981	0.007	0.14	0.41				0.007	0.13	0.42	0.09	0.68	0.68	0.0046	0.29	0.29			
1982	0.006	0.14	0.42				0.006	0.14	0.43				0.0044	0.60	0.60			
1983	0.006	0.14	0.42				0.006	0.14	0.43				0.0024	0.25	0.25			
1984	0.003	0.15	0.43				0.003	0.14	0.44				0.0020	0.23	0.23			
1985	0.002	0.17	0.45				0.002	0.16	0.46				0.0014	0.31	0.31			
1986	0.004	0.20	0.47				0.004	0.19	0.48				0.0026	0.26	0.26			
1987	0.007	0.15	0.43				0.007	0.14	0.43				0.0031	0.24	0.24			
1988	0.008	0.14	0.42				0.008	0.14	0.43				0.0022	0.27	0.27			
1989	0.007	0.16	0.44				0.007	0.15	0.44				0.0032	0.31	0.31			
1990	0.005	0.12	0.40				0.005	0.12	0.41									
1991	0.004	0.16	0.44				0.004	0.14	0.44									
1992	0.006	0.15	0.42				0.006	0.14	0.43									
1993	0.004	0.15	0.43				0.004	0.15	0.44				0.0035	0.19	0.19			
1994	0.002	0.19	0.47				0.002	0.19	0.49				0.0032	0.20	0.20			
1995	0.002	0.18	0.46				0.002	0.17	0.47	0.02	0.58	0.58	0.0055	0.20	0.20			
1996	0.004	0.16	0.44				0.004	0.16	0.45	0.24	0.56	0.56	0.0043	0.16	0.16			
1997	0.005	0.14	0.42				0.004	0.14	0.43	0.04	0.77	0.77	0.0043	0.20	0.20			
1998	0.004	0.15	0.43				0.004	0.15	0.45	0.04	0.65	0.65	0.0038	0.18	0.18			
1999	0.005	0.16	0.44				0.005	0.14	0.44				0.0018	0.18	0.18	0.0019	0.76	0.76
2000				0.002	0.19	0.56	0.003	0.17	0.46				0.0029	0.21	0.21	0.0067	0.61	0.61
2001				0.004	0.18	0.55	0.007	0.16	0.46				0.0085	0.17	0.17	0.0348	0.47	0.47
2002				0.002	0.24	0.61	0.003	0.21	0.51				0.0016	0.24	0.24	0.0299	0.51	0.51
2003				0.007	0.15	0.52	0.012	0.13	0.42				0.0051	0.16	0.16	0.0217	0.49	0.49
2004				0.006	0.16	0.53	0.009	0.13	0.43				0.0033	0.17	0.17	0.0089	0.52	0.52
2005				0.006	0.17	0.54	0.010	0.13	0.42				0.0046	0.14	0.14	0.0124	0.47	0.47
2006				0.003	0.18	0.55	0.005	0.14	0.44				0.0028	0.15	0.15	0.0152	0.48	0.48
2007				0.003	0.19	0.56	0.006	0.15	0.45				0.0025	0.16	0.16	0.0129	0.43	0.43
2008				0.004	0.18	0.55	0.007	0.14	0.44									

Table 14 (Continued). Fishery-independent abundance indices considered in the 2009 cabezon stock assessment for the NCS. The CVs are derived from a bootstrap procedure. The +CV column refers to the inflated CVs used in the model fit.

	Fishery Independent											
	TENERA_adult			PISCO_adult			PISCO_smurf			SLO_smurf		
Year	Index	CV	+CV	Index	CV	+CV	Index	CV	+CV	Index	CV	+CV
1960												
1961												
1962												
1963												
1964												
1965												
1966												
1967												
1968												
1969												
1970												
1971												
1972												
1973												
1974												
1975												
1976												
1977	0.63	0.31	1.06									
1978	0.93	0.66	1.41									
1979	0.89	0.18	0.93									
1980	0.78	0.44	1.19									
1981	0.54	0.53	1.28									
1982	0.78	0.54	1.29									
1983	0.52	0.56	1.30									
1984	0.25	0.79	1.54									
1985	0.53	0.49	1.24									
1986	1.61	0.52	1.27									
1987	0.79	0.69	1.44									
1988	0.98	0.40	1.15									
1989	0.91	0.36	1.11									
1990	0.85	0.39	1.14									
1991	1.11	0.27	1.01									
1992	0.67	0.43	1.18									
1993	0.36	1.04	1.78									
1994	0.30	0.18	0.93									
1995	0.38	0.53	1.28									
1996	0.33	1.02	1.77									
1997	0.54	0.38	1.13									
1998												
1999	0.00	1.83	2.58	0.09	0.26	0.60	0.02	0.34	0.81			
2000	0.26	0.33	1.07	0.07	0.29	0.63	0.03	0.20	0.67			
2001	0.27	0.44	1.19	0.10	0.25	0.59	0.17	0.22	0.69			
2002	0.23	0.22	0.97	0.06	0.22	0.56	0.03	0.21	0.68			
2003	0.34	0.25	1.00	0.11	0.11	0.45	0.06	0.23	0.70			
2004	0.50	0.29	1.04	0.06	0.17	0.52	0.02	0.23	0.70			
2005	0.32	0.18	0.92	0.06	0.18	0.52	0.01	0.30	0.76			
2006	0.49	0.35	1.10	0.05	0.17	0.52	0.02	0.23	0.70	0.28	0.44	1.24
2007	0.17	0.45	1.19	0.06	0.13	0.47	0.02	0.24	0.71	0.28	0.51	1.30
2008	0.35	0.24	0.98	0.06	0.12	0.46	0.02	0.25	0.72	1.18	0.30	1.09

Table 15. Fishery-dependent and -independent abundance indices considered in the 2009 cabezon stock assessment for the SCS. The CVs are derived from a bootstrap procedure. The +CV column refers to the inflated CVs used in the model fit.

	Fishery Dependent									Fishery Independent								
	Southern California CPFV									CalCOFI			Impingement			PISCO_adult		
Year	Index	CV	+CV	Index	CV	+CV	Index	CV	+CV	Index	CV	+CV	Index	CV	+CV	Index	CV	+CV
1960	0.000	0.28	0.56				0.000	0.28	0.57									
1961	0.001	0.22	0.50				0.001	0.22	0.51									
1962	0.003	0.16	0.44				0.003	0.16	0.46									
1963	0.005	0.16	0.44				0.006	0.17	0.46									
1964	0.005	0.15	0.44				0.005	0.14	0.43									
1965	0.003	0.14	0.42				0.004	0.13	0.42									
1966	0.005	0.13	0.41				0.006	0.13	0.43									
1967	0.003	0.12	0.40				0.003	0.12	0.41									
1968	0.002	0.14	0.42				0.002	0.13	0.43									
1969	0.002	0.15	0.43				0.002	0.15	0.44									
1970	0.002	0.13	0.41				0.002	0.13	0.42									
1971	0.002	0.14	0.42				0.003	0.15	0.44									
1972	0.005	0.13	0.41				0.006	0.14	0.43				0.001	0.34	0.89			
1973	0.003	0.14	0.42				0.003	0.13	0.43				0.002	0.28	0.83			
1974	0.003	0.14	0.42				0.004	0.14	0.43				0.001	0.21	0.76			
1975	0.004	0.13	0.41				0.005	0.12	0.41				0.002	0.13	0.68			
1976	0.002	0.12	0.40				0.003	0.12	0.42				0.002	0.13	0.68			
1977	0.002	0.13	0.41				0.002	0.13	0.42				0.001	0.23	0.78			
1978	0.002	0.13	0.41				0.002	0.13	0.42	0.016	0.72	1.73	0.001	0.19	0.74			
1979													0.000	0.22	0.77			
1980	0.002	0.12	0.41				0.002	0.12	0.41	0.004	1.53	2.54	0.001	0.17	0.72			
1981	0.002	0.12	0.40				0.002	0.12	0.41	0.002	0.35	1.37	0.001	0.22	0.78			
1982	0.001	0.13	0.41				0.001	0.14	0.43				0.001	0.27	0.83			
1983	0.001	0.16	0.44				0.001	0.15	0.45	0.001	0.86	1.88	0.000	0.25	0.80			
1984	0.000	0.19	0.47				0.000	0.19	0.48	0.002	0.39	1.40	0.001	0.23	0.78			
1985	0.001	0.16	0.44				0.001	0.17	0.46	0.004	0.43	1.44	0.001	0.20	0.75			
1986	0.002	0.15	0.43				0.003	0.15	0.44	0.002	0.45	1.47	0.000	0.21	0.76			
1987	0.004	0.12	0.40				0.004	0.11	0.40	0.001	0.61	1.63	0.001	0.20	0.76			
1988	0.003	0.13	0.41				0.004	0.13	0.42	0.002	0.55	1.57	0.000	0.39	0.94			
1989	0.004	0.12	0.40				0.005	0.11	0.41	0.005	0.47	1.49	0.001	0.26	0.82			
1990	0.005	0.11	0.39				0.006	0.11	0.40	0.001	0.60	1.62	0.000	0.28	0.83			
1991	0.003	0.12	0.40				0.004	0.11	0.41	0.002	0.60	1.61	0.000	0.24	0.79			
1992	0.002	0.12	0.40				0.002	0.11	0.40	0.001	0.79	1.81	0.000	0.23	0.78			
1993	0.001	0.14	0.42				0.001	0.15	0.44	0.000	0.51	1.53	0.000	0.36	0.91			
1994	0.001	0.22	0.50				0.001	0.22	0.51	0.000	0.87	1.88	0.000	0.35	0.90			
1995	0.001	0.15	0.44				0.001	0.16	0.45	0.003	0.52	1.54	0.000	0.48	1.03			
1996	0.002	0.12	0.40				0.002	0.11	0.40	0.003	0.45	1.47	0.000	0.48	1.03			
1997	0.002	0.10	0.38				0.002	0.11	0.40	0.002	0.41	1.42	0.000	0.34	0.89			
1998	0.001	0.17	0.45				0.001	0.16	0.46	0.000	0.51	1.52	0.000	0.42	0.97			
1999	0.001	0.20	0.48				0.001	0.20	0.49	0.003	0.41	1.43	0.001	0.20	0.75			
2000				0.001	0.18	0.61	0.001	0.18	0.47	0.002	0.53	1.55	0.000	0.39	0.94	0.04	0.71	1.99
2001				0.001	0.20	0.63	0.001	0.15	0.44	0.001	0.49	1.50	0.000	0.57	1.13			
2002				0.000	0.24	0.68	0.001	0.23	0.52	0.004	0.40	1.42	0.001	0.40	0.95			
2003				0.001	0.27	0.71	0.001	0.23	0.53	0.007	0.46	1.48	0.001	0.49	1.04	0.02	0.71	1.99
2004				0.001	0.23	0.66	0.001	0.19	0.49	0.003	0.53	1.54	0.000	0.63	1.18	0.03	0.57	1.86
2005				0.000	0.23	0.66	0.000	0.23	0.53	0.002	0.40	1.41	0.000	0.66	1.21	0.01	0.71	1.99
2006				0.001	0.20	0.63	0.001	0.17	0.46	0.006	0.36	1.38	0.000	0.78	1.33	0.02	0.52	1.80
2007				0.001	0.21	0.65	0.001	0.19	0.48	0.002	0.46	1.48	0.000	0.60	1.15			
2008				0.001	0.21	0.64	0.001	0.19	0.48	0.005	0.59	1.61	0.001	0.51	1.06	0.01	0.71	1.99

Table 16. Fishery-dependent and -independent abundance indices considered in the 2009 cabezon stock assessment for the state-wide California and Oregon sub-stocks. The CVs are derived from a bootstrap procedure. The +CV column refers to the inflated CVs used in the model fit.

	Fishery Dependent									Fishery Independent			OREGON		
	California CPFV									PISCO_adult			ORBS		
Year	Index	CV	+CV	Index	CV	+CV	Index	CV	+CV	Index	CV	+CV	Index	CV	+CV
1960	0.004	0.13	0.33				0.004	0.13	0.33						
1961	0.004	0.12	0.32				0.004	0.11	0.31						
1962	0.006	0.12	0.32				0.006	0.11	0.31						
1963	0.010	0.11	0.31				0.010	0.11	0.31						
1964	0.010	0.11	0.31				0.010	0.09	0.30						
1965	0.010	0.10	0.30				0.010	0.09	0.30						
1966	0.011	0.09	0.29				0.012	0.09	0.29						
1967	0.006	0.09	0.29				0.007	0.09	0.29						
1968	0.004	0.10	0.30				0.004	0.09	0.29						
1969	0.004	0.12	0.32				0.004	0.11	0.31						
1970	0.005	0.10	0.30				0.005	0.09	0.29						
1971	0.004	0.10	0.30				0.005	0.10	0.30						
1972	0.009	0.09	0.29				0.009	0.09	0.29						
1973	0.006	0.09	0.29				0.006	0.08	0.28						
1974	0.006	0.09	0.29				0.006	0.09	0.29						
1975	0.005	0.09	0.29				0.005	0.09	0.29						
1976	0.005	0.09	0.29				0.005	0.08	0.28						
1977	0.004	0.09	0.29				0.004	0.09	0.29						
1978	0.007	0.09	0.29				0.007	0.09	0.29						
1979															
1980	0.005	0.09	0.29				0.005	0.09	0.29						
1981	0.004	0.09	0.29				0.004	0.10	0.30						
1982	0.003	0.10	0.30				0.003	0.10	0.30						
1983	0.003	0.11	0.31				0.003	0.10	0.30						
1984	0.001	0.12	0.32				0.001	0.11	0.32						
1985	0.001	0.12	0.32				0.001	0.12	0.32						
1986	0.003	0.12	0.32				0.003	0.12	0.32						
1987	0.005	0.09	0.29				0.005	0.09	0.29						
1988	0.005	0.09	0.29				0.005	0.09	0.29						
1989	0.005	0.10	0.30				0.005	0.08	0.29						
1990	0.005	0.08	0.28				0.005	0.09	0.29						
1991	0.004	0.09	0.29				0.004	0.09	0.29						
1992	0.003	0.09	0.29				0.003	0.09	0.29						
1993	0.002	0.11	0.31				0.002	0.11	0.31						
1994	0.001	0.14	0.34				0.001	0.15	0.35						
1995	0.001	0.11	0.31				0.001	0.11	0.31						
1996	0.003	0.09	0.29				0.003	0.09	0.29						
1997	0.003	0.09	0.29				0.003	0.08	0.28						
1998	0.002	0.11	0.31				0.002	0.10	0.30						
1999	0.002	0.13	0.33				0.002	0.12	0.32	0.07	0.26	0.51			
2000				0.001	0.13	0.40	0.002	0.12	0.32	0.06	0.26	0.52			
2001				0.002	0.14	0.41	0.003	0.12	0.32	0.08	0.25	0.51	0.08	0.20	0.40
2002				0.001	0.18	0.46	0.001	0.16	0.36	0.04	0.22	0.47	0.13	0.14	0.34
2003				0.002	0.12	0.40	0.004	0.12	0.32	0.10	0.11	0.36	0.13	0.12	0.32
2004				0.002	0.13	0.40	0.003	0.11	0.31	0.05	0.17	0.42	0.17	0.13	0.33
2005				0.002	0.13	0.40	0.003	0.12	0.32	0.04	0.18	0.43	0.17	0.09	0.29
2006				0.002	0.13	0.41	0.002	0.11	0.31	0.05	0.17	0.42	0.13	0.10	0.30
2007				0.002	0.14	0.41	0.002	0.11	0.31	0.05	0.13	0.38	0.16	0.12	0.32
2008				0.002	0.14	0.41	0.002	0.12	0.32	0.05	0.12	0.37	0.16	0.10	0.30

Table 17. Input variables and parameters of the population dynamics model for NCS and SCS. The base-case values are given for those parameters that are pre-specified. An X indicates the parameter is estimated. Prior distributions for the parameters are listed in the SS3 control files (Appendices C-2 and D-2).

	NCS				SCS			
			Blocking				Blocking	
Parameter	Pre-specified in Base Case	Estimated in Base Case	1999-2008	2000-2008*	Pre-specified in Base Case	Estimated in Base Case	1999-2008	2000-2008
Age at minimum length (L_{min})	0				0			
Age at maximum length (L_{max})	L_{inf}				L_{inf}			
Natural Mortality (*M*)	0.25(F)/0.3(M)				0.25(F)/0.3(M)			
Minimum Length (L_{min})		X			12.42(F)/11.67(M)			
Maximum Length (L_{max})		X			64(F)/43.5(M)			
Growth rate (k)		X			0.13(F)/0.23(M)			
Length at age 0 CV		X			0.16(F)/0.33(M)			
Length at age L_{inf} CV		X			0.12(F)/0.06(M)			
$\ln R_O$		X				X		
steepness (*h*)	0.7				0.7			
σ_R	0.5				0.7			
Recruitment (years)		(1970-2006)				(1970-2006)		
Selectivities								
Commercial non-live								
parameter 1		X			40.1			
parameter 2		X			-0.94			
parameter 3		X			4.1			
parameter 4	4				4			
parameter 5	-10				-10			
parameter 6	10				10			
Commericial live								
parameter 1		X	X		38.3		38	
parameter 2		X	X		-0.57		-0.3	
parameter 3		X	X		3.37		2.3	
parameter 4		X	X		-2		3	
parameter 5	-5				-5		5	
parameter 6		X	X		6.24		-3.5	
Recreational Man-made								
parameter 1		X				X		
parameter 2		X				X		
parameter 3		X				X		
parameter 4		X				X		
parameter 5	-10				-10			
parameter 6		X				X		
Recreational Shore								
parameter 1		X				X		
parameter 2		X				X		
parameter 3		X				X		
parameter 4		X				X		
parameter 5	-10				-10			
parameter 6		X				X		
Recreational PBR								
parameter 1		X		X		X		X
parameter 2		X		X		X		X
parameter 3		X		X		X		X
parameter 4	4				4			
parameter 5	-10				-10			
parameter 6	10				10			
Recreational CPFV								
parameter 1		X		X		X		X
parameter 2		X		X		X		X
parameter 3		X		X		X		X
parameter 4	4				4			
parameter 5	-10				-10			
parameter 6	10				10			
CPFV survey	mirrors Recreational CPFV				mirrors Recreational CPFV			

* Indicates there are two block patterns within the blocked years

Table 18. Input variables and parameters of the population dynamics model for the state-wide CAS and ORS sub-stocks. The base-case values are given for those parameters that are pre-specified. An X indicates the parameter is estimated. Prior distributions for the parameters are listed in the SS3 control files (Appendices E-2 and F-2).

	CAS				ORS			
			Blocking				Blocking	
Parameter	Pre-specified in Base Case	Estimated in Base Case	1999-2008	2000-2008*	Pre-specified in Base Case	Estimated in Base Case	2000-2008*	2003-2008
Age at minimum length (L_{min})	0				0			
Age at maximum length (L_{max})	L_{inf}				L_{inf}			
Natural Mortality (*M*)	0.25(F)/0.3(M)				0.25(F)/0.3(M)			
Minimum Length (L_{min})		X				X		
Maximum Length (L_{max})		X				X		
Growth rate (k)		X				X		
Length at age 0 CV		X				X		
Length at age 17 CV		X				X		
lnR_O		X				X		
steepness (*h*)	0.7				0.7			
σ_R	0.5				0.5			
Recruitment (years)		(1970-2006)				(1980-2006)		
Selectivities								
Commercial non-live								
parameter 1		X				X		
parameter 2		X				X		
parameter 3		X				X		
parameter 4	4				4			
parameter 5	-10				-10			
parameter 6	10				10			
Commericial live								
parameter 1		X	X			X	X	
parameter 2		X	X			X	X	
parameter 3		X	X			X	X	
parameter 4		X	X			X	X	
parameter 5	-5				-5			
parameter 6		X	X			X	X	
Recreational Man-made					Man-Made and Shore			
parameter 1		X			make up the "SHORE" fleet			
parameter 2		X						
parameter 3		X			see below			
parameter 4		X						
parameter 5	-10							
parameter 6		X						
Recreational Shore								
parameter 1		X				X		
parameter 2		X				X		
parameter 3		X				X		
parameter 4		X				X		
parameter 5	-10				-10			
parameter 6		X				X		
Recreational PBR					PBR and CPFV			
parameter 1		X		X	make up the "BOAT" fleet			
parameter 2		X		X				
parameter 3		X		X				
parameter 4	4				see below			
parameter 5	-10							
parameter 6	10							
Recreational CPFV					Includes PBR & CPFV			
parameter 1		X		X		X		X
parameter 2		X		X		X		X
parameter 3		X		X		X		X
parameter 4	4				4			
parameter 5	-10				-10			
parameter 6	10				10			
CPFV survey	mirrors Recreational CPFV				mirrors Recreational CPFV			

* Indicates there are two block patterns within the blocked years

Table 19. Time series of spawning output (SB in mt) and recruitment (Rec in 1000s) for the NCS and SCS in years 1916-1959. Standard deviations (based on asymptotic estimation) of each yearly measure is given in the 'sd' column.

	NCS				SCS			
Year	SB	sd	Rec	sd	SB	sd	Rec	sd
Virgin	1036	60	876	55	263	24	206	19
1916	1036	60	876	55	263	24	206	19
1917	1036	60	876	55	263	24	206	19
1918	1035	60	876	55	263	24	206	19
1919	1035	60	876	55	263	24	206	19
1920	1034	60	876	55	263	24	206	19
1921	1034	60	876	55	263	24	206	19
1922	1033	60	876	55	263	24	206	19
1923	1033	60	876	55	263	24	206	19
1924	1033	60	876	55	263	24	206	19
1925	1033	60	876	55	263	24	206	19
1926	1031	60	876	55	263	24	206	19
1927	1031	60	876	55	263	24	206	19
1928	1031	60	876	55	263	24	206	19
1929	1030	60	875	55	263	24	206	19
1930	1029	60	875	55	263	24	206	19
1931	1027	60	875	55	262	24	206	19
1932	1025	60	875	55	262	24	206	19
1933	1021	60	875	55	262	24	206	19
1934	1017	60	874	55	262	24	206	19
1935	1012	60	874	55	261	24	206	19
1936	1006	60	873	55	261	24	206	19
1937	996	60	872	55	261	24	206	19
1938	990	60	872	55	260	24	206	19
1939	980	60	871	55	259	24	206	19
1940	977	60	870	55	259	24	206	19
1941	972	60	870	55	259	24	206	19
1942	968	60	869	55	259	24	206	19
1943	968	60	869	55	258	24	206	19
1944	967	60	869	55	258	24	206	19
1945	966	60	869	55	257	24	206	19
1946	966	60	869	55	257	24	206	19
1947	965	60	869	55	257	24	206	19
1948	934	60	866	55	255	24	205	19
1949	892	60	861	55	252	24	205	19
1950	856	60	857	55	249	24	205	19
1951	817	60	852	55	247	24	205	19
1952	772	59	845	55	245	24	205	19
1953	760	59	843	55	243	24	204	19
1954	766	59	844	55	239	24	204	19
1955	780	60	846	55	229	24	203	19
1956	792	60	848	55	219	24	202	19
1957	780	60	846	55	206	24	200	19
1958	773	60	845	55	198	24	199	19
1959	775	60	846	55	194	24	199	19

Table 19 (Continued). Time series of spawning output (SB in mt) and recruitment (Rec in 1000s) for the CAS in years 1916-1959. Standard deviations (based on asymptotic estimation) of each yearly measure is given in the 'sd' column.

	CAS			
Year	SB	sd	Rec	sd
Virgin	1207	61	917	50
1916	1207	61	917	50
1917	1207	61	917	50
1918	1206	61	917	50
1919	1205	61	917	50
1920	1205	61	917	50
1921	1204	61	917	50
1922	1204	61	917	50
1923	1204	61	917	50
1924	1203	61	917	50
1925	1203	61	917	50
1926	1202	61	916	50
1927	1202	61	916	50
1928	1202	61	916	50
1929	1201	61	916	50
1930	1199	61	916	50
1931	1197	61	916	50
1932	1195	61	916	50
1933	1190	61	916	50
1934	1186	61	915	50
1935	1181	61	915	50
1936	1174	60	914	50
1937	1162	60	913	50
1938	1156	60	913	50
1939	1144	60	912	50
1940	1141	60	911	50
1941	1135	60	911	50
1942	1130	60	910	50
1943	1129	60	910	50
1944	1127	60	910	50
1945	1127	60	910	50
1946	1126	60	910	50
1947	1124	60	910	50
1948	1091	60	907	50
1949	1045	60	902	50
1950	1004	59	898	50
1951	960	59	892	50
1952	911	59	886	50
1953	894	59	884	50
1954	894	59	884	50
1955	896	59	884	50
1956	897	59	884	50
1957	871	59	881	50
1958	856	59	878	50
1959	855	59	878	50

Table 19 (Continued). Time series of spawning output (SB in mt) and recruitment (Rec in 1000s) for the NCS and SCS in years 1960-2008. Standard deviations (based on asymptotic estimation) of each yearly measure is given in the 'sd' column.

	NCS				SCS			
Year	SB	sd	Rec	sd	SB	sd	Rec	sd
Virgin	1036	60	876	55	263	24	206	19
1960	782	60	847	55	198	24	199	19
1961	794	60	848	55	203	24	200	19
1962	807	60	850	55	209	24	201	19
1963	809	60	850	55	211	24	201	19
1964	779	60	846	56	210	24	201	19
1965	780	60	846	56	210	24	201	19
1966	771	60	845	56	207	24	200	19
1967	753	60	842	56	200	24	199	19
1968	759	60	843	56	199	24	199	19
1969	767	60	844	56	200	24	199	19
1970	771	60	1511	718	202	24	582	338
1971	765	60	1325	623	202	24	332	305
1972	776	60	1140	509	200	23	263	185
1973	766	60	927	385	189	22	265	156
1974	784	68	737	285	206	24	206	108
1975	827	84	608	222	224	25	158	74
1976	885	93	592	210	233	25	113	54
1977	912	95	864	298	239	25	144	61
1978	913	92	1208	310	243	24	148	68
1979	862	87	602	180	235	23	155	64
1980	817	80	505	155	225	22	283	72
1981	749	75	732	175	186	20	90	44
1982	703	70	474	143	159	18	86	34
1983	677	67	636	161	125	16	124	46
1984	640	63	516	135	123	14	475	76
1985	610	59	336	104	107	13	85	41
1986	592	55	1012	195	94	12	44	20
1987	536	51	1041	193	81	11	136	54
1988	499	48	487	137	78	11	198	64
1989	460	45	612	102	84	12	73	39
1990	442	41	1014	98	81	12	73	37
1991	466	37	772	67	65	11	76	36
1992	488	33	684	55	52	10	60	30
1993	460	28	1333	92	47	10	63	35
1994	461	25	842	74	50	10	420	104
1995	478	23	629	72	45	10	147	80
1996	456	23	639	95	42	10	107	63
1997	441	24	1231	183	43	10	164	71
1998	431	28	1048	185	57	12	378	134
1999	372	32	507	105	66	14	503	186
2000	351	37	491	121	69	17	87	53
2001	364	46	421	135	74	20	128	78
2002	405	56	584	203	95	26	227	118
2003	443	65	733	252	124	35	152	80
2004	421	71	552	215	145	42	79	41
2005	410	75	886	341	157	46	92	46
2006	404	79	738	292	164	48	121	61
2007	417	84	750	80	168	49	192	26
2008	438	90	764	81	164	49	194	27
2009	469	97	776	394	158	48	192	137

Table 19 (Continued). Time series of spawning output (SB in mt) and recruitment (Rec in 1000s) for the CAS and ORS in years 1960-2008. Standard deviations (based on asymptotic estimation) of each yearly measure is given in the 'sd' column.

	CAS				ORS			
Year	SB	sd	Rec	sd	SB	sd	Rec	sd
Virgin	1207	61	917	50	409	57	195	28
1960	867	59	880	50				
1961	885	59	883	50				
1962	904	59	885	50				
1963	909	60	886	50				
1964	877	59	881	50				
1965	878	59	882	50				
1966	865	59	880	50				
1967	839	59	876	50				
1968	843	59	876	50				
1969	852	60	878	50				
1970	859	60	871	352				
1971	853	60	944	389				
1972	861	60	1115	468				
1973	822	60	1417	541	381	57	193	28
1974	807	64	1117	420	381	57	193	28
1975	803	71	786	277	380	57	193	28
1976	829	77	609	211	379	57	193	28
1977	866	79	789	264	374	57	193	28
1978	903	80	1227	320	371	57	193	28
1979	886	78	783	238	361	57	192	28
1980	867	75	761	224	358	57	154	50
1981	789	71	736	193	359	57	251	66
1982	734	68	449	138	349	57	104	37
1983	686	65	801	213	346	57	137	38
1984	665	62	1679	269	344	57	129	32
1985	633	59	460	154	341	57	90	26
1986	613	56	716	179	336	56	212	54
1987	568	54	1059	234	318	55	193	57
1988	573	53	811	217	302	53	104	42
1989	586	53	649	151	280	50	165	66
1990	585	51	964	141	267	49	142	58
1991	590	48	749	94	260	48	181	54
1992	596	43	681	73	253	47	199	47
1993	566	38	1297	92	245	46	219	52
1994	569	33	777	75	240	44	178	55
1995	572	29	594	71	237	43	176	47
1996	540	27	437	76	243	42	202	46
1997	508	27	812	133	253	42	200	47
1998	475	27	1177	194	251	42	236	50
1999	384	28	779	161	246	41	356	67
2000	333	30	467	116	242	41	211	50
2001	313	34	341	107	239	41	188	44
2002	338	41	543	182	238	44	148	41
2003	379	50	732	232	245	48	131	38
2004	366	57	425	155	256	54	187	58
2005	360	61	565	206	254	58	137	54
2006	359	66	559	212	245	61	88	41
2007	376	73	732	77	235	64	141	73
2008	392	79	750	79	226	66	180	32
2009	410	85	759	386	214	69	178	94

Table 20. Total cabezon spawning output and depletion rates in differing California models, compared to the 2005 assessment.

	Total California Cabezon Spawning Biomass (mt)				
Model	SB_{1916}	SB_{2005}	SB_{2005}/SB_{1916}	SB_{2009}	SB_{2005}/SB_{1916}
2009 Assessment					
NCS+SCS	1298	567	44%	627	48%
CAS	1207	360	30%	410	34%
2005 Assessment					
NCS+SCS	1361	516	37.9%		
CAS	1268	634	50.0%		

Table 21. Values for the likelihood components and summary statistics related to current status of cabezon sub-stocks for sensitivity tests by changing the data sources included in each assessment. Gray boxes indicate data source is ignored. Green indicates stock status above the target reference point ($SB_{2009/1916} \geq SB_{40\%}$). Yellow indicates stock status in the precautionary zone ($SB_{25\%} < SB_{2009/1916} < SB_{40\%}$). Red indicates stock status below the limit reference point (($SB_{2009/1916} \leq SB_{25\%}$).

A) NCS (Trials 1-11)

	Trial											
Likelihood Components	Base Case	1	2	3	4	5	6	7	8	9	10	11
Abundance Index												
CPFV (1960-1999)	26	26		26	27	26	26	26	25	26	26	
CPFV (2000-2008)		3										
CPFV (1960-2008)			29									
TENERA adult survey				2							3	
PISCO adult survey					1						1	
PISCO SMURFs						2					2	
SLO SMURFS							0				0	
CDFG hook and line								1			1	
PSMFC dockside									7		7	
PSMFC onboard										8	8	
Mean Body Weight	21	21	20	21	21	21	21	21	21	21	21	22
Length Comps.	1246	1232	1234	1233	1232	1234	1232	1233	1233	1232	1232	1230
Commerical (non-live)	40	27	28	27	27	27	27	27	27	27	27	27
Commerical (live)	95	96	94	95	95	95	95	95	94	95	94	94
Rec: Man-made	233	230	233	232	233	233	230	233	234	233	234	231
Rec: Beach/bank	262	264	262	263	262	263	264	263	262	263	261	262
Rec: PBR	277	277	277	277	276	277	277	276	276	276	277	277
Rec: CPFV	339	339	340	339	339	339	339	339	340	339	340	340
Conditional age at length	2095	2096	2099	2096	2097	2096	2096	2096	2097	2097	2098	2095
Recruitment penalty	8	9	10	9	9	8	9	9	9	9	9	11
Parameter priors	23	21	24	22	22	22	21	22	23	23	22	23
TOTAL LIKELIHOOD	3420	3408	3416	3410	3409	3409	3406	3408	3414	3415	3429	3380
1916 reproductive output	1036 (60)	1043 (60)	1102 (67)	1028 (58)	1020 (58)	1038 (60)	1028 (60)	1036 (60)	1041 (60)	1035 (60)	1020 (55)	952
2009 reproductive output	469 (97)	489 (97)	648 (112)	454 (90)	443 (90)	488 (99)	465 (96)	473 (97)	506 (95)	475 (96)	469 (83)	337
%Depletion	45% (7%)	47% (7%)	59% (7%)	44% (7%)	43% (7%)	47% (7%)	45% (7%)	46% (7%)	49% (7%)	46% (7%)	46% (6%)	35% (7%)
MSY	129 (8)	130 (8)	139 (9)	128 (8)	127 (8)	129 (8)	129 (8)	129 (8)	130 (8)	129 (8)	127 (7)	103 (7)

Table 21 (Continued).

B) NCS (Trials 12-21)

	Trial										
Likelihood Components	Base Case	12	13	14	15	16	17	18	19	20	21
Abundance Index											
CPFV (1960-1999)	26	26	26	26	24	25	28	25	21	16	25
CPFV (2000-2008)											
CPFV (1960-2008)											
TENERA adult survey											
PISCO adult survey											
PISCO SMURFs											
SLO SMURFS											
CDFG hook and line											
PSMFC dockside											
PSMFC onboard											
Mean Body Weight	21		21	23	20	22	19	20	25	26	23
Length Comps.	1246	1233	1203	1140	999	967	955	895		1110	1205
Commerical (non-live)	40	27		27	27	28	25	27		26	24
Commerical (live)	95	96	94		98	100	97	95		76	80
Rec: Man-made	233	232	232	231		230	225	236		208	222
Rec: Beach/bank	262	264	263	268	259		261	259		235	271
Rec: PBR	277	276	275	276	271	274		279		251	274
Rec: CPFV	339	338	339	338	343	335	346			315	334
Conditional age at length	2095	2095	2098	2081	2087	2095	2081	2092	2033		
Recruitment penalty	8	9	9	8	8	10	7	8	8	14	13
Parameter priors	23	22	22	20	25	19	18	23	10	1	0
TOTAL LIKELIHOOD	3420	3386	3379	3299	3164	3138	3109	3063	2098	1166	1266
1916 reproductive output	1036 (60)	1043 (61)	1043 (62)	1043 (64)	959 (53)	1126 (71)	1097 (72)	979 (57)	925 (111)	257 (30)	1197 (103)
2009 reproductive output	469 (97)	646 (98)	501 (101)	465 (107)	450 (95)	605 (128)	475 (104)	422 (88)	48 (31)	162 (67)	735 (167)
%Depletion	45% (7%)	44% (7%)	48% (7%)	45% (8%)	47% (8%)	54% (9%)	43% (7%)	43% (7%)	5% (3%)	63% (10%)	61% (9%)
MSY	129 (8)	129 (8)	132 (8)	129 (9)	122 (7)	144 (10)	123 (9)	124 (8)	82 (4)	118 (7)	119 (10)

Table 21 (Continued).

B) SCS (Trials 1-7)

Likelihood Components	Trial: Base Case	1	2	3	4	5	6	7
Abundance Index								
CPFV (1960-1999)	44	44		45	44	44	45	
CPFV (2000-2008)	2			2	1	2	2	
CPFV (1960-2008)			48					
CalCOFI manta tows				28			26	
SoCal Edison Impingement					18		16	
PISCO adult survey						0	0	
Mean Body Weight	66	66	66	66	67	64	68	58
Length Comps.	807	806	805	816	811	778	819	808
Commerical (live)	38	38	37	39	40	38	40	38
Rec: Man-made	120	120	119	120	120	120	121	119
Rec: Beach/bank	152	152	152	150	152	124	150	150
Rec: PBR	200	200	199	202	201	200	203	199
Rec: CPFV	297	297	297	304	299	296	305	302
Conditional age at length	40	40	41	43	39	40	43	41
Recruitment penalty	15	15	16	12	13	15	11	17
Parameter priors	0	0	0	0	0	0	0	0
TOTAL LIKELIHOOD	974	972	976	1013	995	944	1031	924
1916 reproductive output	262 (23)	266 (24)	271 (22)	277 (19)	246 (17)	261 (24)	265 (16)	292 (30)
2009 reproductive output	158 (48)	165 (49)	178 (44)	162 (38)	107 (28)	156 (48)	130 (28)	213 (71)
%Depletion	60% (14%)	62% (14%)	66% (12%)	59% (11%)	44% (9%)	60% (14%)	49% (8%)	73% (18%)
MSY	30 (3)	30 (3)	30 (3)	32 (2)	28 (2)	29 (3)	27 (2)	29 (3)

Table 21 (Continued).

B) SCS (Trials 8-15)

	Trial								
Likelihood Components	Base Case	8	9	10	11	12	13	14	15
Abundance Index									
CPFV (1960-1999)	44	36	44	43	38	42	49	26	45
CPFV (2000-2008)	2	2	2	1	2	2	1	1	1
CPFV (1960-2008)									
CalCOFI manta tows									
SoCal Edison Impingement									
PISCO adult survey									
Mean Body Weight	66		65	63	40	61	56	28	66
Length Comps.	807	798	771	687	650	607	499		802
Commerical (live)	38	37		38	39	40	37		35
Rec: Man-made	120	118	120		121	121	120		119
Rec: Beach/bank	152	149	152	153		152	147		151
Rec: PBR	200	201	202	201	201		196		197
Rec: CPFV	297	293	296	295	290	294			299
Conditional age at length	40	44	37	40	38	37	44	32	
Recruitment penalty	15	13	15	15	15	15	12	10	15
Parameter priors	0	0	0	0	0	0	0	0	0
TOTAL LIKELIHOOD	974	892	934	849	783	764	661	98	929
1916 reproductive output	262 (23)	300 (37)	247 (21)	256 (23)	260 (22)	241 (19)	300 (34)	248 (22)	285 (30)
2009 reproductive output	158 (48)	203 (67)	122 (40)	138 (43)	138 (45)	99 (33)	184 (64)	37 (19)	202 (59)
%Depletion	60% (14%)	68% (15%)	49% (13%)	54% (13%)	53% (14%)	41% (11%)	61% (15%)	15% (7%)	71% (15%)
MSY	30 (3)	35 (4)	28 (2)	28 (2)	25 (2)	27 (2)	33 (4)	23 (2)	32 (3)

Table 21 (Continued).

C) CAS (Trials 1-10)

Likelihood Components	Trial: Base Case	1	2	3	4	5	6	7	8	9	10
Abundance Index											
CPFV (1960-1999)	50	49		50	50	50	50	48	50	50	
CPFV (2000-2008)		2								3	
CPFV (1960-2008)			56							140	
TENERA adult survey				2						2	
PISCO adult survey					1					2	
PISCO SMURFs						7				8	
SLO SMURFS							0			0	
CalCOFI								15		15	
SoCal Edison Impingement									33	33	
Mean Body Weight	18	18	17	18	18	18	18	18	19	19	18
Length Comps.	1449	1450	1458	1449	1448	1450	1449	1451	1452	1456	1440
Commerical (non-live)	44	44	45	44	43	44	44	44	43	44	43
Commerical (live)	83	83	81	83	83	83	83	84	85	85	82
Rec: Man-made	248	248	249	248	248	248	248	248	243	247	246
Rec: Beach/bank	291	291	290	291	291	291	291	292	298	296	288
Rec: PBR	289	290	288	289	289	291	289	289	291	292	290
Rec: CPFV	494	495	505	494	493	493	494	495	492	493	491
Conditional age at length	863	862	869	863	864	863	863	864	861	863	865
Recruitment penalty	8	8	9	8	8	8	8	7	7	6	12
Parameter priors	10	10	9	10	9	10	10	9	8	9	10
TOTAL LIKELIHOOD	2397	2400	2417	2399	2398	2405	2397	2412	2431	2462	2345
1916 reproductive output	1207 (61)	1219 (61)	1179 (73)	1205 (60)	1194 (59)	1212 (61)	1206 (61)	1245 (61)	1218 (58)	1241 (55)	1128 (62)
2009 reproductive output	410 (85)	434 (84)	501 (110)	406 (81)	387 (79)	424 (88)	409 (85)	458 (87)	392 (72)	413 (69)	291 (73)
%Depletion	34% (6%)	36% (6%)	43% (7%)	34% (6%)	32% (5%)	35% (6%)	34% (6%)	37% (6%)	32% (5%)	33% (5%)	26% (6%)
MSY	141 (8)	143 (8)	148 (9)	141 (8)	140 (8)	142 (8)	141 (8)	146 (8)	146 (8)	147 (7)	110 (7)

Table 21 (Continued).

C) CAS (Trials 1-10)

	Trial									
Likelihood Components	Base Case	11	12	13	14	15	16	17	18	19
Abundance Index										
CPFV (1960-1999)	50	50	50	48	48	47	49	47	29	43
CPFV (2000-2008)										
CPFV (1960-2008)										
TENERA adult survey										
PISCO adult survey										
PISCO SMURFs										
SLO SMURFS										
CalCOFI										
SoCal Edison Impingement										
Mean Body Weight	18		18	20	16	19	18	17	16	19
Length Comps.	1449	1449	1403	1360	1198	1152	1149	940		1401
Commerical (non-live)	44	43		42	44	44	43	46		40
Commerical (live)	83	84	82		87	89	87	80		75
Rec: Man-made	248	248	247	245		243	242	244		249
Rec: Beach/bank	291	292	291	298	292		292	289		270
Rec: PBR	289	289	288	295	286	289		282		270
Rec: CPFV	494	493	496	481	489	488	485			498
Conditional age at length	863	863	864	853	850	858	854	868	824	
Recruitment penalty	8	8	7	8	8	8	9	6	7	14
Parameter priors	10	9	9	10	14	6	5	10	3	1
TOTAL LIKELIHOOD	2397	2379	2351	2298	2134	2090	2084	1887	878	1477
1916 reproductive output	1207 (61)	1209 (61)	1223 (63)	1327 (71)	1113 (59)	1263 (68)	1268 (76)	1277 (77)	1203 (168)	1366 (71)
2009 reproductive output	410 (85)	390 (83)	429 (87)	533 (123)	350 (76)	500 (103)	437 (93)	524 (126)	92 (78)	589 (145)
%Depletion	34% (6%)	32% (6%)	35% (6%)	40% (8%)	32% (6%)	40% (6%)	35% (6%)	41% (8%)	8% (6%)	43% (9%)
MSY	141 (8)	141 (8)	143 (8)	157 (12)	134 (7)	152 (9)	135 (8)	153 (11)	107 (7)	115 (6)

Table 21 (Continued).

D) ORS

Likelihood Components	Trial									
	Base Case	1	2	3	4	5	6	7	8	9
Abundance Index										
ORBS (2001-2008)	10		10	10	11	9	2		6	7
Mean Body Weight	5	5		5	6	5	3		4	5
Length Comps.	623	619	625	534	475	419	423		577	623
Commerical (non-live)	88	88	88		89	88	88		88	88
Commerical (live)	140	143	141	140		131	144		135	141
Rec: Shore	192	190	192	191	190		190		169	194
Rec: Boat	204	197	204	202	197	200		No convergence	186	201
Conditional age at length	262	259	261	261	259	261	255			260
Recruitment penalty	6	10	6	6	4	5	7		10	7
Parameter priors	8	7	8	8	8	2	1		1	10
TOTAL LIKELIHOOD	914	900	909	825	763	701	692		599	912
Virgin reproductive output	409 (57)	281 (32)	406 (55)	401 (53)	366 (44)	463 (80)	567 (186)		267 (76)	351 (43)
2009 reproductive output	214 (69)	57 (31)	212 (67)	206 (64)	194 (53)	281 (99)	377 (210)		190 (87)	140 (49)
%Depletion	52% (10%)	20% (9%)	53% (10%)	51% (10%)	53% (9%)	61% (11%)	66% (16%)		71% (15%)	40% (10%)
MSY	51 (8)	30 (40)	43 (6)	43 (6)	44 (5)	50 (9)	56 (18)		51 (13)	37 (5)

Table 22. Sensitivity results to assumptions of sex-specific natural mortality (*M*) for each cabezon sub-stock. Green indicates stock status above the target reference point ($SB_{2009/1916} \geq SB_{40\%}$). Yellow indicates stock status in the precautionary zone ($SB_{25\%} < SB_{2009/1916} < SB_{40\%}$). Red indicates stock status below the limit reference point (($SB_{2009/1916} \leq SB_{25\%}$).

	Natural mortality (*M*)		Derived Outputs				
Substock	Female	Male	SB_0	SB_{2009}	Depletion	MSY	NegLogLike
NCS	0.15	0.15	1117 (47)	228 (55)	20% (5%)	87 (4)	3383
NCS	0.15	0.2	1257 (51)	272 (64)	22% (2%)	87 (4)	3378
NCS	0.2	0.2	992 (48)	358 (73)	36% (6%)	102 (5)	3385
NCS	0.2	0.25	1100 (52)	385 (80)	35% (6%)	104 (5)	3387
NCS	0.25	0.25	920 (53)	426 (87)	46% (7%)	128 (8)	3406
NCS	0.25	0.3	1036 (60)	469 (97)	45% (7%)	129 (8)	3420
NCS	0.3	0.3	958 (77)	523 (115)	55% (8%)	172 (15)	3427
NCS	0.3	0.35	927 (105)	723 (170)	78% (11%)	239 (28)	3418
NCS	0.35	0.35	1058 (109)	787 (175)	74% (10%)	238 (26)	3414
SCS	0.15	0.15	295 (15)	45 (15)	15% (5%)	20 (1)	1001
SCS	0.15	0.2	334 (17)	43 (15)	13% (4%)	20 (1)	988
SCS	0.2	0.2	259 (17)	98 (29)	38% (10%)	24 (2)	984
SCS	0.2	0.25	287 (19)	96 (30)	33% (9%)	24 (2)	973
SCS	0.25	0.25	241 (23)	158 (47)	65% (14%)	30 (3)	985
SCS	0.25	0.3	262 (23)	158 (48)	60% (14%)	30 (3)	974
SCS	0.3	0.3	275 (46)	264 (87)	96% (18%)	44 (7)	989
SCS	0.3	0.35	282 (42)	252 (83)	90% (18%)	41 (6)	978
SCS	0.35	0.35	554 (281)	673 (413)	121% (19%)	112 (56)	992
CAS	0.15	0.15	1300 (56)	165 (89)	11% (3%)	104 (4)	2391
CAS	0.15	0.2	1494 (63)	189 (56)	13% (3%)	105 (4)	2390
CAS	0.2	0.2	1144 (53)	269 (64)	24% (3%)	121 (6)	2385
CAS	0.2	0.25	1300 (58)	303 (69)	23% (5%)	119 (6)	2388
CAS	0.25	0.25	1081 (57)	406 (87)	38% (7%)	147 (9)	2392
CAS	0.25	0.3	1207 (61)	410 (85)	34% (6%)	141 (8)	2397
CAS	0.3	0.3	1063 (66)	443 (92)	42% (7%)	173 (12)	2412
CAS	0.3	0.35	1129 (64)	509 (99)	45% (7%)	166 (10)	2385
CAS	0.35	0.35	1169 (109)	586 (133)	50% (8%)	239 (24)	2433
OR	0.15	0.15	299 (18)	65 (16)	22% (5%)	25 (1)	965
OR	0.15	0.2	375 (24)	99 (26)	26% (6%)	26 (2)	953
OR	0.2	0.2	301 (23)	98 (26)	33% (7%)	30 (2)	932
OR	0.2	0.25	373 (32)	129 (38)	37% (8%)	32 (3)	928
OR	0.25	0.25	326 (38)	154 (46)	47% (9%)	40 (5)	914
OR	0.25	0.3	409 (57)	214 (69)	52% (10%)	51 (8)	914
OR	0.3	0.3	423 (95)	278 (110)	66% (12%)	62 (14)	907
OR	0.3	0.35	535 (140)	371 (161)	69% (13%)	69 (18)	912
OR	0.35	0.35	1027 (845)	895 (883)	87% (15%)	180 (148)	906

Table 23. Results of sensitivity trials to model specification for each cabezon sub-stock. Green indicates stock status above the target reference point ($SB_{2009/1916} \geq SB_{40\%}$). Yellow indicates stock status in the precautionary zone ($SB_{25\%} < SB_{2009/1916} < SB_{40\%}$). Red indicates stock status below the limit reference point (($SB_{2009/1916} \leq SB_{25\%}$).

A) NCS

Trial	SB_{1916}	SB_{2009}	Depletion	MSY	Likelihood
Base Case	1036 (60)	469 (97)	45% (7%)	129 (8)	3420
Untuned	1043 (63)	474 (99)	46% (7%)	129 (9)	3073
Original Index CVs	1262 (69)	1014 (154)	80% (9%)	157 (10)	3567
Retrospecitive analysis					
no 2008	1029 (57)	461 (93)	45% (7%)	127 (8)	3337
no 2007-2008	1014 (54)	432 (89)	43% (7%)	124 (7)	3284
no 2006-2008	1052 (55)	496 (94)	47% (7%)	128 (7)	3234
no 2005-2008	1046 (52)	560 (103)	54% (8%)	125 (44)	3169
no 2004-2008	992 (45)	379 (78)	38% (7%)	119 (48)	3100
no 1999-2008	808 (57)	258 (90)	32% (10%)	97 (33)	1529
Catch history					
Halved	518 (30)	235 (49)	45% (7%)	64 (4)	3421
Double	2073 (121)	937 (194)	45% (7%)	258 (16)	3421
Discard mortality					
none	1026 (60)	470 (96)	46% (7%)	128 (8)	3421
total	1041 (61)	464 (98)	45% (7%)	130 (8)	3408
No blocking of selectivities	987 (65)	582 (105)	59% (7%)	126 (9)	3574
Recruitment deviations					
start:1960	1051 (62)	380 (86)	36% (7%)	132 (9)	3415
start:1980	1051 (53)	517 (80)	49% (6%)	130 (7)	3426
No rec. devs. Estimated	964 (26)	449 (20)	47% (18%)	101 (2)	3529
Selectivity					
dome-shaped: PBR (5) & CPFV (6)	1277 (98)	598 (133)	47% (8%)	130 (10)	3404
logistic: MM (3) & BB (4)	1072 (65)	455 (100)	43% (7%)	131 (9)	3478
Ricker S/R	1305 (76)	205 (61)	16% (4%)	67 (4)	3407
$CV_{old\ males}$ = 0.1	1418 (188)	488 (199)	34% (10%)	145 (23)	1141
O'Connell VBGF parameters	842 (29)	109 (46)	13% (5%)	87 (3)	1421
$Male_{CA}$ VBGF = $Male_{OR}$	Unconverged model				
No ageing error	1051 (63)	505 (101)	48% (7%)	120 (8)	3370
Estimate *M*	1194 (74)	360 (82)	30% (6%)	85 (5)	3405
Remove pre-1990 RecFIN lengths	1031 (66)	514 (108)	50% (8%)	133 (9)	2943

B) SCS

Trial	SB_{1916}	SB_{2009}	Depletion	MSY	Likelihood
Base Case	262 (23)	158 (48)	60% (14%)	30 (3)	974
Untuned	271 (29)	124 (50)	46% (15%)	30 (3)	702
Original Index CVs	246 (18)	141 (33)	57% (10%)	28 (2)	1204
Retrospecitive analysis					
no 2008	252 (23)	126 (42)	50% (13%)	29 (3)	930
no 2007-2008	267 (24)	154 (48)	58% (14%)	30 (3)	901
no 2006-2008	265 (24)	152 (46)	57% (13%)	30 (3)	863
no 2005-2008	260 (22)	157 (44)	61% (13%)	29 (2)	822
no 2004-2008	252 (21)	133 (42)	52% (13%)	29 (2)	787
no 1999-2008	262 (25)	168 (49)	64% (14%)	30 (4)	611
Catch history					
Halved	131 (12)	79 (24)	60% (14%)	15 (1)	974
Double	525 (46)	311 (94)	59% (14%)	59 (5)	974
Discard mortality					
none	263 (24)	160 (48)	61% (14%)	30 (3)	974
total	264 (24)	157 (48)	59% (14%)	30 (3)	974
No blocking of selectivities	299 (34)	250 (66)	84% (14%)	32 (4)	1030
Original 1980 RecFIN PBR estimate	309 (32)	213 (68)	69% (16%)	35 (4)	979
Recruitment deviations					
start:1960	261 (24)	145 (47)	56% (14%)	29 (3)	974
start:1980	249 (13)	139 (30)	56% (10%)	28 (1)	986
No rec. devs. Estimated	226 (5)	90 (10)	40% (4%)	23 (0)	1049
Selectivity					
dome-shaped: PBR (5) & CPFV (6)	285 (33)	199 (67)	70% (16%)	32 (4)	969
logistic: MM (3) & BB (4)	283 (29)	195 (60)	69% (15%)	31 (3)	984
Ricker S/R	333 (28)	55 (28)	17% (8%)	16 (1)	981
$CV_{old\ males}$ = 0.1	321 (35)	115 (43)	36% (11%)	31 (3)	990
O'Connell VBGF parameters*	Unconverged model				
$Male_{CA}$ VBGF = $Male_{OR}$	131 (8)	30 (9)	23% (7%)	22 (1)	1004
No ageing error	264 (23)	155 (47)	59% (13%)	26 (2)	973
Estimate *M*	310 (24)	123 (46)	40% (14%)	24 (2)	963
Remove pre-1990 RecFIN lengths	219 (17)	106 (31)	48% (12%)	23 (2)	600
Man-made 2000 mean weight increased	260 (23)	146 (45)	56% (13%)	29 (3)	969

Table 23 (continued). Results of sensitivity trials to model specification for each cabezon sub-stock. Green indicates stock status above the target reference point ($SB_{2009/1916} \geq SB_{40\%}$). Yellow indicates stock status in the precautionary zone ($SB_{25\%} < SB_{2009/1916} < SB_{40\%}$). Red indicates stock status below the limit reference point (($SB_{2009/1916} \leq SB_{25\%}$).

C) CAS

Trial	SB_{1916}	SB_{2009}	Depletion	MSY	Likelihood
Base Case	1207 (61)	410 (85)	34% (6%)	141 (8)	2397
Untuned	1350 (83)	235 (68)	17% (4%)	162 (11)	2264
Original Index CVs	1548 (67)	1079 (155)	70% (8%)	187 (10)	2686
1 Area, Multiple Fleets	1178 (40)	408 (43)	35% (3%)	106 (4)	3459
2 Area, Multiple Fleets, est. rec. ratio	1750 (152)	1176 (226)	67% (8%)	283 (18)	3050
Retrospecitive analysis					
no 2008	1198 (55)	377 (76)	32% (5%)	138 (7)	2333
no 2007-2008	1202 (53)	370 (74)	31% (5%)	138 (36)	2278
no 2006-2008	1230 (55)	416 (75)	34% (5%)	141 (7)	2221
no 2005-2008	1250 (58)	439 (91)	35% (6%)	146 (74)	2145
no 2004-2008	1179 (45)	287 (62)	24% (5%)	134 (57)	2059
no 1999-2008	1355 (216)	610 (268)	45% (13%	177 (97)	1260
Catch history					
Halved	604 (30)	205 (42)	34% (6%)	70 (4)	2397
Double	2415 (121)	820 (170)	34% (6%)	282 (16)	2397
Discard mortality					
none	1199 (60)	415 (85)	35% (6%)	140 (8)	2396
total	1221 (62)	411 (88)	34% (6%)	143 (8)	2399
No blocking of selectivities	1023 (55)	433 (73)	42% (5%)	123 (7)	2570
Original 1980 RecFIN PBR estimate	1227 (62)	416 (86)	34% (6%)	144 (8)	2396
Recruitment deviations					
start:1960	1196 (66)	327 (77)	27% (6%)	142 (9)	2389
start:1980	1245 (55)	483 (77)	39% (5%)	145 (7)	2401
No rec. devs. Estimated	1285 (33)	592 (36)	46% (2%)	121 (3)	2477
Selectivity					
dome-shaped: PBR (5) & CPFV (6)	1516 (109)	554 (123)	37% (6%)	141 (9)	2365
logistic: MM (3) & BB (4)	1245 (61)	417 (88)	34% (6%)	141 (8)	2411
Ricker S/R	1517 (76)	114 (42)	8% (3%)	75 (4)	2375
$CV_{old\ males} = 0.1$	1234 (62)	404 (85)	33% (6%)	119 (6)	2408
O'Connell VBGF parameters	969 (37)	80 (23)	8% (2%)	98 (4)	1695
$Male_{CA}$ VBGF = $Male_{OR}$	1145 (216)	648 (207)	57% (9%)	233 (39)	3157
No ageing error	1226 (63)	436 (87)	36% (6%)	126 (7)	2377
Estimate *M*	1455 (100)	289 (75)	20% (5%)	97 (5)	2386

D) ORS

Trial	SB_{1916}	SB_{2009}	Depletion	MSY	Likelihood
Base Case	409 (57)	214 (69)	52% (10%)	51 (8)	914
Untuned	304 (51)	194 (60)	49% (10%)	42 (6)	862
Original Index CVs	463 (66)	309 (81)	67% (9%)	59 (9)	950
Retrospecitive analysis					
no 2008	571 (187)	406 (217)	71% (15%)	65	787
no 2007-2008	367 (65)	193 (71)	57% (13%)	47 (9)	670
no 2006-2008	512 (369)	414 (418)	81% (24%)	92 (69)	537
no 2005-2008	225 (61)	110 (67)	49% (19%)	42 (10)	448
no 2004-2008	228 (56)	100 (90)	44% (4%)	38 (11)	409
no 1999-2008	189 (26)	2 (11)	1% (6%)	24 (3)	249
Discard mortality					
none	400 (55)	208 (66)	52% (10%)	43 (6)	914
total	477 (70)	250 (83)	52% (10%)	51 (8)	915
No blocking of selectivities	316 (41)	166 (53)	53% (10%)	34 (5)	1053
RecFin mt removal estimates used	418 (59)	220 (72)	53% (10%)	44 (6)	915
Recruitment deviations					
start:1990	353 (38)	149 (41)	42% (8%)	38 (4)	925
No rec. devs. Estimated	497 (56)	312 (58)	63% (5%)	58 (7)	967
Selectivity					
dome-shaped: Boat mode	483 (107)	295 (125)	59% (13%)	49 (11)	908
Ricker S/R	411 (58)	217 (70)	53% (10%)	44 (7)	915
No ageing error	410 (60)	219 (72)	53% (10%)	45 (7)	910

Table 24. Projection of potential cabezon ABC, OY, spawning biomass and depletion for each substock base case models, based on the SPR=45% and 50% targets and appropriate control rule.

NCS	40:10 and $SPR_{45\%}$					60:20 and $SPR_{50\%}$				
Year	ABC (mtons)	OY (mtons)	Age 2+ biomass (mtons)	Spawning biomass (mtons)	Depletion	ABC (mtons)	OY (mtons)	Age 2+ biomass (mtons)	Spawning biomass (mtons)	Depletion
2009	137	137	1049	469	45.2%	114	95	1049	469	45.2%
2010	132	132	1023	447	43.2%	114	96	1057	472	45.5%
2011	128	128	1008	433	41.8%	115	97	1066	476	45.9%
2012	126	126	999	423	40.9%	116	99	1075	479	46.2%
2013	125	125	992	418	40.3%	117	100	1083	482	46.5%
2014	124	124	988	414	40.0%	118	101	1090	485	46.8%
2015	123	123	984	412	39.7%	119	102	1095	488	47.1%
2016	123	122	980	410	39.6%	119	103	1099	490	47.3%
2017	122	122	978	409	39.4%	120	104	1102	492	47.4%
2018	122	121	975	407	39.3%	120	104	1104	493	47.6%
2019	122	121	973	406	39.2%	120	105	1106	494	47.6%
2020	121	121	971	405	39.1%	120	105	1108	495	47.7%

SCS	40:10 and $SPR_{45\%}$					60:20 and $SPR_{50\%}$				
Year	ABC (mtons)	OY (mtons)	Age 2+ biomass (mtons)	Spawning biomass (mtons)	Depletion	ABC (mtons)	OY (mtons)	Age 2+ biomass (mtons)	Spawning biomass (mtons)	Depletion
2009	39	39	293	158	60.0%	33	33	293	158	60.0%
2010	34	34	273	134	51.1%	30	28	278	138	52.6%
2011	32	32	261	120	45.6%	28	25	272	127	48.5%
2012	30	30	255	112	42.7%	27	24	271	123	46.9%
2013	30	30	252	109	41.5%	27	23	272	123	46.6%
2014	29	29	250	107	40.9%	27	24	274	123	46.9%
2015	29	29	249	107	40.6%	28	24	276	124	47.2%
2016	29	29	248	106	40.3%	28	24	277	125	47.5%
2017	29	29	247	105	40.1%	28	24	278	125	47.7%
2018	29	29	245	105	39.9%	28	24	278	126	47.9%
2019	29	28	245	104	39.7%	28	24	279	126	47.9%
2020	28	28	244	104	39.5%	28	25	279	126	48.0%

Table 24 (Continued).

CAS	40:10 and $SPR_{45\%}$					60:20 and $SPR_{50\%}$				
Year	ABC (mtons)	OY (mtons)	Age 2+ biomass (mtons)	Spawning biomass (mtons)	Depletion	ABC (mtons)	OY (mtons)	Age 2+ biomass (mtons)	Spawning biomass (mtons)	Depletion
2009	115	108	877	410	34.0%	95	59	877	410	34.0%
2010	112	103	884	395	32.7%	98	64	924	424	35.1%
2011	111	103	904	393	32.5%	102	70	972	443	36.7%
2012	113	106	929	401	33.2%	107	77	1017	465	38.5%
2013	116	110	952	413	34.2%	112	84	1056	487	40.3%
2014	120	114	973	425	35.2%	116	91	1090	506	41.9%
2015	122	118	989	434	36.0%	120	96	1117	522	43.2%
2016	124	120	1001	441	36.5%	122	101	1138	534	44.3%
2017	126	122	1011	447	37.0%	125	104	1156	544	45.1%
2018	127	124	1019	451	37.3%	126	107	1170	552	45.7%
2019	128	125	1026	454	37.6%	128	109	1180	557	46.2%
2020	129	126	1031	456	37.8%	129	110	1189	562	46.6%

ORS	40:10 and $SPR_{45\%}$					60:20 and $SPR_{50\%}$				
Year	ABC (mtons)	OY (mtons)	Age 2+ biomass (mtons)	Spawning biomass (mtons)	Depletion	ABC (mtons)	OY (mtons)	Age 2+ biomass (mtons)	Spawning biomass (mtons)	Depletion
2009	60	60	455	214	52.4%	51	47	455	214	52.4%
2010	53	53	425	189	46.3%	47	41	437	196	48.0%
2011	50	50	411	170	41.6%	45	37	433	184	44.9%
2012	48	48	406	161	39.4%	45	37	437	180	44.0%
2013	48	48	406	159	38.8%	46	38	444	182	44.5%
2014	49	48	407	159	38.9%	47	39	451	186	45.4%
2015	49	49	407	160	39.1%	47	40	457	189	46.2%
2016	49	49	407	160	39.1%	48	41	461	192	46.8%
2017	49	49	407	160	39.1%	48	42	464	193	47.2%
2018	49	49	407	160	39.1%	49	42	466	194	47.5%
2019	49	49	407	160	39.0%	49	42	467	195	47.7%
2020	49	49	406	159	39.0%	49	43	469	196	47.8%

Table 25. Decision analysis of spawning output depletion based on different states of nature (columns) under different catch histories (rows) and control rules for each cabezon sub-stock. For the 40-10 rule ($F_{45\%}$), 0.40 and 0.25 are the target and limit reference points, respectively. For the 60-20 rule ($F_{50\%}$), 0.60 and 0.30 are the target and limit reference points, respectively. At or above the target reference point is indicated by green; between the target and limit reference points is indicated by yellow; below the limit reference point is indicated by red. Catches for 2009-2010 were provided by California and Oregon and reflect current catch targets. Control rules are implemented after 2010.

NCS: 40-10, $F_{45\%}$

		Removals			State of Nature		
					Low *M* (F= 0.2/M=0.25) p = 0.25	Base Case *M* (F=0.25/M=0.3) p = 0.5	High *M* (F=0.3/M=0.35) p = 0.25
	Year	Comm.	Rec.	Total			
Low *M* catches	2009	21	34	55	0.34	0.45	0.53
	2010	25	38	63	0.37	0.48	0.56
	2011	48	47	94	0.38	0.50	0.58
	2012	48	47	95	0.38	0.50	0.58
	2013	47	47	94	0.38	0.50	0.59
	2014	47	47	94	0.38	0.50	0.59
	2015	47	47	94	0.38	0.51	0.60
	2016	48	47	95	0.38	0.51	0.61
	2017	48	47	95	0.38	0.51	0.62
	2018	48	47	95	0.38	0.51	0.62
	2019	48	47	95	0.38	0.52	0.63
	2020	48	47	96	0.39	0.52	0.63
Base case *M* catches	2009	21	34	55	0.34	0.45	0.53
	2010	25	38	63	0.37	0.48	0.56
	2011	76	74	150	0.38	0.50	0.58
	2012	72	70	142	0.35	0.47	0.55
	2013	70	67	137	0.33	0.45	0.54
	2014	68	64	133	0.31	0.43	0.53
	2015	67	63	130	0.29	0.42	0.53
	2016	66	62	128	0.28	0.41	0.53
	2017	66	61	127	0.27	0.41	0.53
	2018	65	60	126	0.26	0.41	0.53
	2019	65	60	125	0.26	0.40	0.53
	2020	65	59	124	0.25	0.40	0.54
High *M* catches	2009	21	34	55	0.34	0.45	0.53
	2010	25	38	63	0.37	0.48	0.56
	2011	116	112	228	0.38	0.50	0.58
	2012	106	99	206	0.31	0.42	0.51
	2013	100	91	192	0.25	0.37	0.47
	2014	97	86	183	0.21	0.34	0.45
	2015	95	83	178	0.18	0.31	0.43
	2016	93	81	175	0.16	0.29	0.42
	2017	92	80	172	0.14	0.28	0.42
	2018	91	79	170	0.12	0.26	0.41
	2019	90	78	168	0.09	0.25	0.41
	2020	89	77	166	0.07	0.24	0.40

Table 25 (Continued).

NCS: 60-20, $F_{50\%}$

		Removals			State of Nature		
					Low *M* (F= 0.2/M=0.25) p = 0.25	Base Case *M* (F=0.25/M=0.3) p = 0.5	High *M* (F=0.3/M=0.35) p = 0.25
	Year	Comm.	Rec.	Total			
Low *M* catches	2009	21	34	55	0.34	0.45	0.53
	2010	25	38	63	0.37	0.48	0.56
	2011	29	28	57	0.38	0.50	0.58
	2012	32	31	63	0.40	0.52	0.60
	2013	34	34	68	0.42	0.54	0.62
	2014	35	36	71	0.43	0.55	0.64
	2015	37	37	74	0.44	0.56	0.65
	2016	38	38	76	0.45	0.57	0.66
	2017	38	39	78	0.45	0.58	0.67
	2018	39	40	79	0.46	0.58	0.68
	2019	40	41	81	0.46	0.59	0.68
	2020	40	41	82	0.47	0.59	0.69
Base case *M* catches	2009	21	34	55	0.34	0.45	0.53
	2010	25	38	63	0.37	0.48	0.56
	2011	56	55	111	0.38	0.50	0.58
	2012	55	54	109	0.37	0.49	0.57
	2013	54	53	107	0.37	0.48	0.57
	2014	54	52	106	0.36	0.48	0.58
	2015	54	52	106	0.35	0.48	0.58
	2016	54	52	106	0.35	0.48	0.59
	2017	54	52	106	0.35	0.48	0.59
	2018	54	52	106	0.35	0.48	0.59
	2019	54	52	106	0.34	0.48	0.60
	2020	54	52	106	0.34	0.48	0.60
High *M* catches	2009	21	34	55	0.34	0.45	0.53
	2010	25	38	63	0.37	0.48	0.56
	2011	94	90	184	0.38	0.50	0.58
	2012	85	80	166	0.33	0.45	0.53
	2013	80	75	155	0.30	0.42	0.51
	2014	78	71	149	0.27	0.39	0.50
	2015	77	70	147	0.25	0.38	0.49
	2016	76	69	146	0.24	0.37	0.49
	2017	76	69	145	0.22	0.36	0.49
	2018	76	68	144	0.21	0.35	0.49
	2019	75	68	143	0.19	0.34	0.48
	2020	75	68	143	0.18	0.34	0.48

Table 25 (Continued).

SCS: 40-10, $F_{45\%}$

	Year	Removals Comm.	Removals Rec.	Removals Total	State of Nature: Low *M* (F= 0.2/M=0.25) p = 0.25	State of Nature: Base Case *M* (F=0.25/M=0.3) p = 0.5	State of Nature: High *M* (F=0.3/M=0.35) p = 0.25
Low *M* catches	2009	5	9	14	0.33	0.60	0.90
	2010	6	10	16	0.32	0.57	0.83
	2011	6	11	17	0.31	0.55	0.79
	2012	6	11	17	0.31	0.54	0.76
	2013	6	11	18	0.32	0.55	0.75
	2014	7	12	19	0.33	0.55	0.75
	2015	7	12	19	0.34	0.56	0.74
	2016	7	13	20	0.35	0.57	0.74
	2017	7	13	20	0.36	0.57	0.74
	2018	8	13	21	0.36	0.57	0.73
	2019	8	13	21	0.37	0.57	0.73
	2020	8	14	21	0.37	0.57	0.73
Base case *M* catches	2009	5	9	14	0.33	0.60	0.90
	2010	6	10	16	0.32	0.57	0.83
	2011	13	24	37	0.31	0.55	0.79
	2012	12	22	34	0.27	0.50	0.72
	2013	12	21	33	0.25	0.47	0.68
	2014	11	20	32	0.23	0.45	0.66
	2015	11	20	31	0.22	0.44	0.64
	2016	11	19	30	0.21	0.43	0.63
	2017	11	19	30	0.20	0.42	0.62
	2018	11	19	30	0.19	0.42	0.61
	2019	11	19	29	0.18	0.41	0.61
	2020	11	18	29	0.17	0.41	0.60
High *M* catches	2009	5	9	14	0.33	0.60	0.90
	2010	6	10	16	0.32	0.57	0.83
	2011	25	44	68	0.31	0.55	0.79
	2012	21	38	59	0.21	0.43	0.66
	2013	19	34	53	0.14	0.35	0.58
	2014	18	32	50	0.10	0.30	0.53
	2015	17	30	47	0.06	0.27	0.49
	2016	16	29	45	0.04	0.24	0.47
	2017	16	28	44	0.02	0.22	0.45
	2018	16	27	43	0.01	0.20	0.44
	2019	15	27	42	0.00	0.18	0.43
	2020	15	26	41	0.00	0.17	0.42

Table 25 (Continued).

SCS: 60-20, $F_{50\%}$

	Year	Removals: Comm.	Removals: Rec.	Removals: Total	State of Nature: Low *M* (F= 0.2/M=0.25) p = 0.25	State of Nature: Base Case *M* (F=0.25/M=0.3) p = 0.5	State of Nature: High *M* (F=0.3/M=0.35) p = 0.25
Low *M* catches	2009	5	9	14	0.33	0.60	0.90
	2010	6	10	16	0.32	0.57	0.83
	2011	3	5	8	0.31	0.55	0.79
	2012	4	6	10	0.33	0.56	0.78
	2013	4	7	11	0.35	0.58	0.78
	2014	5	8	13	0.38	0.60	0.79
	2015	5	9	14	0.40	0.61	0.79
	2016	6	10	15	0.41	0.63	0.79
	2017	6	10	16	0.42	0.63	0.79
	2018	6	11	17	0.44	0.64	0.79
	2019	7	11	18	0.44	0.64	0.78
	2020	7	12	18	0.45	0.64	0.78
Base case *M* catches	2009	5	9	14	0.33	0.60	0.90
	2010	6	10	16	0.32	0.57	0.83
	2011	11	19	30	0.31	0.55	0.79
	2012	10	17	27	0.29	0.52	0.74
	2013	9	17	26	0.28	0.50	0.71
	2014	9	16	25	0.27	0.49	0.69
	2015	9	16	25	0.27	0.49	0.68
	2016	9	16	25	0.27	0.49	0.68
	2017	9	16	25	0.27	0.49	0.67
	2018	9	16	25	0.27	0.49	0.67
	2019	9	16	25	0.27	0.49	0.66
	2020	9	16	25	0.27	0.48	0.66
High *M* catches	2009	5	9	14	0.33	0.60	0.90
	2010	6	10	16	0.32	0.57	0.83
	2011	21	37	57	0.31	0.55	0.79
	2012	18	33	51	0.23	0.45	0.68
	2013	17	30	47	0.18	0.39	0.61
	2014	15	28	43	0.14	0.35	0.57
	2015	15	26	40	0.11	0.32	0.54
	2016	14	25	39	0.09	0.31	0.52
	2017	14	24	37	0.07	0.29	0.51
	2018	13	23	37	0.05	0.28	0.51
	2019	13	23	36	0.03	0.27	0.50
	2020	13	23	35	0.02	0.26	0.50

Table 25 (Continued).

ORS: 40-10, $F_{45\%}$

		Removals			State of Nature		
					Low *M* (F= 0.2/M=0.25)	Base Case *M* (F=0.25/M=0.3)	High *M* (F=0.3/M=0.35)
	Year	Comm.	Rec.	Total	p = 0.25	p = 0.5	p = 0.25
Low *M* catches	2009	31	16	47	0.37	0.52	0.69
	2010	31	16	47	0.33	0.48	0.65
	2011	14	10	24	0.29	0.44	0.61
	2012	15	10	25	0.29	0.45	0.61
	2013	16	11	27	0.31	0.47	0.63
	2014	17	12	29	0.32	0.49	0.66
	2015	18	13	30	0.34	0.51	0.68
	2016	18	13	31	0.35	0.52	0.69
	2017	19	13	32	0.35	0.54	0.71
	2018	19	14	33	0.36	0.55	0.72
	2019	20	14	34	0.36	0.55	0.72
	2020	20	14	34	0.37	0.56	0.73
Base case *M* catches	2009	31	16	47	0.37	0.52	0.69
	2010	31	16	47	0.33	0.48	0.65
	2011	30	22	52	0.29	0.44	0.61
	2012	29	21	50	0.25	0.41	0.59
	2013	29	20	49	0.23	0.40	0.58
	2014	29	20	49	0.22	0.40	0.59
	2015	29	20	49	0.21	0.40	0.60
	2016	29	20	49	0.20	0.40	0.60
	2017	29	20	49	0.18	0.40	0.61
	2018	29	20	49	0.17	0.39	0.61
	2019	29	20	49	0.16	0.39	0.62
	2020	29	20	49	0.14	0.39	0.62
High *M* catches	2009	31	16	47	0.37	0.52	0.69
	2010	31	16	47	0.33	0.48	0.65
	2011	61	45	106	0.29	0.44	0.61
	2012	56	40	96	0.18	0.34	0.53
	2013	54	37	91	0.10	0.28	0.49
	2014	52	36	88	0.04	0.23	0.46
	2015	51	35	86	0.01	0.19	0.45
	2016	51	34	85	0.01	0.16	0.44
	2017	50	34	83	0.00	0.14	0.43
	2018	49	33	82	0.00	0.11	0.42
	2019	49	33	81	0.00	0.08	0.41
	2020	48	32	80	0.00	0.05	0.41

Table 25 (Continued).

ORS: 60-20, $F_{50\%}$

		Removals			State of Nature		
	Year	Comm.	Rec.	Total	Low *M* (F= 0.2/M=0.25) p = 0.25	Base Case *M* (F=0.25/M=0.3) p = 0.5	High *M* (F=0.3/M=0.35) p = 0.25
Low *M* catches	2009	31	16	47	0.37	0.52	0.69
	2010	31	16	47	0.33	0.48	0.65
	2011	6	5	11	0.29	0.44	0.61
	2012	8	6	14	0.31	0.47	0.63
	2013	10	7	17	0.34	0.50	0.66
	2014	12	9	20	0.37	0.53	0.69
	2015	13	10	23	0.39	0.56	0.71
	2016	14	10	25	0.41	0.58	0.73
	2017	15	11	26	0.43	0.59	0.75
	2018	16	12	28	0.44	0.61	0.76
	2019	17	12	29	0.45	0.62	0.76
	2020	17	12	29	0.45	0.62	0.77
Base case *M* catches	2009	31	16	47	0.37	0.52	0.69
	2010	31	16	47	0.33	0.48	0.65
	2011	21	15	36	0.29	0.44	0.61
	2012	21	15	36	0.28	0.43	0.60
	2013	22	15	37	0.28	0.44	0.61
	2014	23	16	38	0.28	0.45	0.63
	2015	23	16	40	0.28	0.46	0.64
	2016	24	17	41	0.28	0.47	0.65
	2017	24	17	42	0.28	0.47	0.66
	2018	25	17	42	0.27	0.47	0.67
	2019	25	18	42	0.27	0.48	0.67
	2020	25	18	43	0.26	0.48	0.68
High *M* catches	2009	31	16	47	0.37	0.52	0.69
	2010	31	16	47	0.33	0.48	0.65
	2011	52	38	90	0.29	0.44	0.61
	2012	47	33	79	0.20	0.36	0.55
	2013	44	31	75	0.14	0.32	0.52
	2014	43	30	73	0.10	0.29	0.51
	2015	43	29	72	0.07	0.27	0.50
	2016	42	29	71	0.03	0.25	0.50
	2017	42	29	71	0.01	0.23	0.49
	2018	42	28	70	0.01	0.21	0.49
	2019	41	28	70	0.00	0.19	0.49
	2020	41	28	69	0.00	0.18	0.49

FIGURES

Figure 1. Map of the cabezon sub-stock assessment areas (represented by solid lines at Pt. Conception and the California/Oregon border). Two important headlands are distinguished by broken lines. The North/South management area is shown with the broken dotted line and is also the border between the California Department of Fish and Game's Northern and Central California Marine Management regions. Point Conception divides the Central and Southern Marine Management regions. The 70m isobath indicates nearshore waters. Map courtesy of Marlene Bellman (PSMFC/NOAA Fisheries).

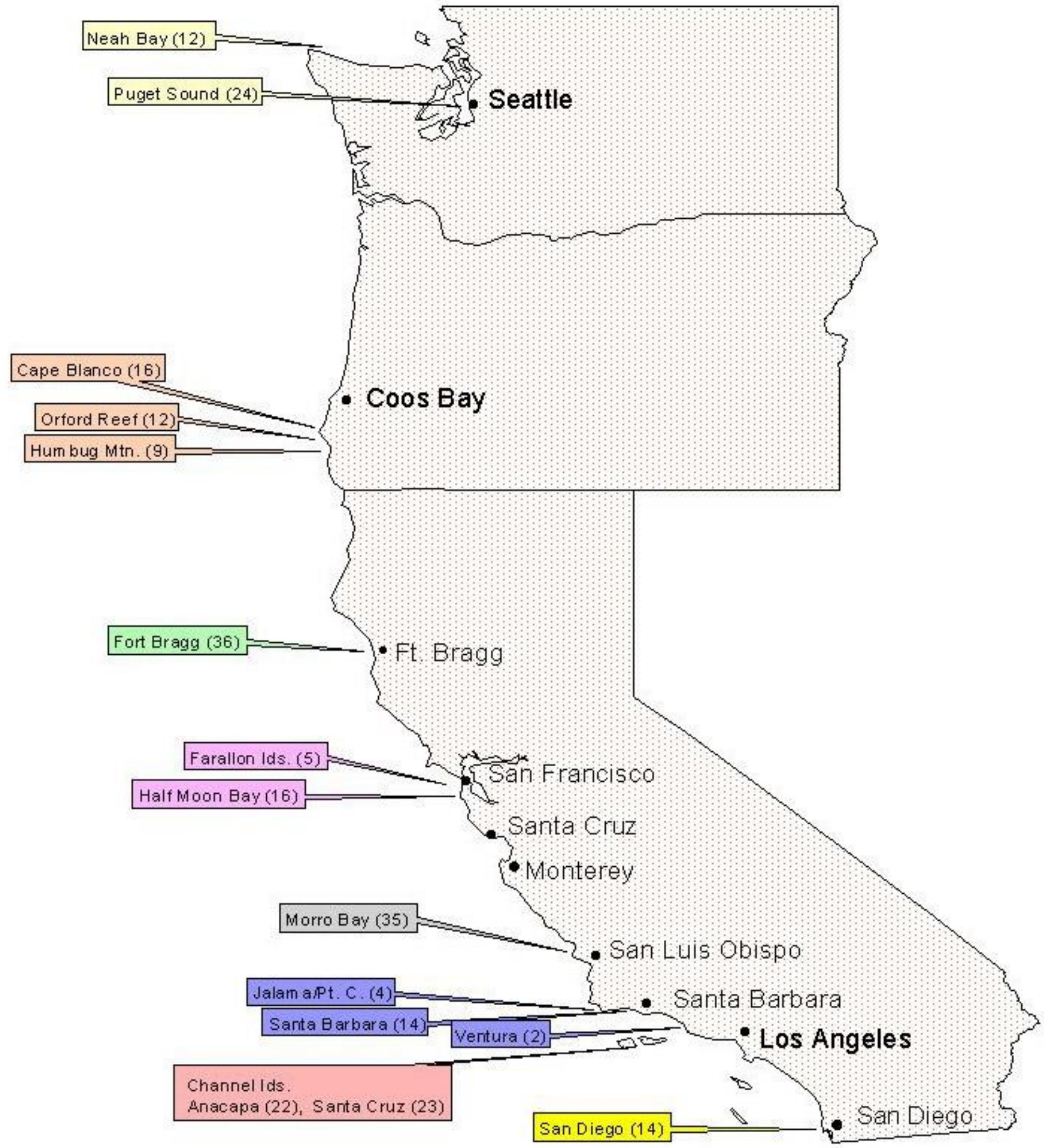

Figure 2. Map of distinct (distinguished by colored) cabezon subpopulations based on mtDNA markers (sample sizes in parentheses) from the work of Villablanca and Nakamura (2008). Map courtesy of F. Villablanca.

Figure 3. Map of California waters including the 18 fishing locations used in the cluster analysis of cabezon population dynamics based on CPFV CPUE. Map courtesy of Marlene Bellman (PSMFC/NOAA Fisheries).

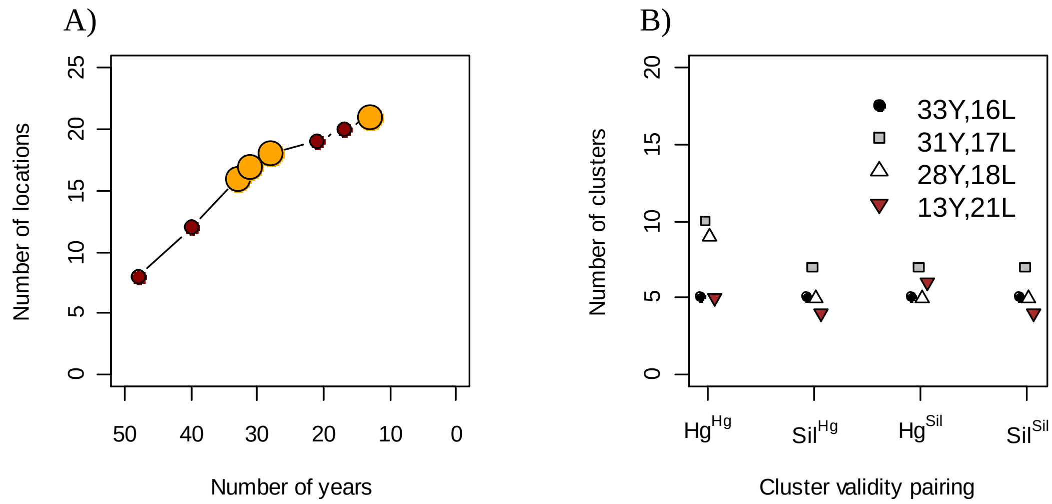

Figure 4. Determination of the CPFV data series used in the spatial clustering analyses of cabezon sub-stocks in California. A) Trade-off between number of years and number of landing locations in the California CPFV CPUE time series. Large circles indicate year/location pairing used in spatial cluster analysis. B) Number of spatial clusters based on cluster validity diagnostic pairings (see Cope and Punt i*n press* for details). Y = Years; L = Location; Hg = Hubert Γ; Sil= Silouette.

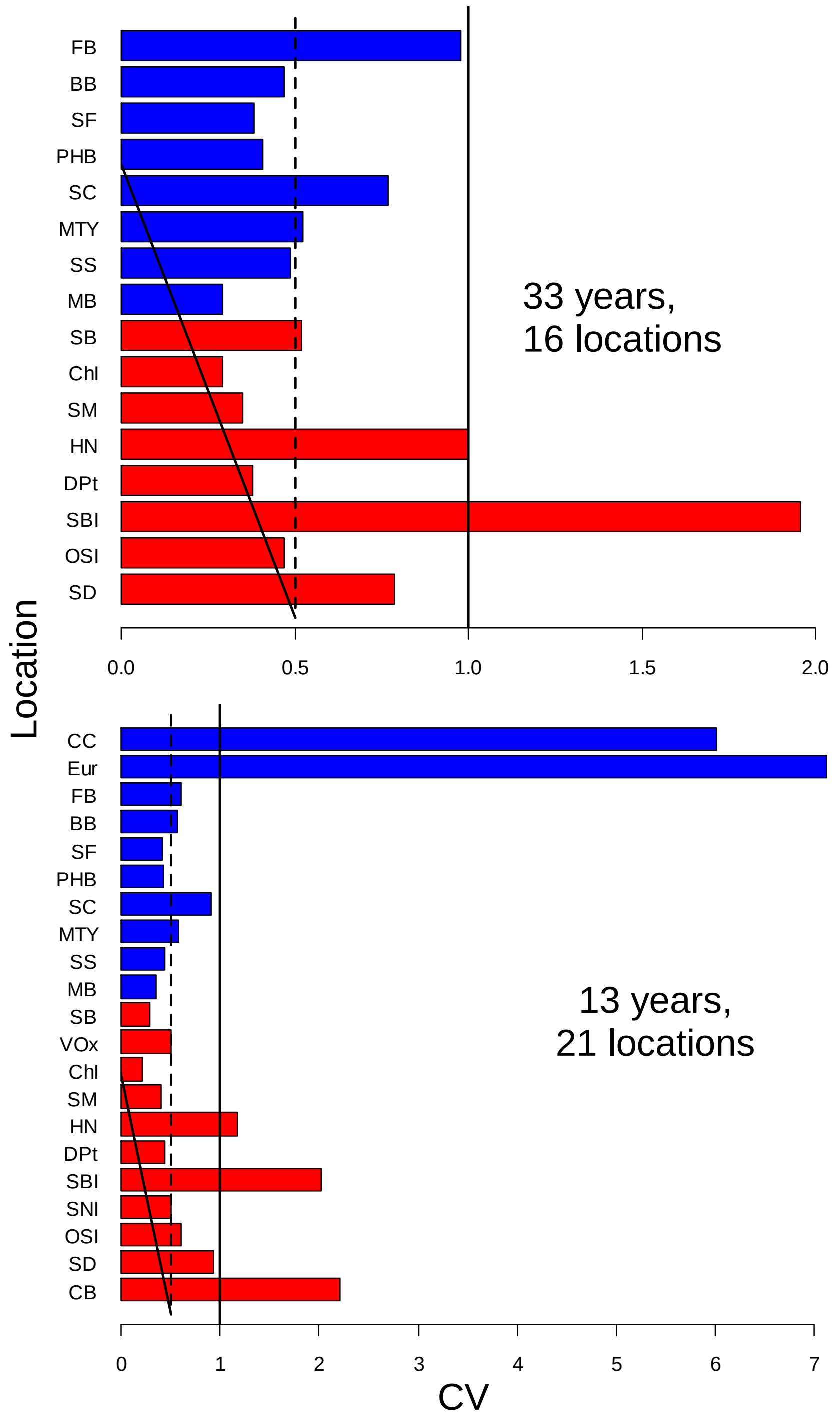

Figure 5. The coefficient of variation (CV) for each fishing location used in the spatial clustering analysis for the two extreme data series based on numbers of years and locations. Blue bars indicate the areas designated as the northern California sub-stock (NCS) while red bars indicate the southern California sub-stock (SCS).

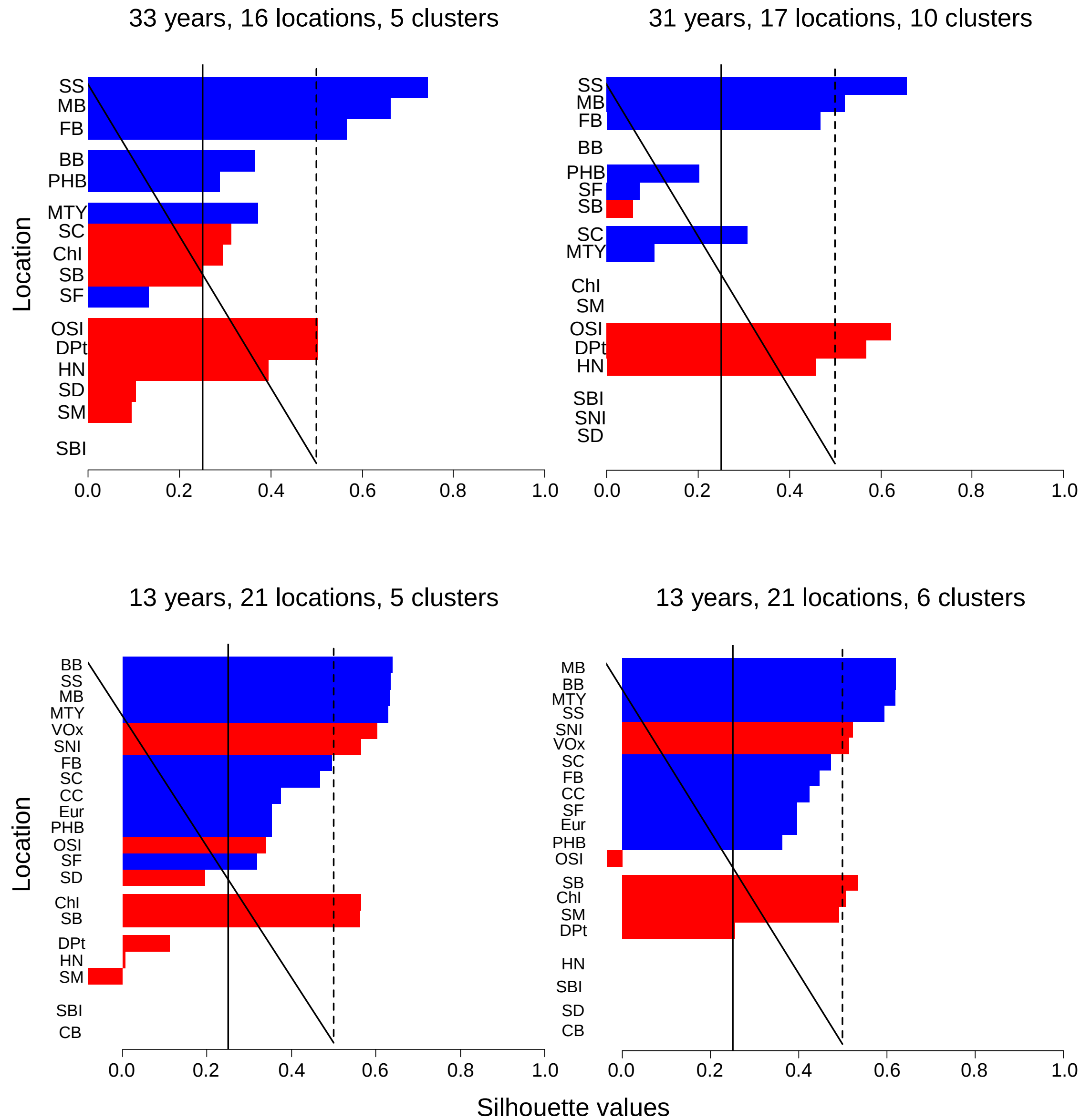

Figure 6. Resultant silhouette plots for the cluster analyses of cabezon fishing locations in California. Number of years, locations and cluster are noted above each plot. Blue bars indicate the areas designated as the northern California sub-stock (NCS) while red bars indicate the southern California sub-stock (SCS).

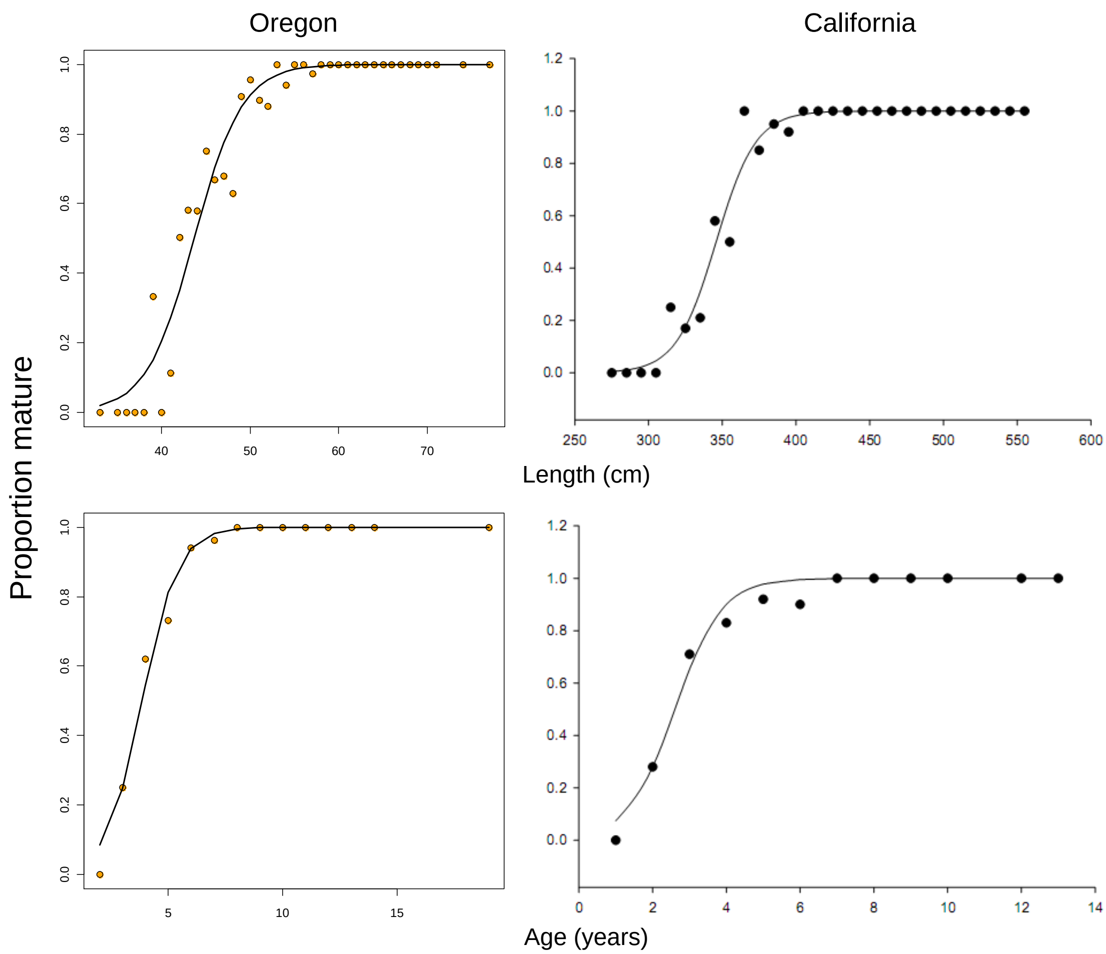

Figure 7. Length (top rows) and age (bottom rows) at maturity curves for Oregon (left panels) and California (right panels).

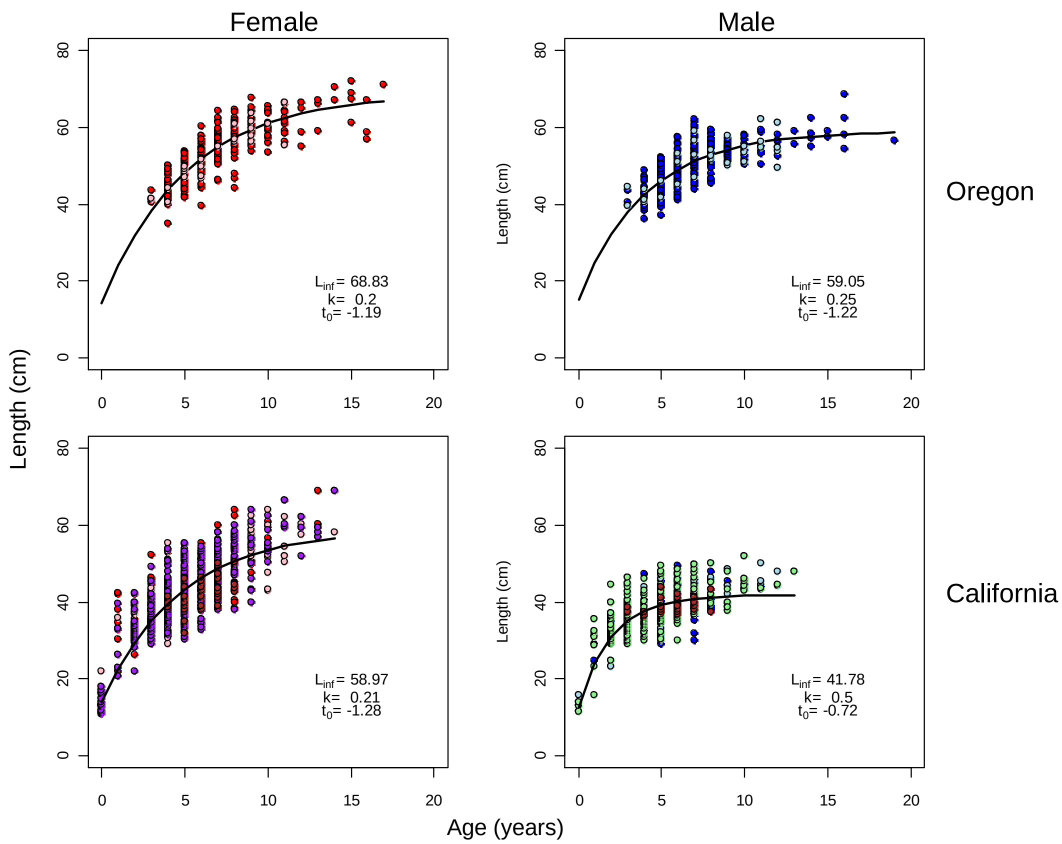

Figure 8. Age and growth fits and parameter estimates for the von Bertalanffy growth function incorporating multiple age reads (differing colored circles) for each sex (columns) and state (rows).

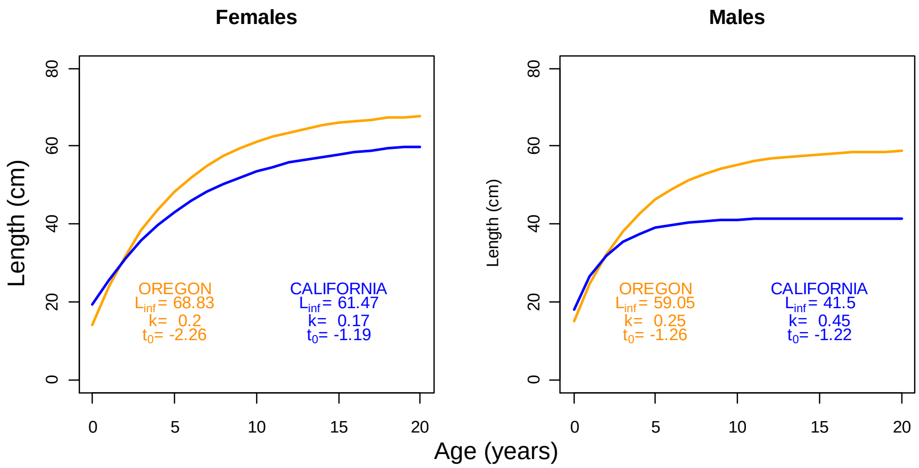

Figure 9. Comparison of estimated age at length of each sex by state. Growth fits in these comparisons are based on fits to the von Bertalanffy growth curve using primary age reads and does not incorporate the ageing error into estimation of the growth curve.

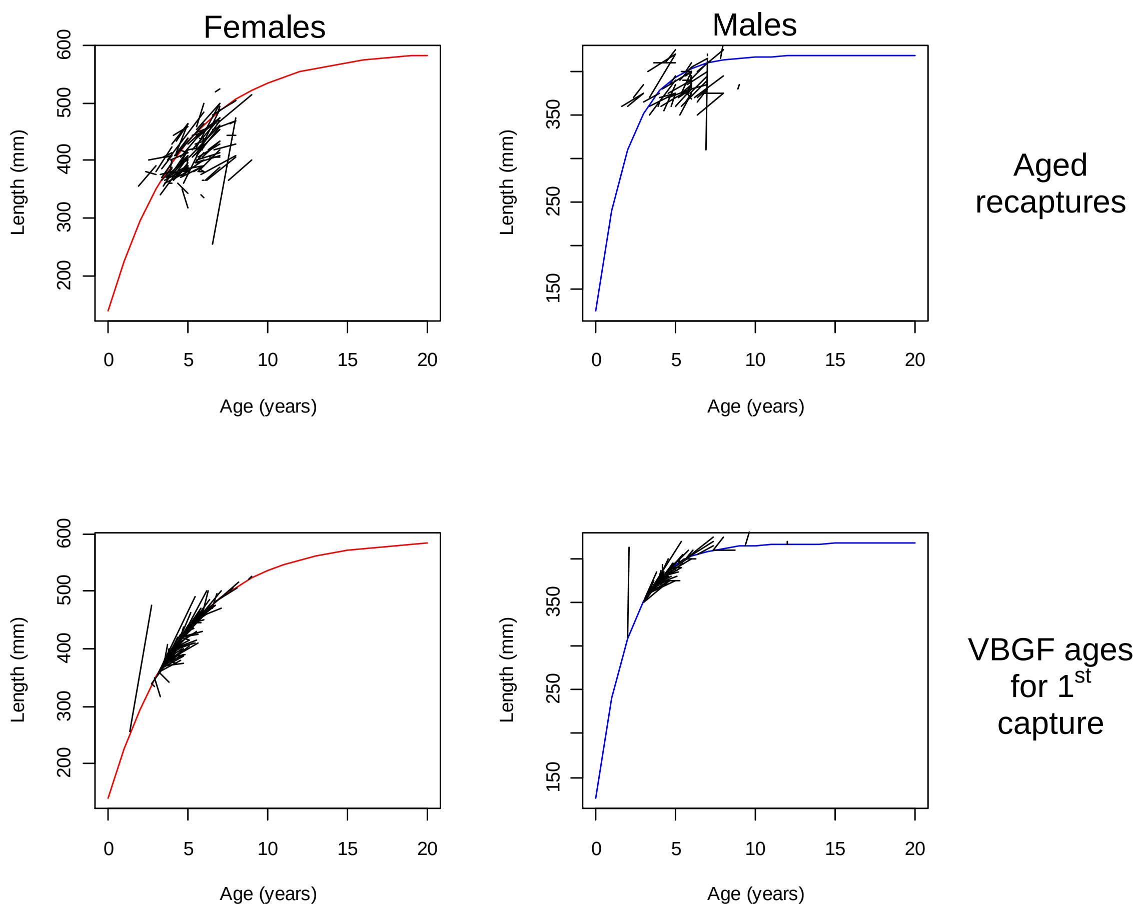

Figure 10. Stick plots of tagging data (black lines) compared to sex-specific (columns) growth curves in California. The tagging were compared to the growth curve in two ways: 1) The capture data was back-calculated from the age recapture (top row); 2) The capture age was estimated from the von Bertalanffy growth function (VBGF) and the recapture age was calculated by adding days at large to the capture age (bottom row).

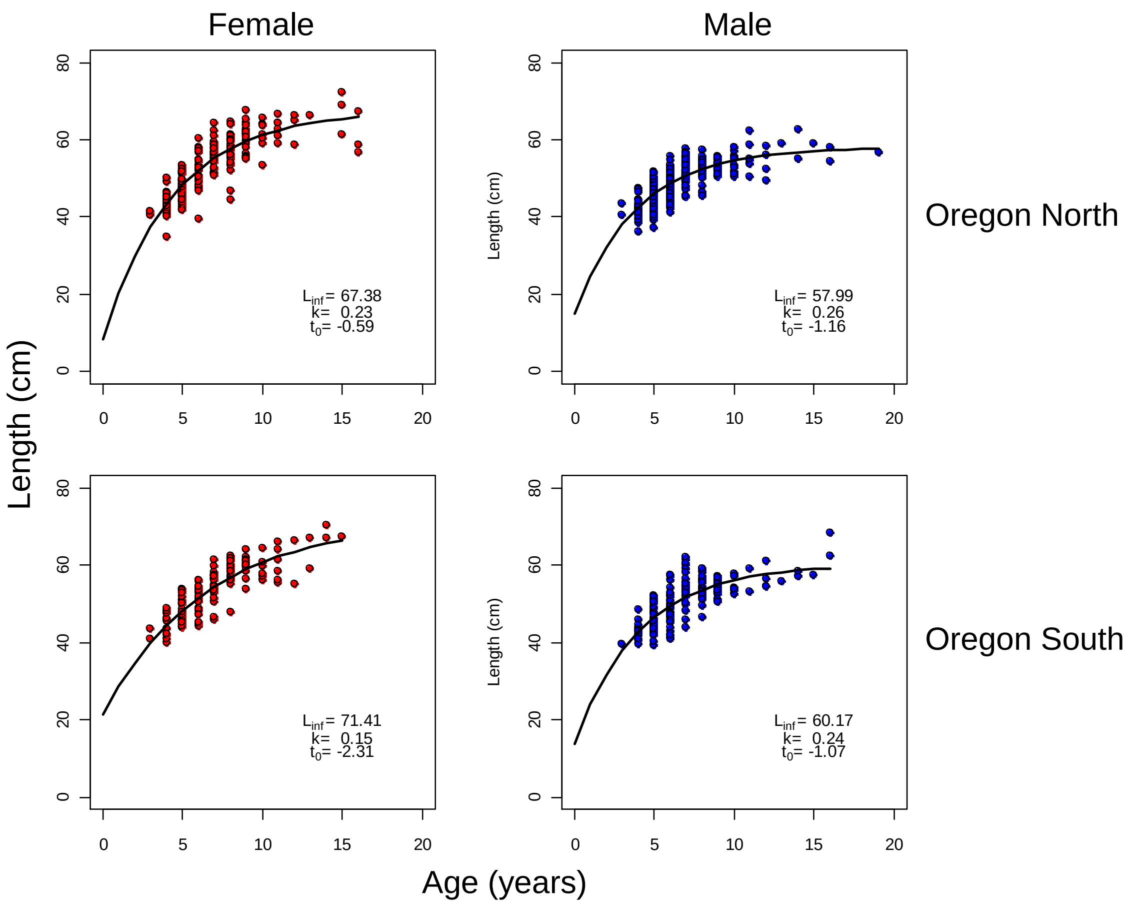

Figure 11. Plots and fits to the von Bertalanffy growth function of Oregon data above (North) and below (South) Cape Blanco.

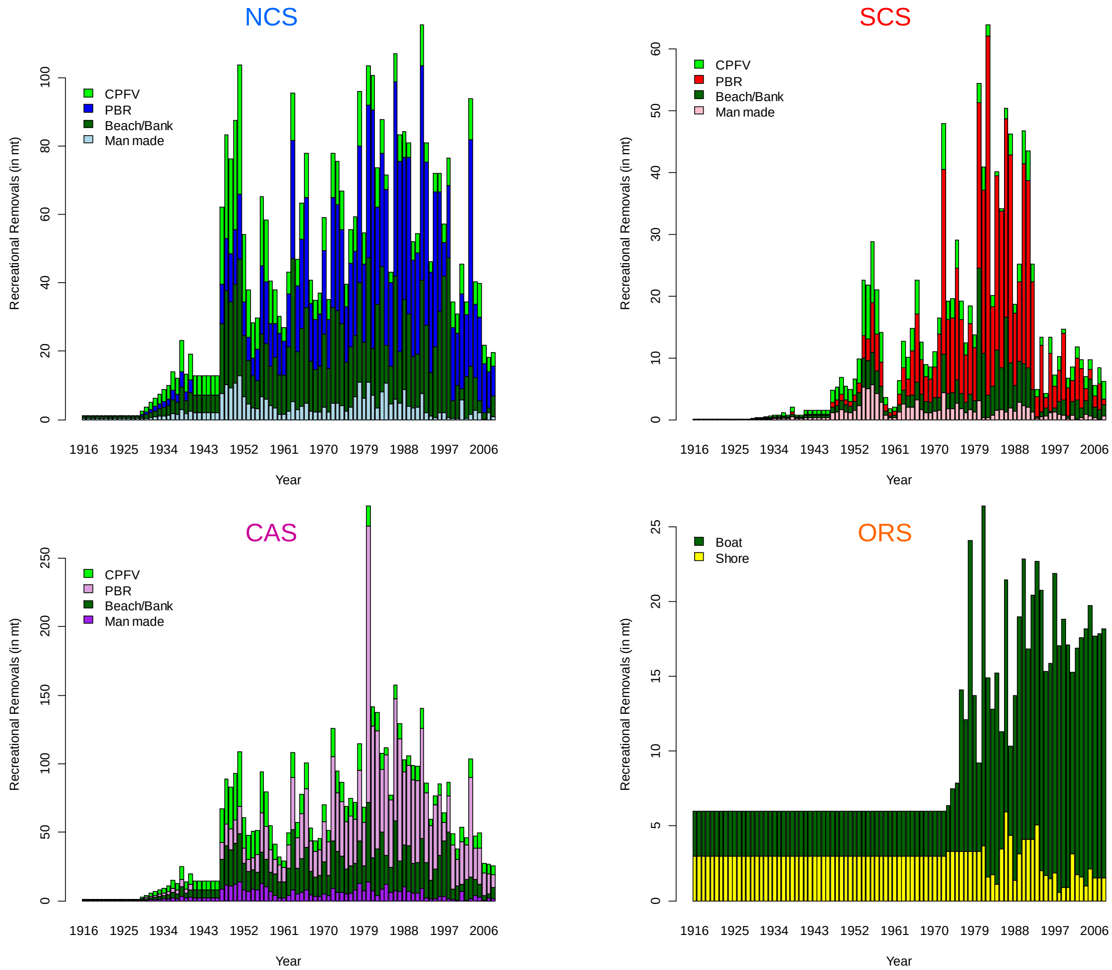

Figure 12. Recreational fishery cabezon removals (in mt) by fleet and sub-stock.

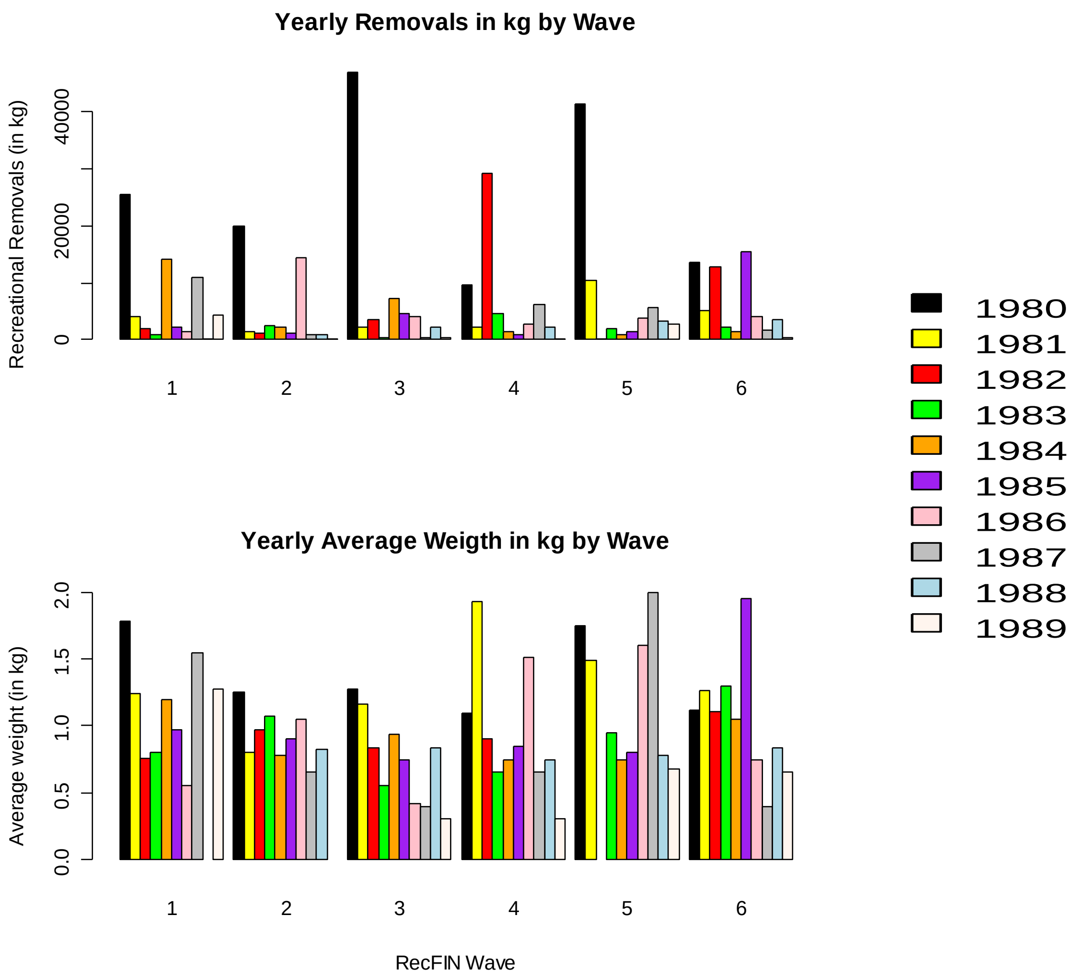

Figure 13. Yearly removals (top panel) and average weight (bottom panel) of cabezon by two-month sampling 'wave' taken in the PBR recreational mode for the SCS in years 1980-1989.

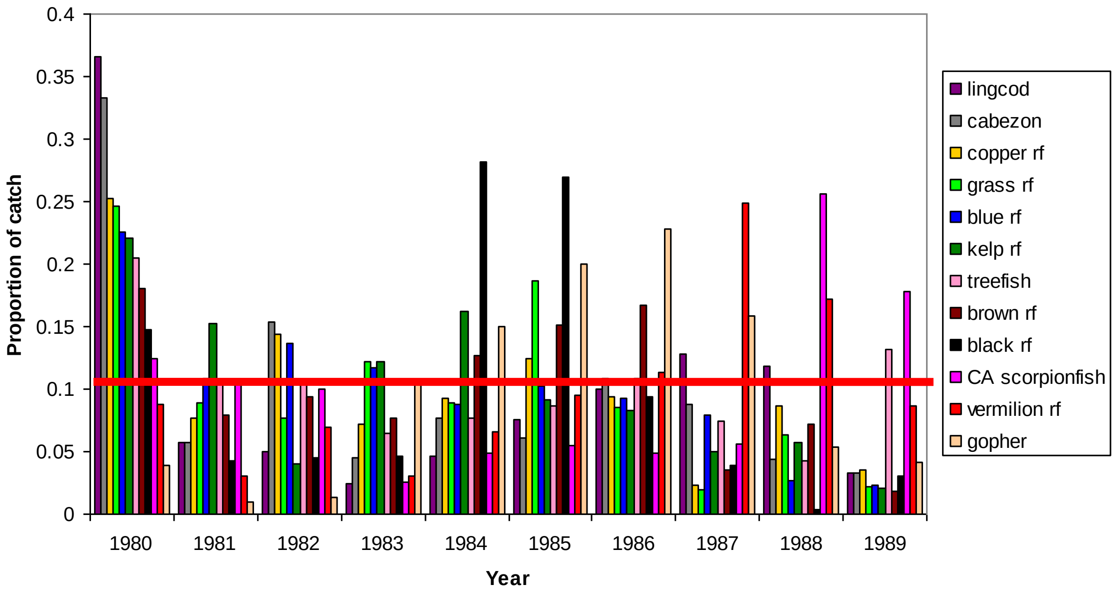

Figure 14. Proportion of yearly catch for several nearshore species associated with cabezon (gray bars) for years 1980-1989. Proportions are species-specific and defined as the proportion of the yearly species catch to the total species catch from 1980-1989. The red horizontal line is the expected value if all years were equivalent in proportionality.

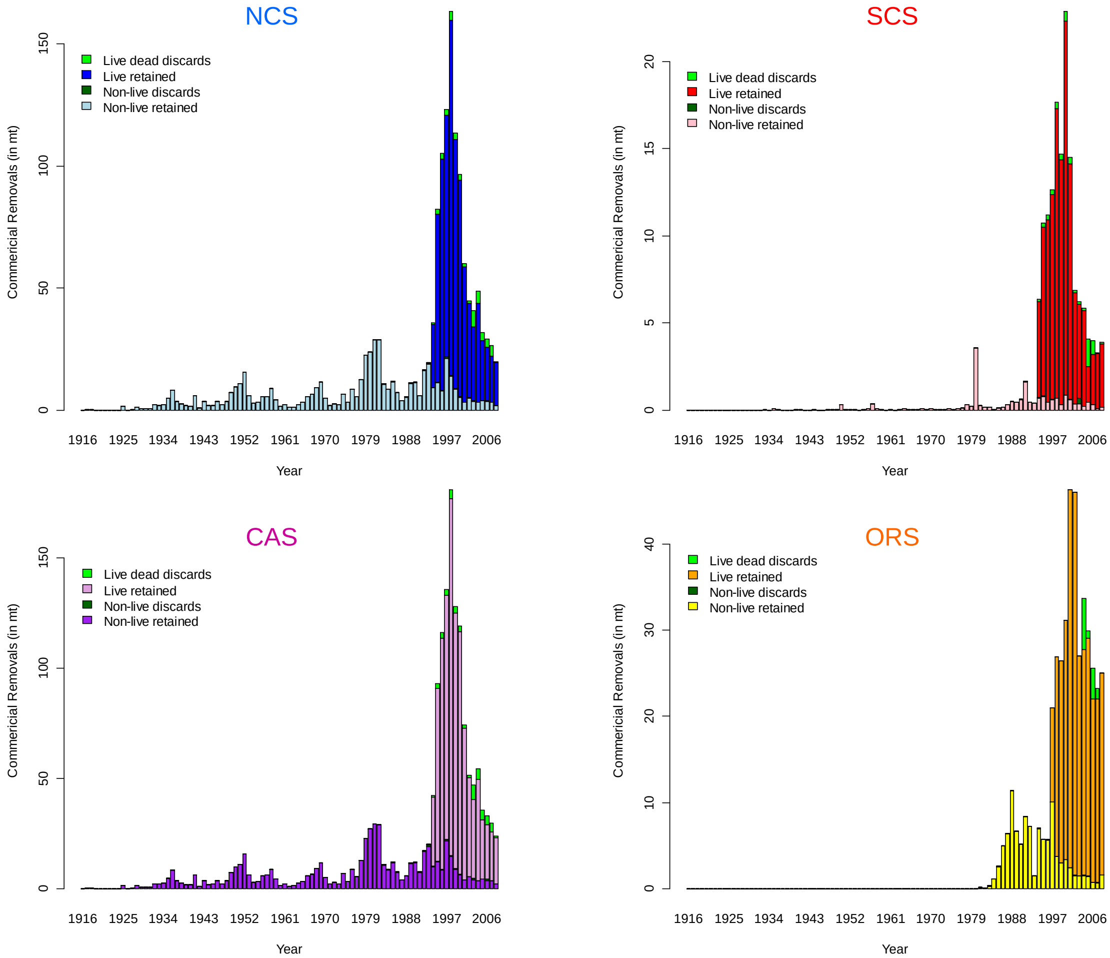

Figure 15. Commercial fishery cabezon removals (in mt) by fleet and sub-stock.

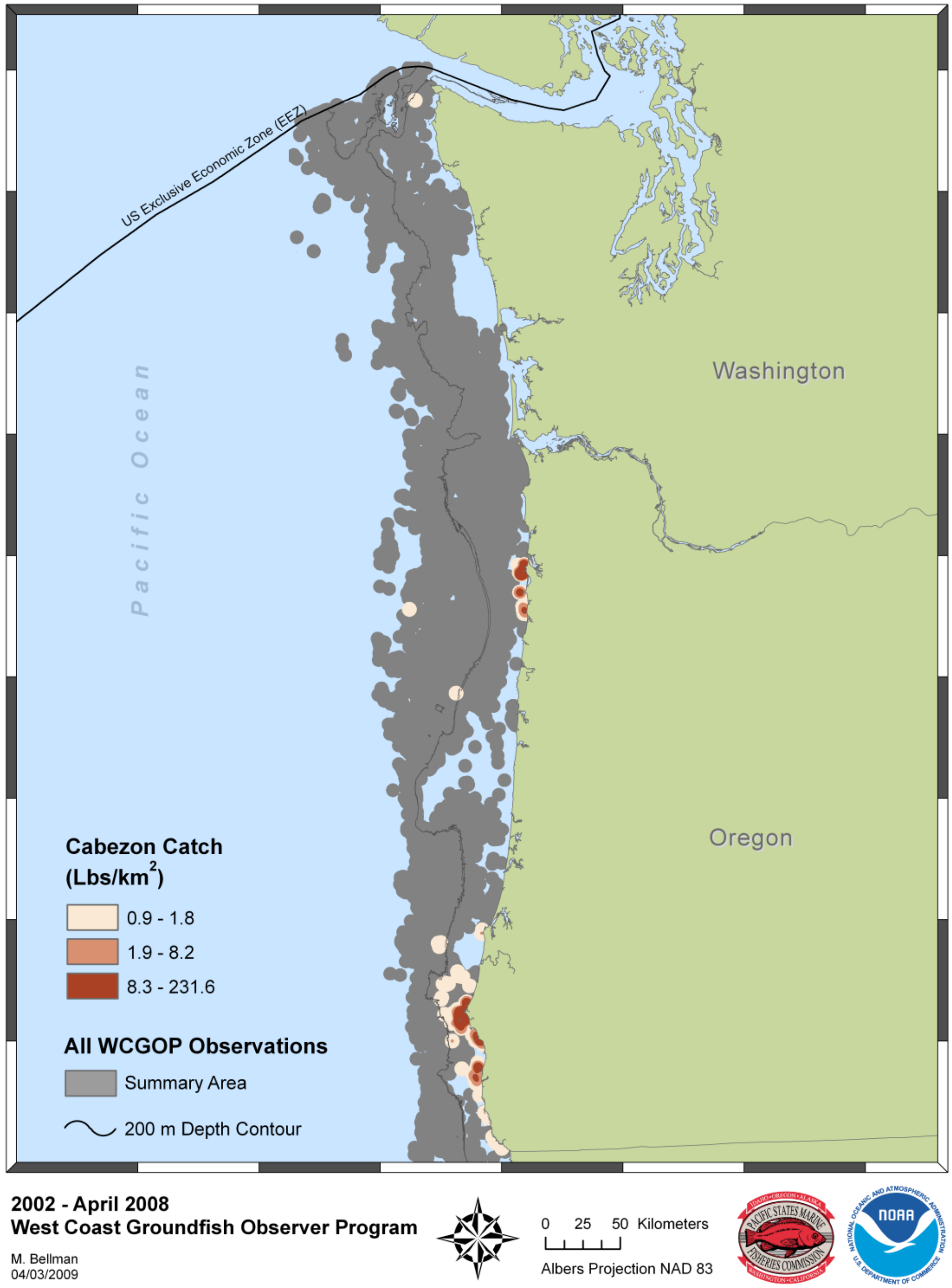

Figure 16. Spatial distribution of cabezon catch (lbs/km^2) observed by the West Coast Groundfish Observer Program from 2002 – April 2008 and the summary area of all observed fishing events off of Washington and Oregon. Map courtesy of M. Bellman.

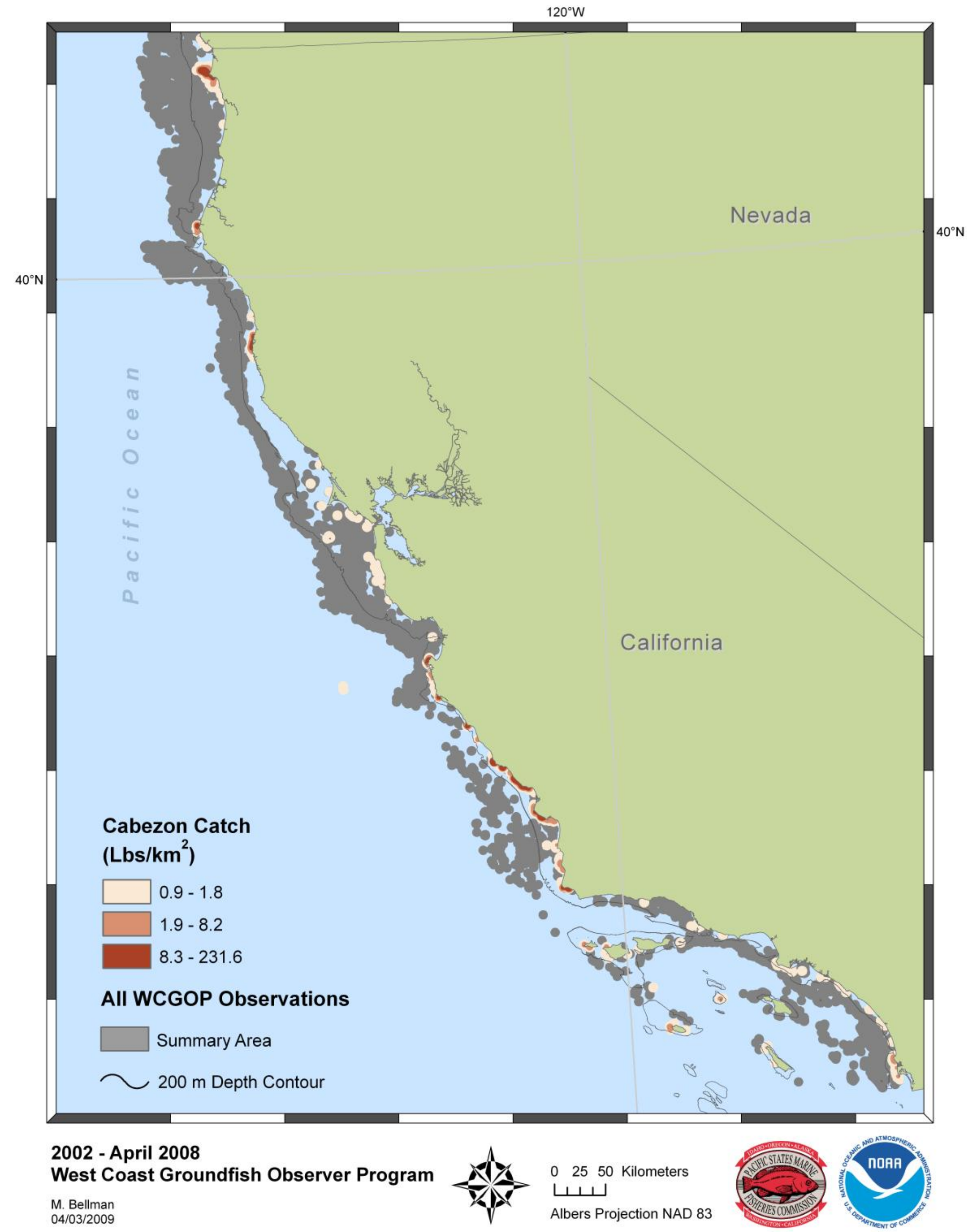

Figure 17. Spatial distribution of cabezon catch (lbs/km^2) observed by the West Coast Groundfish Observer Program from 2002 – April 2008 and the summary area of all observed fishing events off of California. Map courtesy of M. Bellman.

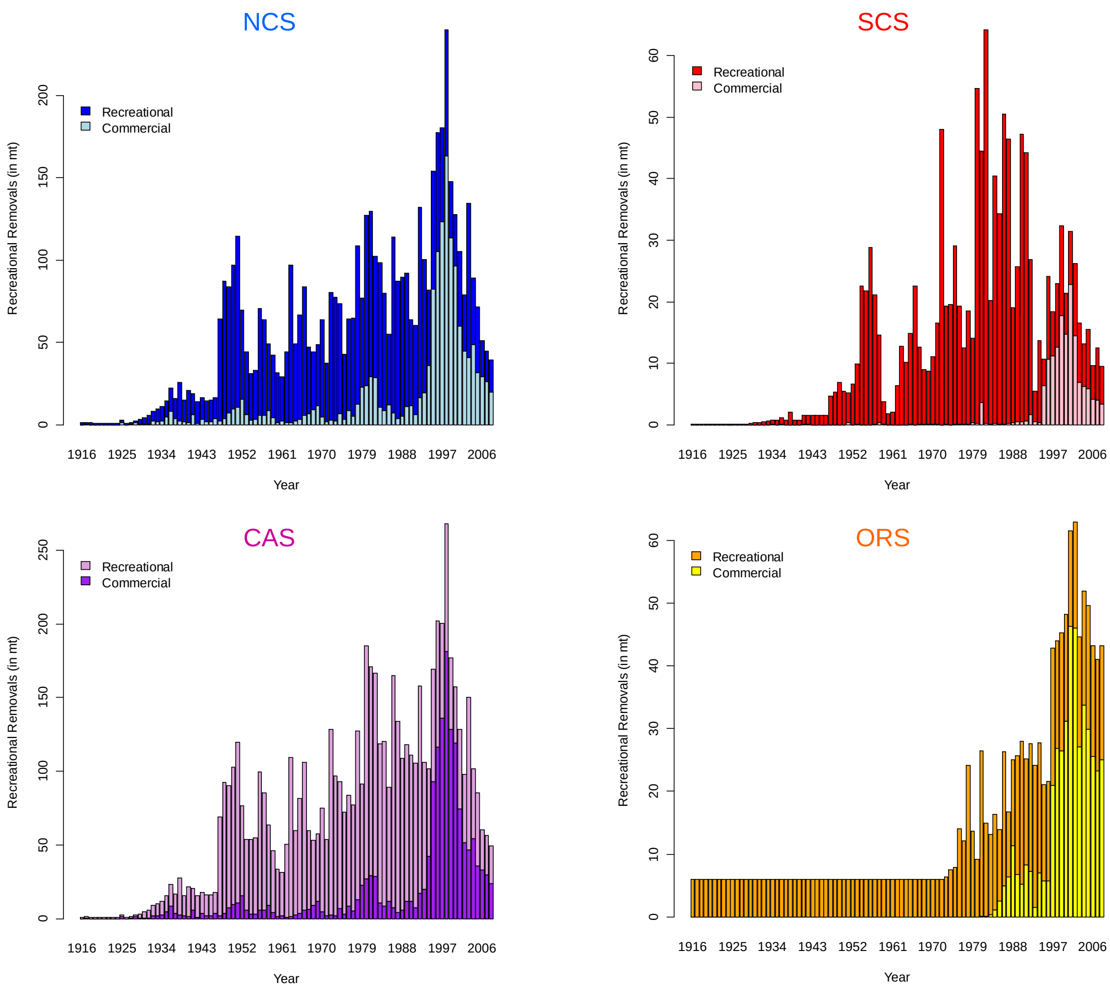

Figure 18. Total removals of cabezon (in mt) by major fishery and sub-stock.

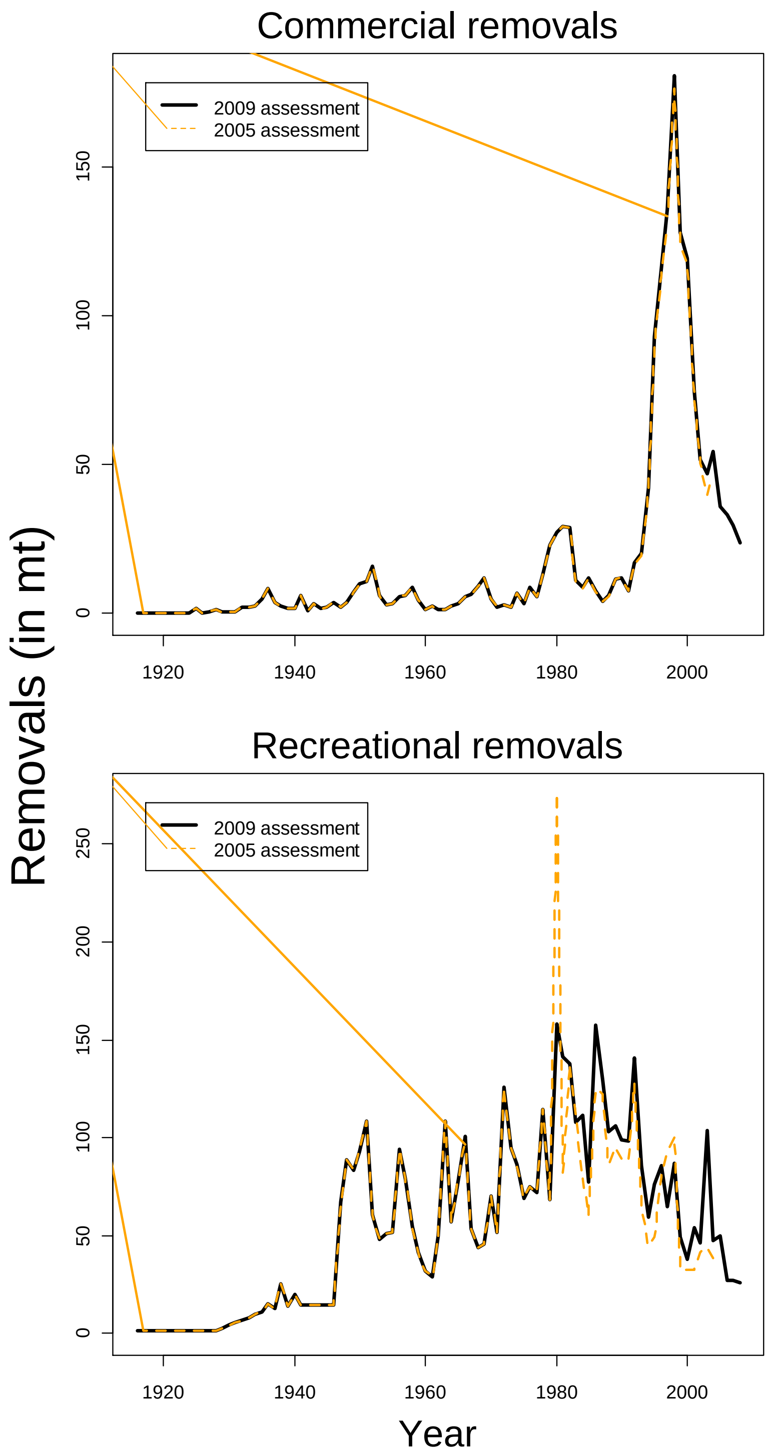

Figure 19. Comparison of total fishery removals between the 2009 and 2005 assessments for the commercial (top panel) and recreational (bottom panel) fishery sectors.

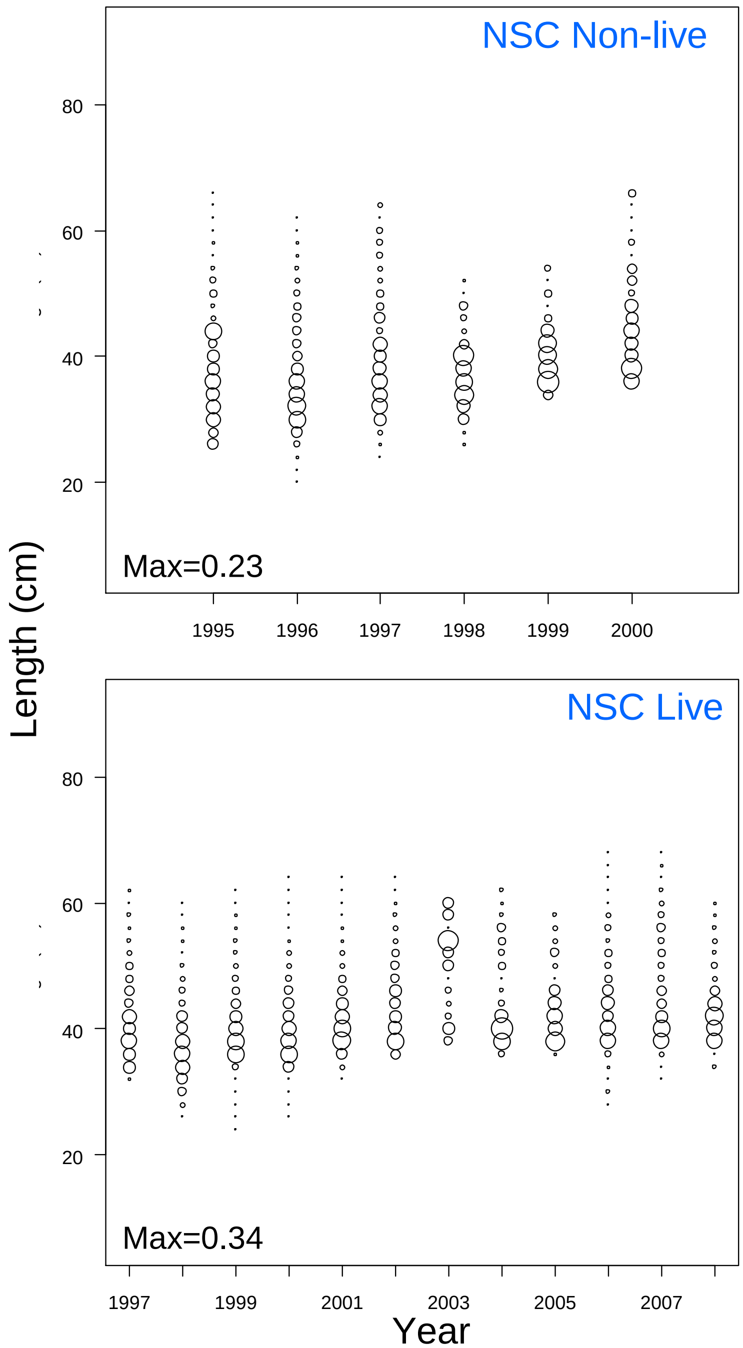

Figure 20. Length composition bubble plots for the NCS commercial fisheries. Values in the lower left of each panel refer to the proportion size of the biggest bubble.

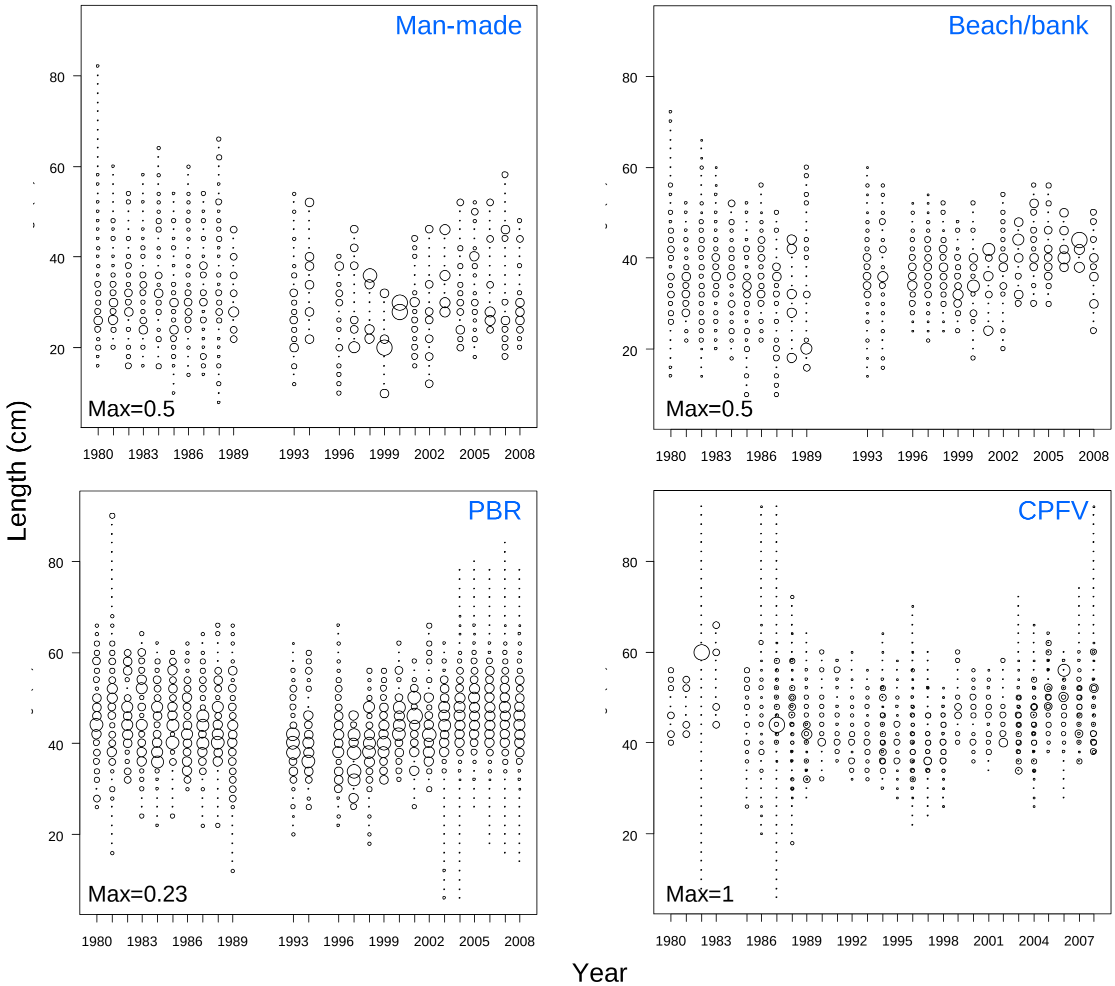

Figure 21. Length composition bubble plots for the NCS recreational fishery modes. Values in the lower left of each panel refer to the proportion size of the biggest bubble.

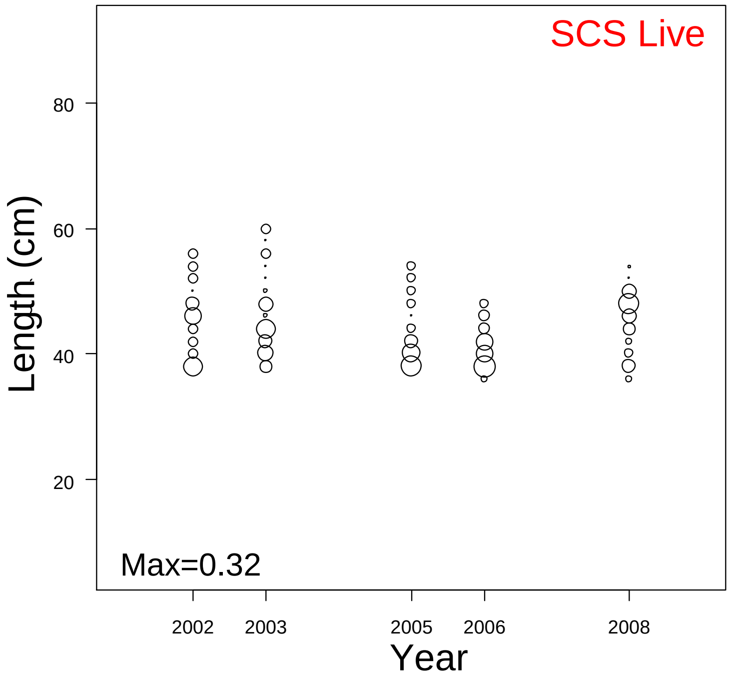

Figure 22. Length composition bubble plots for the SCS live-fish commercial fishery. Values in the lower left of each panel refer to the proportion size of the biggest bubble.

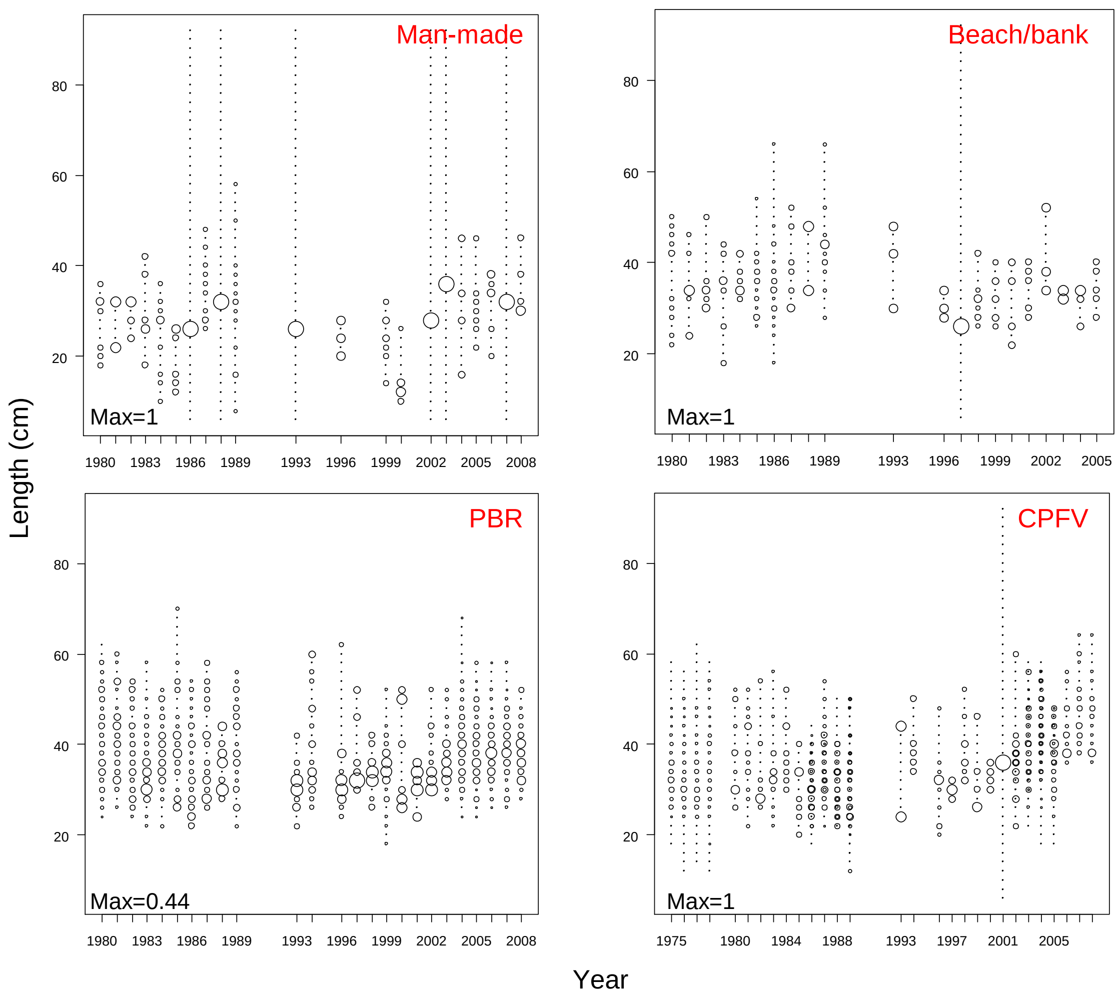

Figure 23. Length composition bubble plots for the SCS recreational fishery modes. Values in the lower left of each panel refer to the proportion size of the biggest bubble.

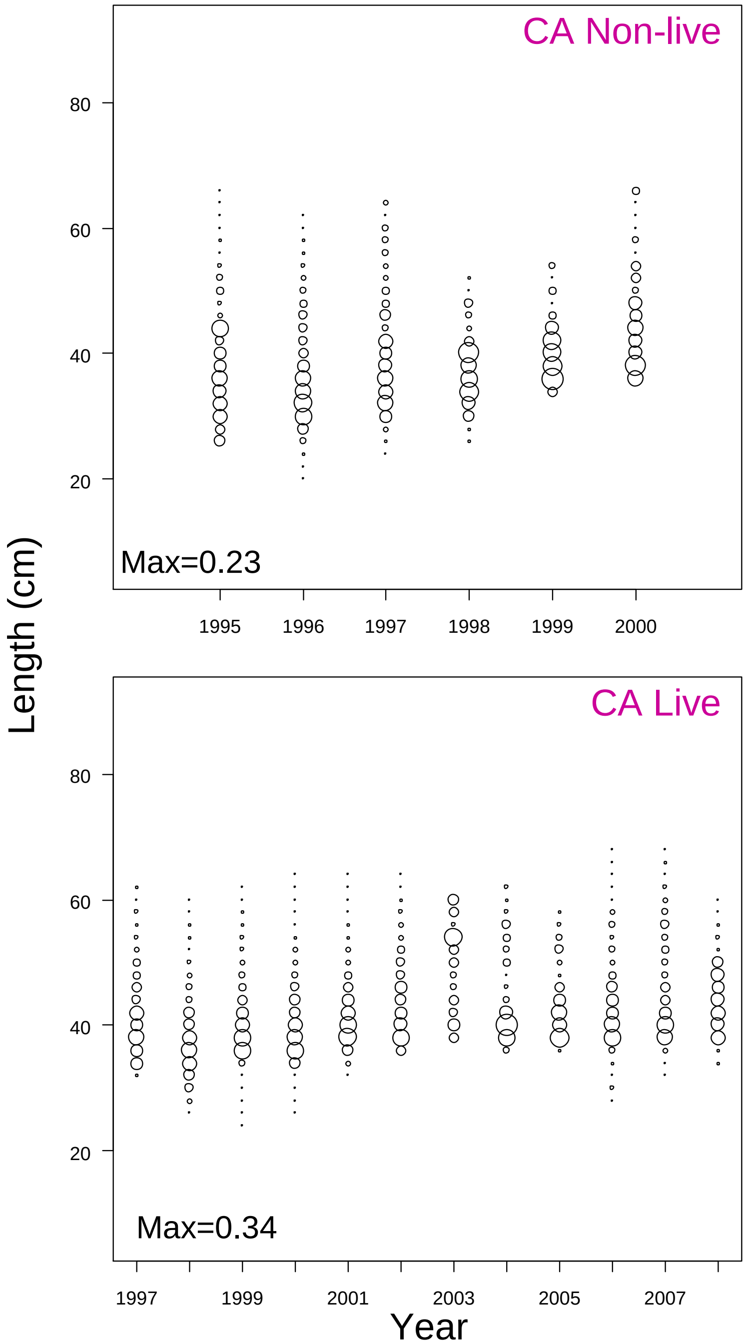

Figure 24. Length composition bubble plots for the CAS commercial fisheries. Values in the lower left of each panel refer to the proportion size of the biggest bubble.

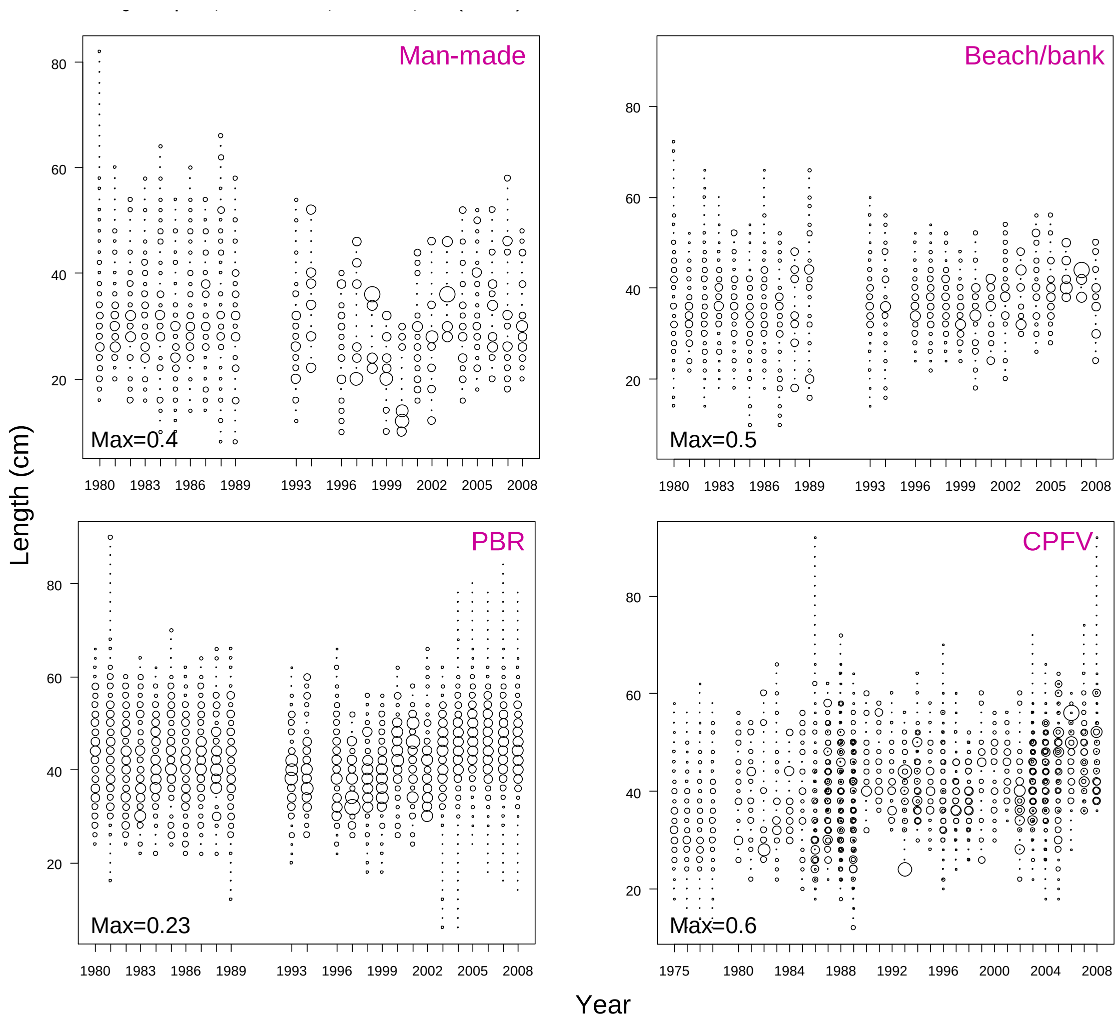

Figure 25. Length composition bubble plots for the CAS recreational fishery modes. Values in the lower left of each panel refer to the proportion size of the biggest bubble.

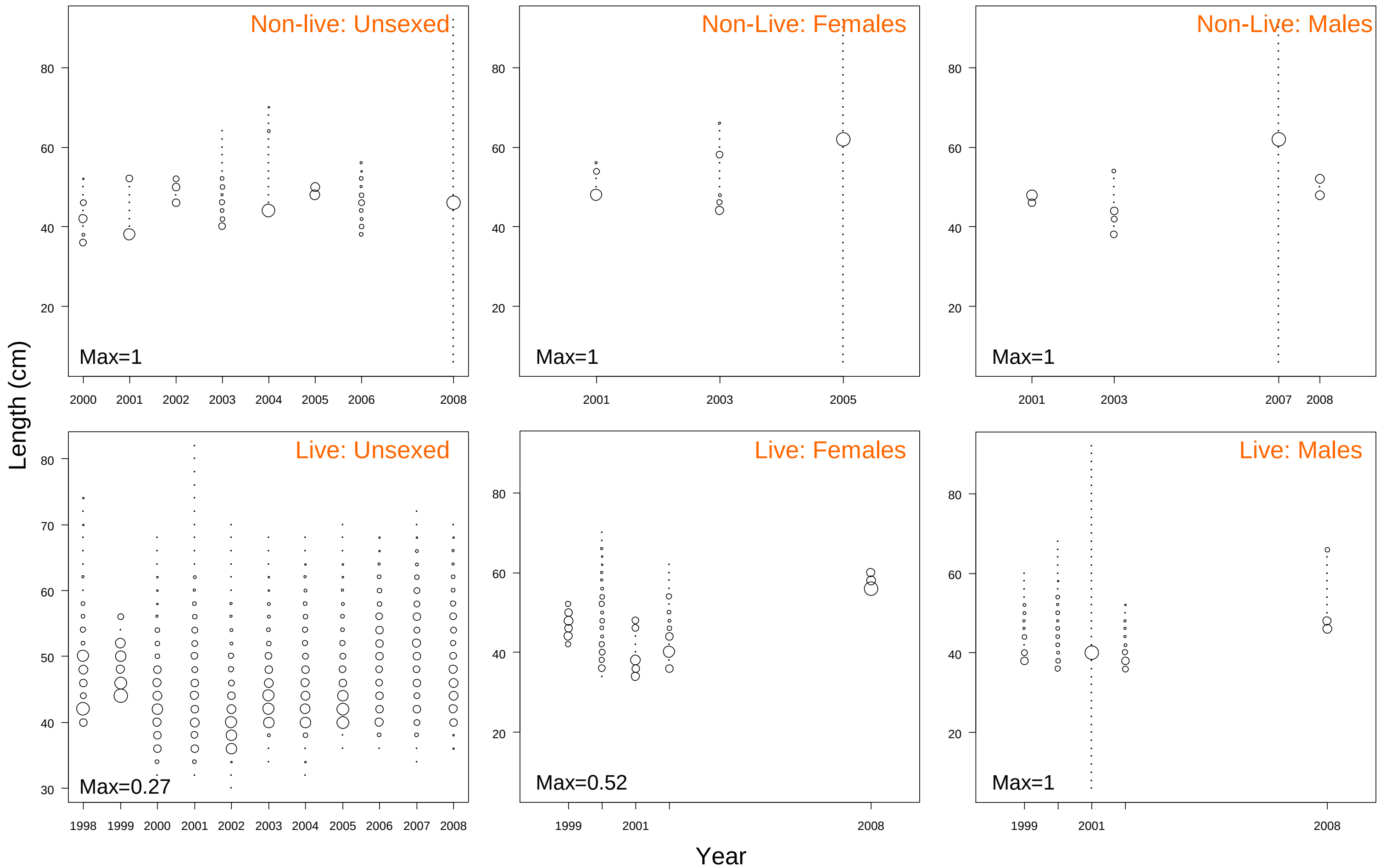

Figure 26. Length composition bubble plots for the ORS commercial fisheries. Values in the lower left of each panel refer to the proportion size of the biggest bubble.

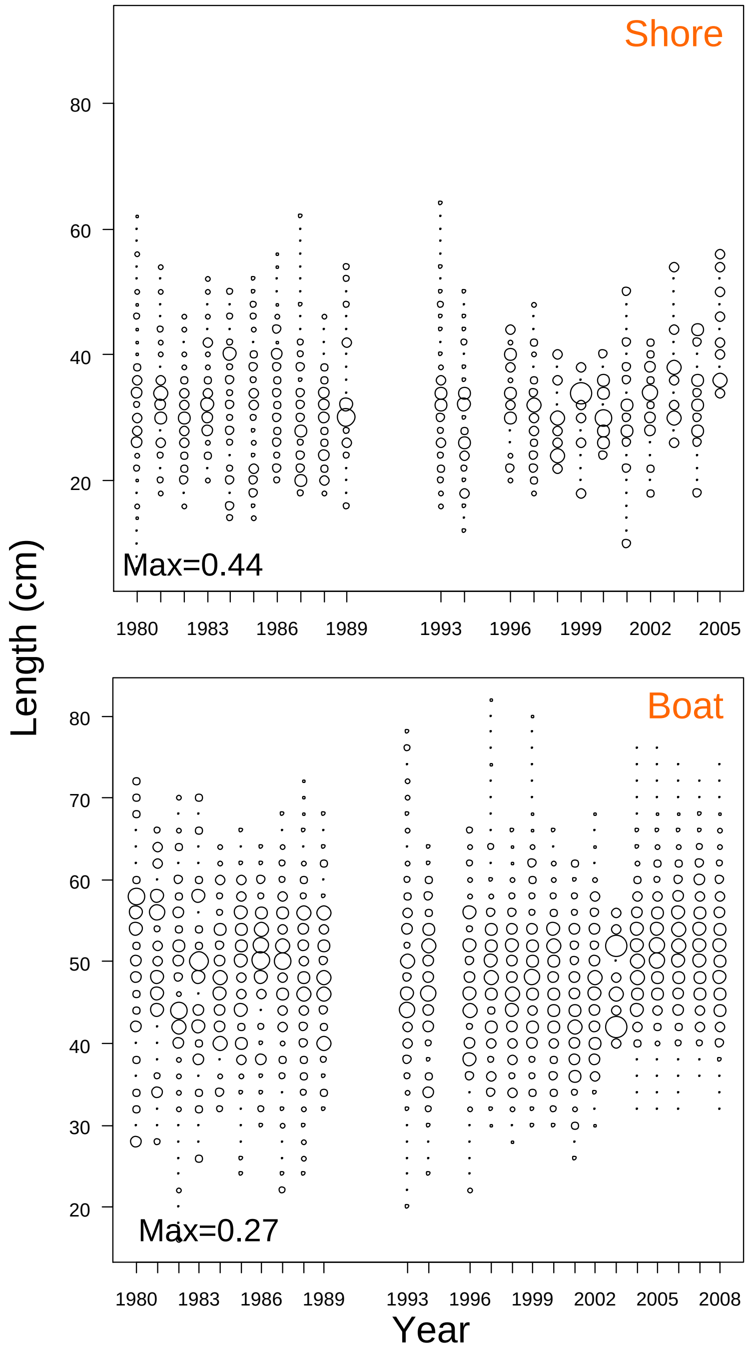

Figure 27. Length composition bubble plots for the ORS recreational fishery modes. Values in the lower left of each panel refer to the proportion size of the biggest bubble.

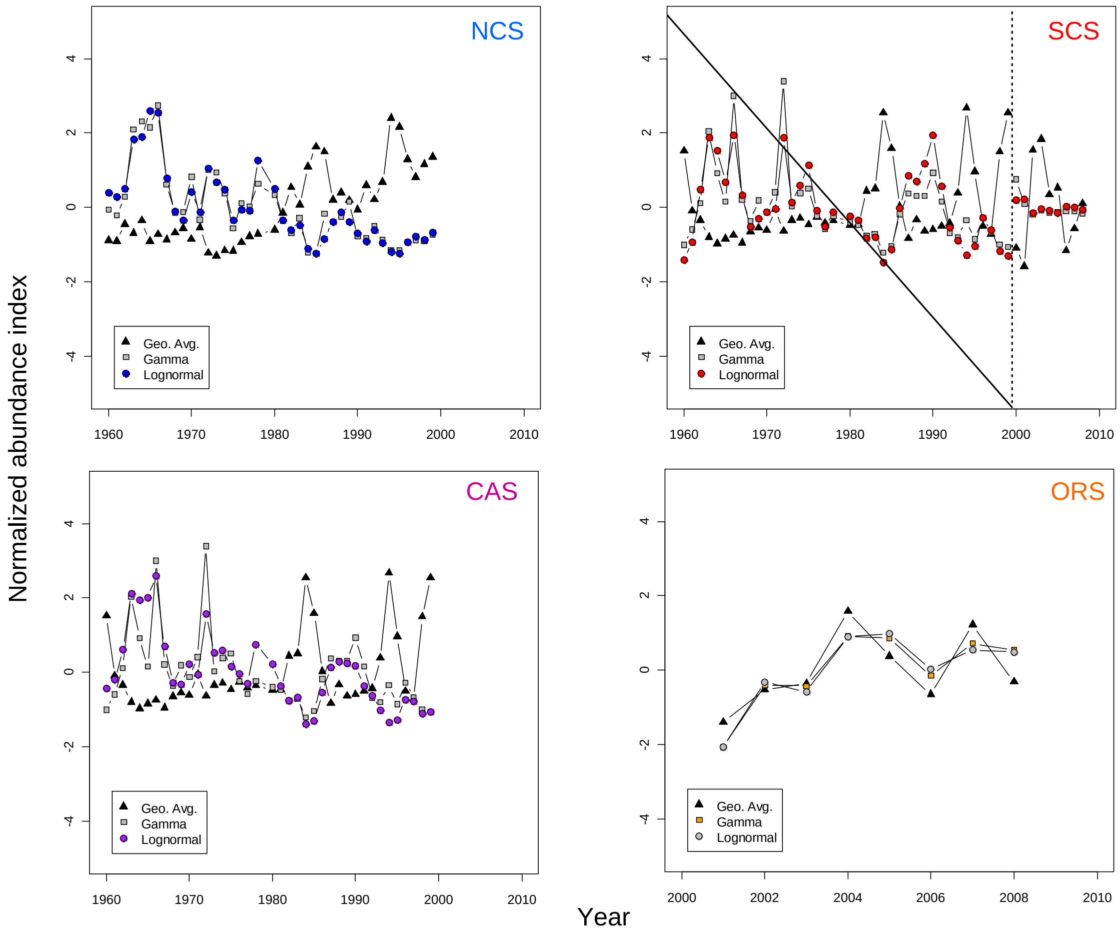

Figure 28. Geometric mean and delta GLM-based CPUE abundance indices for each sub-stock. Plotted values are the normalized (Z-score) index values. Vertical broken line shows the break in time series for the SCS CPFV indices.

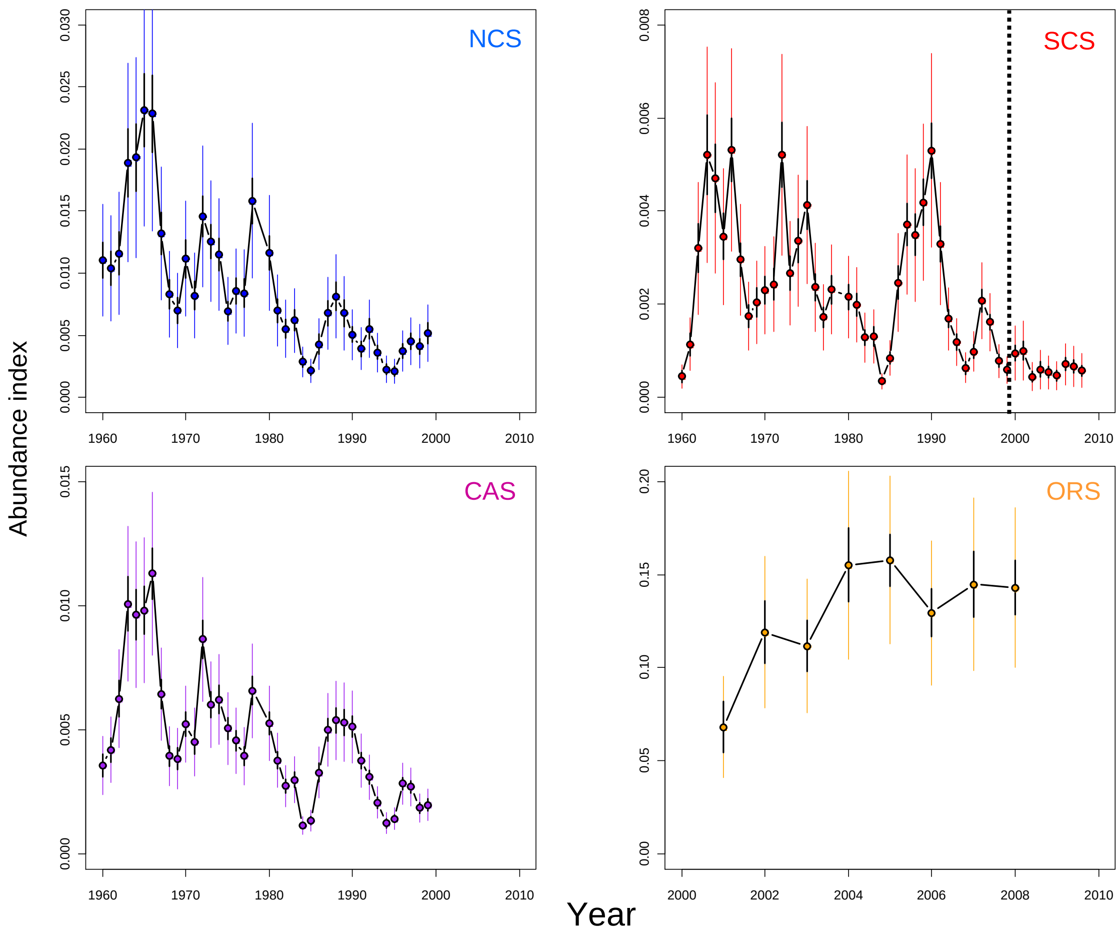

Figure 29. Time series of abundance series for the California CPFV indices and ORBS survey with 95% confidence intervals. Black line confidence intervals are based on the original estimates of CVs from the delta-GLM models; colored lines are based on the inflated CVs. Vertical broken line in the SCS panel distinguishes the two CPFV time series.

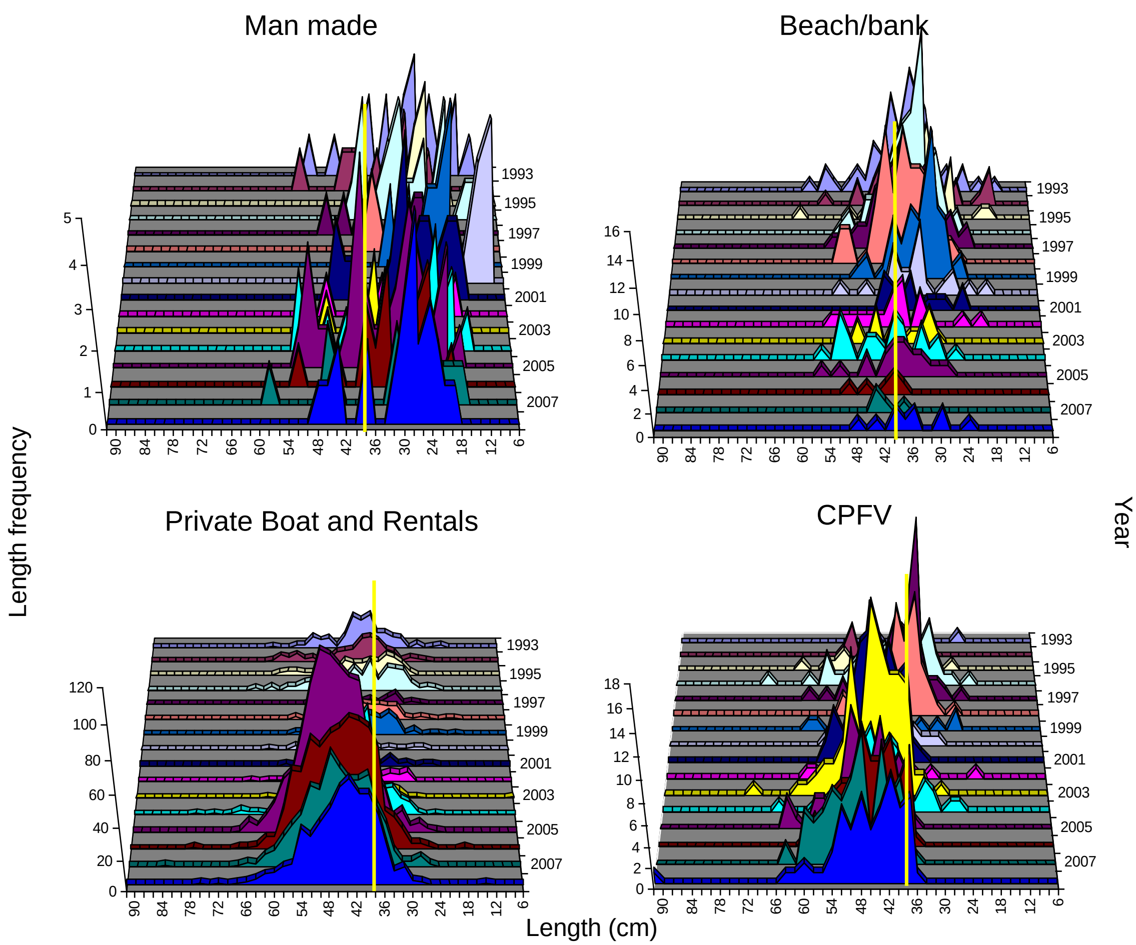

Figure 30. Length compositions for the four recreational modes in California. Yellow vertical line indicates the size limit (38 inches) implemented in 2000.

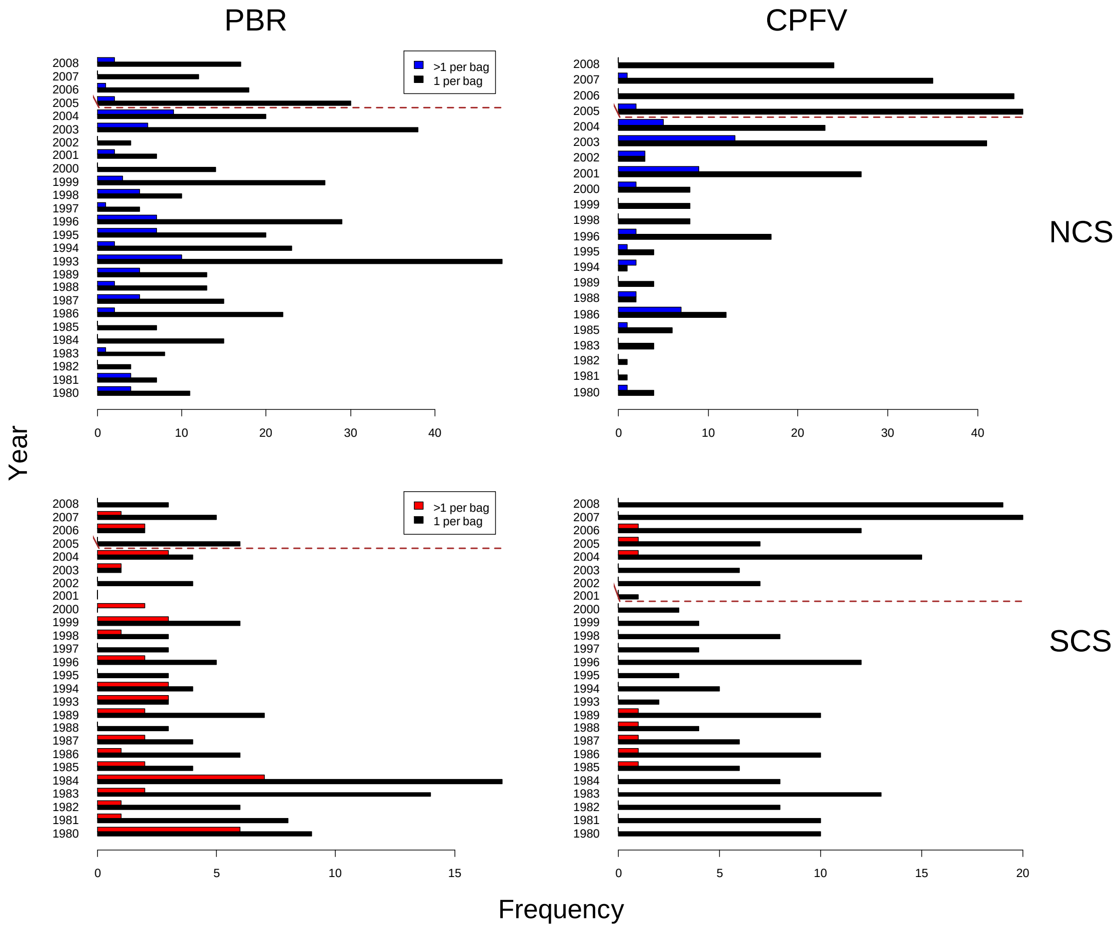

Figure 31. Frequency of cabezon in bags for the NCS and SCS sub-stocks from the PBR and CPFV recreational fishing modes. Horizontal blue and red lines indicate the transition to bag limits of 1.

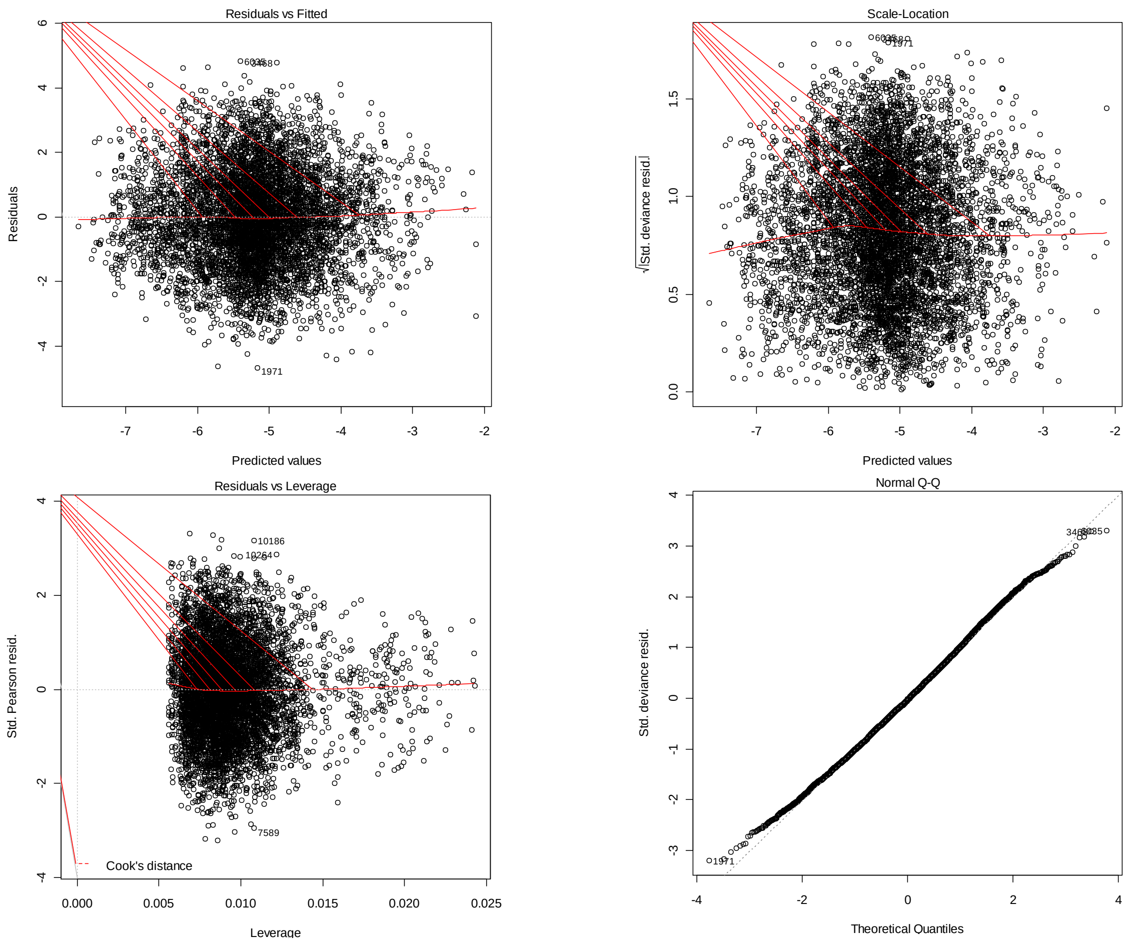

Figure 32. Diagnostic plots of the GLM-fit to the positive records for the CAS CPFV index.

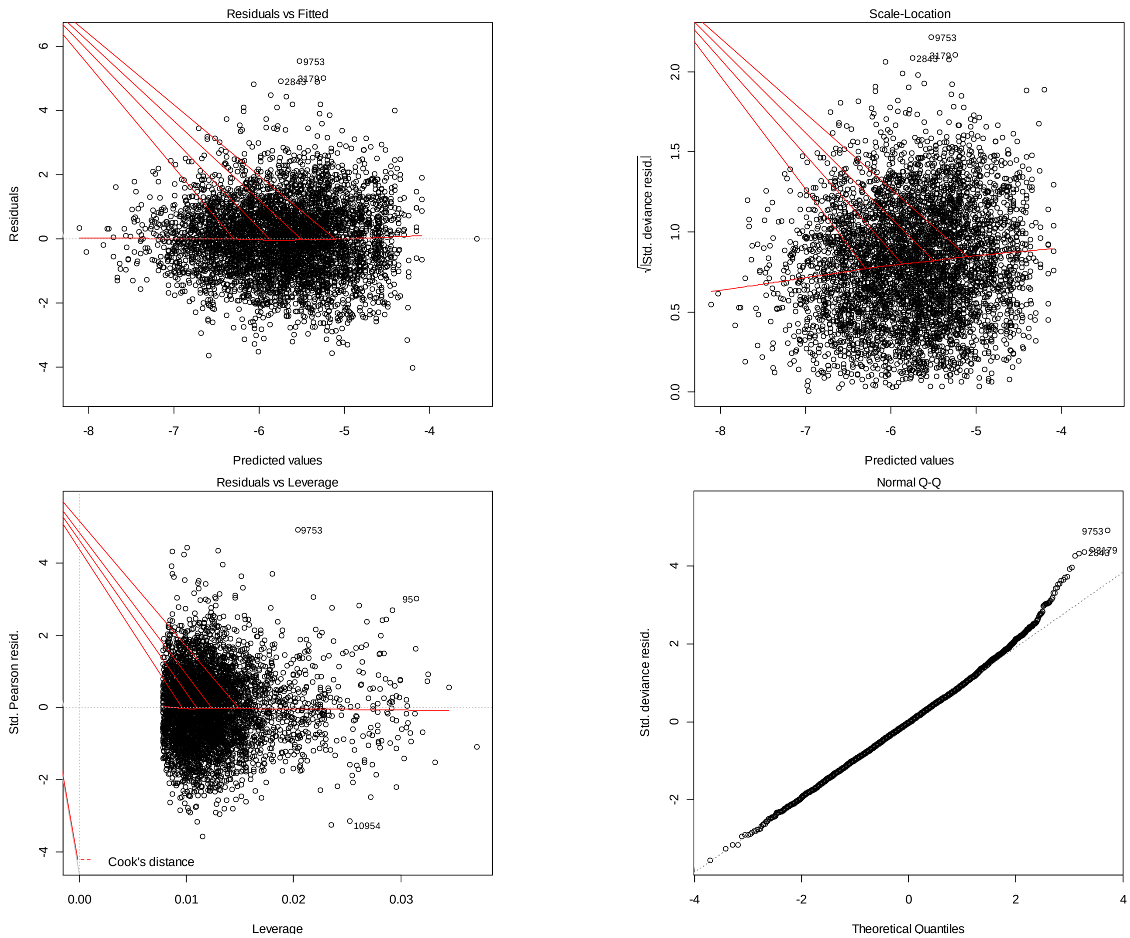

Figure 33. Diagnostic plots of the GLM-fit to the positive records for the NCS CPFV index.

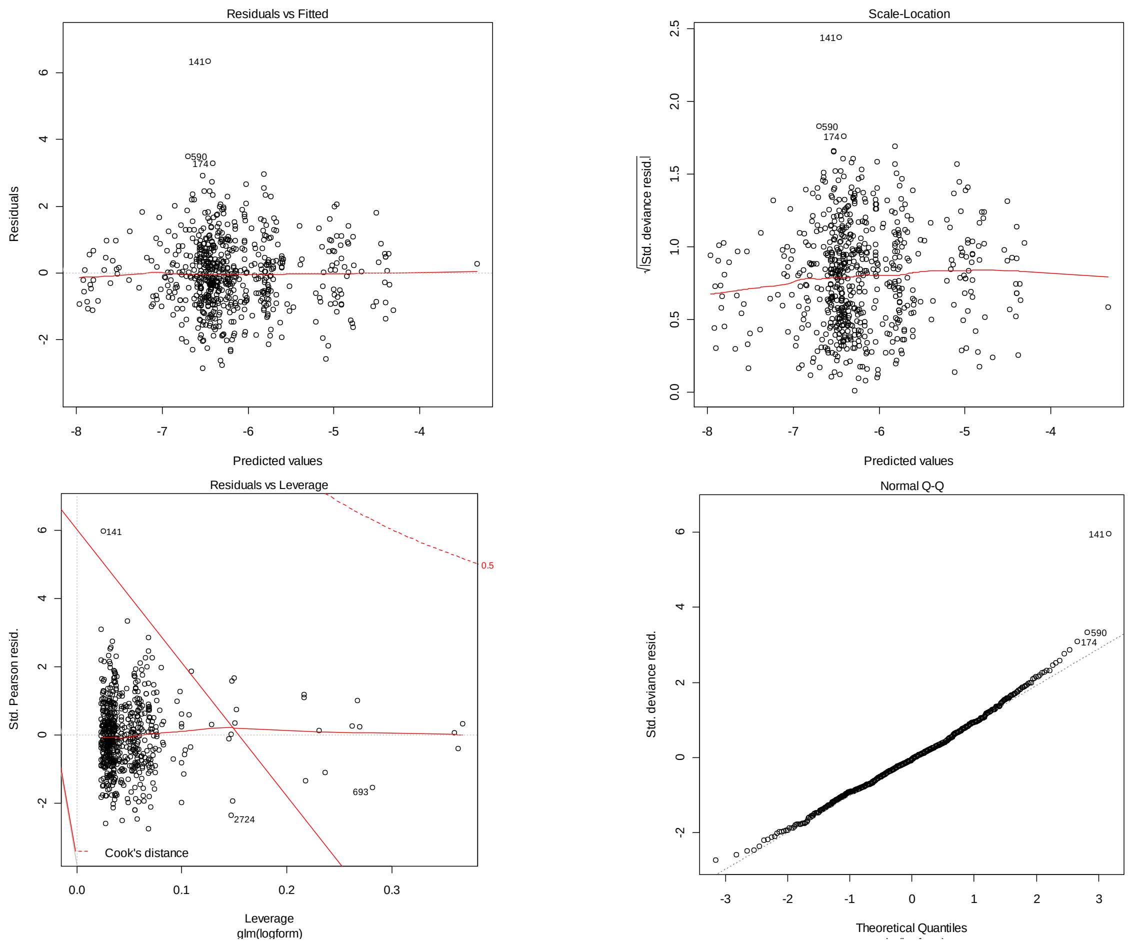

Figure 34. Diagnostic plots of the GLM-fit to the positive records for the SCS CPFV index (1960-2008).

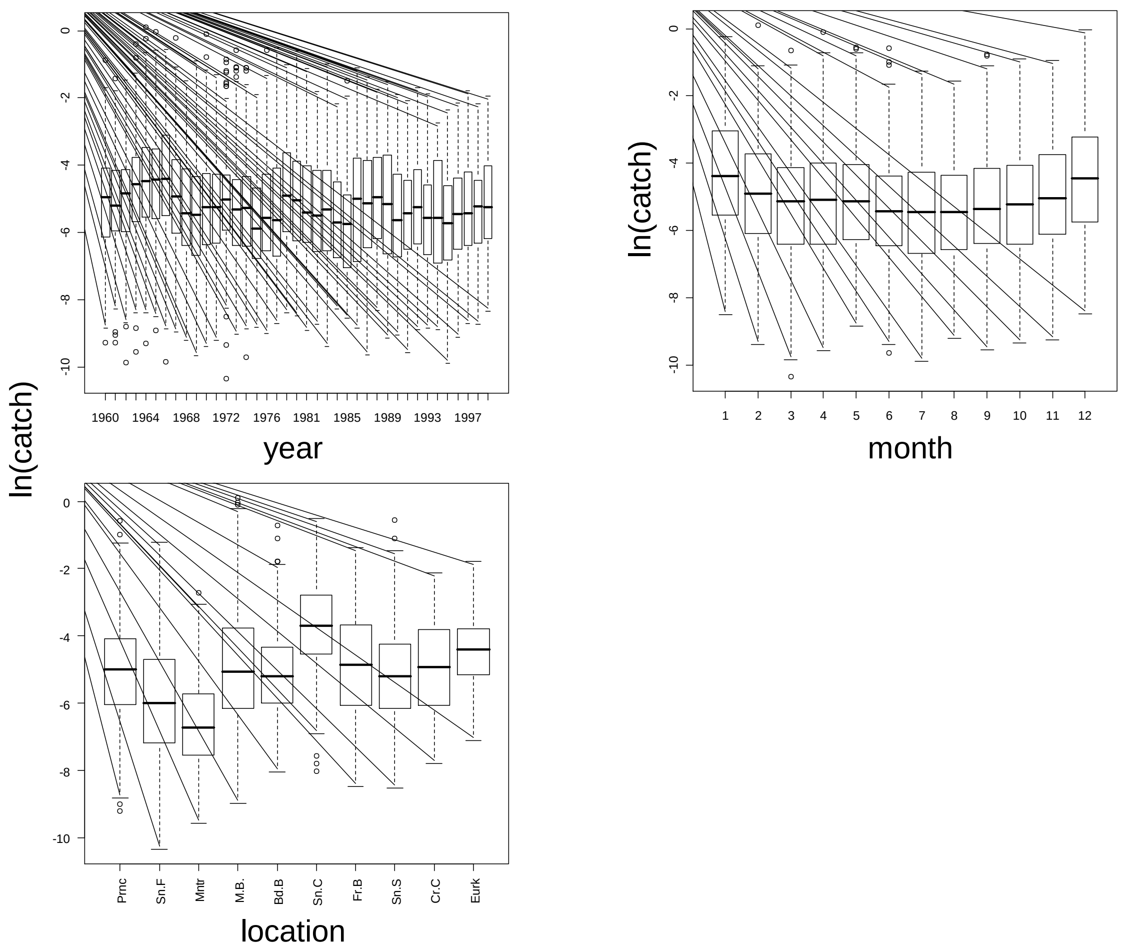

Figure 35. Relationship between the natural log (ln) of catch versus year (top left panel), month (top right panel), and location (lower left panel) for the NCS CPFV index. The location of Santa Cruz (Sn.C) demonstrated significant location-year interactions.

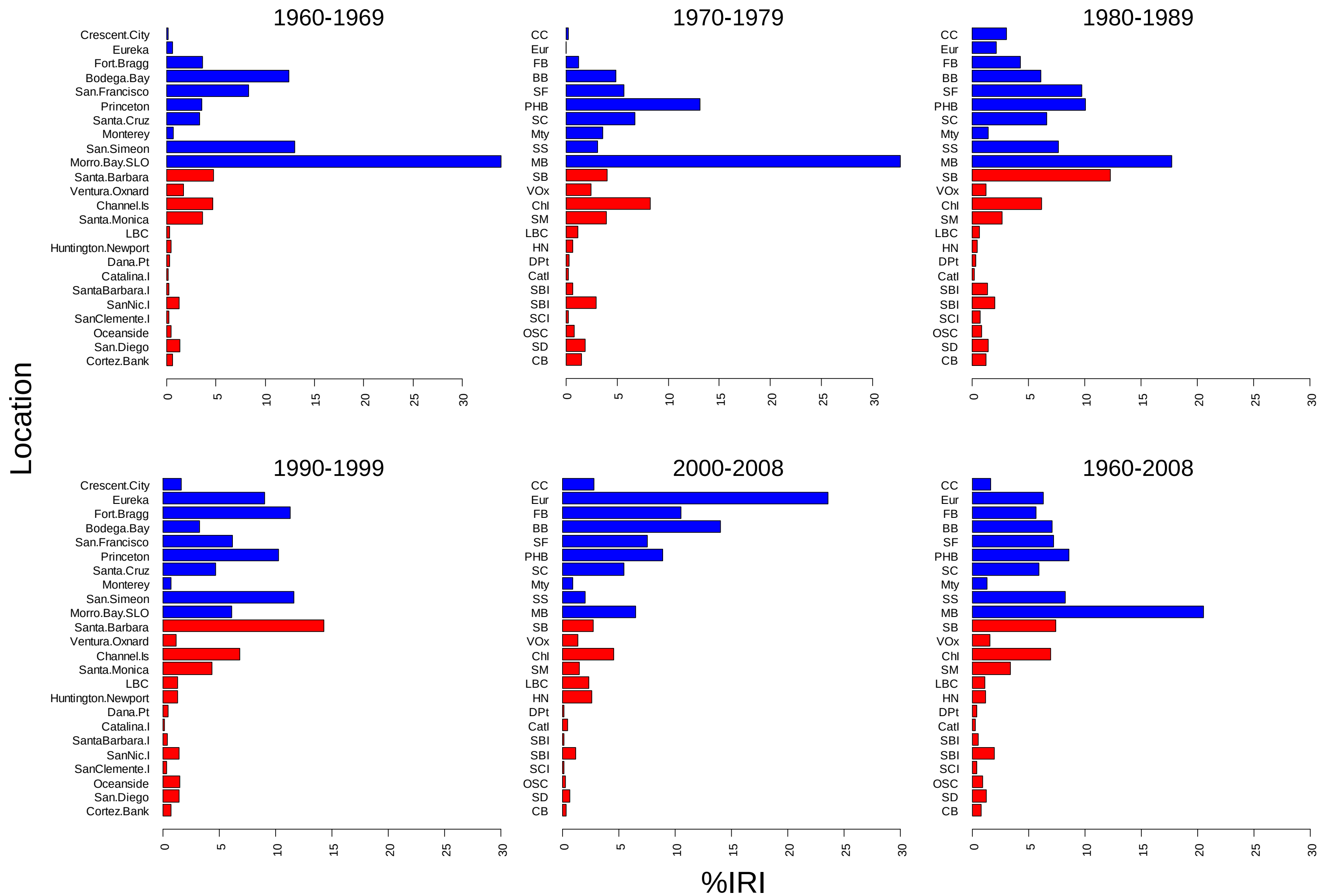

Figure 36. Percent Index of Relative Importance (%IRI) of cabezon catch in the CPFV fishery by fishing location through time.

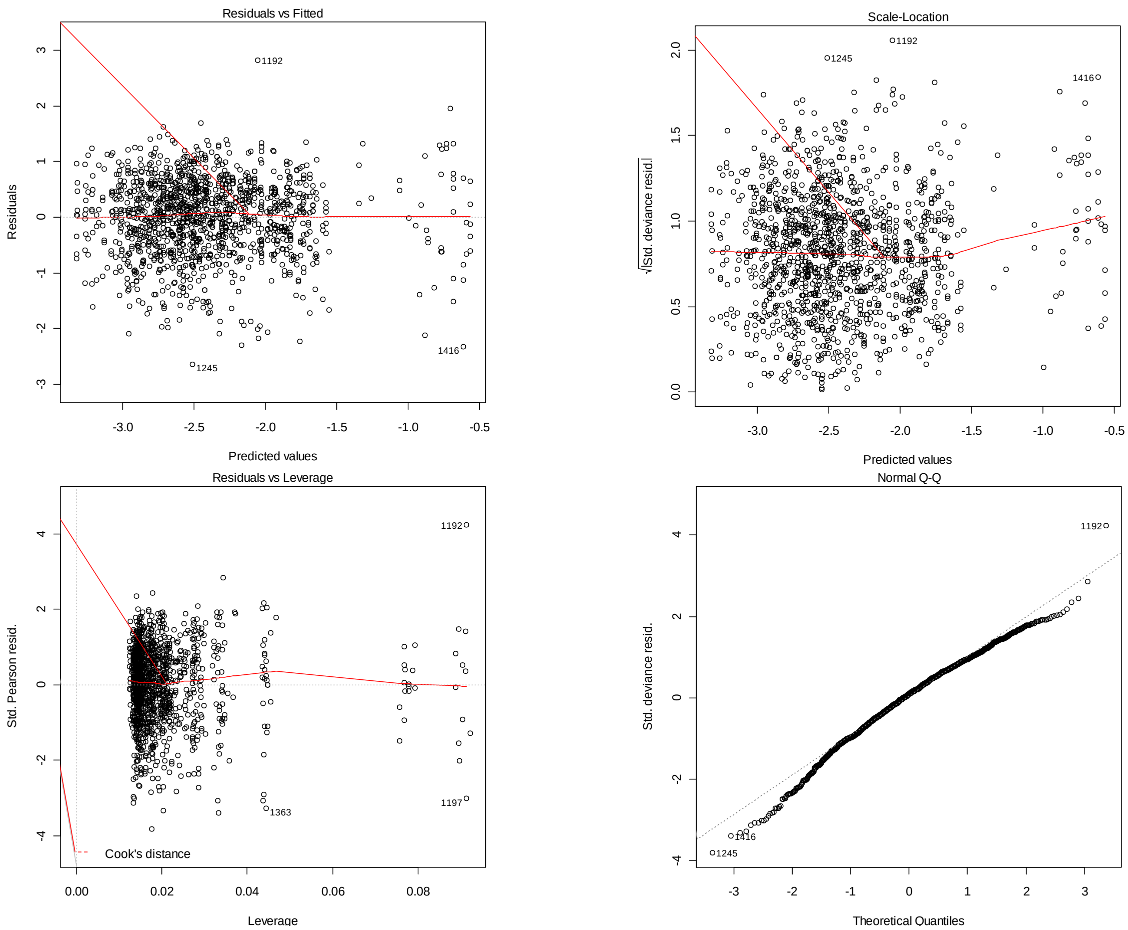

Figure 37. Diagnostic plots of the GLM-fit to the positive records for the ORS ORBS index.

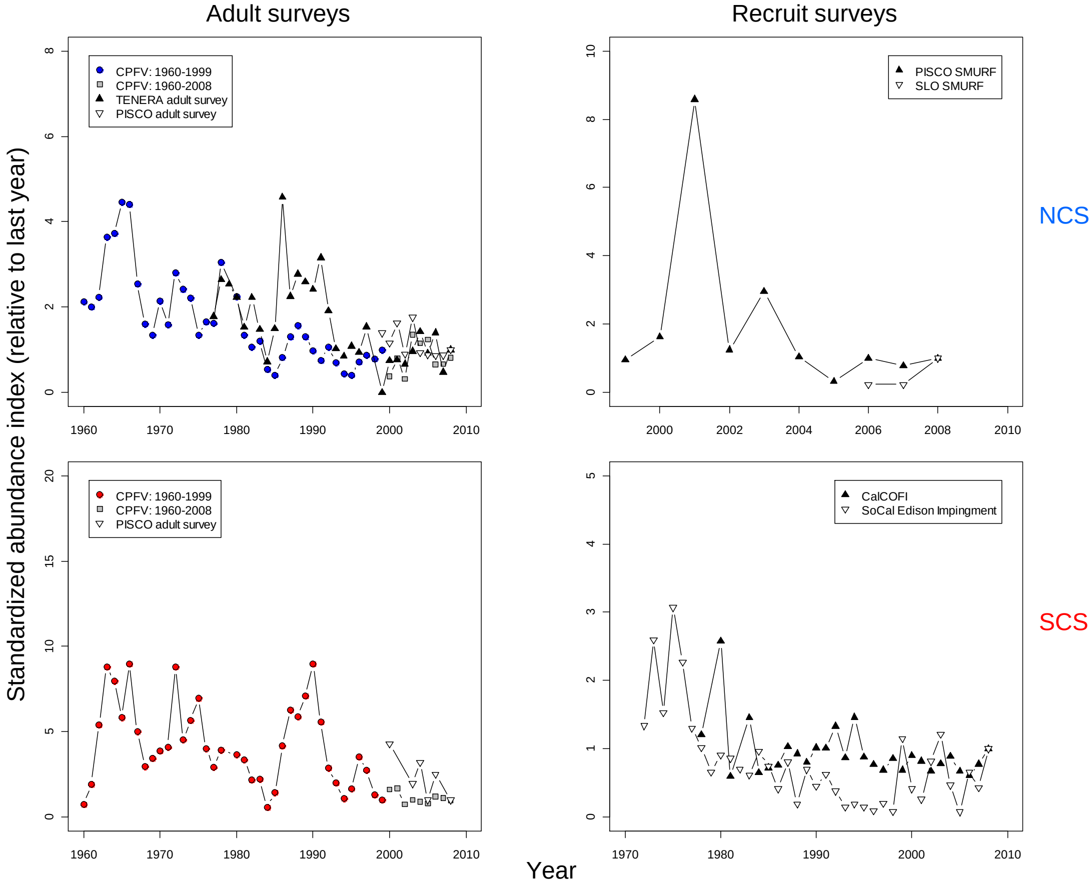

Figure 38. Indices of abundance (mean values) considered in either base case or sensitivity models for the NCS and SCS.

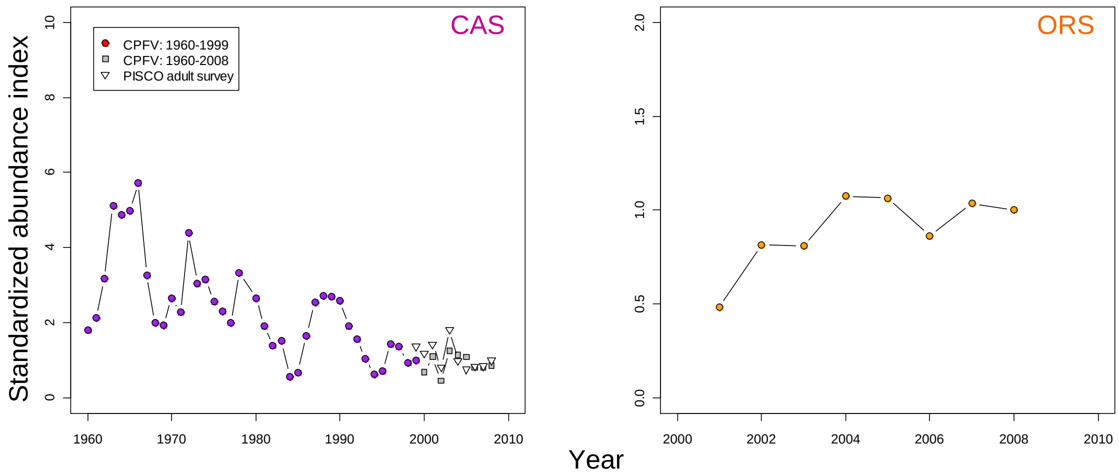

Figure 39. Indices of abundance (mean values) considered in either base case or sensitivity models for the CAS and ORS.

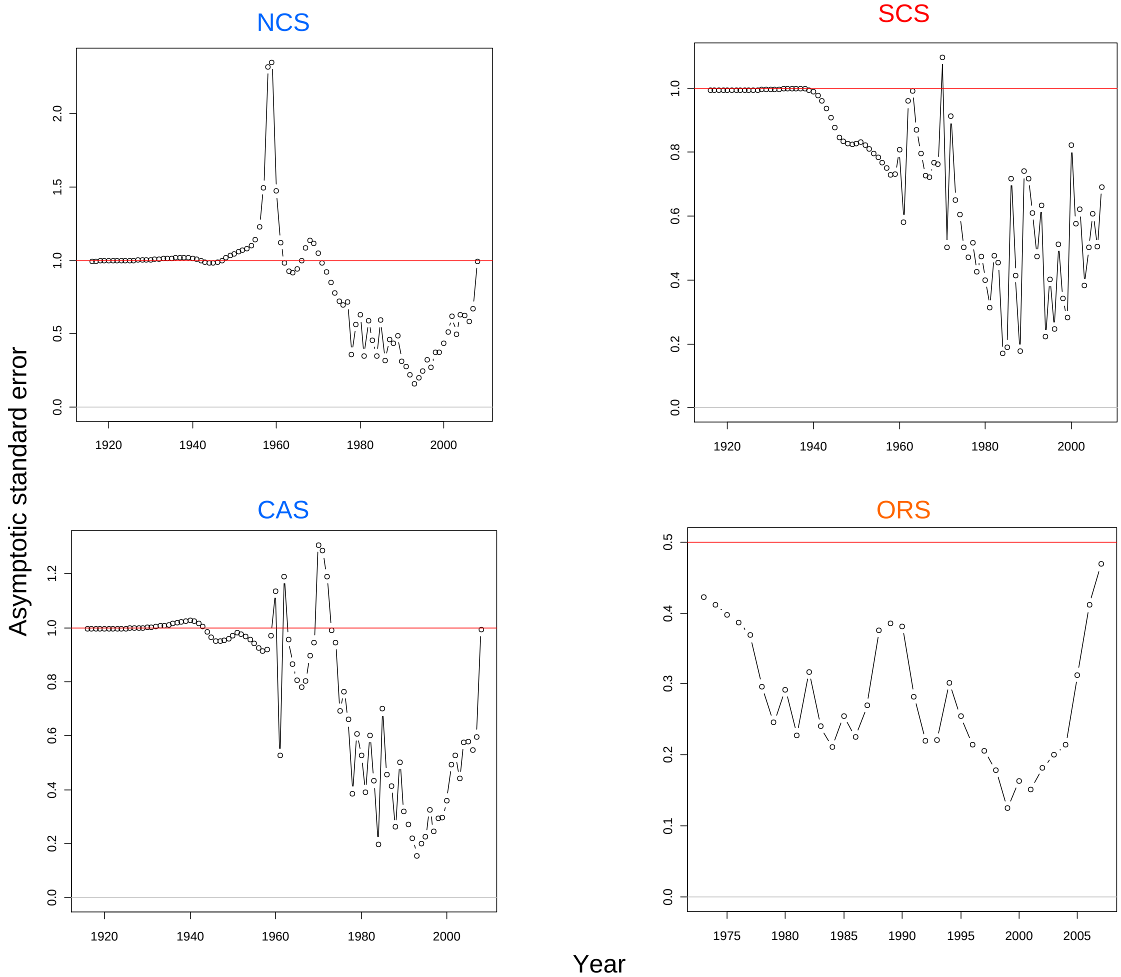

Figure 40. Asymptotic standard error of recruitment deviations when recruitment is estimated for the full time series in each sub-stock base case.

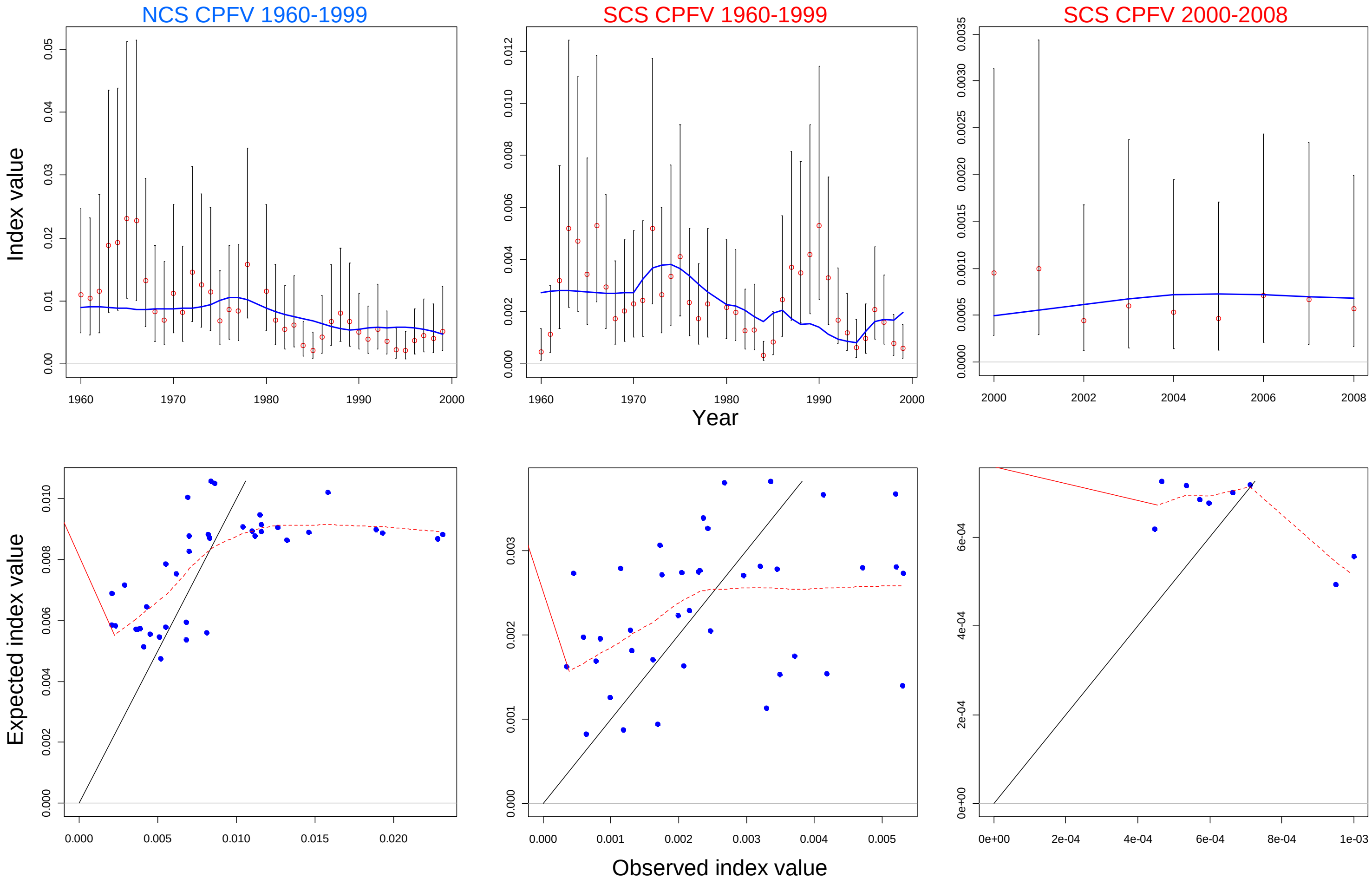

Figure 41. Fits to the CPFV relative abundance time series (top panels) and the 1:1 points to observed and expected index values (bottom panels) used in the NCS and SCS base cases.

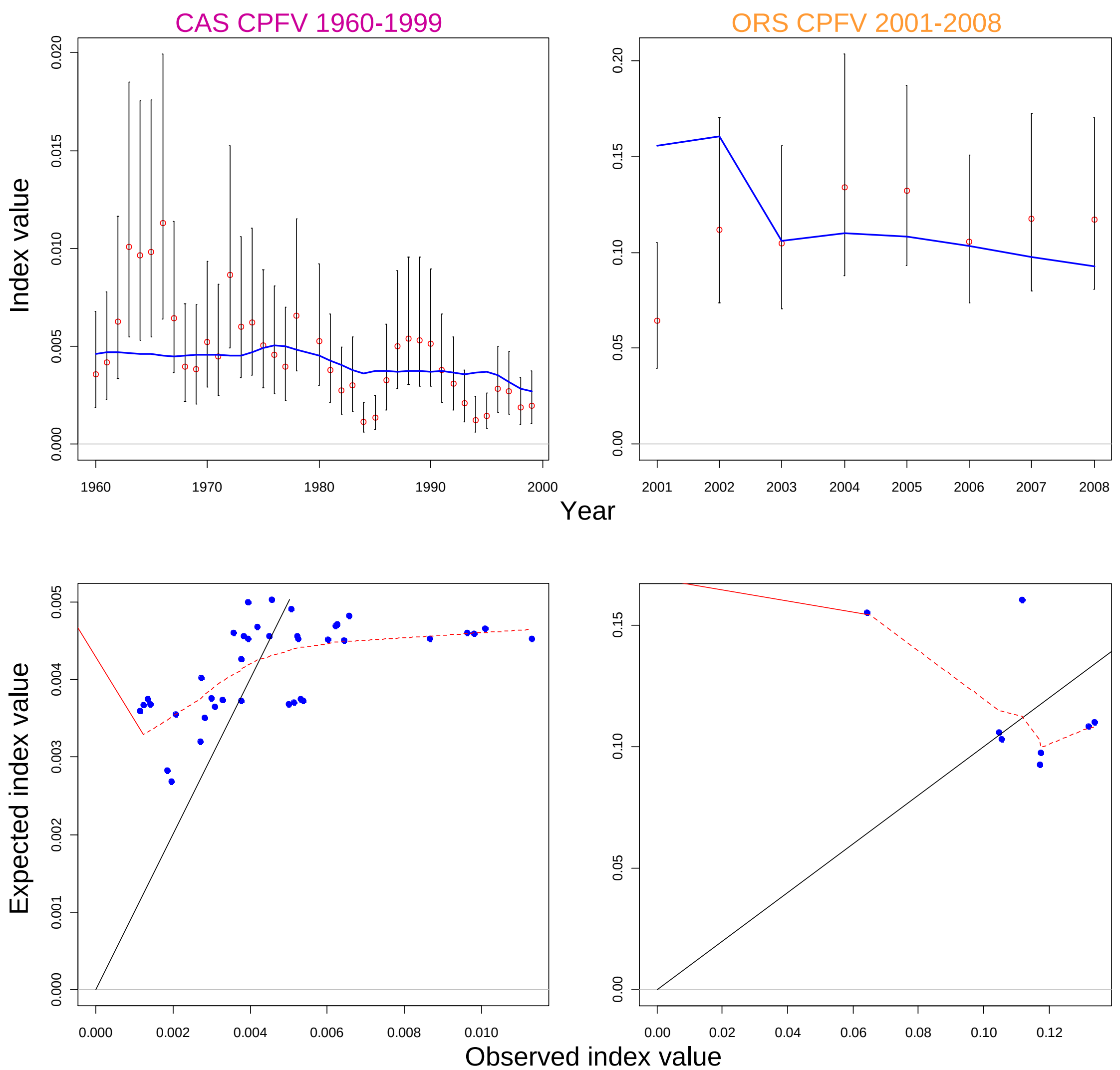

Figure 42. Fits to the CPFV relative abundance time series (top panels) and the 1:1 points to observed and expected index values (bottom panels) used in the CAS and ORS base cases.

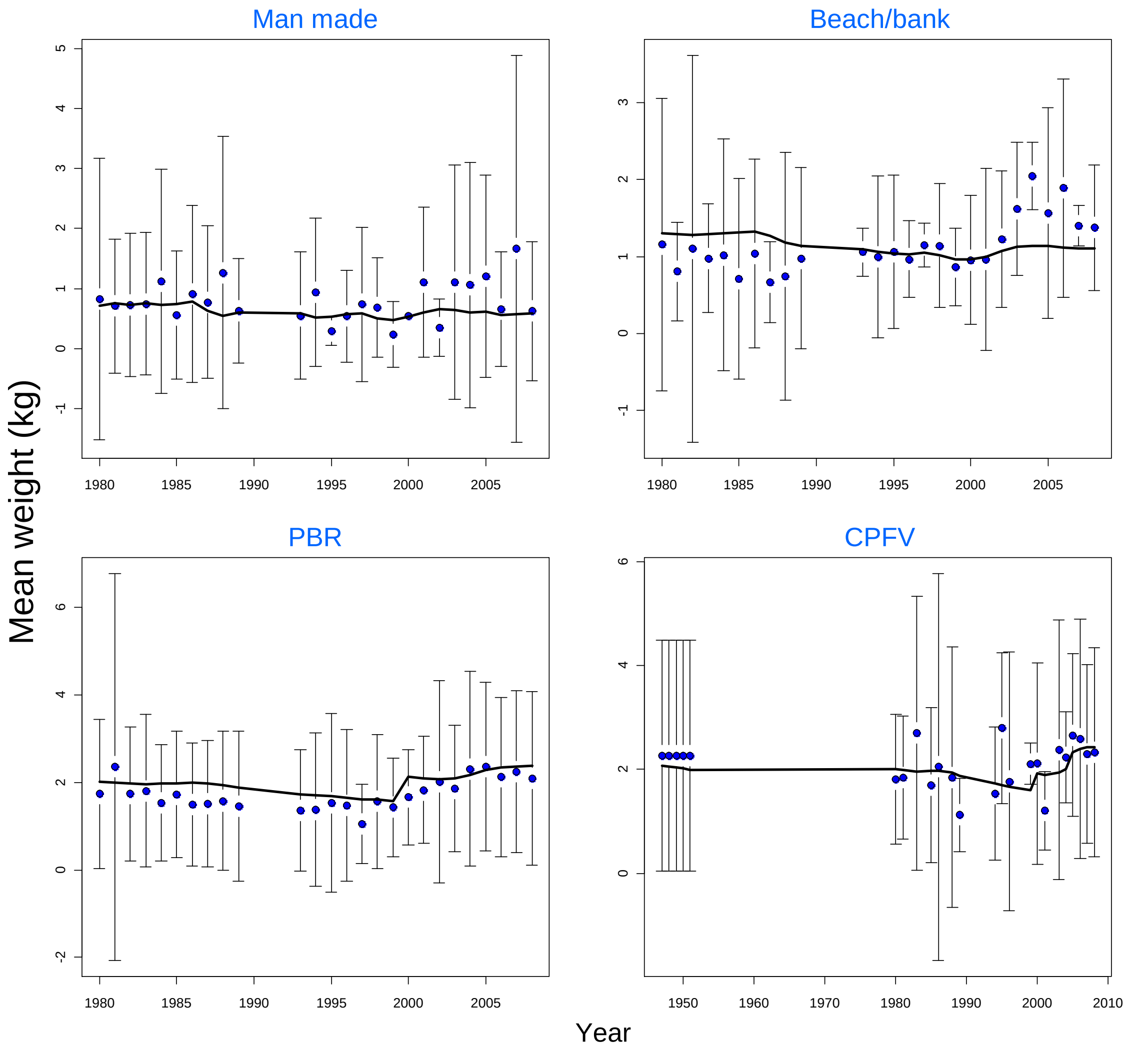

Figure 43. Plots to the observed (solid dots with 95% confidence intervals) and model-predicted (solid black lines) mean weights for each recreational fleet of the NCS.

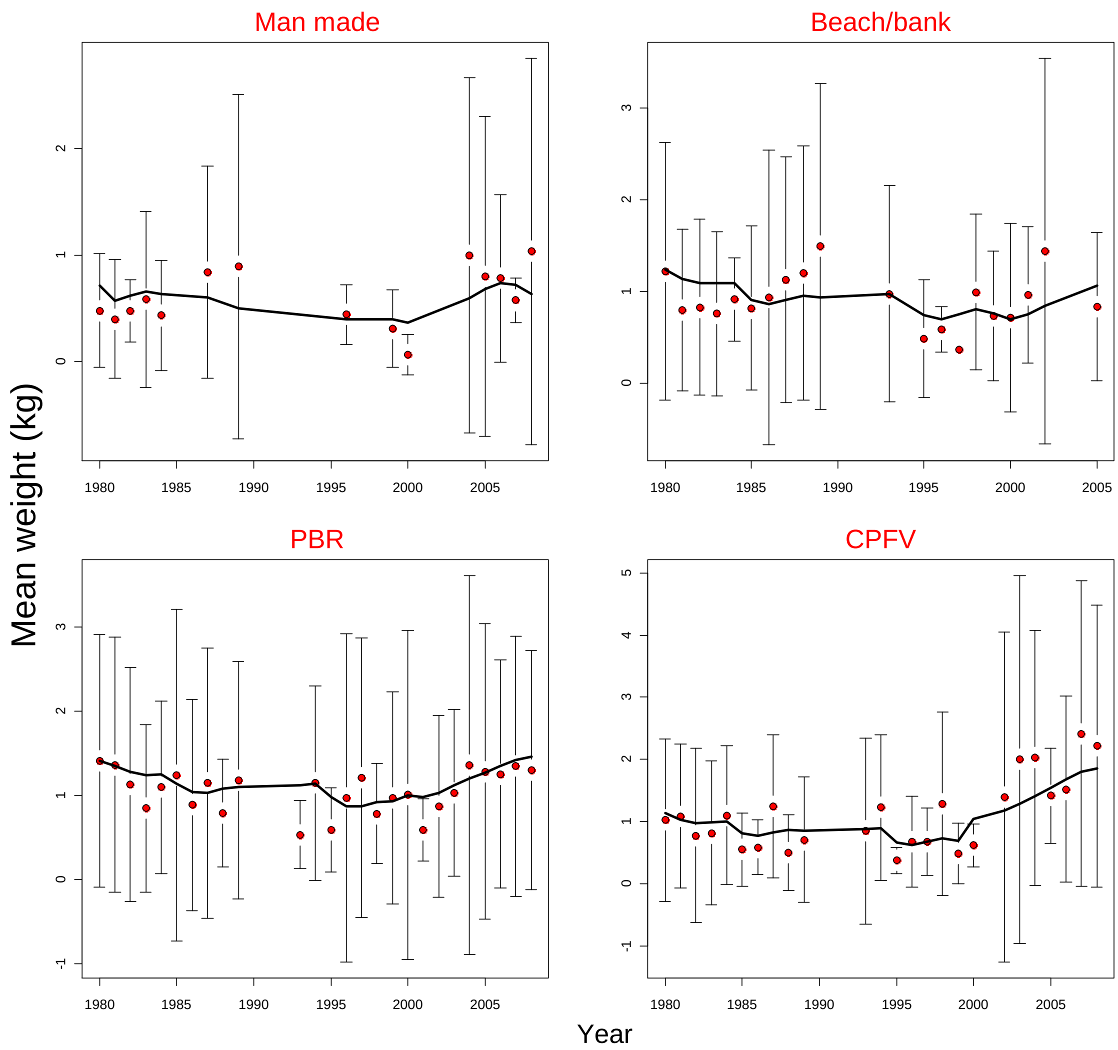

Figure 44. Plots to the observed (solid dots with 95% confidence intervals) and model-predicted (solid black lines) mean weights for each recreational fleet of the SCS.

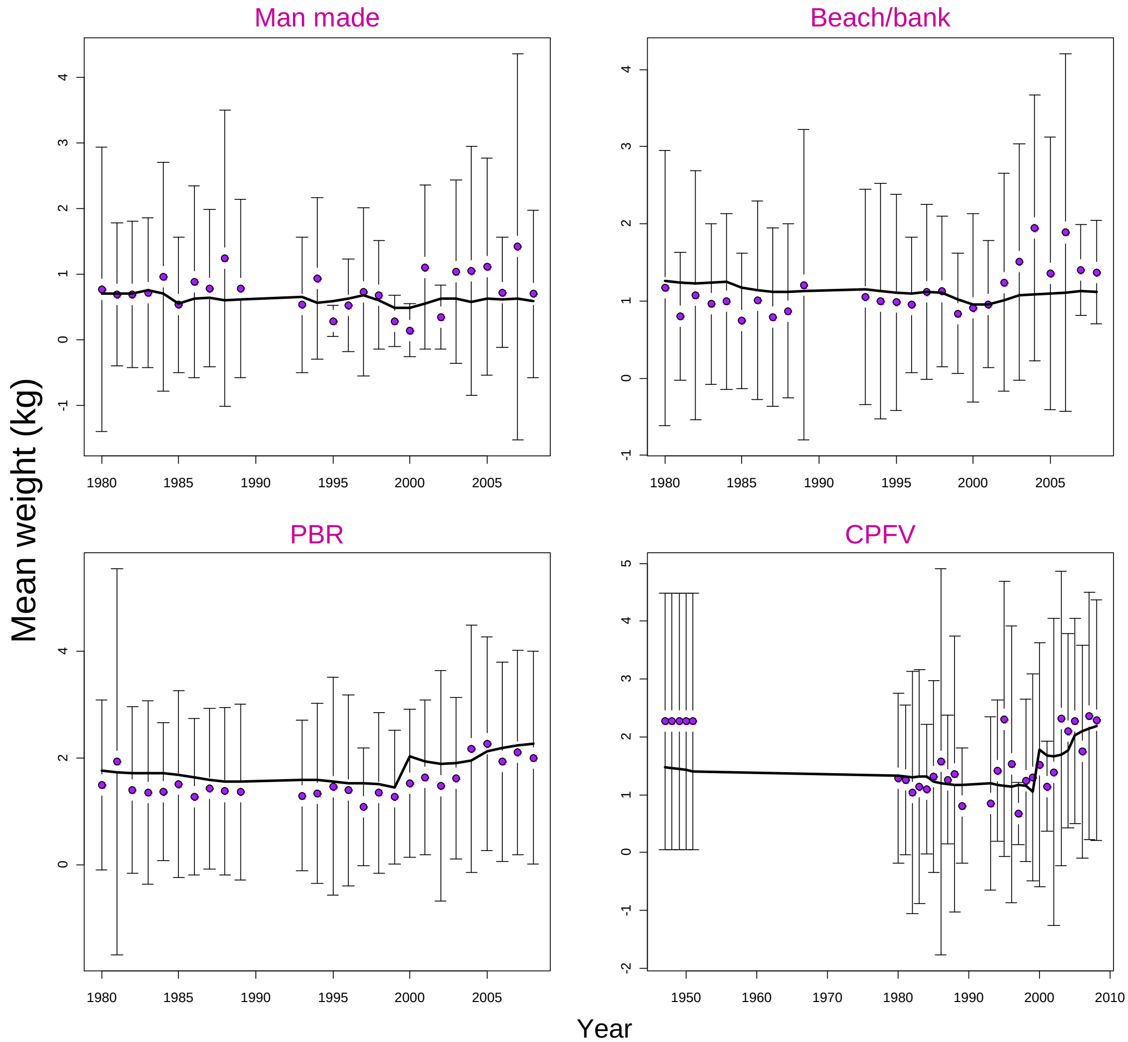

Figure 45. Plots to the observed (solid dots with 95% confidence intervals) and model-predicted (solid black lines) mean weights for each recreational fleet of the CAS.

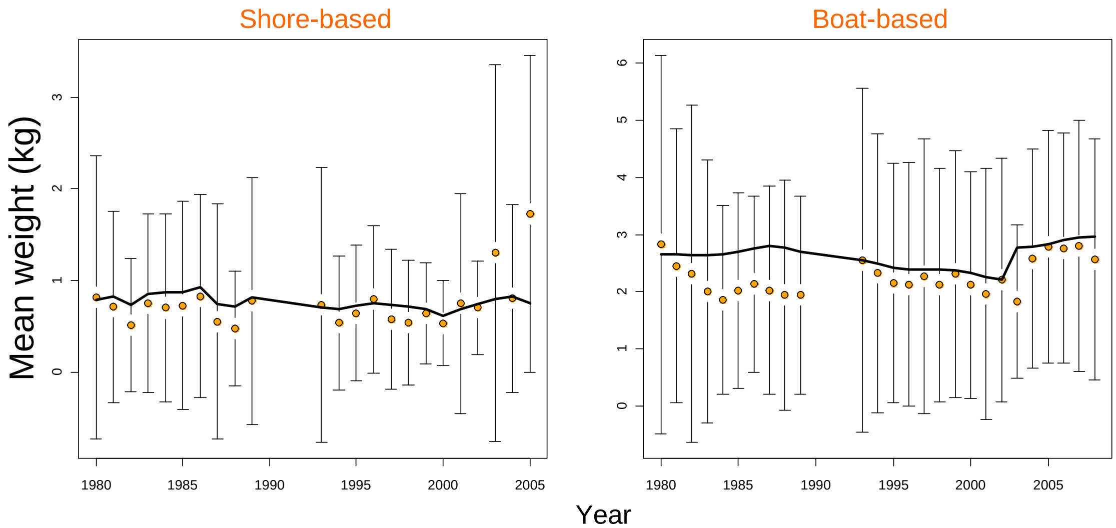

Figure 46. Plots to the observed (solid dots with 95% confidence intervals) and model-predicted (solid black lines) mean weights for each recreational fleet of the ORS.

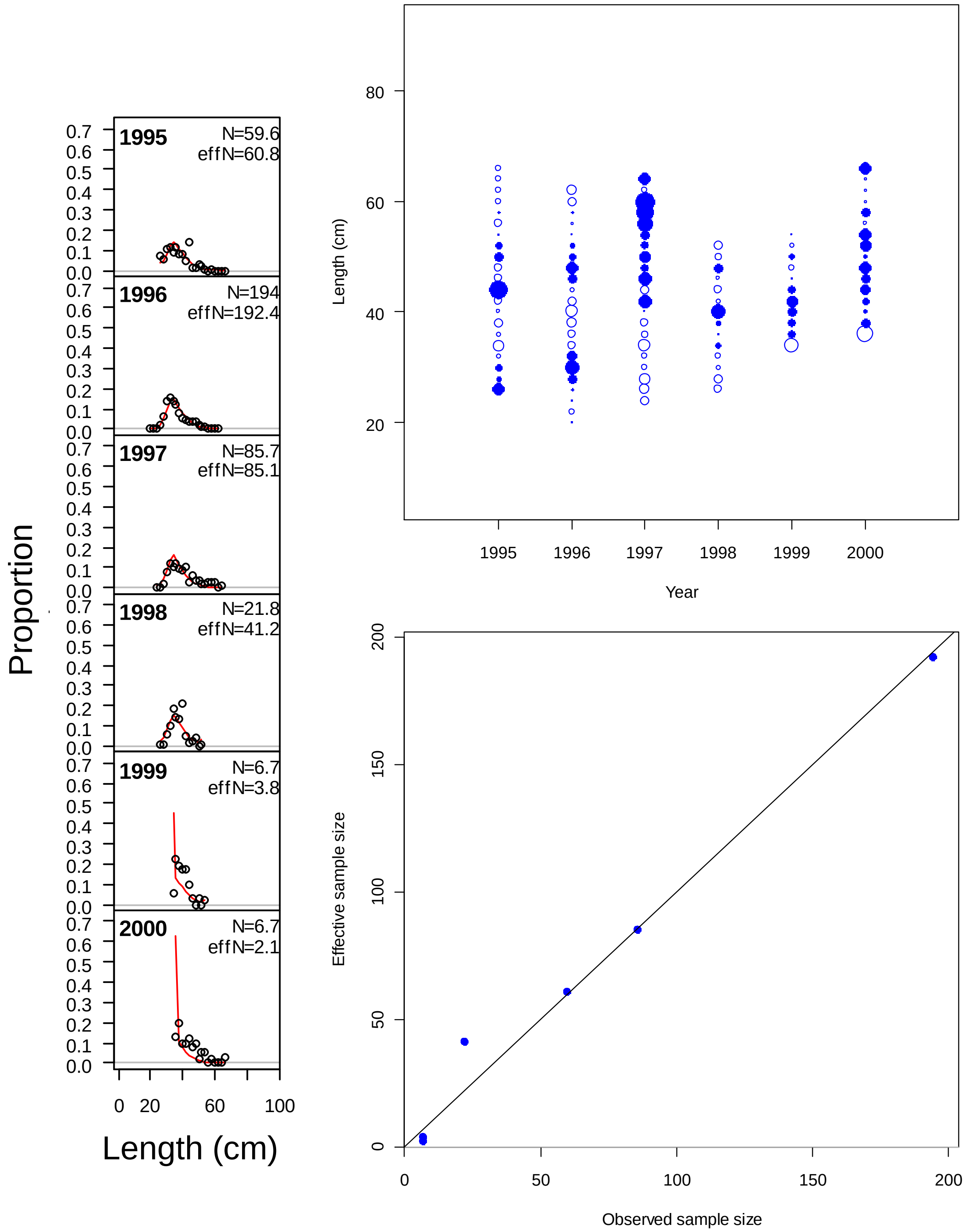

Figure 47. Fits to the Non-live (fleet 1) commercial fishery length compositions for the NCS. Left panel: Observed (circles) and model-predicted fits (red line) to length composition by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

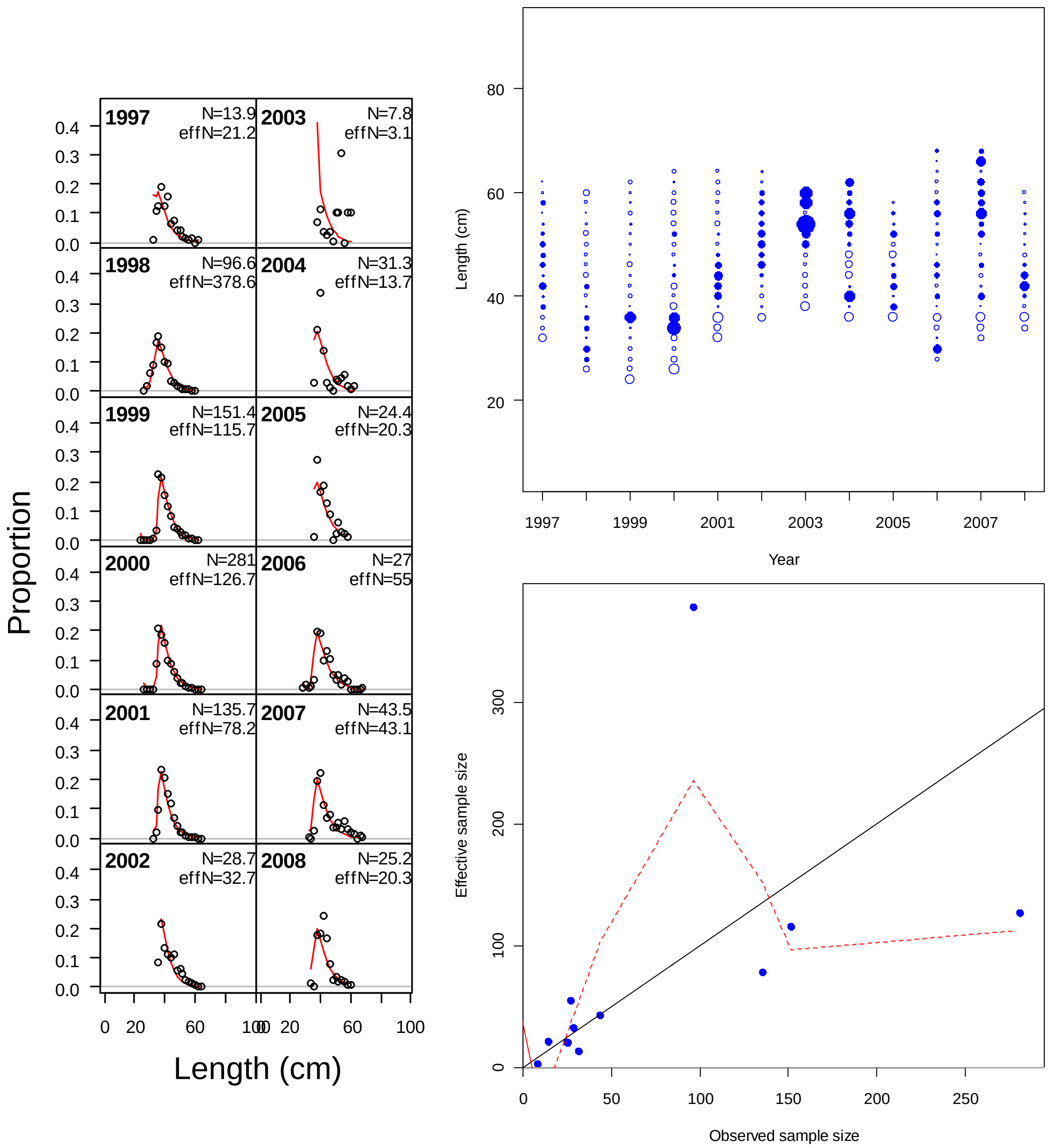

Figure 48. Fits to the live-fish (fleet 2) commercial fishery length compositions for the NCS. Left panel: Observed (circles) and model-predicted fits (red line) to length composition by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

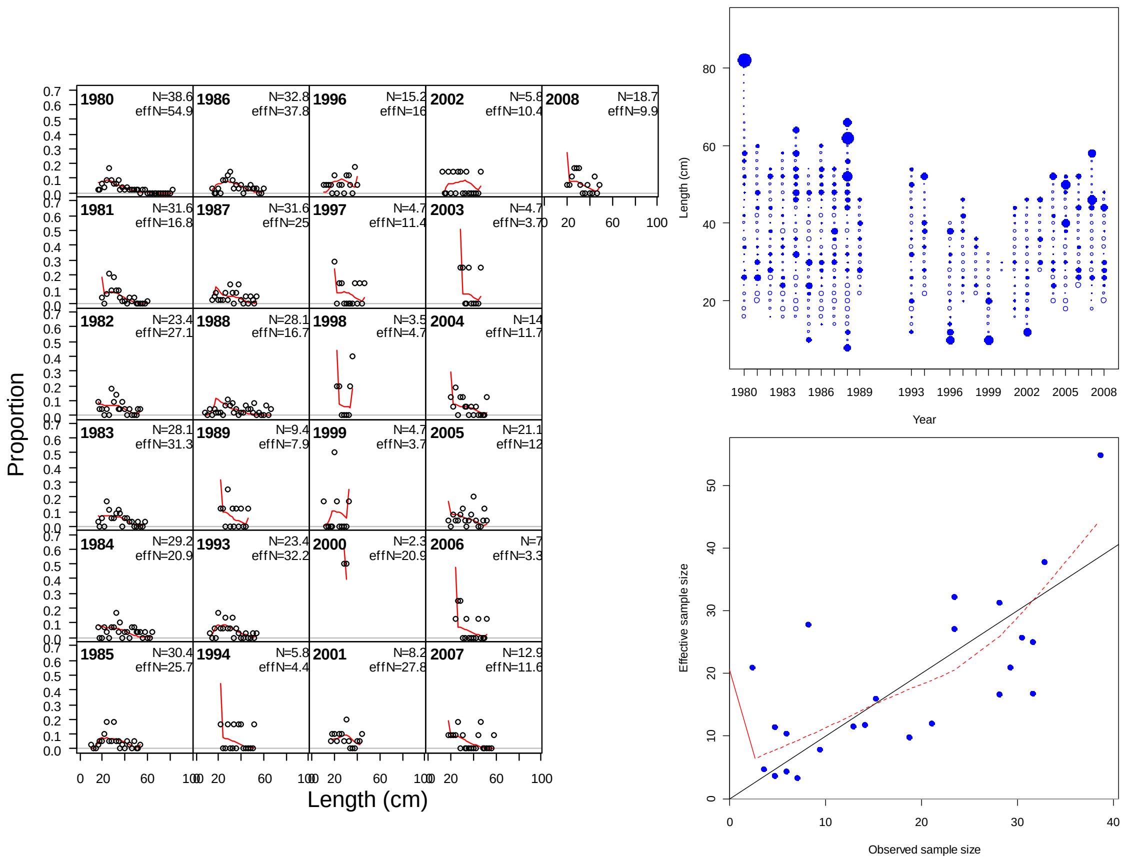

Figure 49. Fits to the man-made (fleet 3) recreational mode length compositions for the NCS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

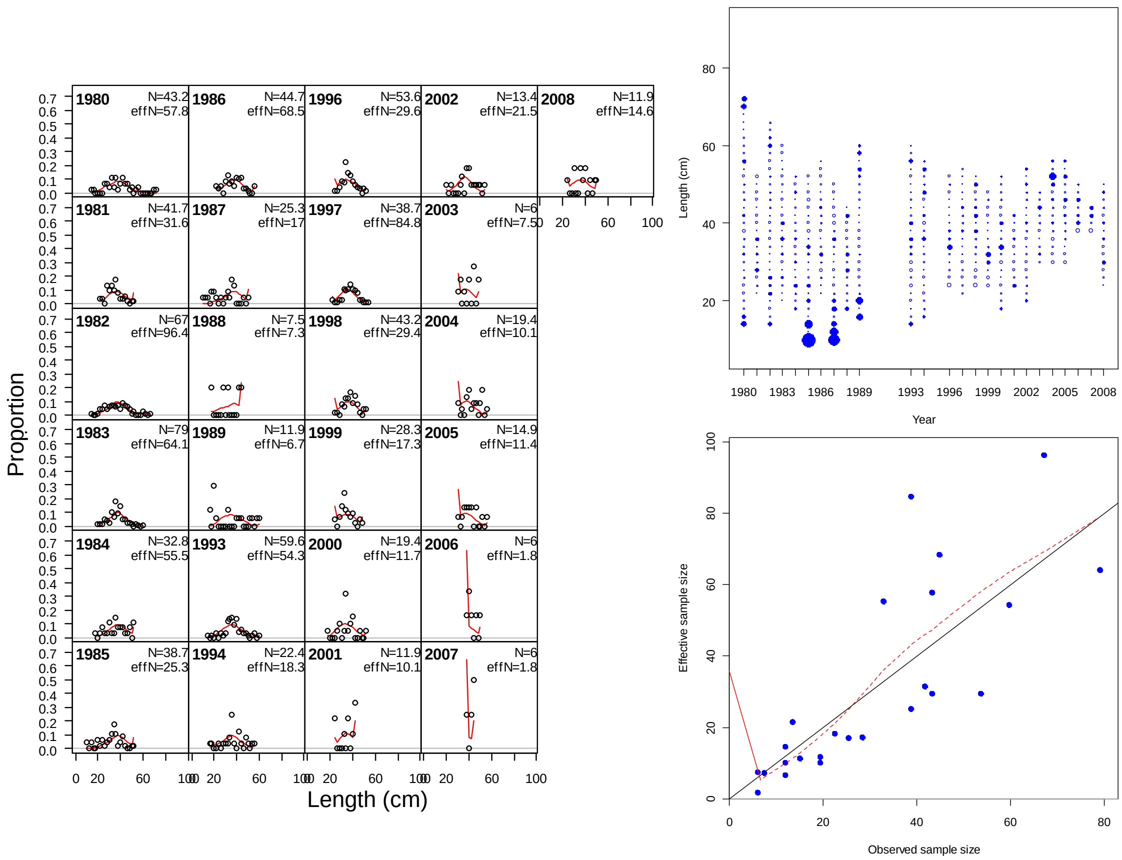

Figure 50. Fits to the beach/bank (fleet 4) recreational mode length compositions for the NCS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

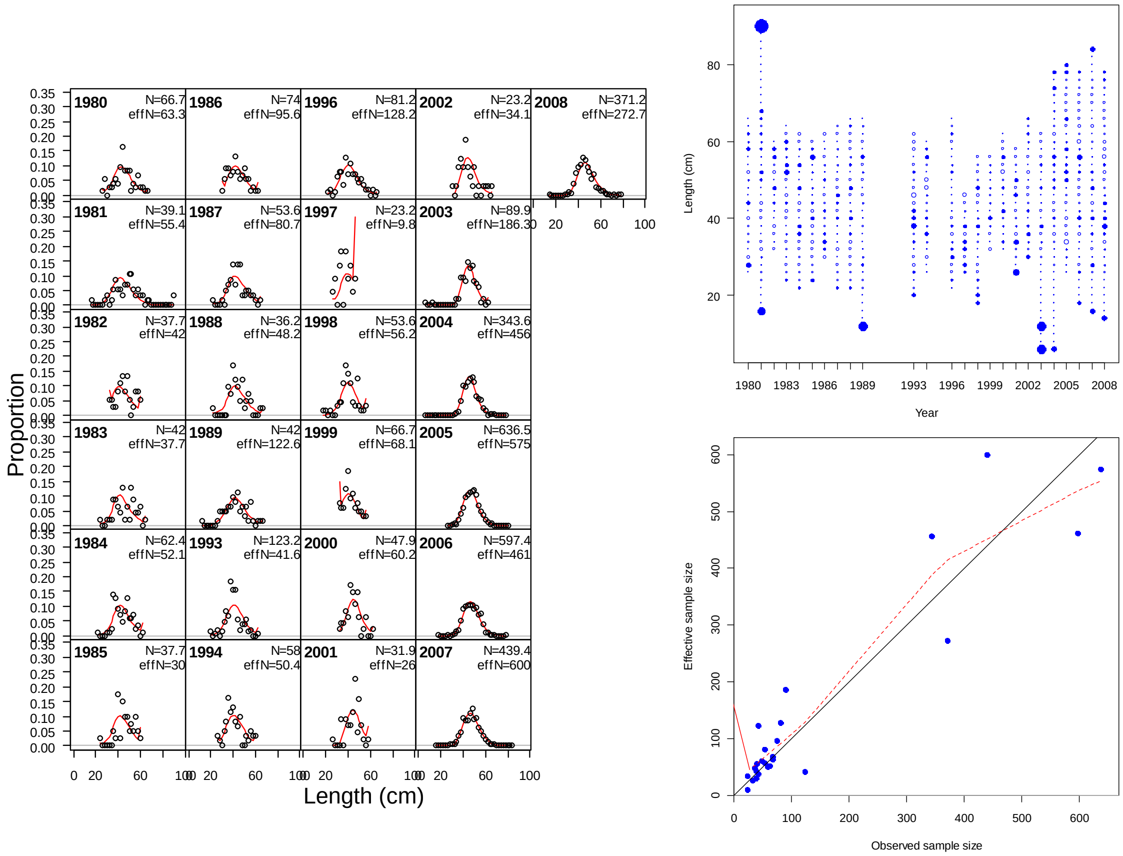

Figure 51. Fits to the PBR (fleet 5) recreational mode length compositions for the NCS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

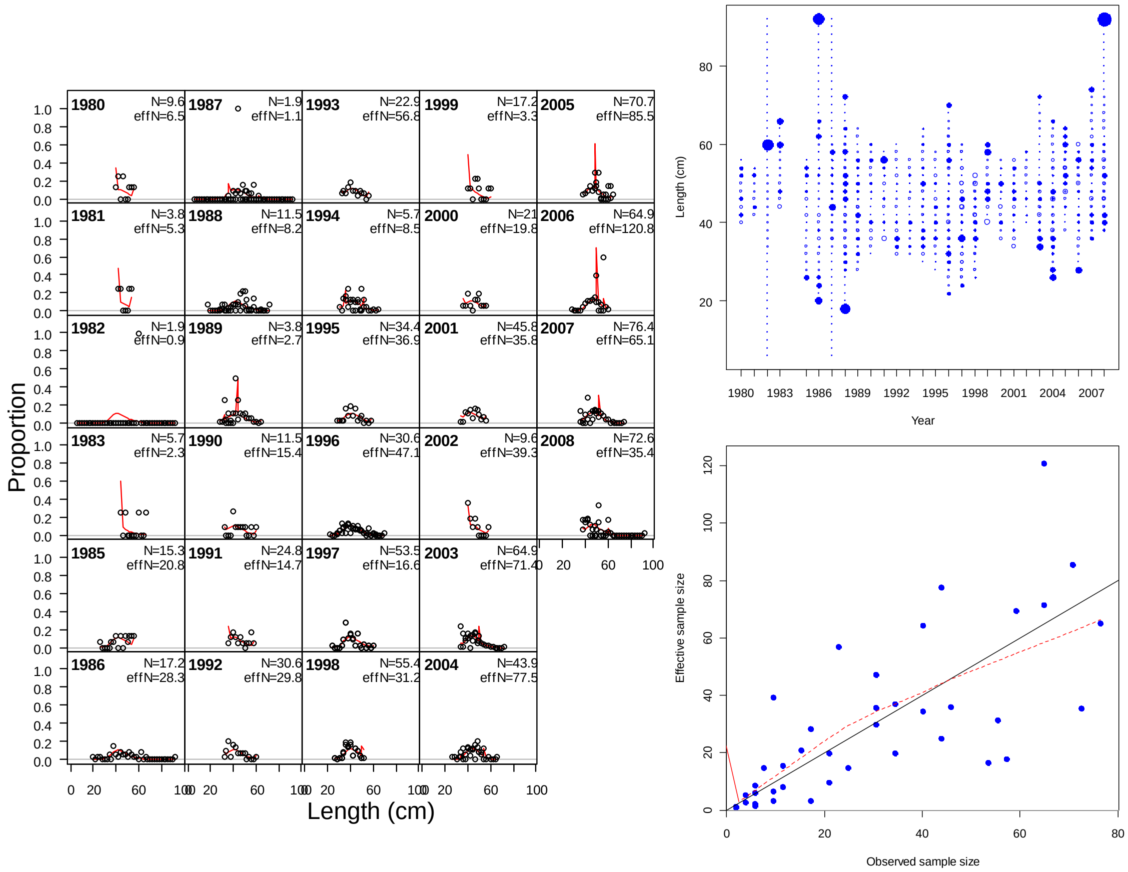

Figure 52. Fits to the CPFV (fleet 6) recreational mode length compositions for the NCS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

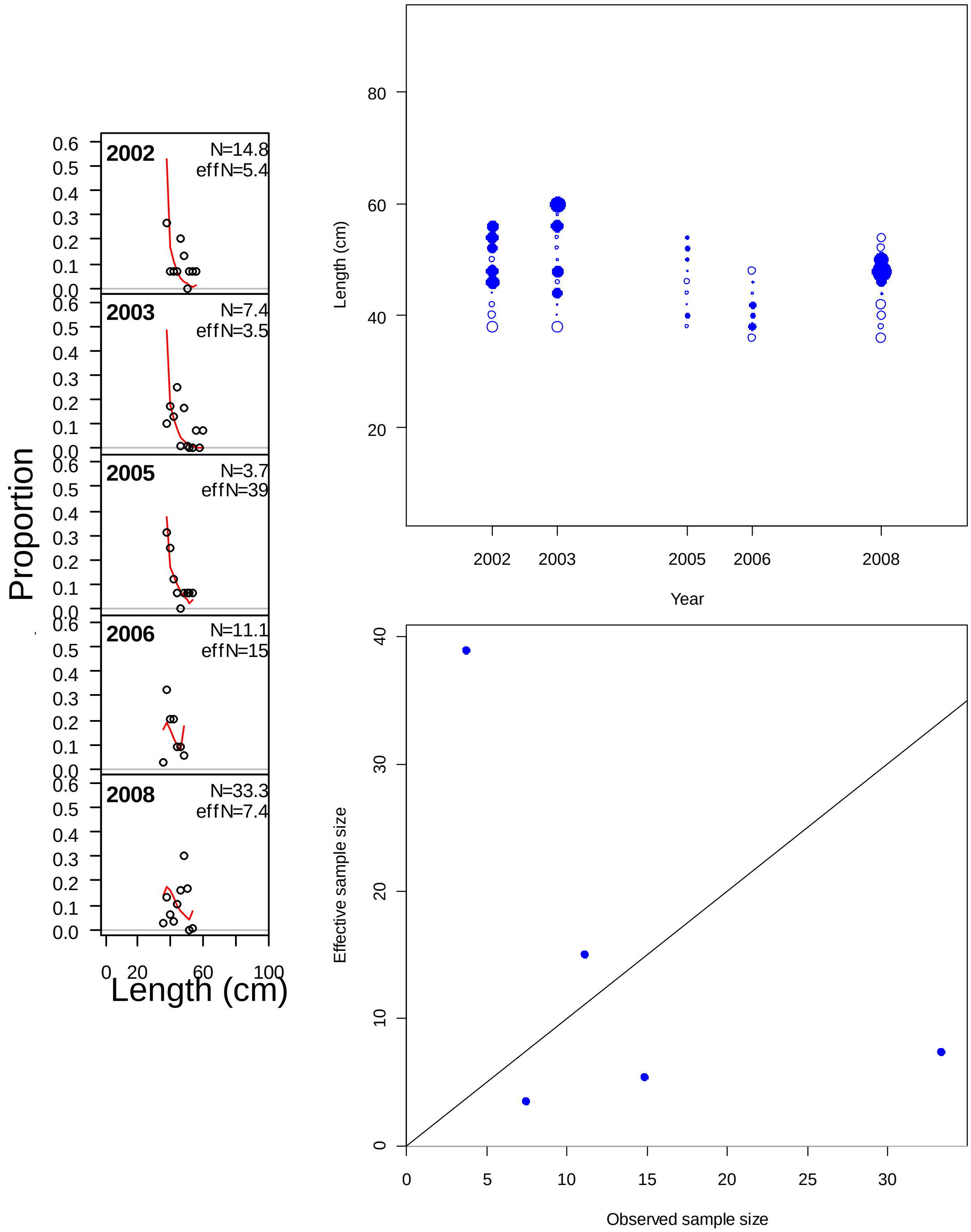

Figure 53. Fits to the live-fish (fleet 2) commercial fishery length compositions for the SCS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

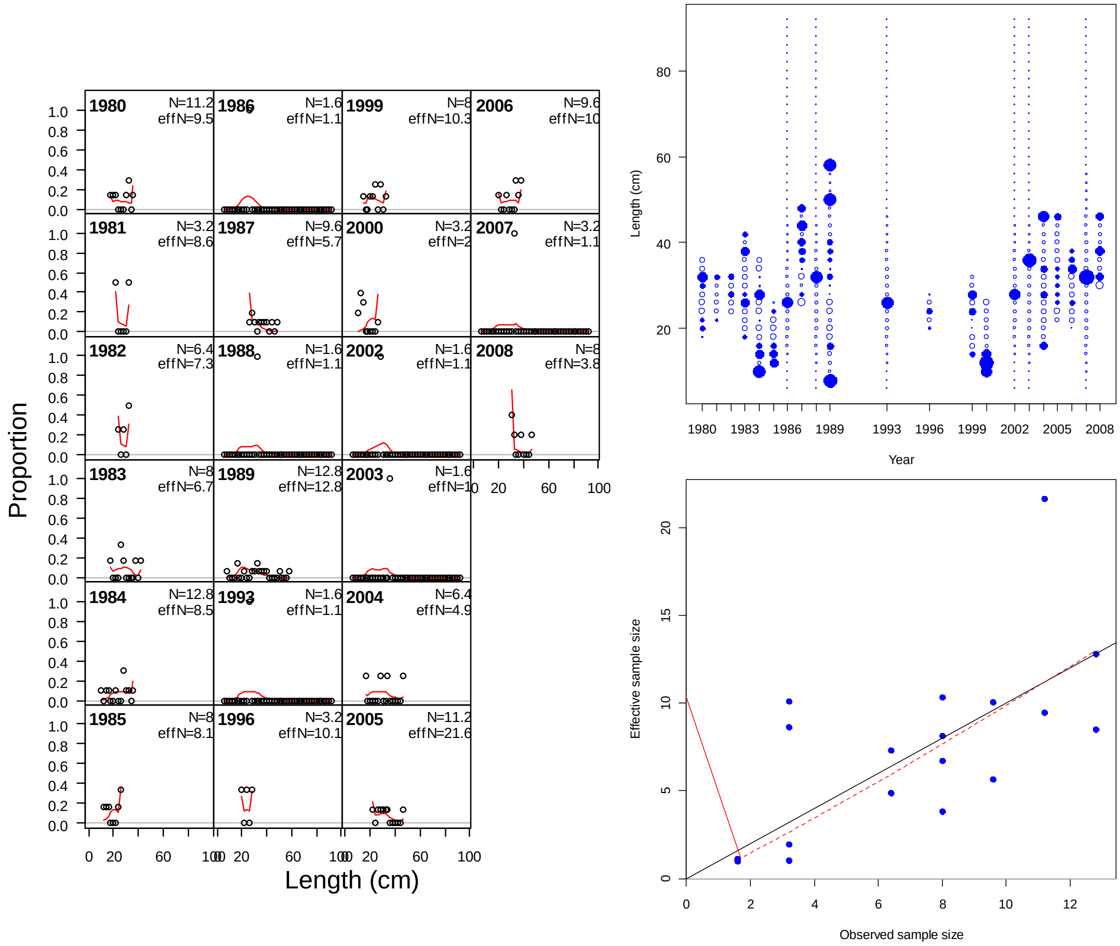

Figure 54. Fits to the man-made (fleet 3) recreational fishery length compositions for the SCS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

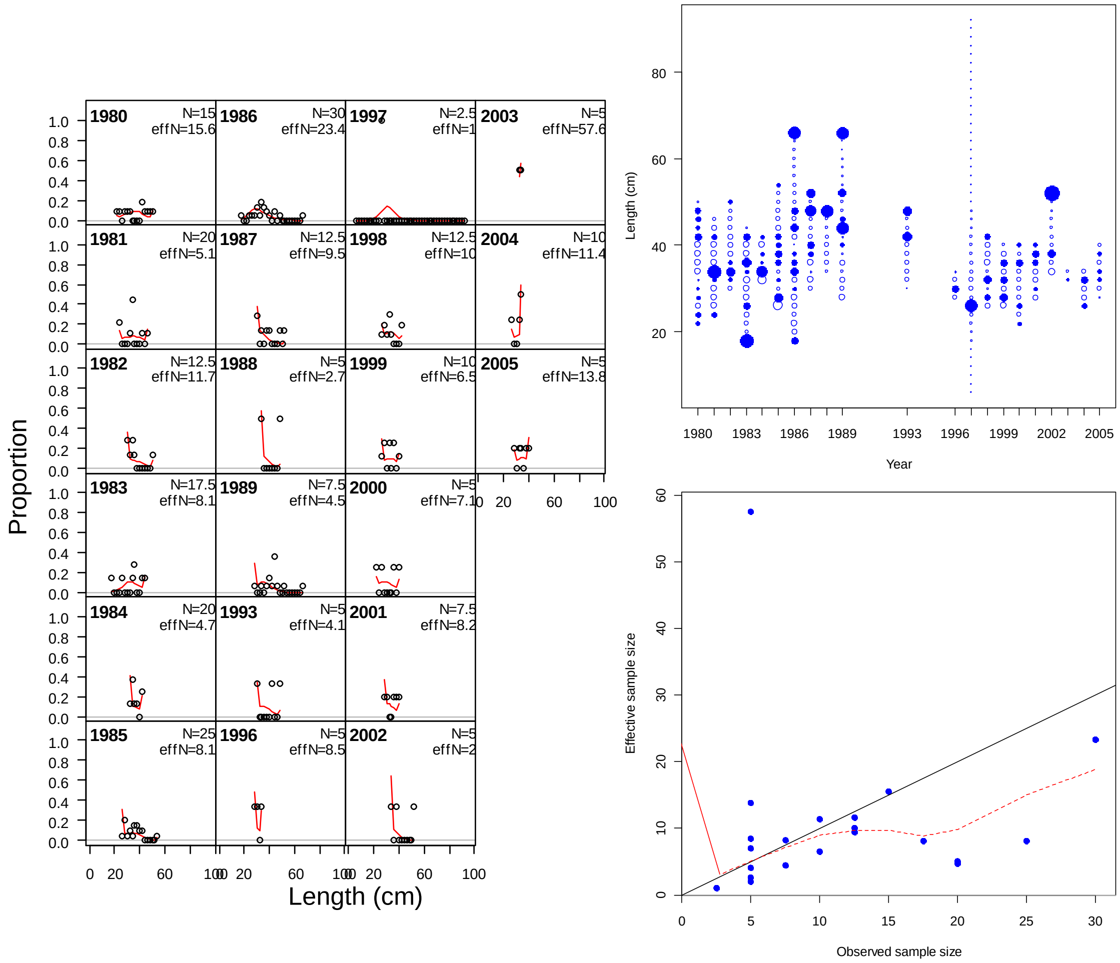

Figure 55. Fits to the beach/bank (fleet 4) recreational fishery length compositions for the SCS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

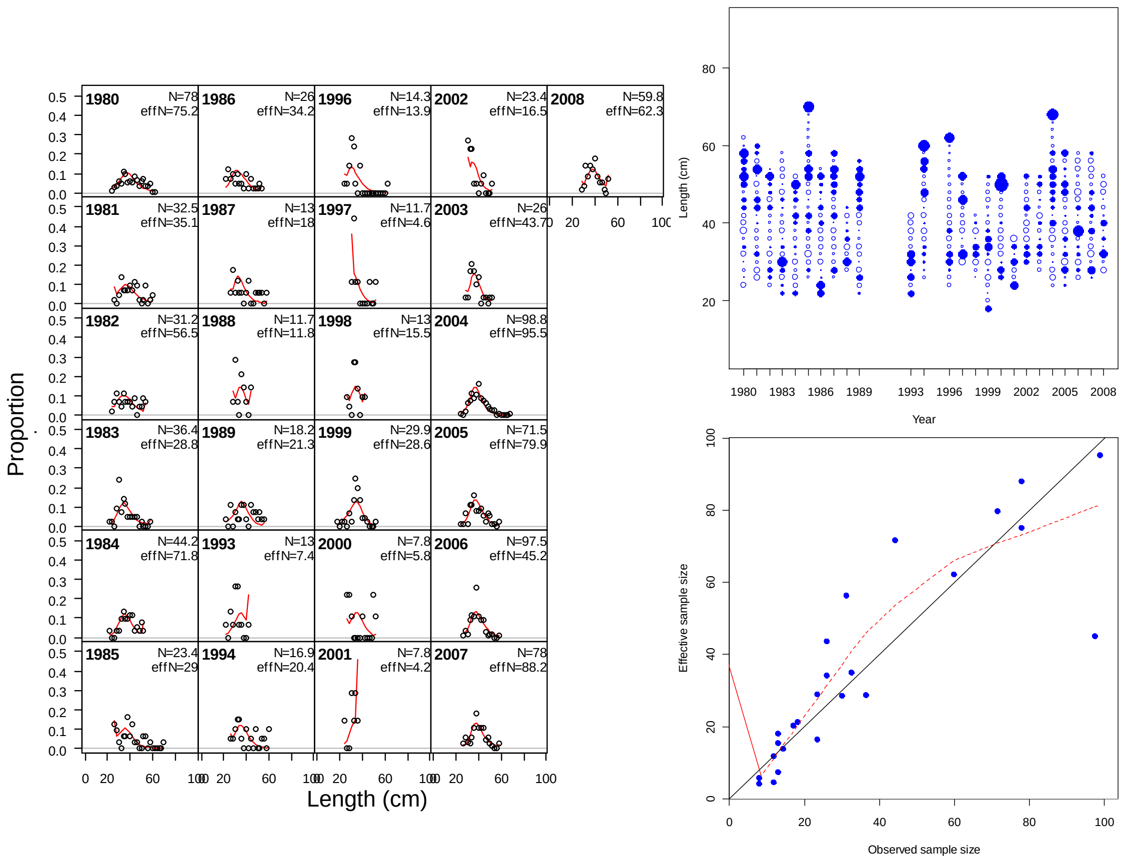

Figure 56. Fits to the PBR (fleet 5) recreational fishery length compositions for the SCS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

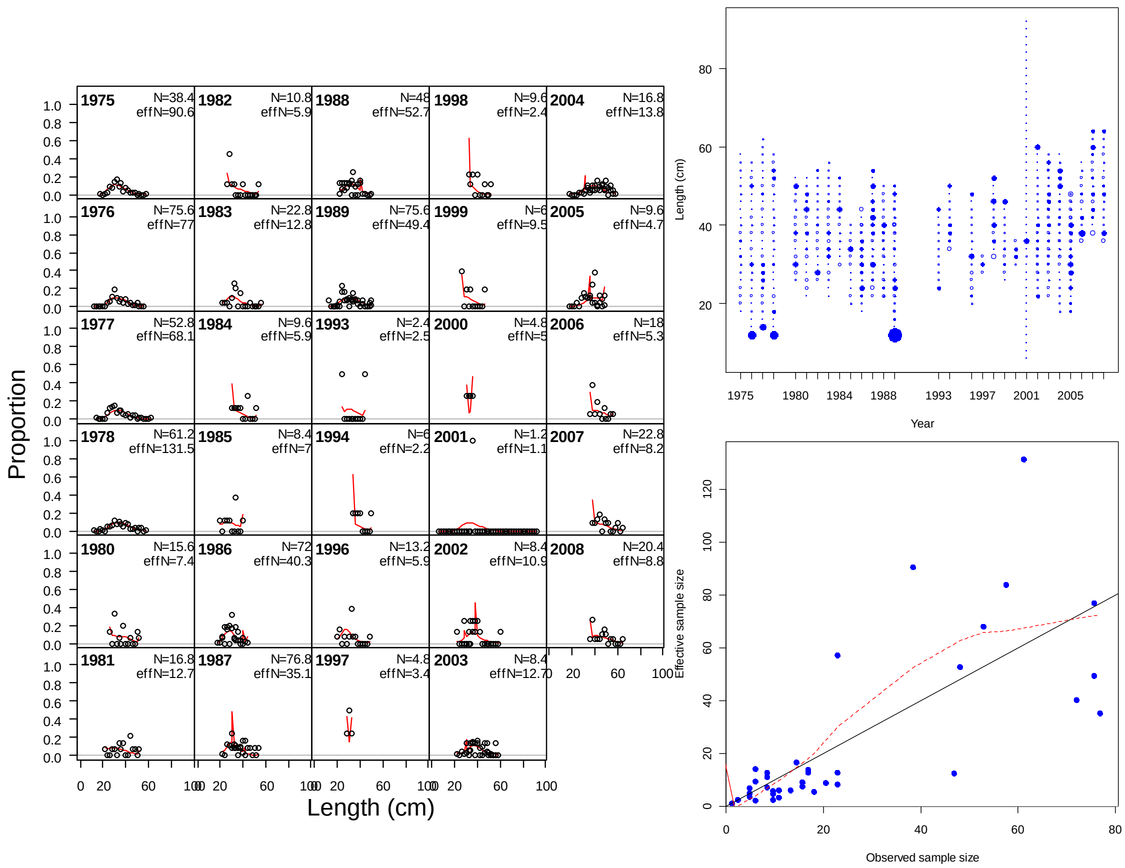

Figure 57. Fits to the CPFV (fleet 6) recreational fishery length compositions for the SCS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

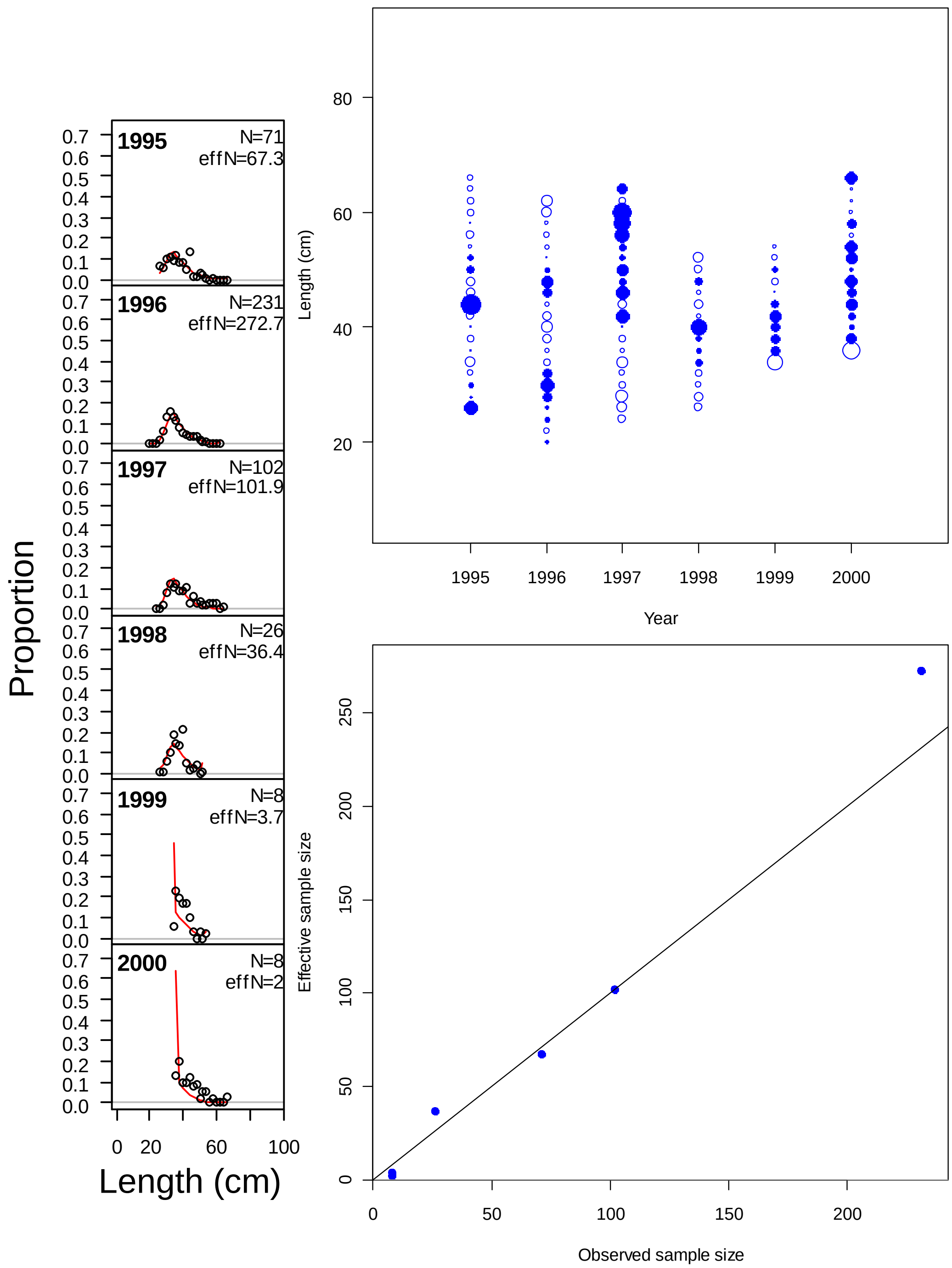

Figure 58. Fits to the non-live (fleet 1) commercial fishery length compositions for the CAS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

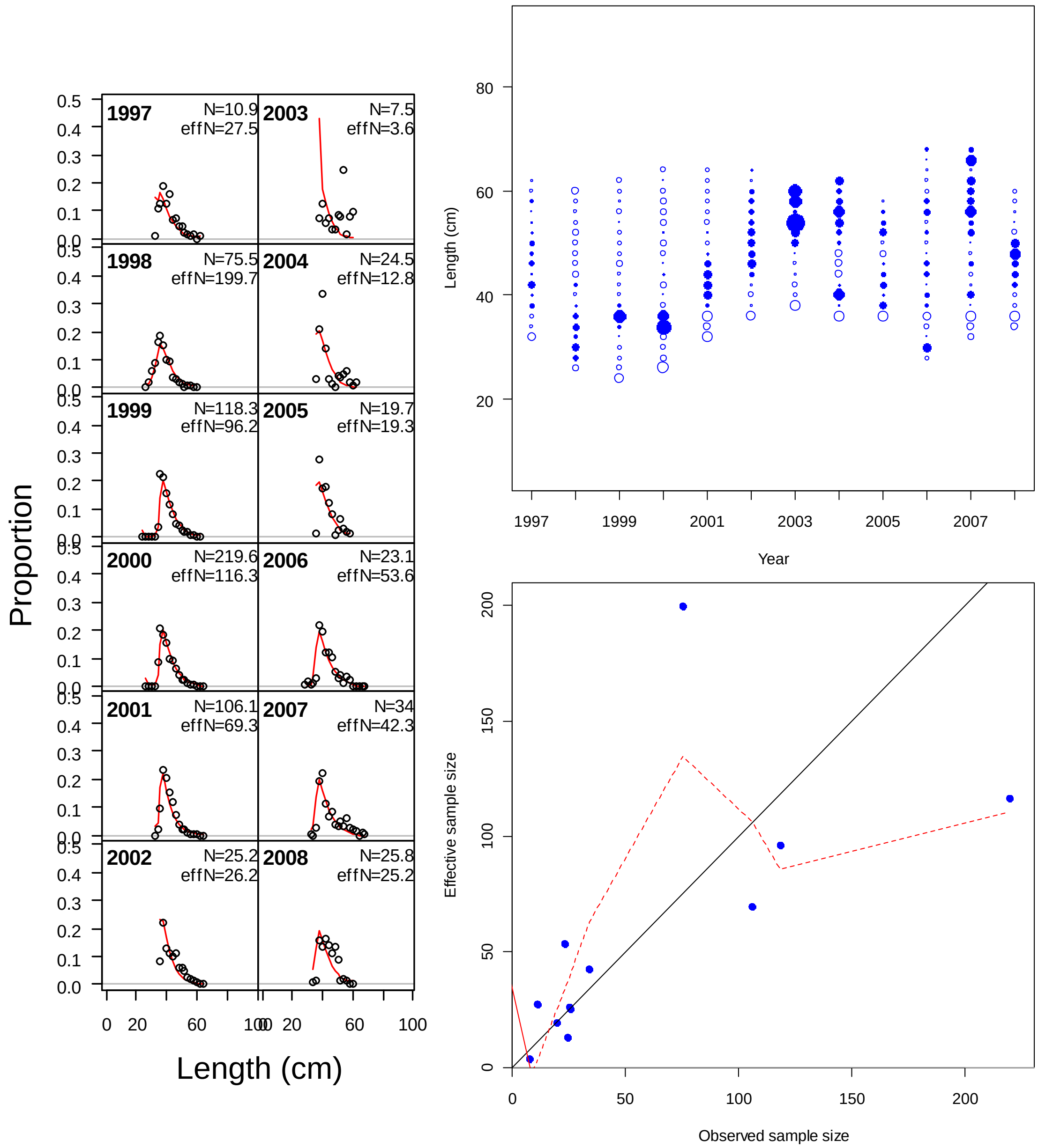

Figure 59. Fits to the live-fish (fleet 2) commercial fishery length compositions for the CAS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

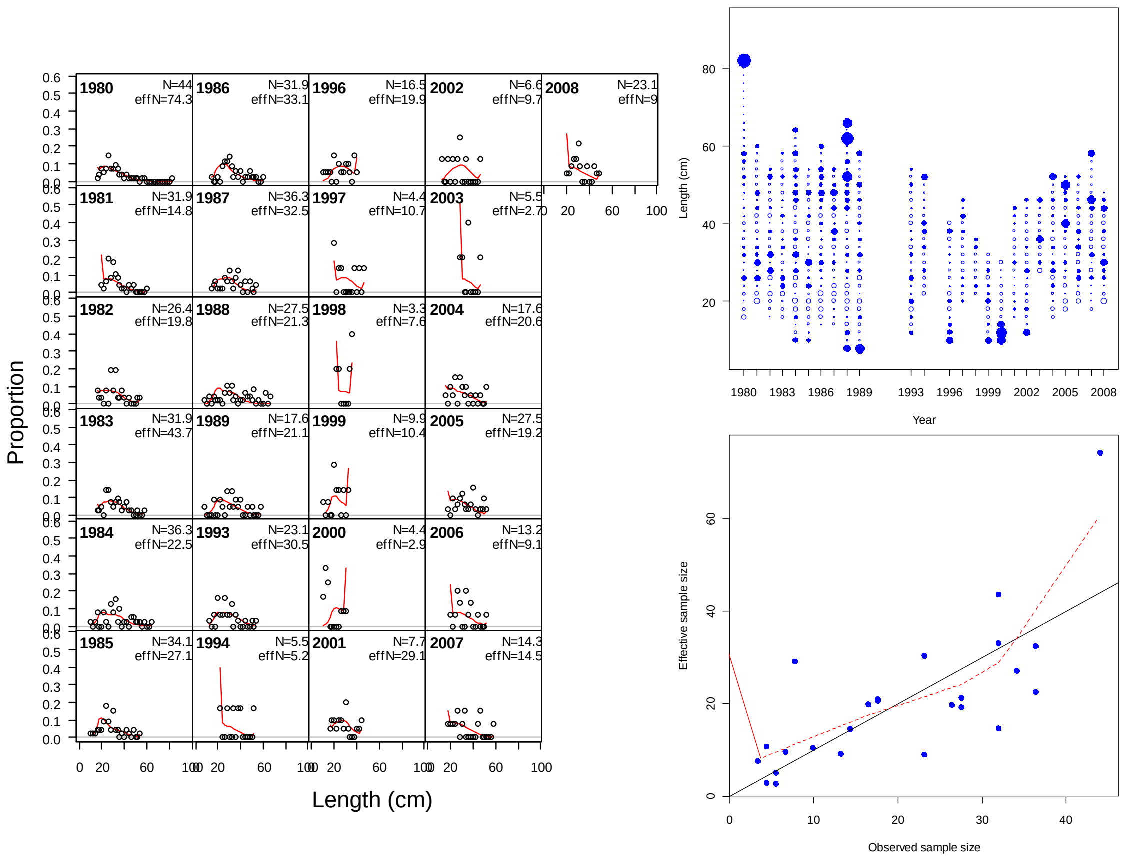

Figure 60. Fits to the man-made (fleet 3) recreational mode length compositions for the CAS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

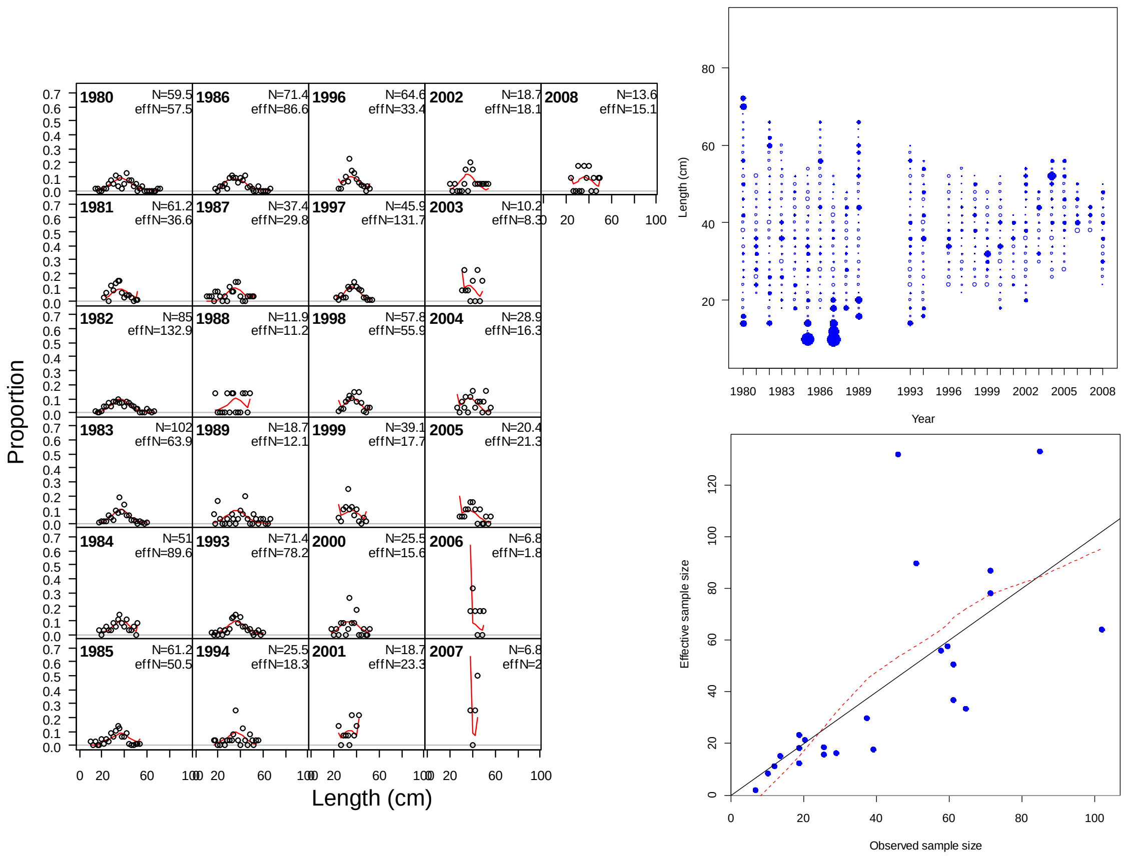

Figure 61. Fits to the beach/bank (fleet 4) recreational mode length compositions for the CAS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

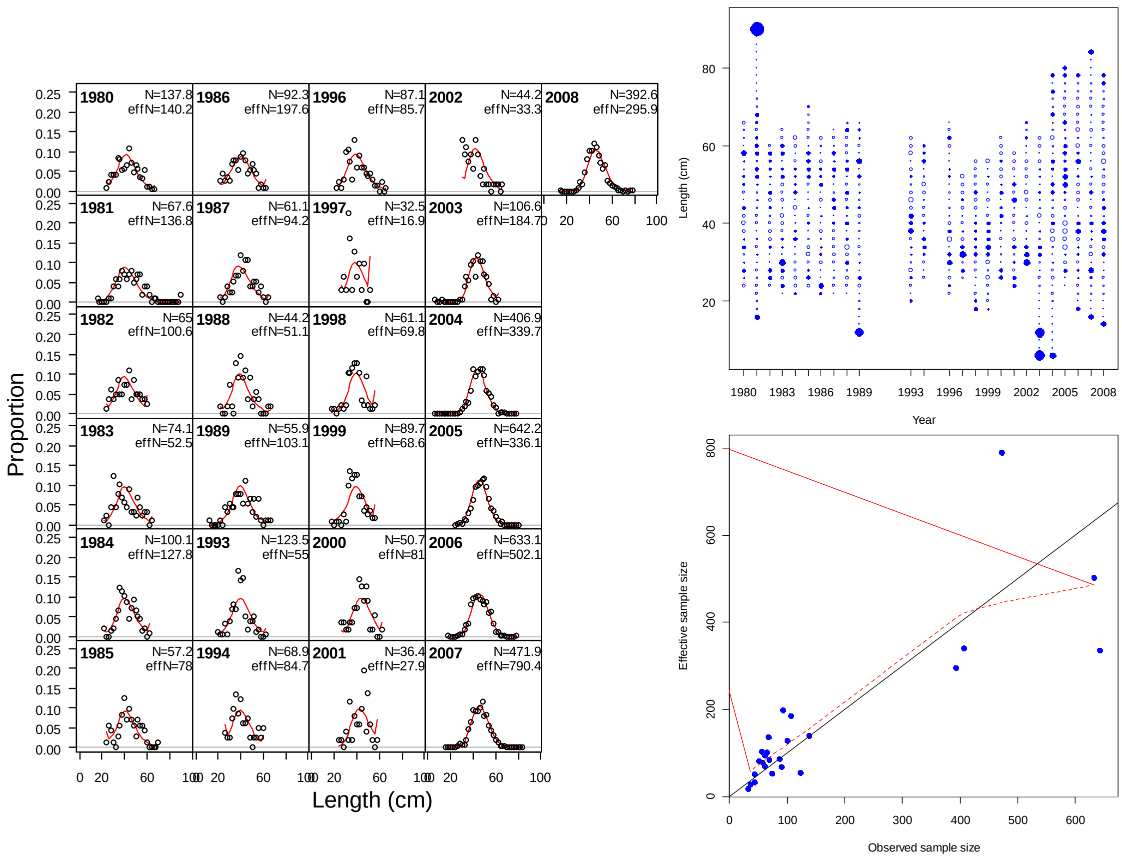

Figure 62. Fits to the PBR (fleet 5) recreational mode length compositions for the CAS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

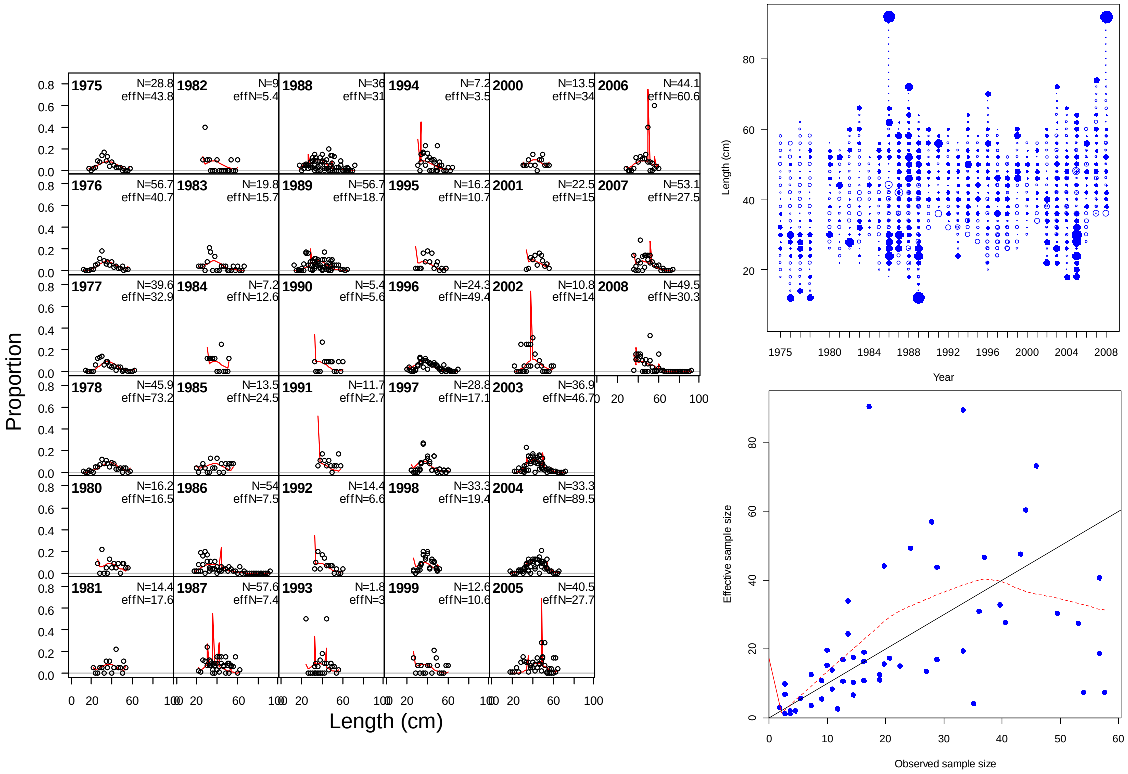

Figure 63. Fits to the CPFV (fleet 6) recreational mode length compositions for the CAS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

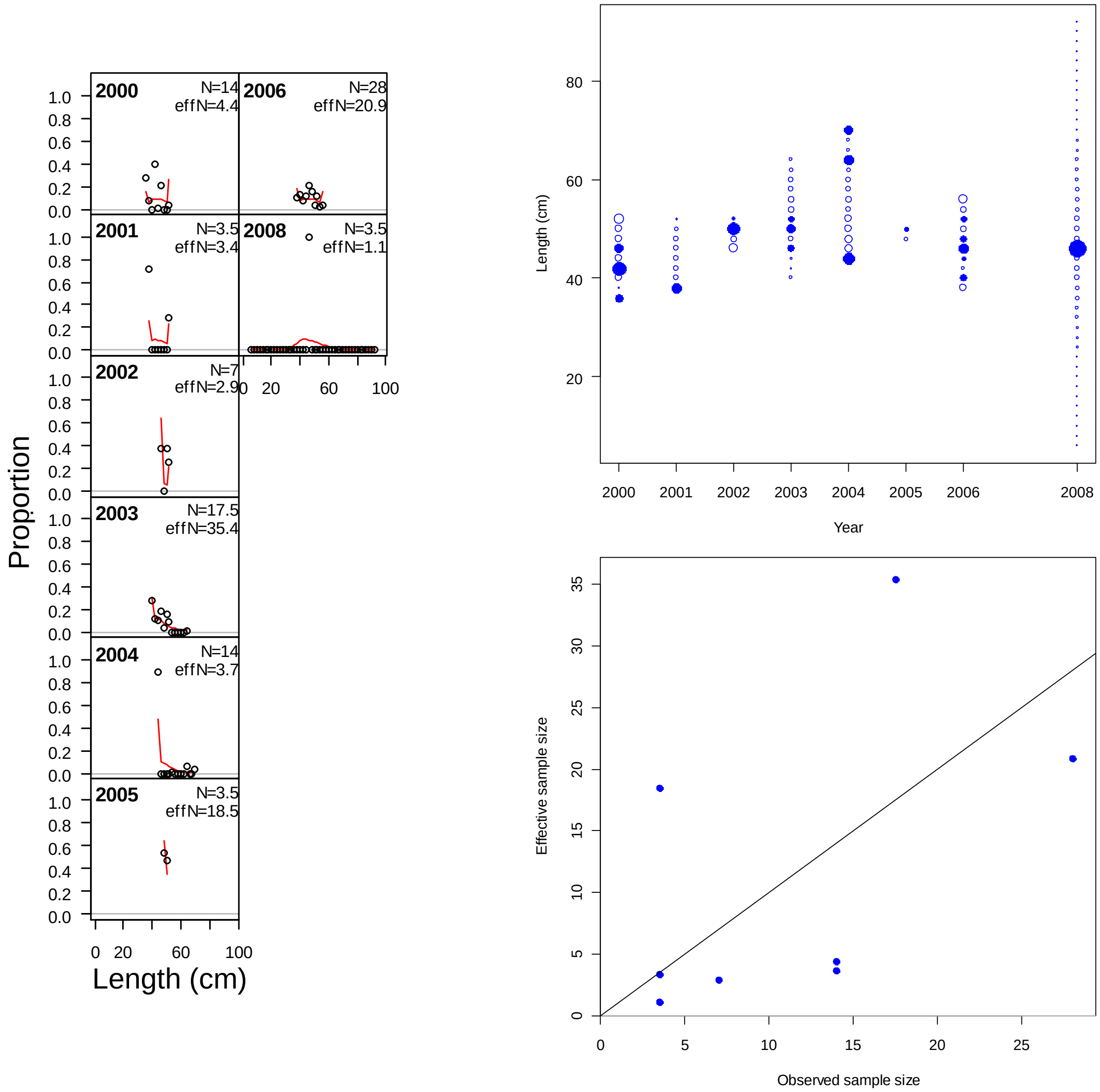

Figure 64. Fits to the unsexed non-live (fleet 1) commercial fishery length compositions for the ORS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

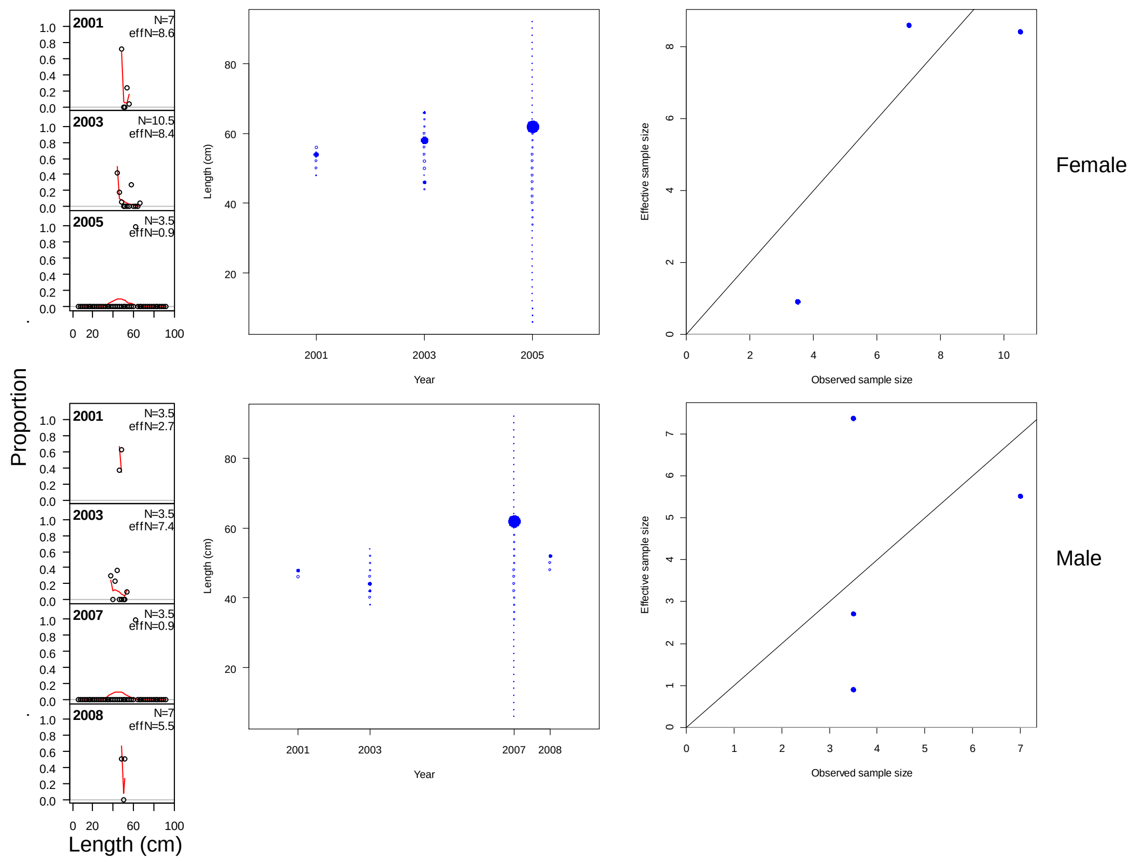

Figure 65. Fits to the sex-specific non-live (fleet 1) commercial fishery length compositions for the ORS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

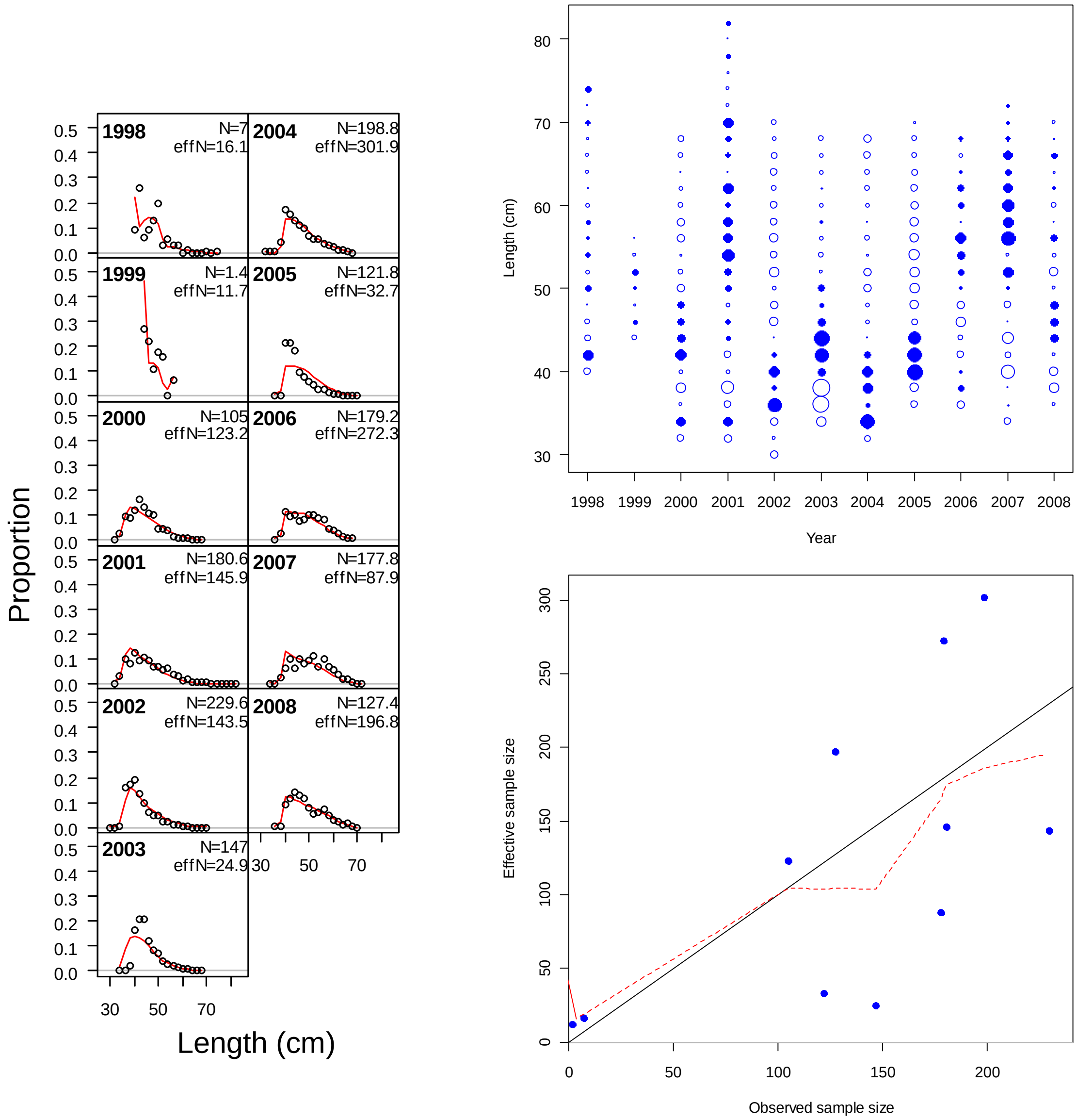

Figure 66. Fits to the unsexed live-fish (fleet 2) commercial fishery length compositions for the ORS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

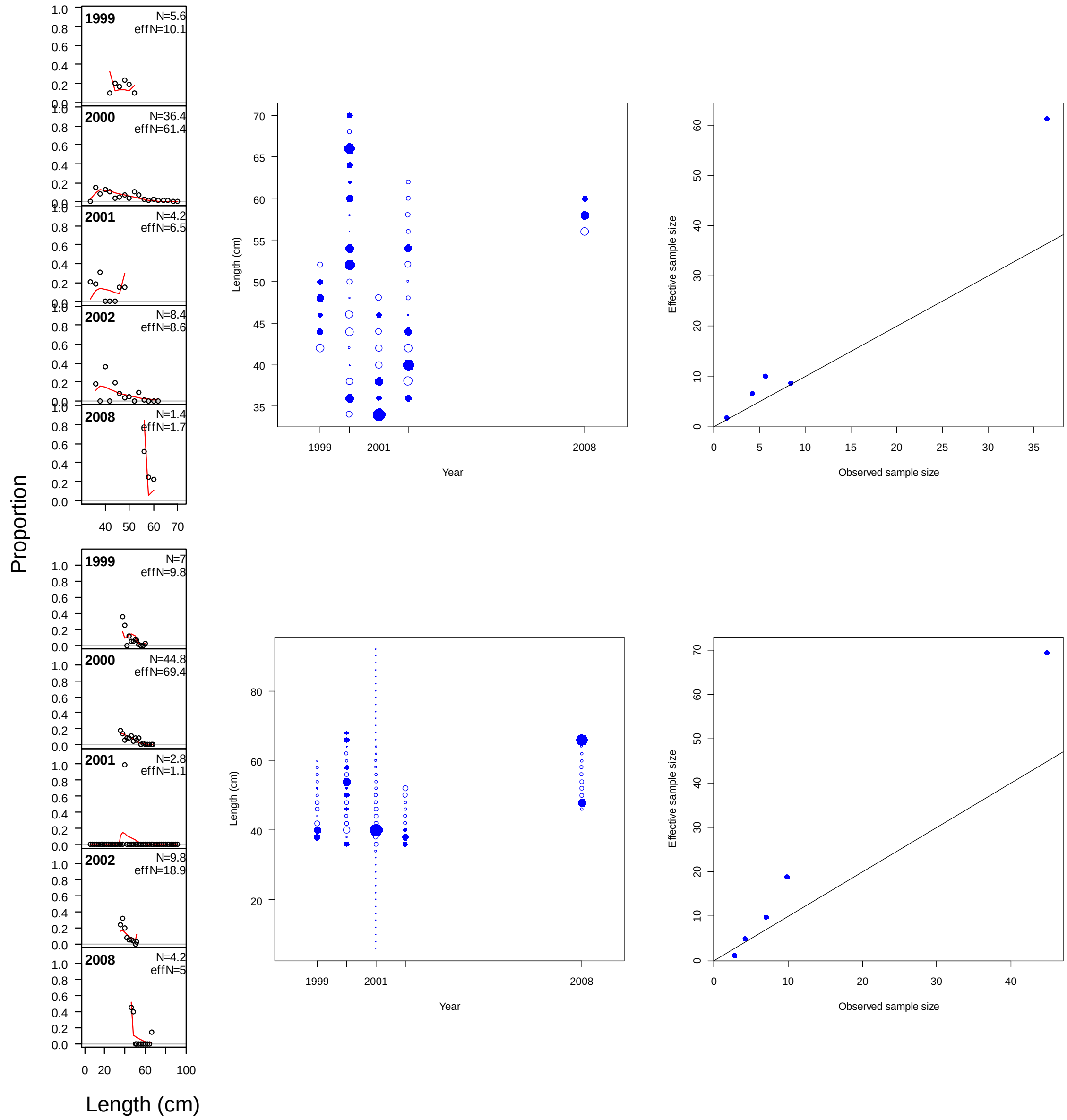

Figure 67. Fits to the sex-specific live-fish (fleet 2) commercial fishery length compositions for the ORS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

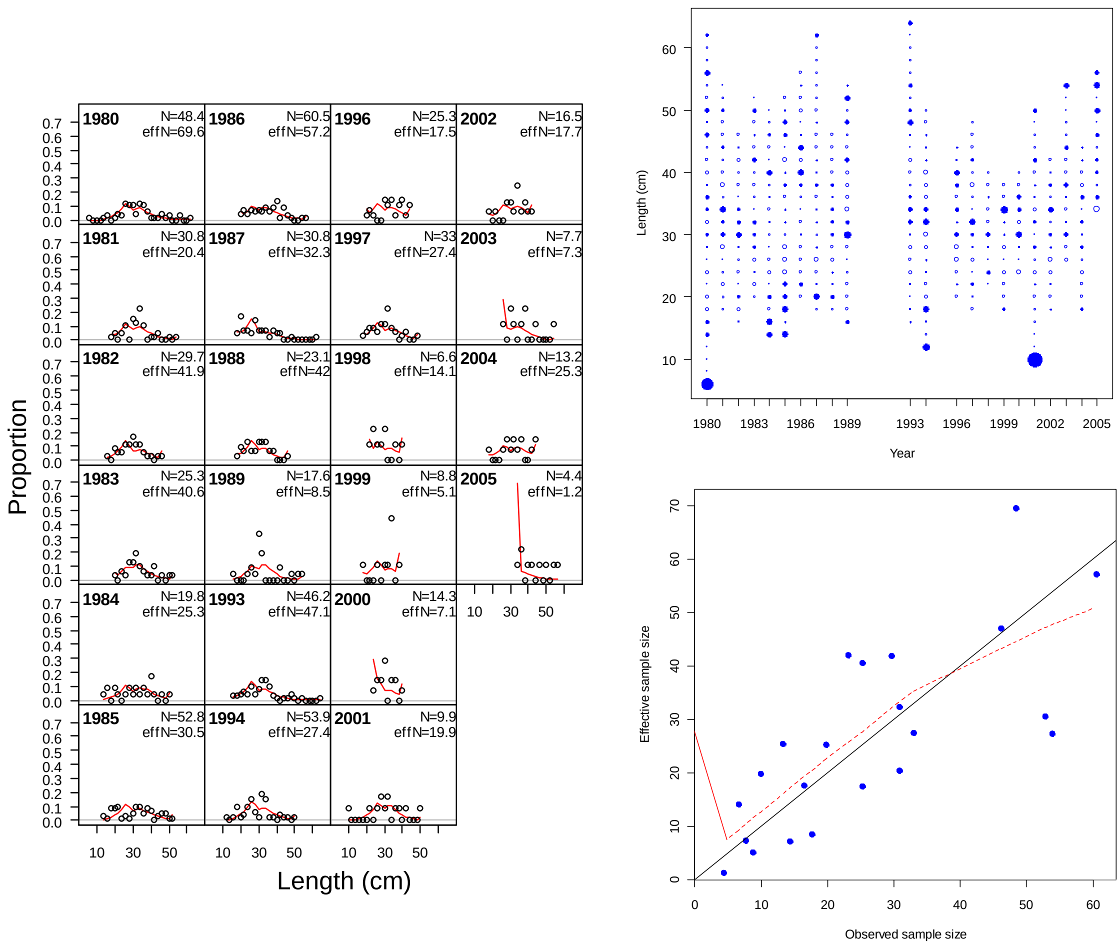

Figure 68. Fits to the shore-based (fleet 3) recreational mode length compositions for the ORS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

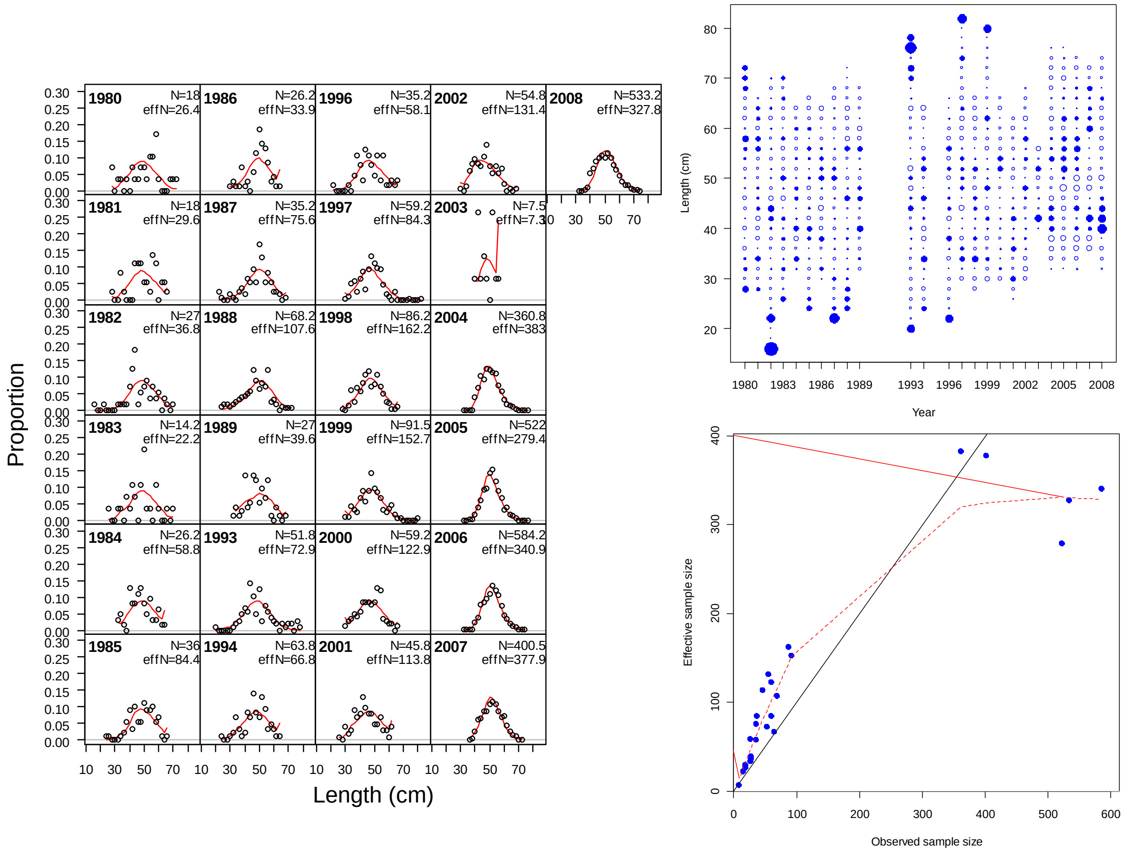

Figure 69. Fits to the boat-based (fleet 4) recreational mode length compositions for the ORS. Left panel: Observed (circles) and model-predicted fits (red line) to length compositions by year; top right panel: Pearson residuals to length composition fits; bottom right panel: comparison of inputted (observed) sample sizes vs. model-derived effective sample sizes for each year. Black solid line is the 1:1 line; red broken line is lowess fit.

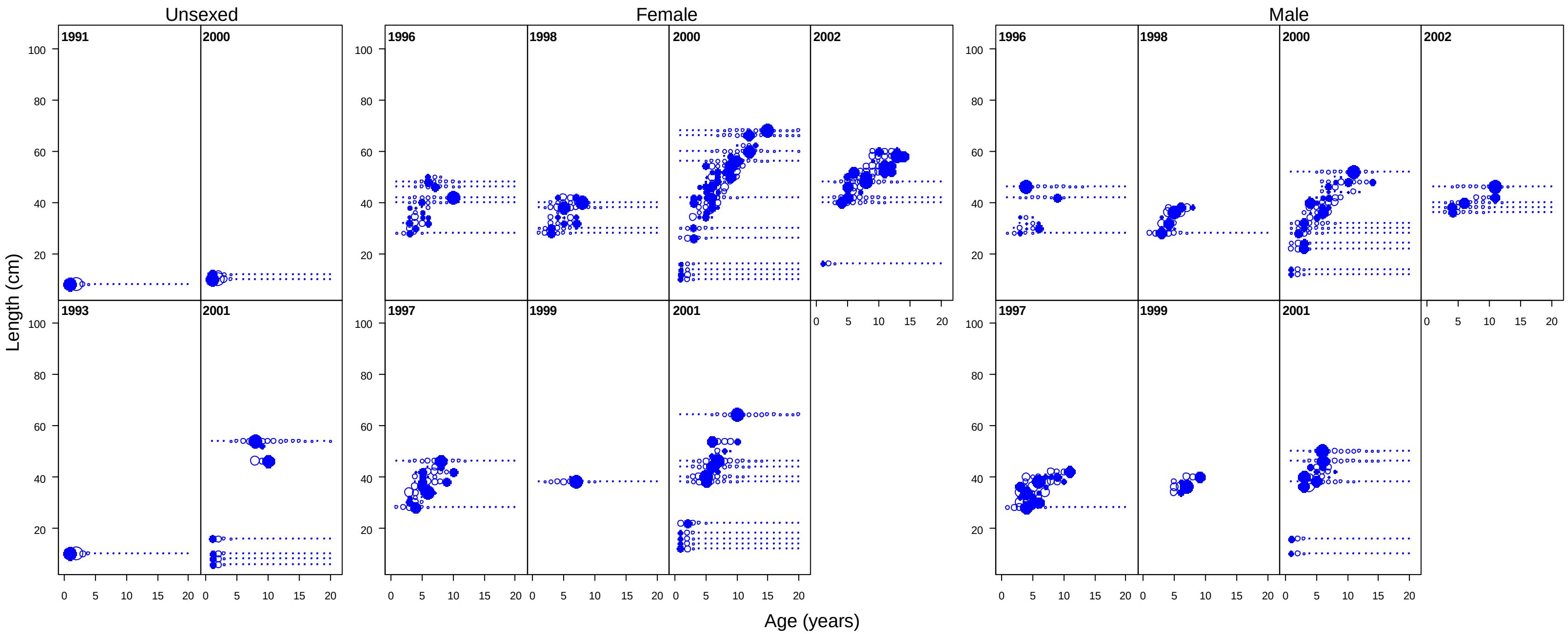

Figure 70. Pearson residual from fits to the unsexed and sexed conditional age at length data for the NCS.

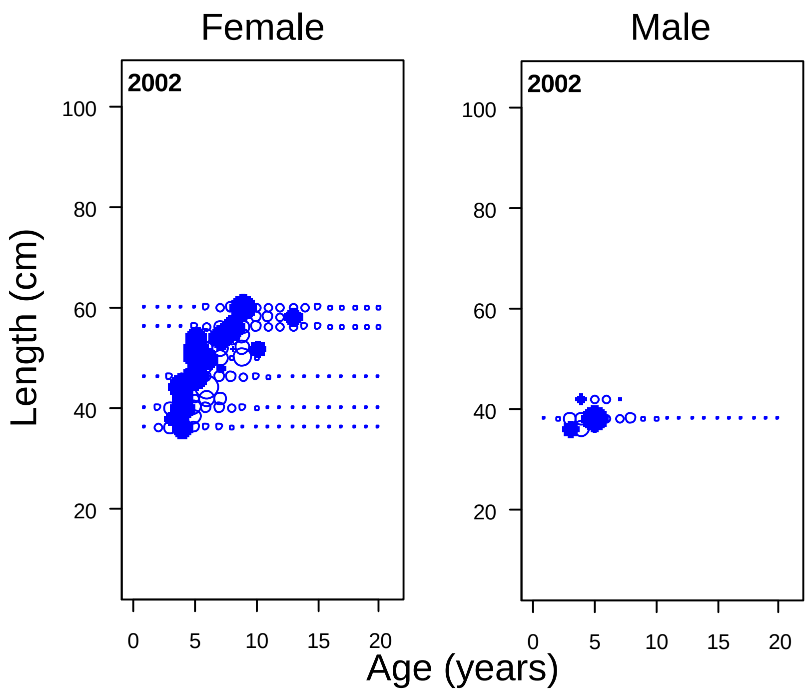

Figure 71. Pearson residual from fits to the sex-specific conditional age at length data for the SCS.

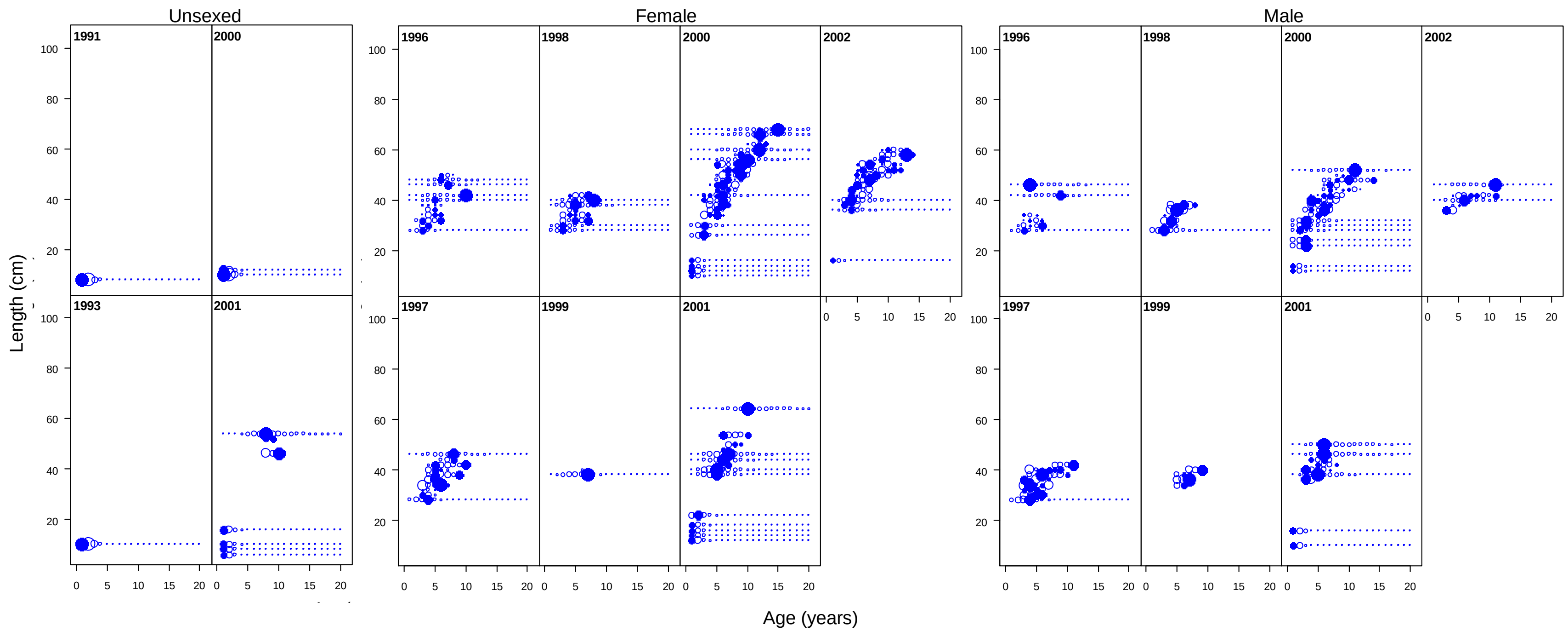

Figure 72. Pearson residual from fits to the unsexed and sexed conditional age at length data for the CAS.

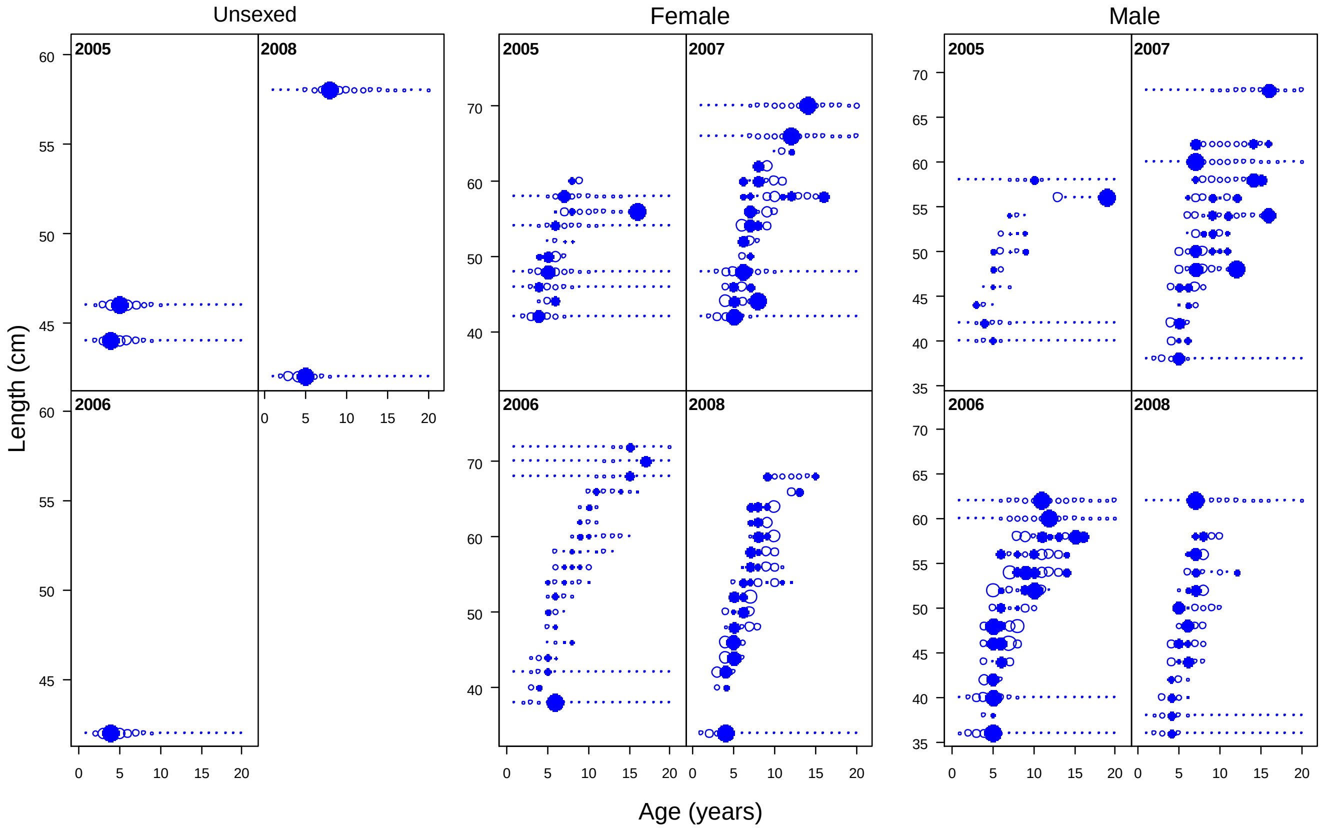

Figure 73. Pearson residual from fits to the unsexed and sexed conditional age at length data for the ORS.

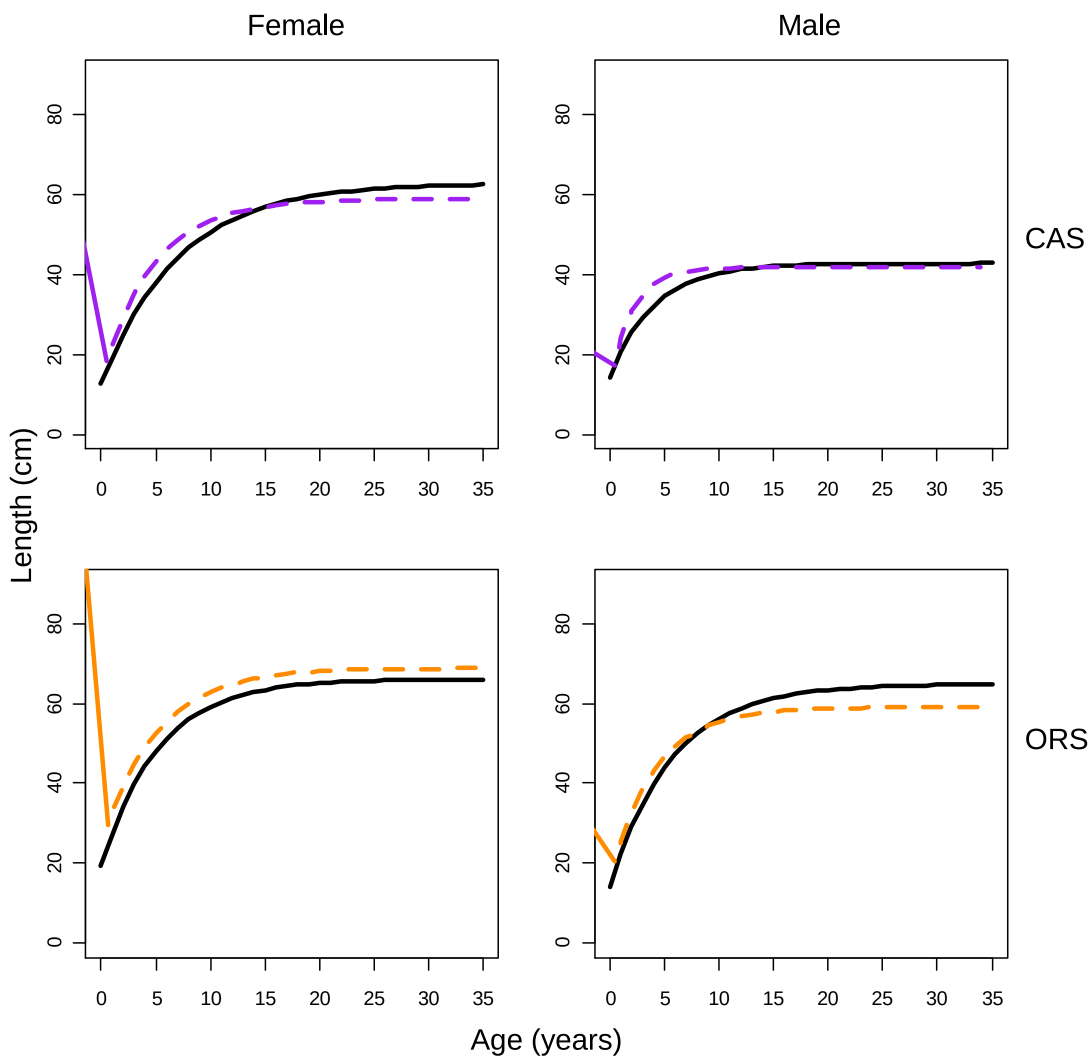

Figure 74. Comparison of growth curves from the assessment model estimates (black line) to externally fit growth curves (broken colored lines) for each sex (columns) and state sub-stock (rows).

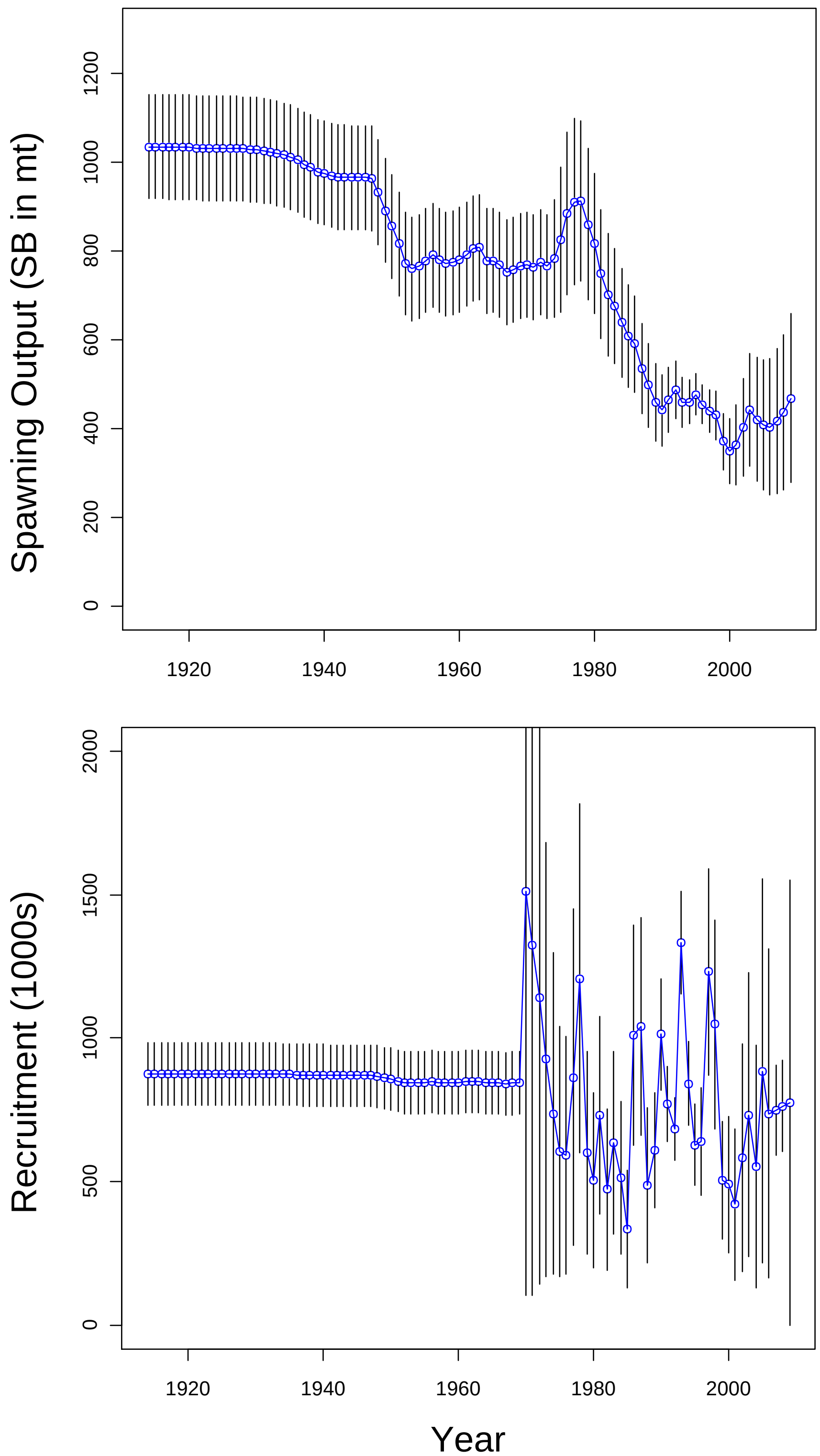

Figure 75. MPD time trajectories for spawning output (top panel) and recruitment trajectories (bottom panel) for the NCS. Vertical black lines are the asymptotic 95% confidence intervals.

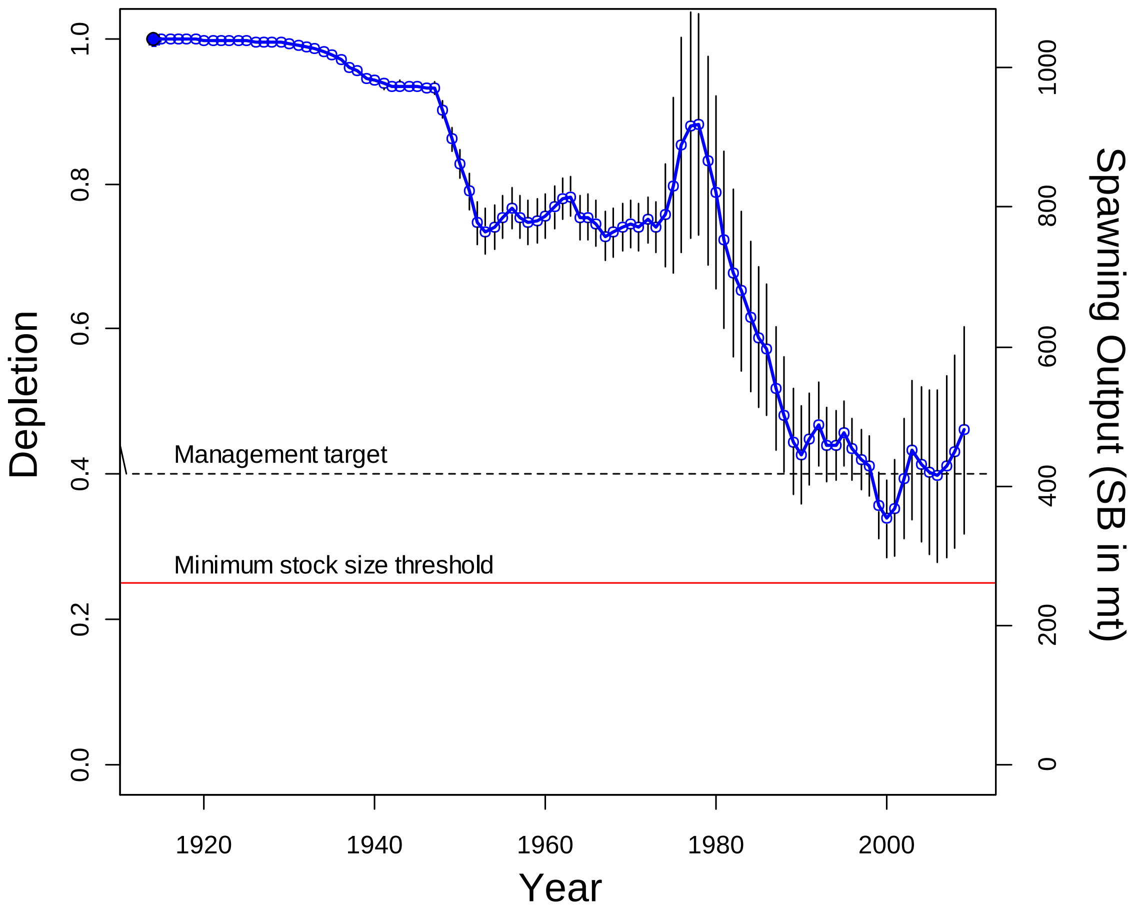

Figure 76. Time trajectories of depletion and spawning output compared to the target ($SB_{40\%}$) and limit reference ($SB_{25\%}$) points for the cabezon NCS.

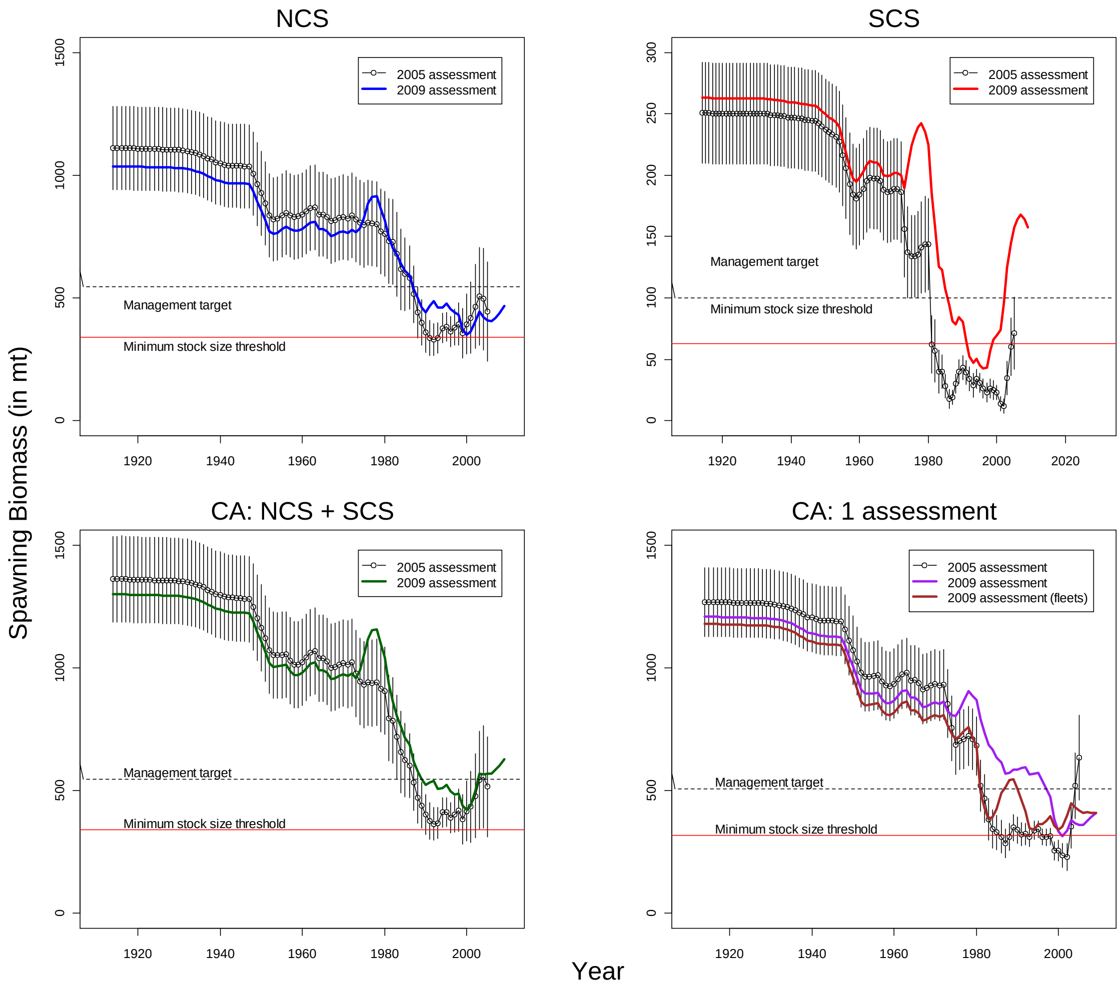

Figure 77. Time trajectories of spawning biomass of the 2005 assessment (black lines) compared to the current 2009 assessment (colored lines) for each sub-stock. Vertical lines are the 95% confidence intervals for the 2005 assessment.

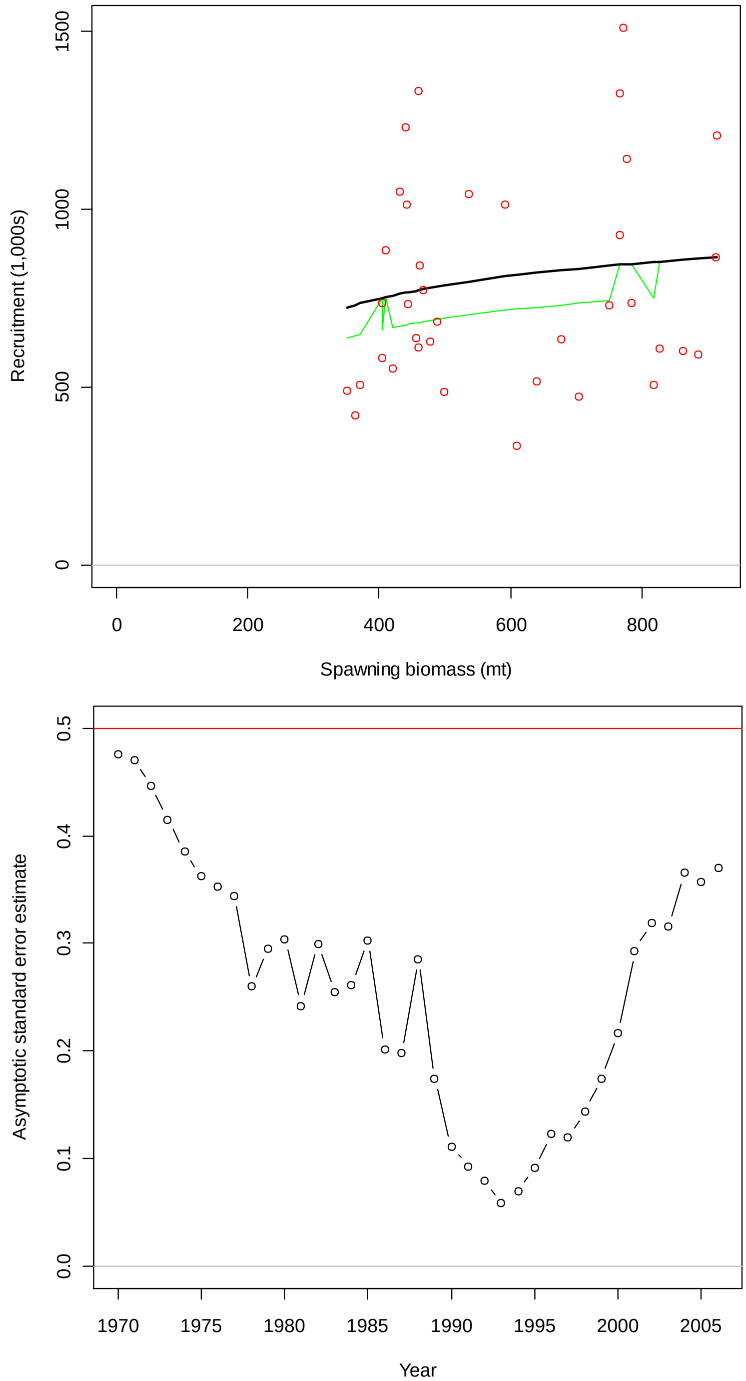

Figure 78. Spawner-recruit relationship (top panel) and the asymptotic standard deviations (bottom panel) for the NCS recruitment time series. Black line in top panel is the expected mean recruits; green line in same panel is the bias-adjusted expected recruits.

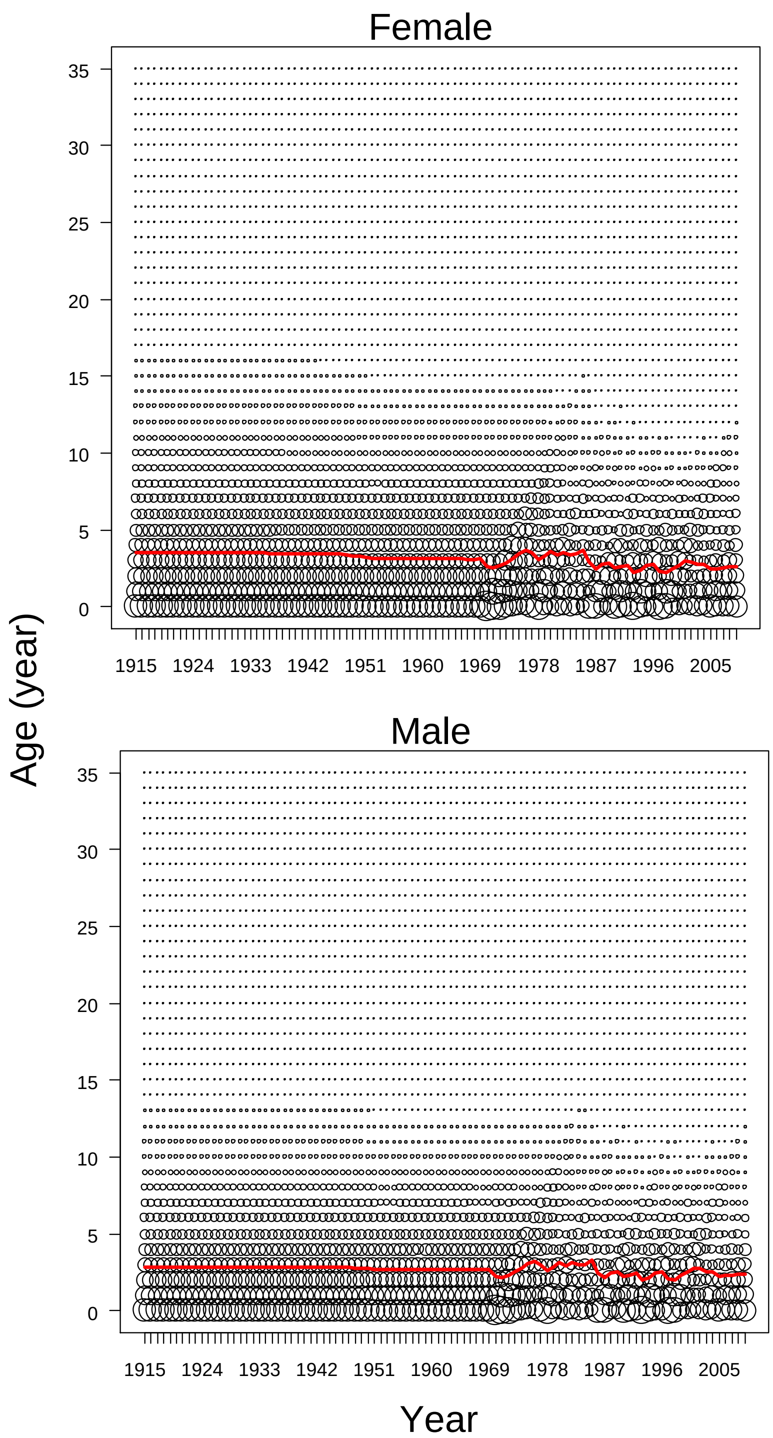

Figure 79. Numbers at age for females (top panel) and males (bottom panel) in the NCS. Red line shows the mean age by year.

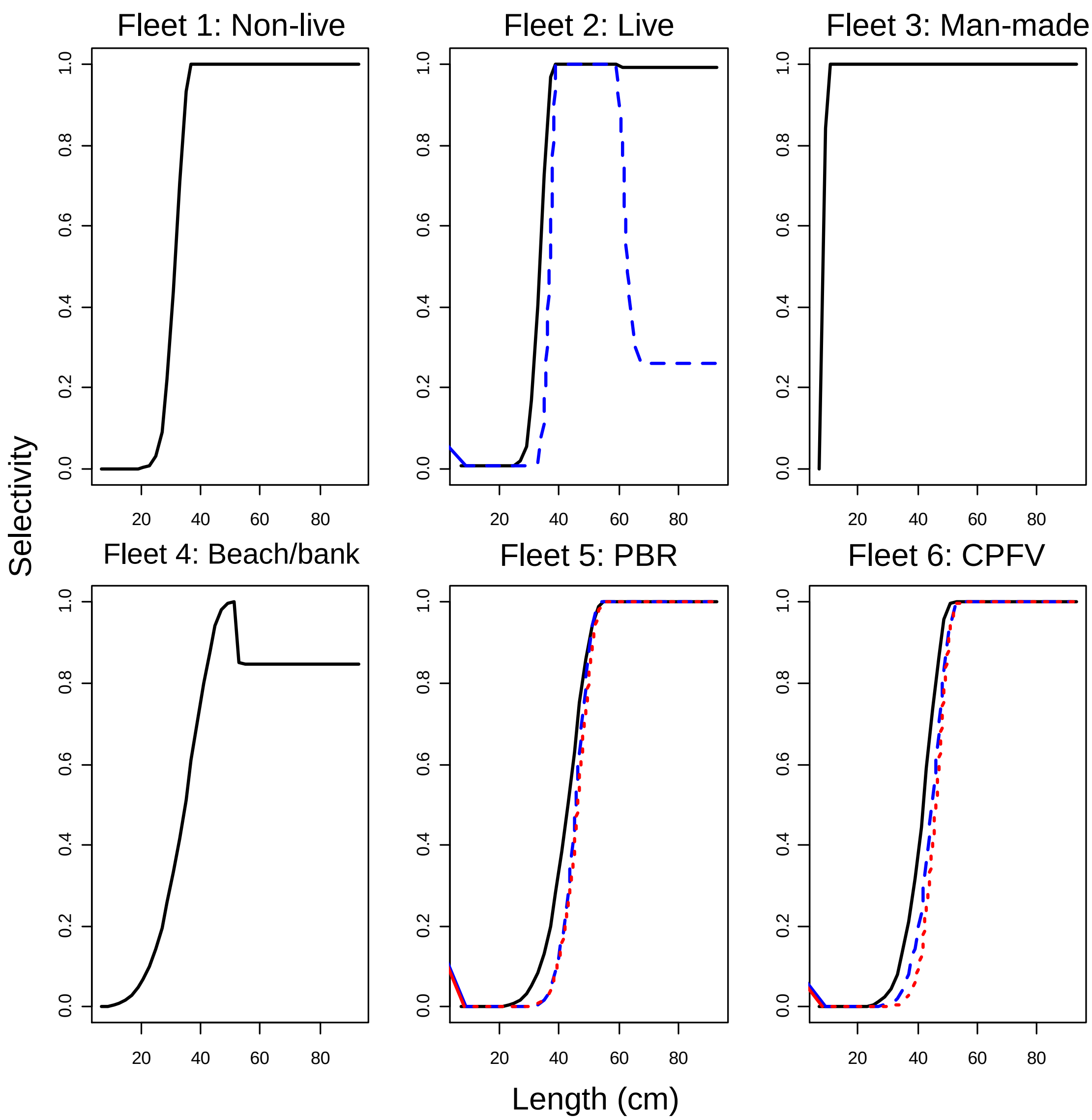

Figure 80. Selectivity at length for female and male cabezon by fishery fleet for the NCS. Black solid lines start selectivity in year 1916; blue broken lines start selectivity in year 1999 (fleet 2) and year 2000 (fleets 5 and 6); red dotted lines start selectivity in 2005.

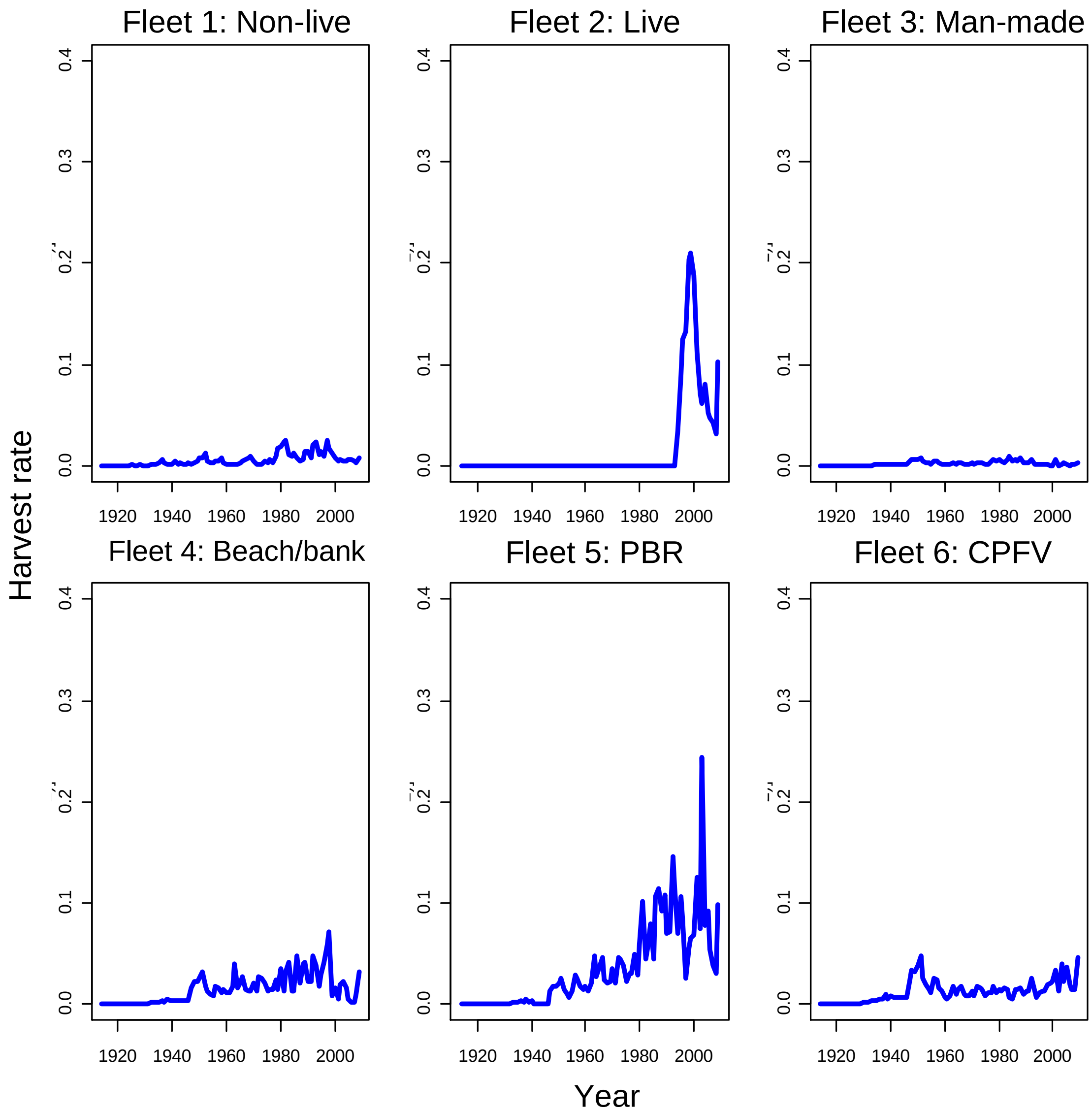

Figure 81. Time series of harvest rates by fishery fleet for the NCS.

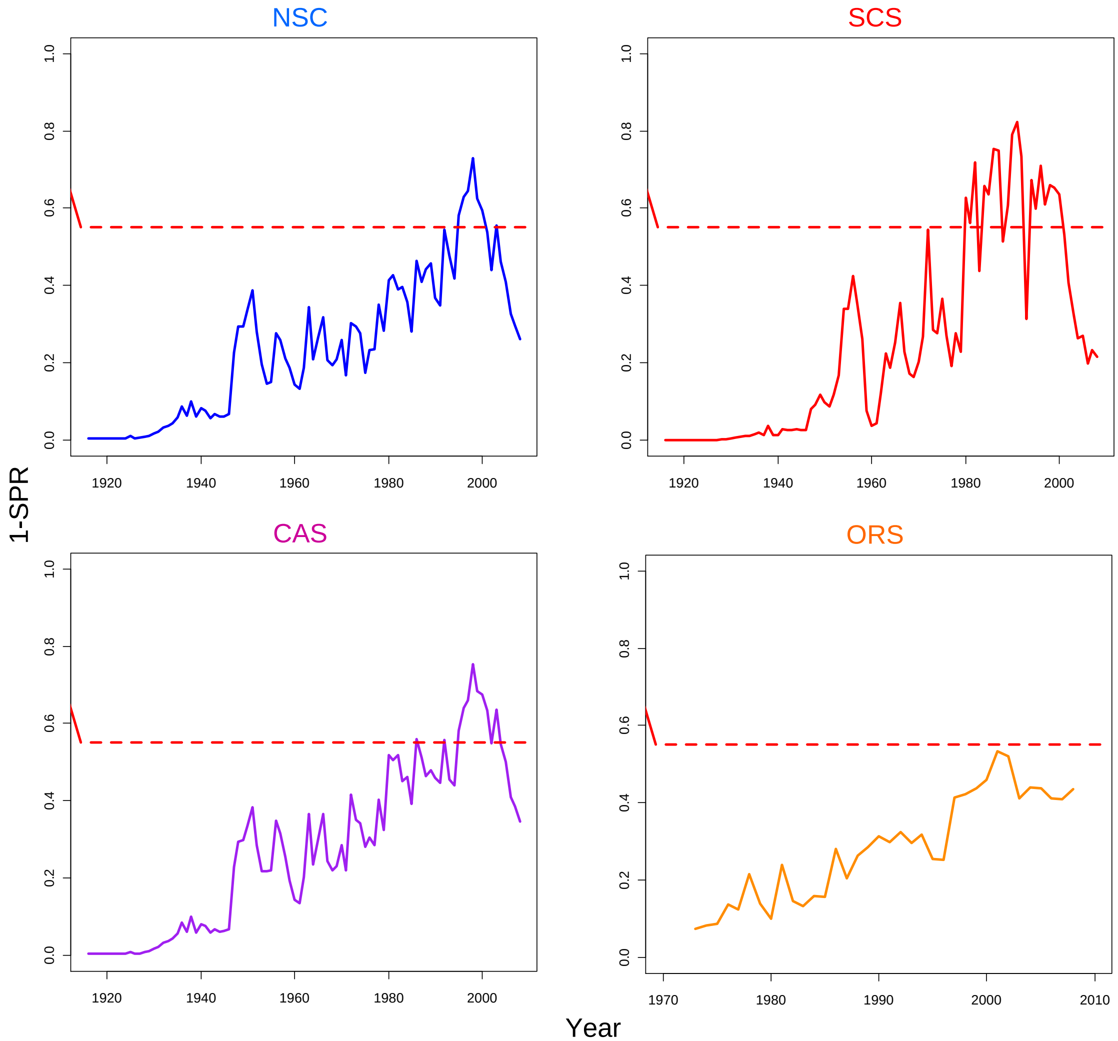

Figure 82. Estimate of the spawning potential ratio (1-SPR) from each of the sub-stock base case models. Values above the red overfishing line indicate fishing above the MSY proxy harvest rate.

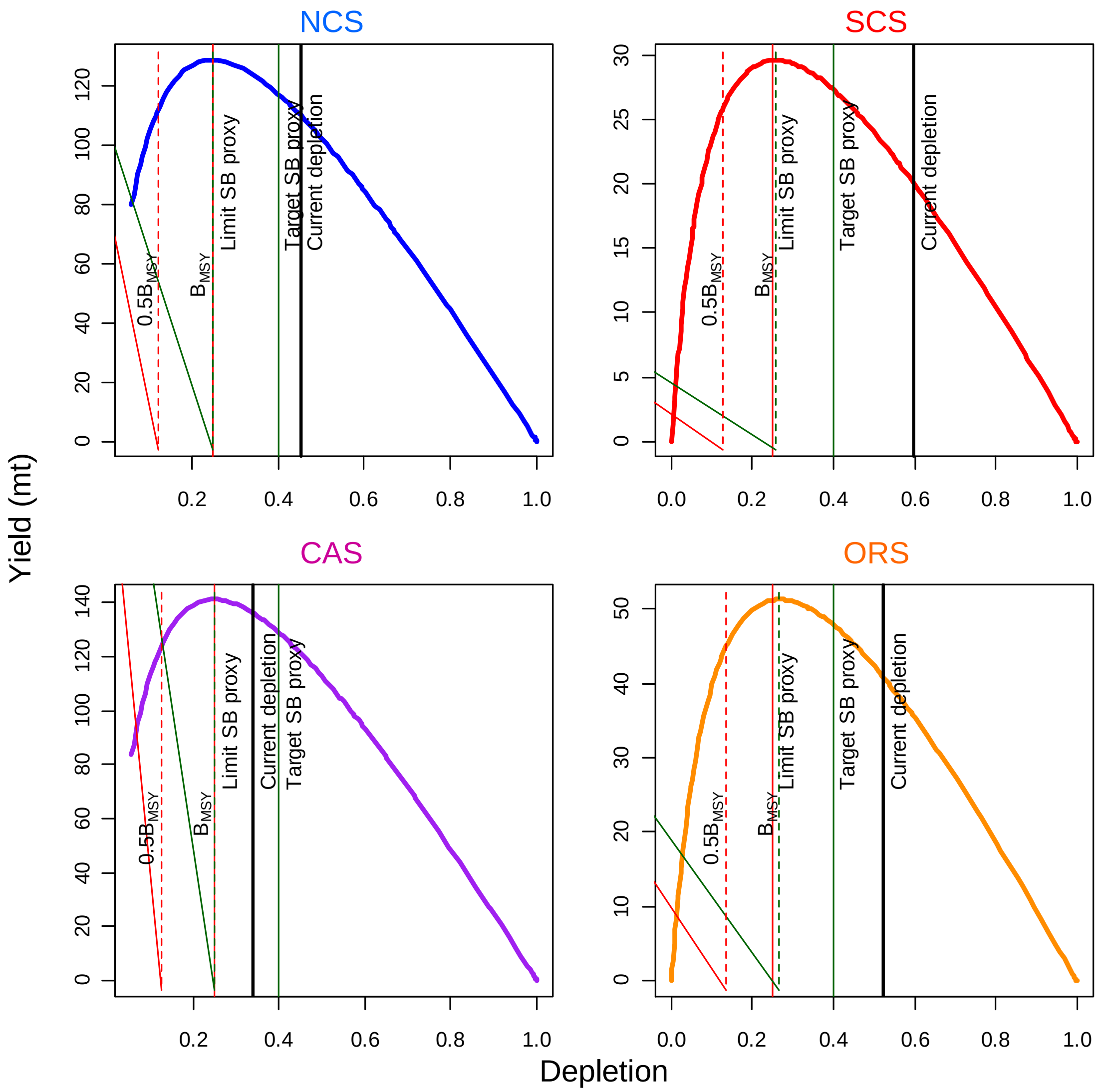

Figure 83. Equilibrium yield curves for each sub-stock base case model. Reference points and current stock status are indicated by the vertical lines.

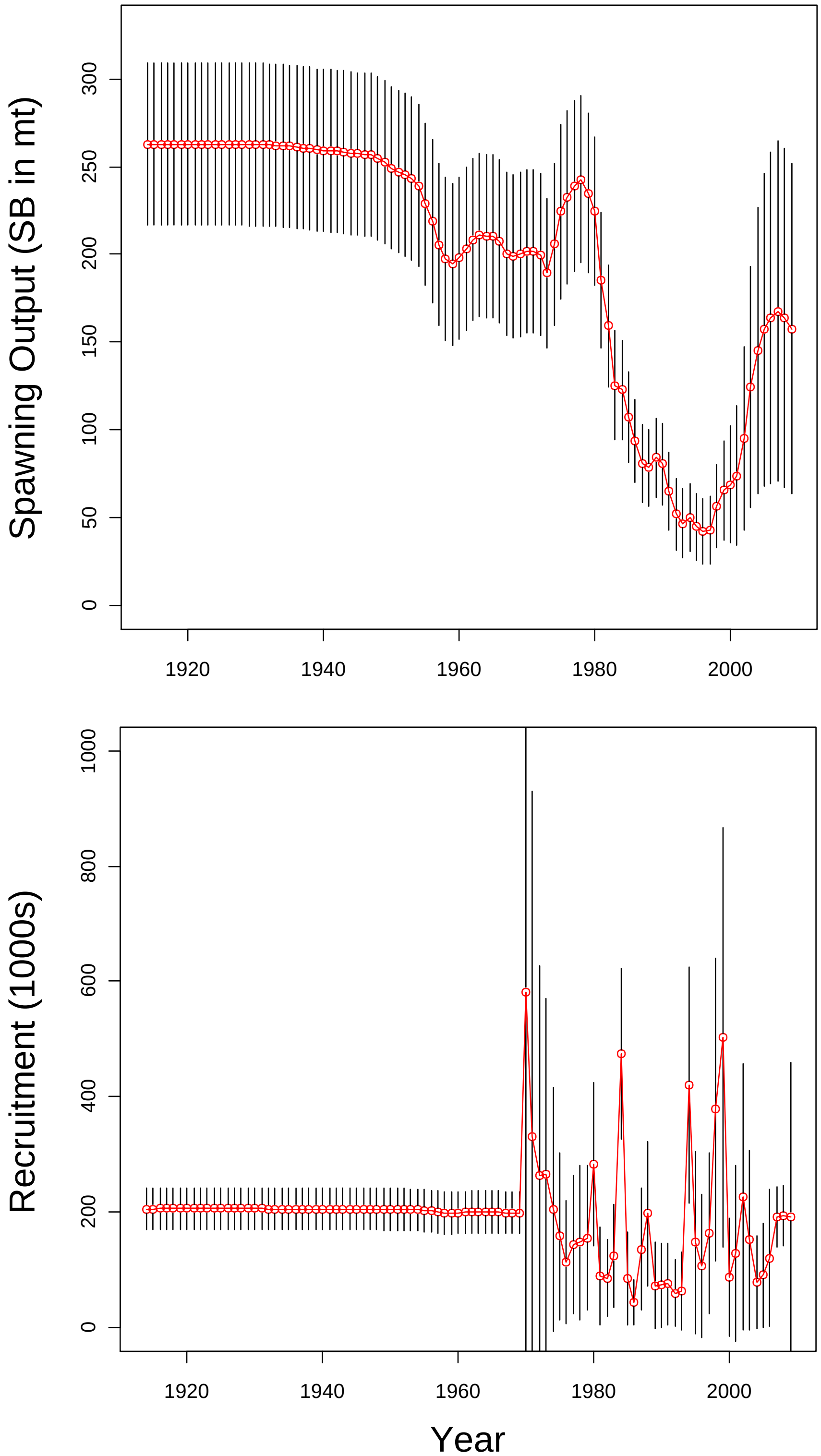

Figure 84. MPD time trajectories for spawning output (top panel) and recruitment trajectories (bottom panel) for the SCS. Vertical black lines are the asymptotic 95% confidence intervals.

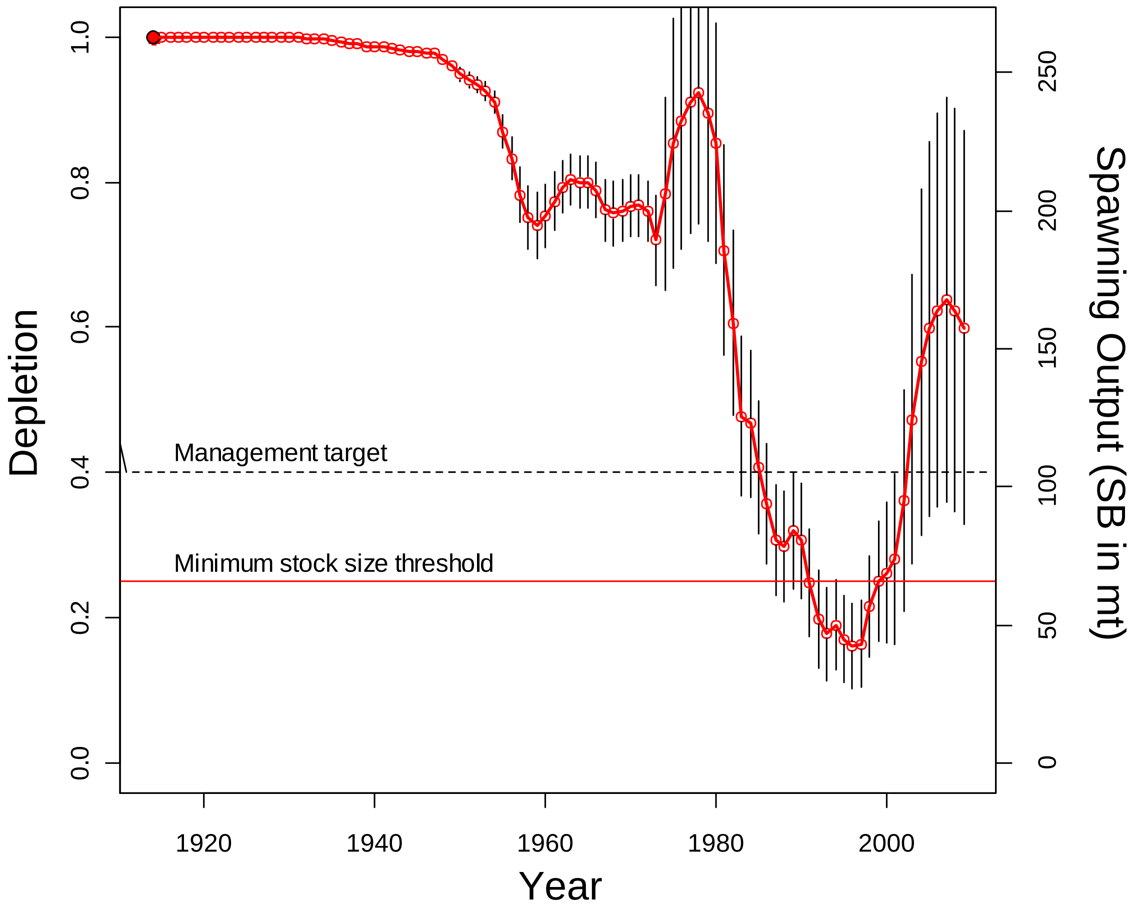

Figure 85. Time trajectories of depletion and spawning output compared to the target ($SB_{40\%}$) and limit reference ($SB_{25\%}$) points for the cabezon SCS.

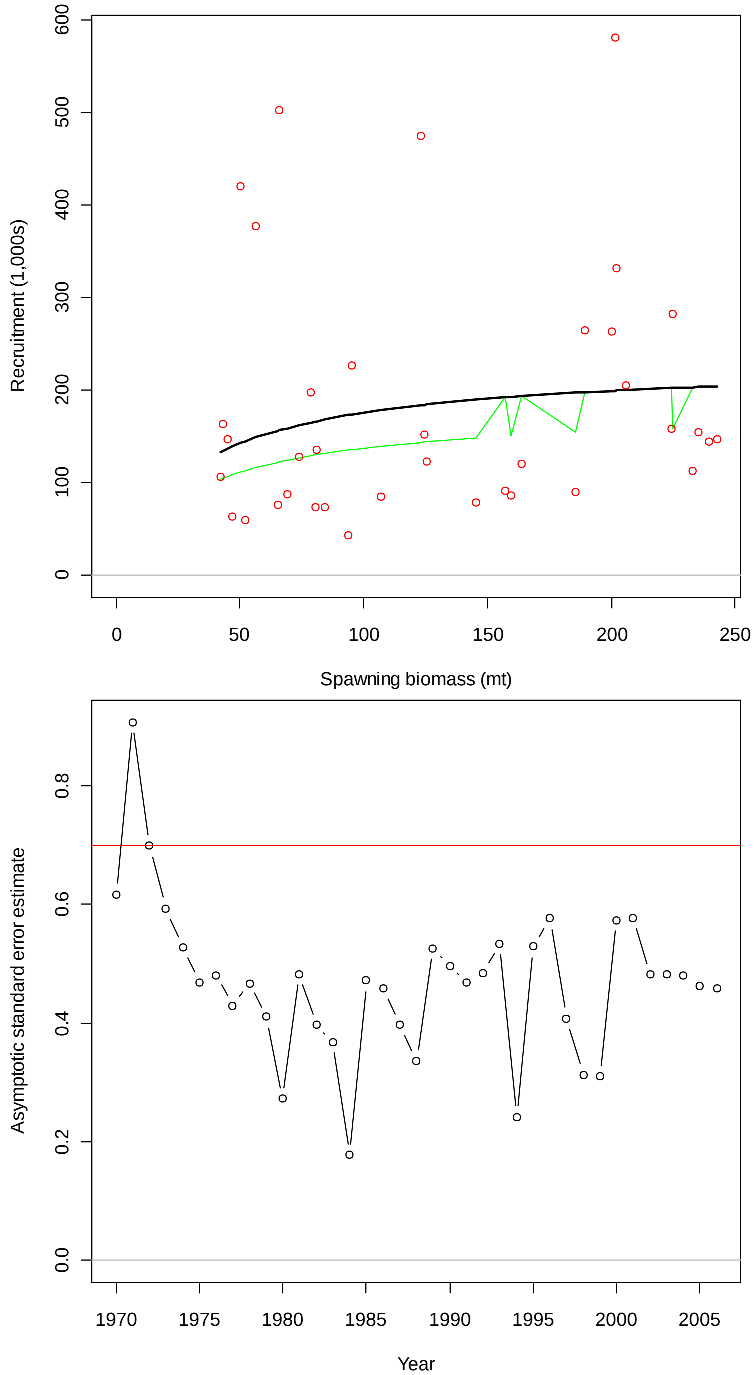

Figure 86. Spawner-recruit relationship (top panel) and the asymptotic standard deviations (bottom panel) for the SCS recruitment time series. Black line in top panel is the expected mean recruits; green line in same panel is the bias-adjusted expected recruits.

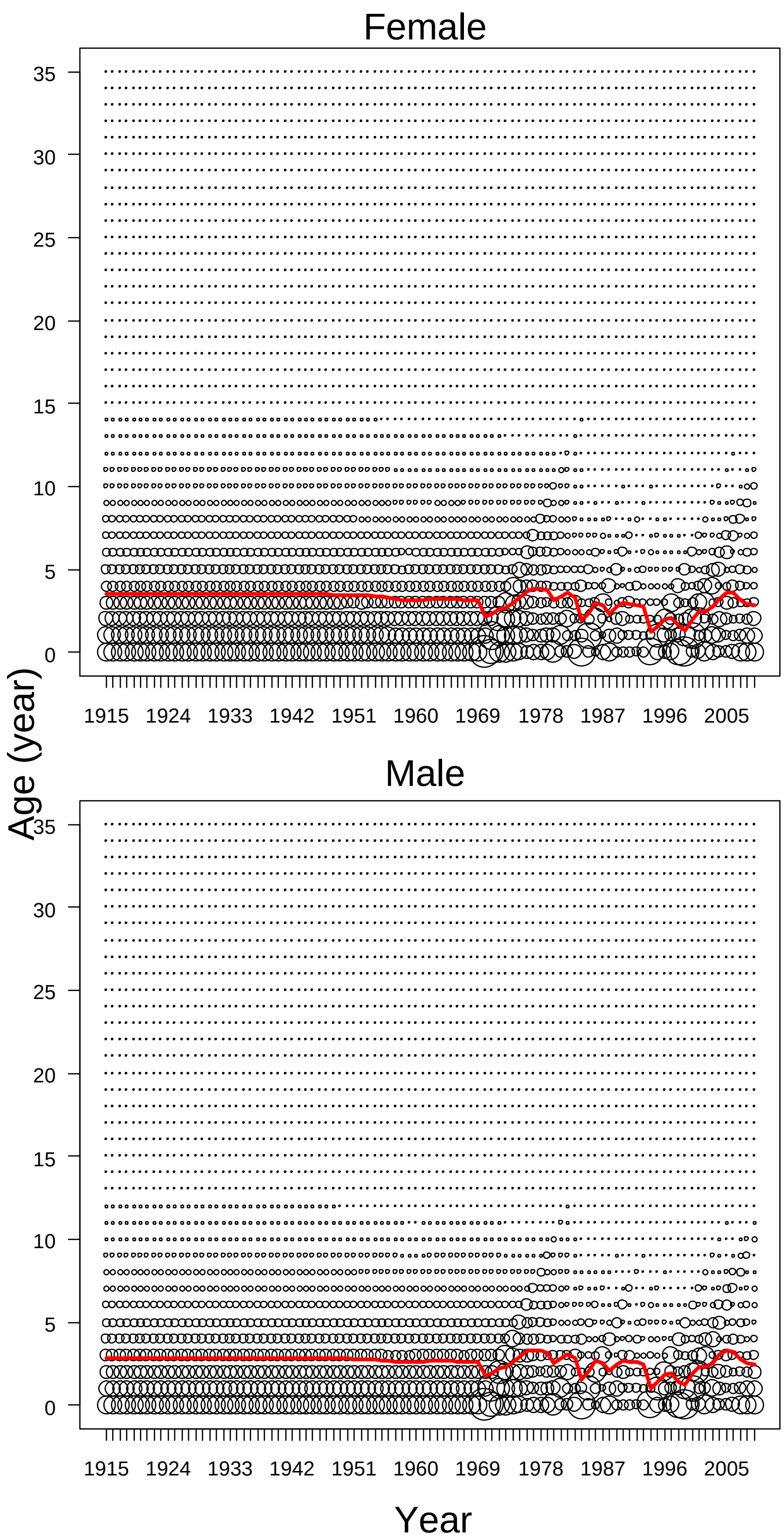

Figure 87. Numbers at age for females (top panel) and males (bottom panel) in the SCS. Red line shows the mean age by year.

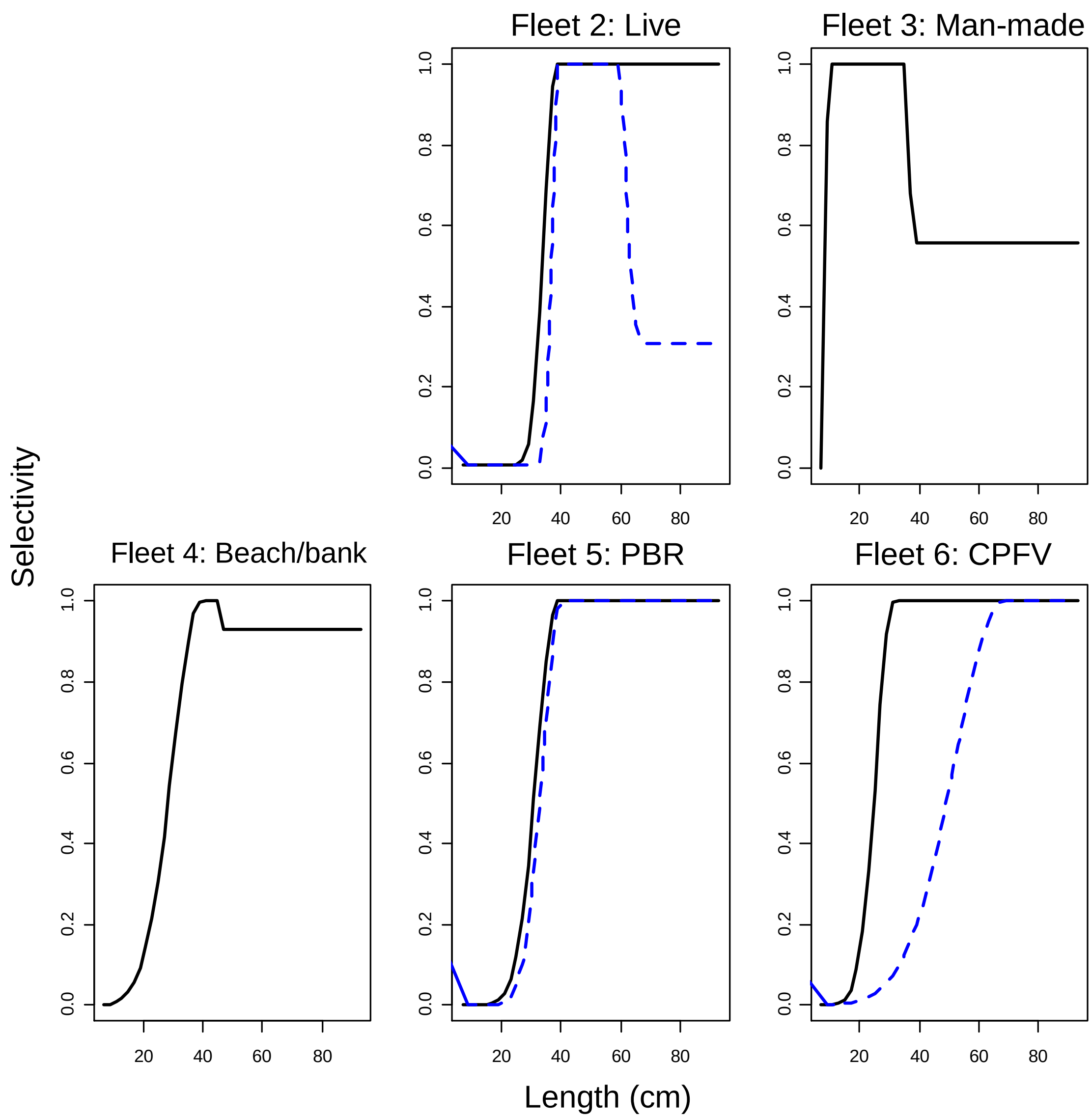

Figure 88. Selectivity at length for female and male cabezon by fishery fleet for the SCS. Black solid lines start selectivity in year 1916; blue broken lines start selectivity in year 1999 (fleet 2) and year 2000 (fleets 5 and 6). There is no length information for the non-live fishery in SCS (not included here).

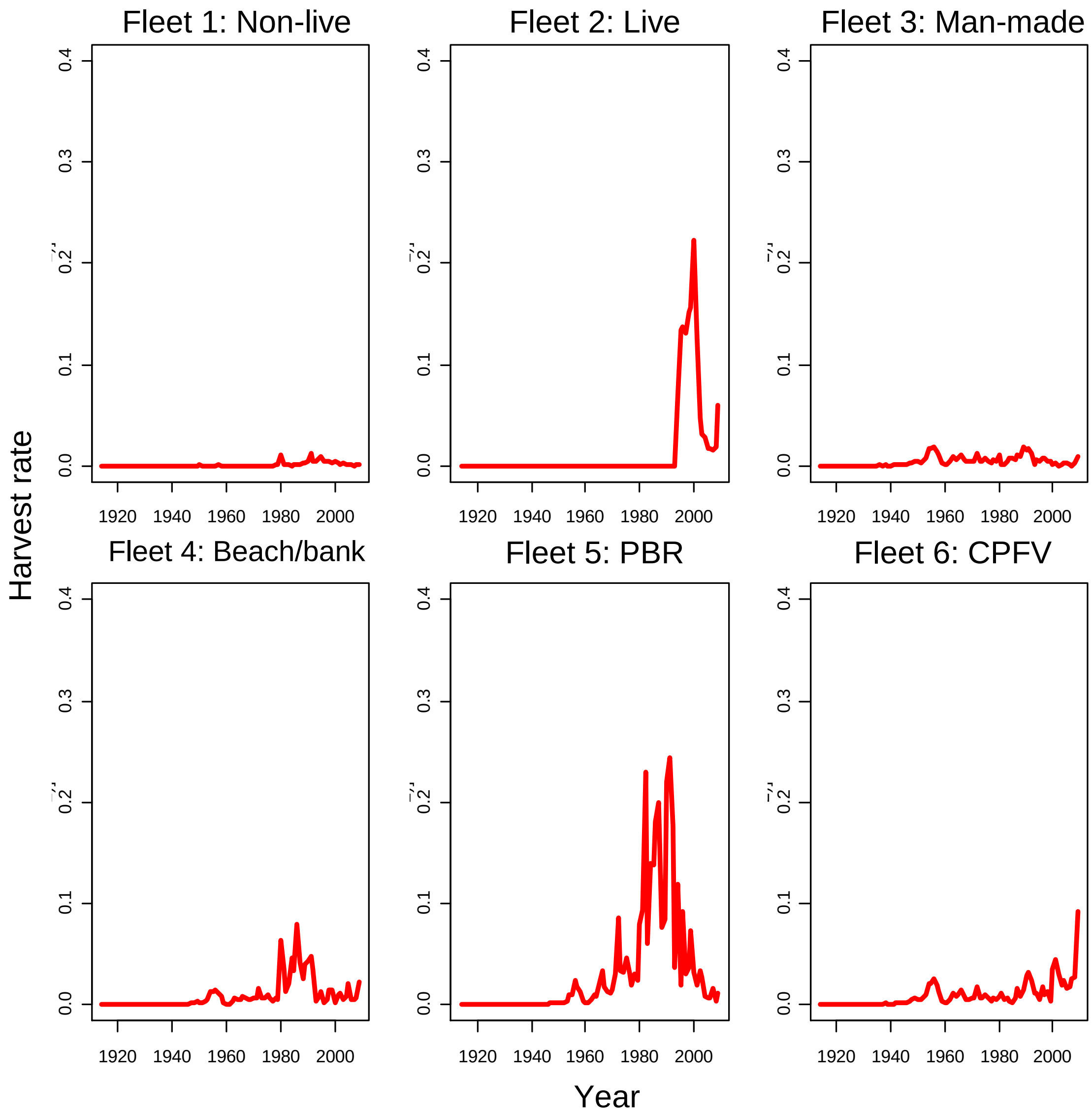

Figure 89. Time series of harvest rates by fishery fleet for the SCS.

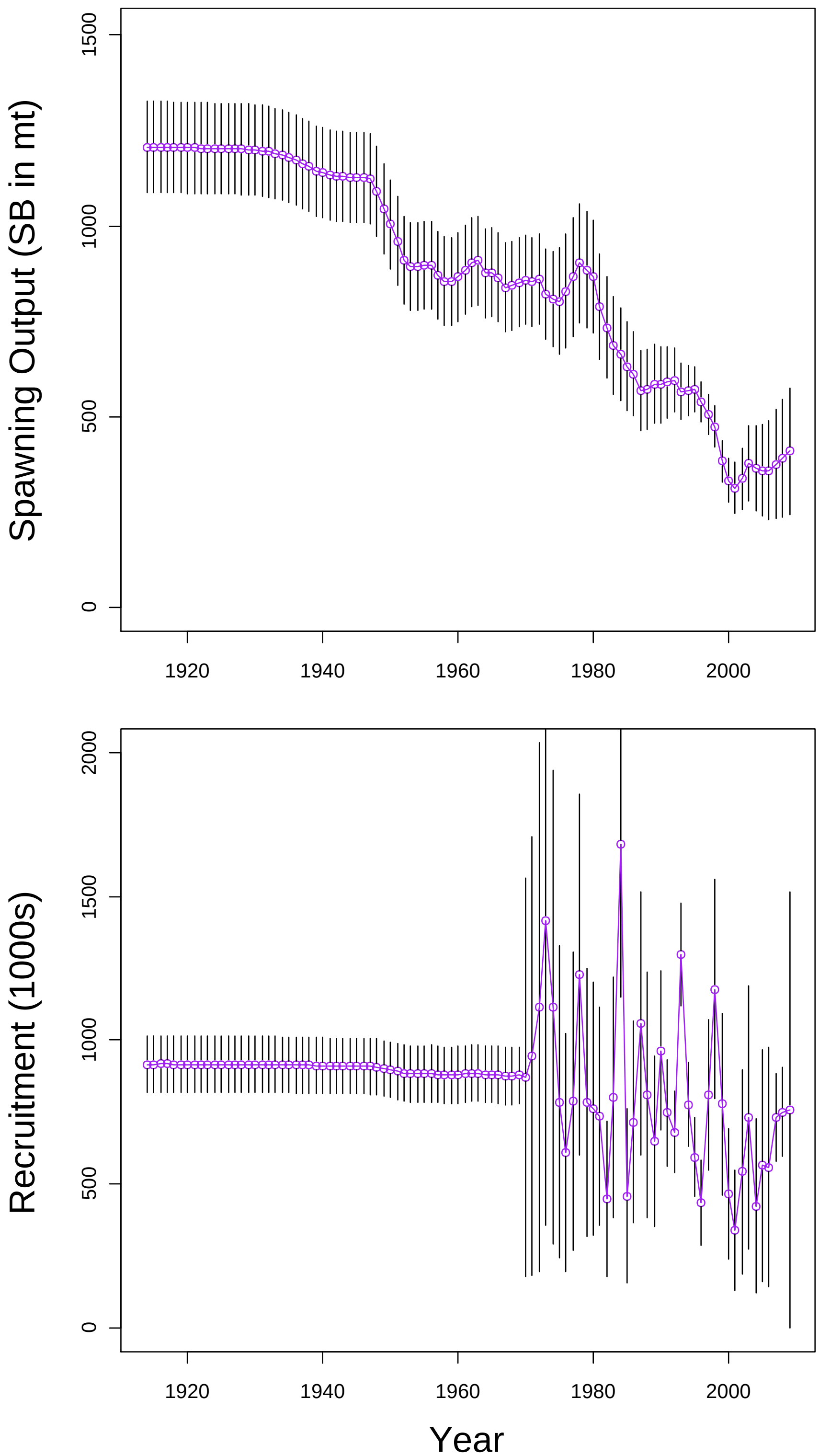

Figure 90. MPD time trajectories for spawning output (top panel) and recruitment trajectories (bottom panel) for the CAS. Vertical black lines are the asymptotic 95% confidence intervals.

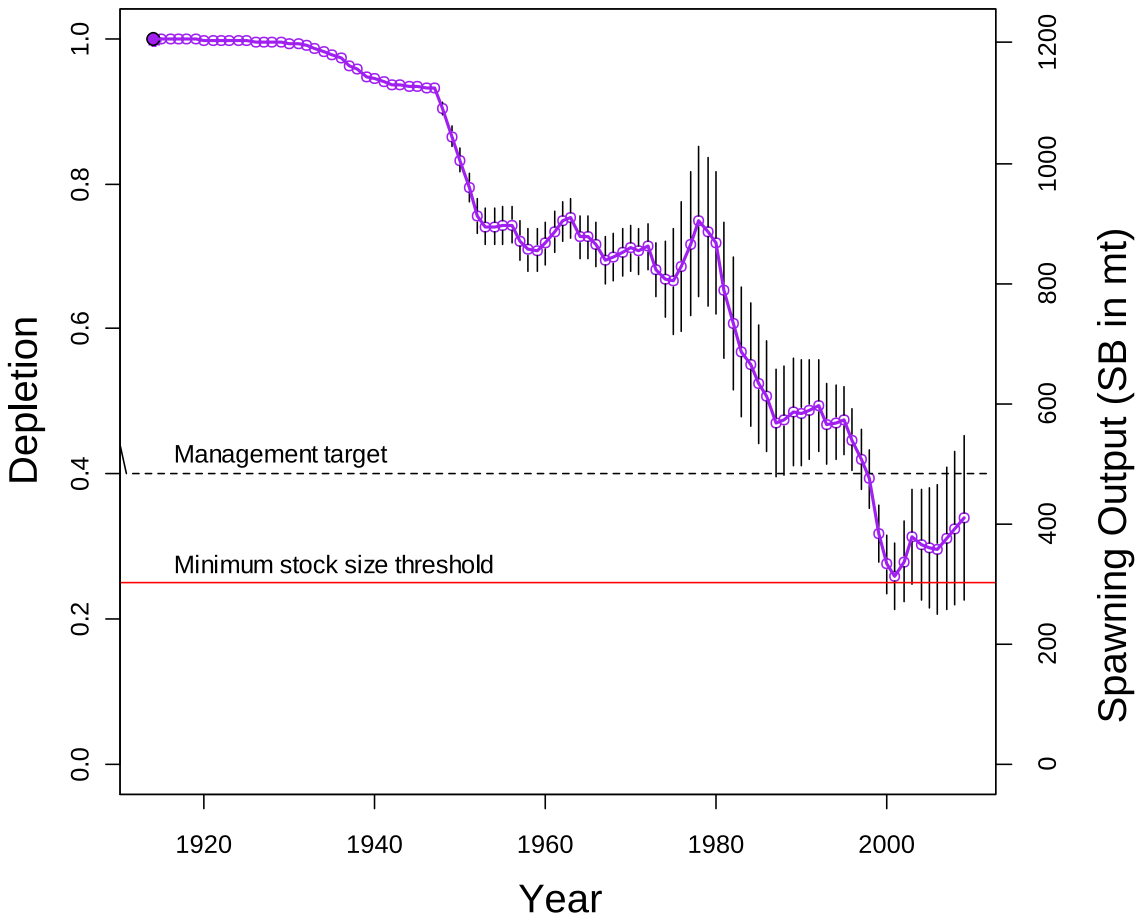

Figure 91. Time trajectories of depletion and spawning output compared to the target ($SB_{40\%}$) and limit reference ($SB_{25\%}$) points for the cabezon CAS.

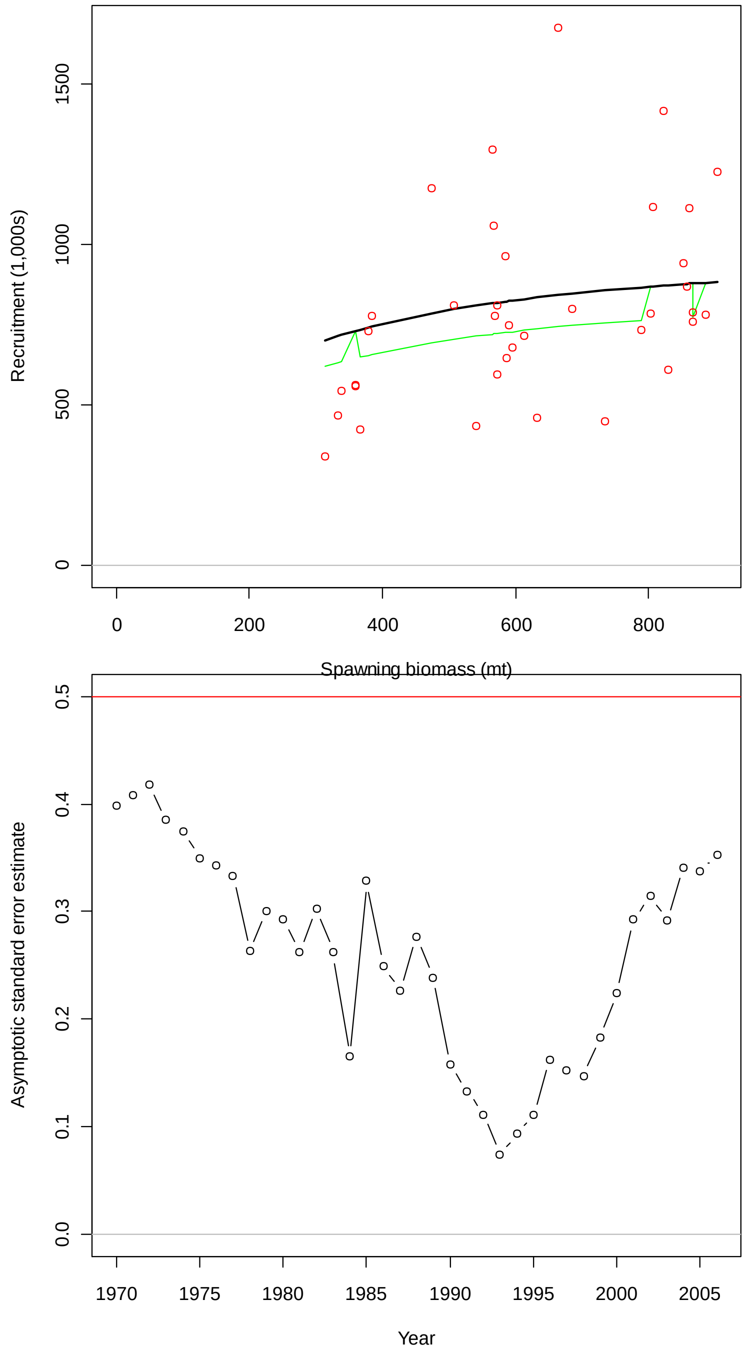

Figure 92. Spawner-recruit relationship (top panel) and the asymptotic standard deviations (bottom panel) for the CAS recruitment time series. Black line in top panel is the expected mean recruits; green line in same panel is the bias-adjusted expected recruits.

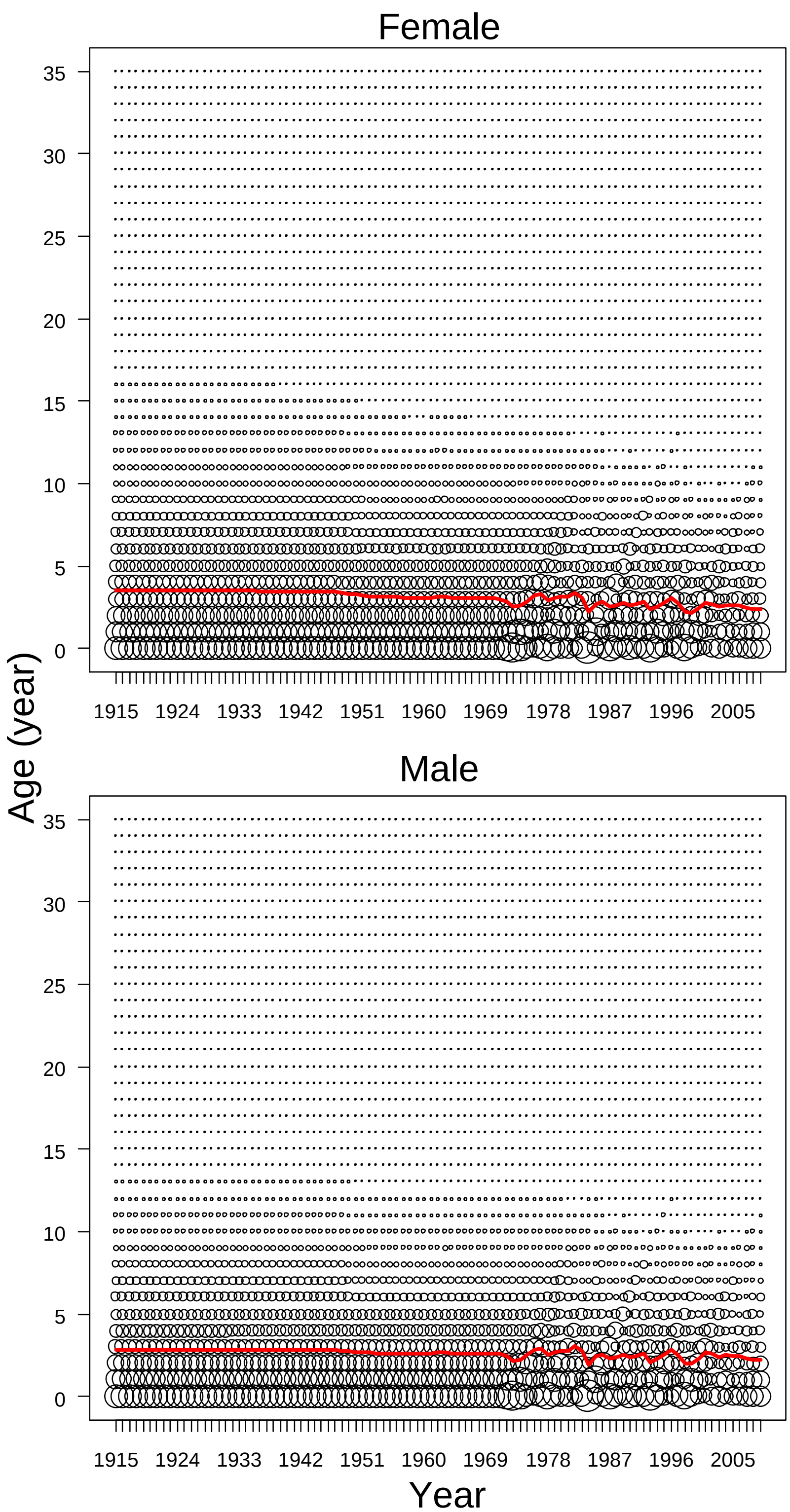

Figure 93. Numbers at age for females (top panel) and males (bottom panel) in the CAS. Red line shows the mean age by year.

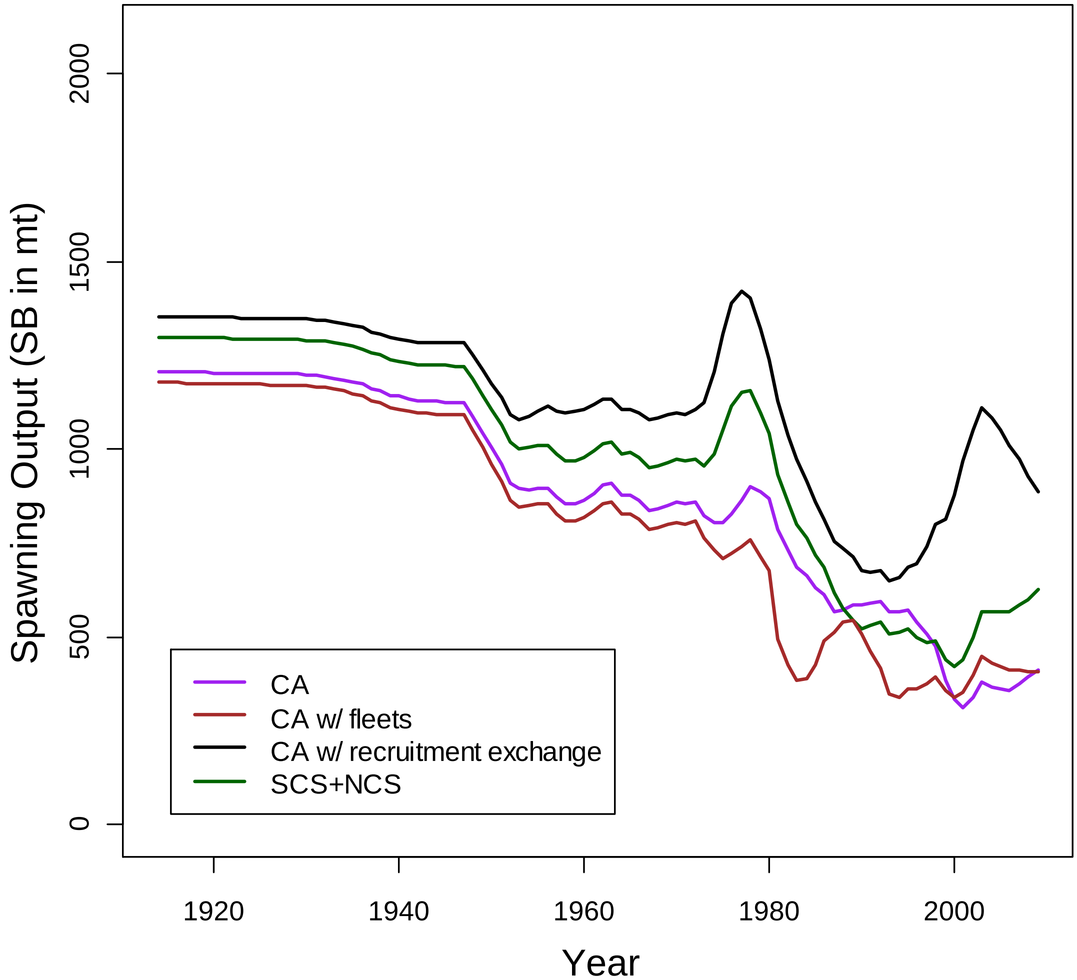

Figure 94. Comparison of spawning output trajectories for four realizations of a state-wide California cabezon sub-stock assessment.

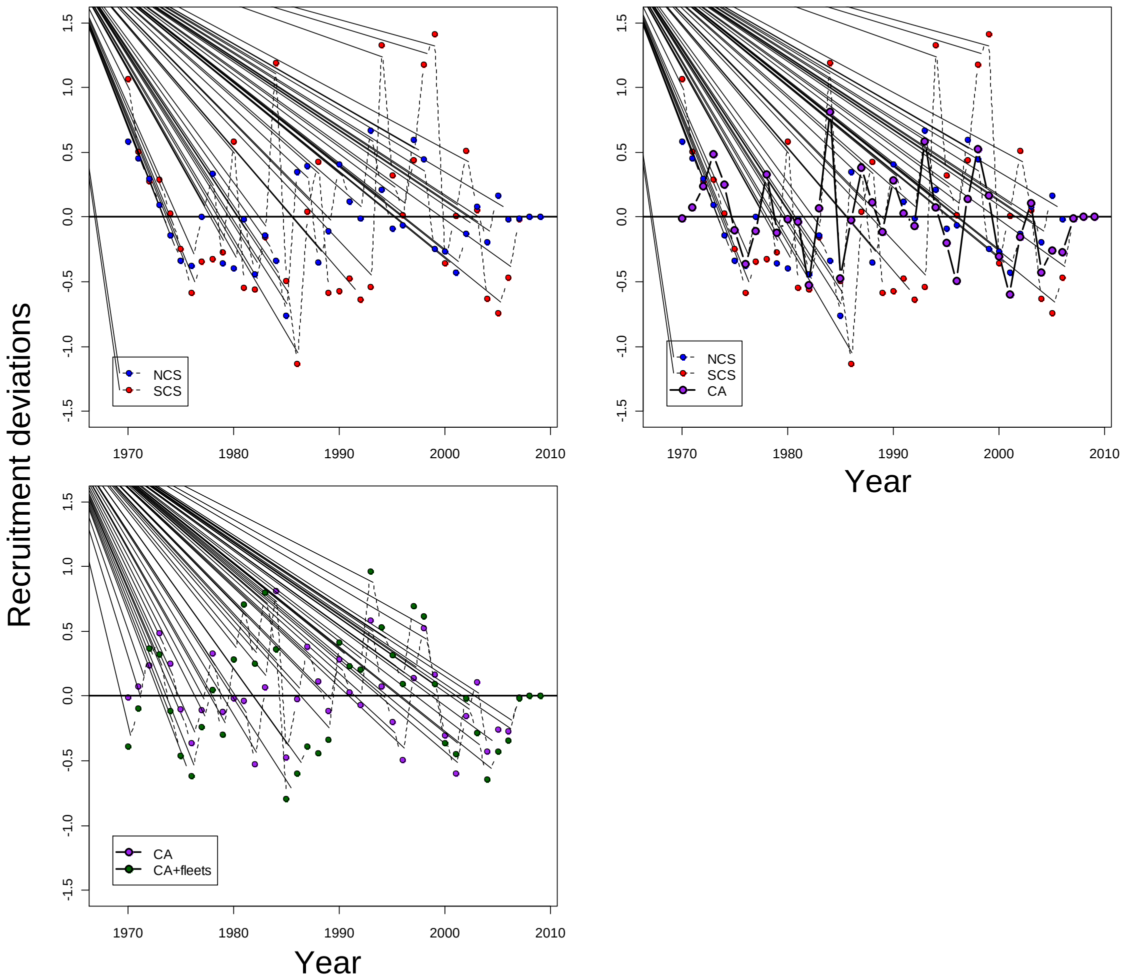

Figure 95. Comparison of recruitment deviations between the NCS and SCS base cases (top left panel), all California sub-stock base cases (top right panel), and CAS and CAS ('+fleets') specified with separate NCS and SCS fleets.

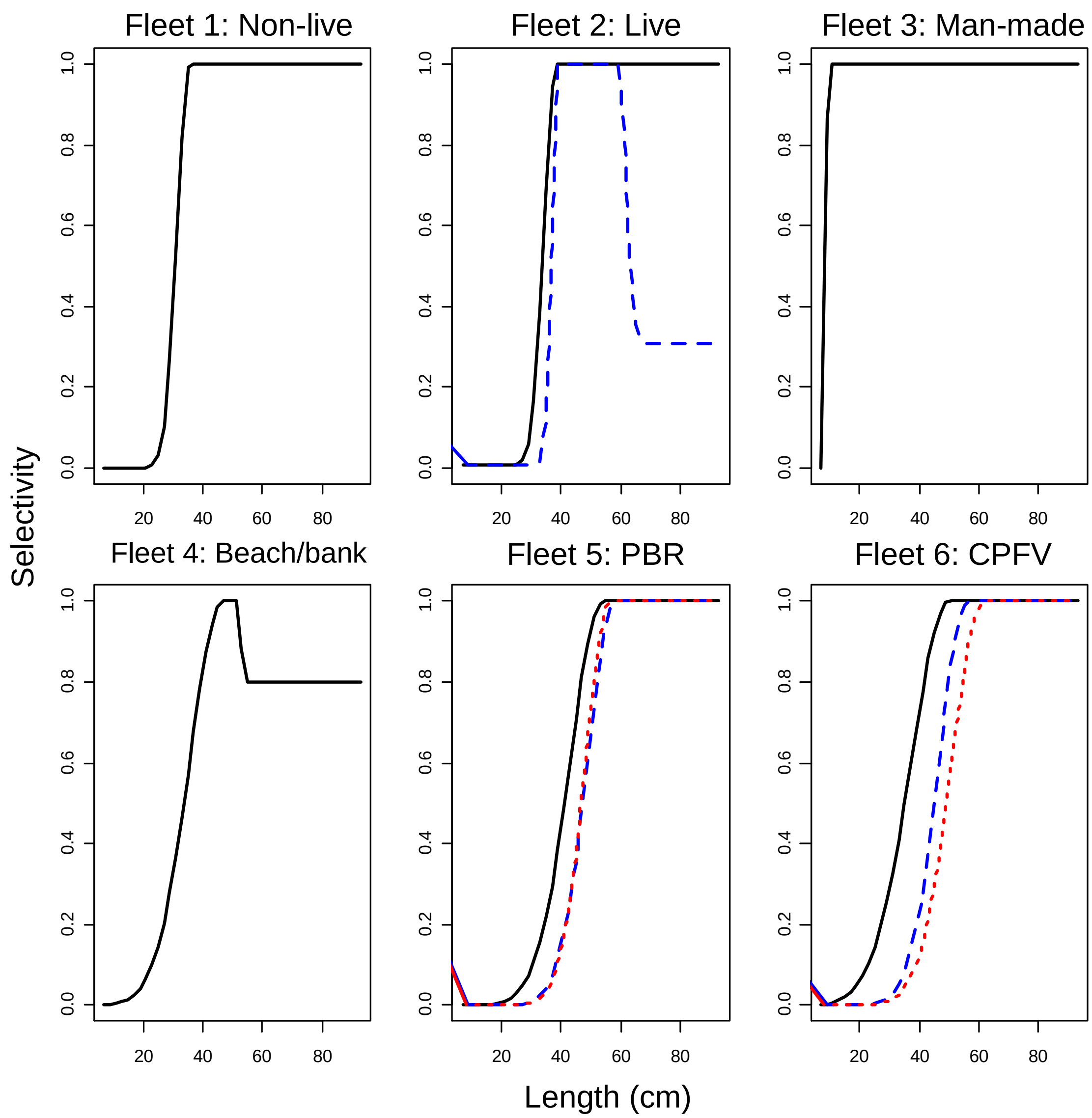

Figure 96. Selectivity at length for female and male cabezon by fishery fleet for the CAS. Black solid lines start selectivity in year 1916; blue broken lines start selectivity in year 1999 (fleet 2) and year 2000 (fleets 5 and 6); red dotted lines start selectivity in 2005.

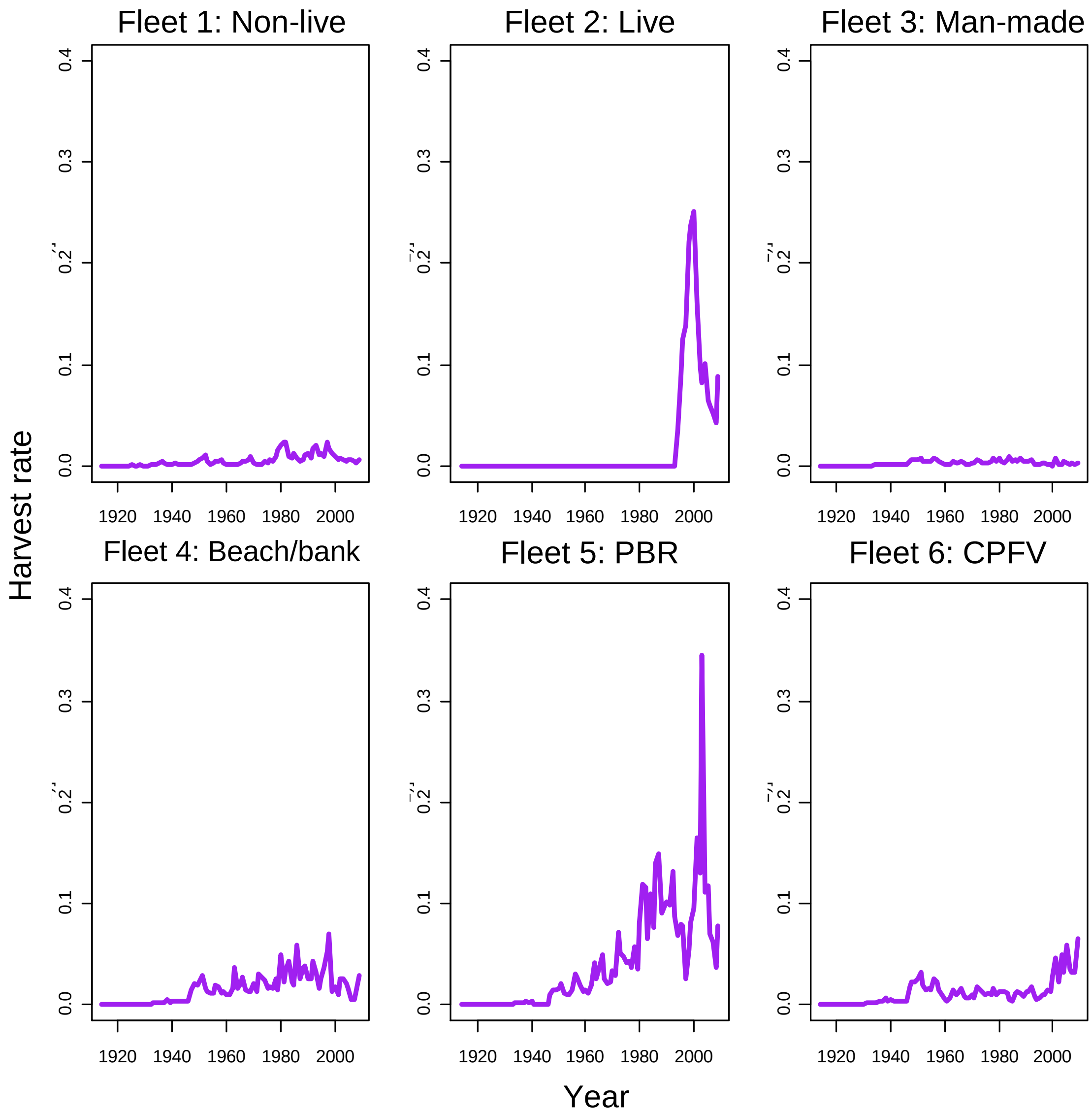

Figure 97. Time series of harvest rates by fishery fleet for the CAS.

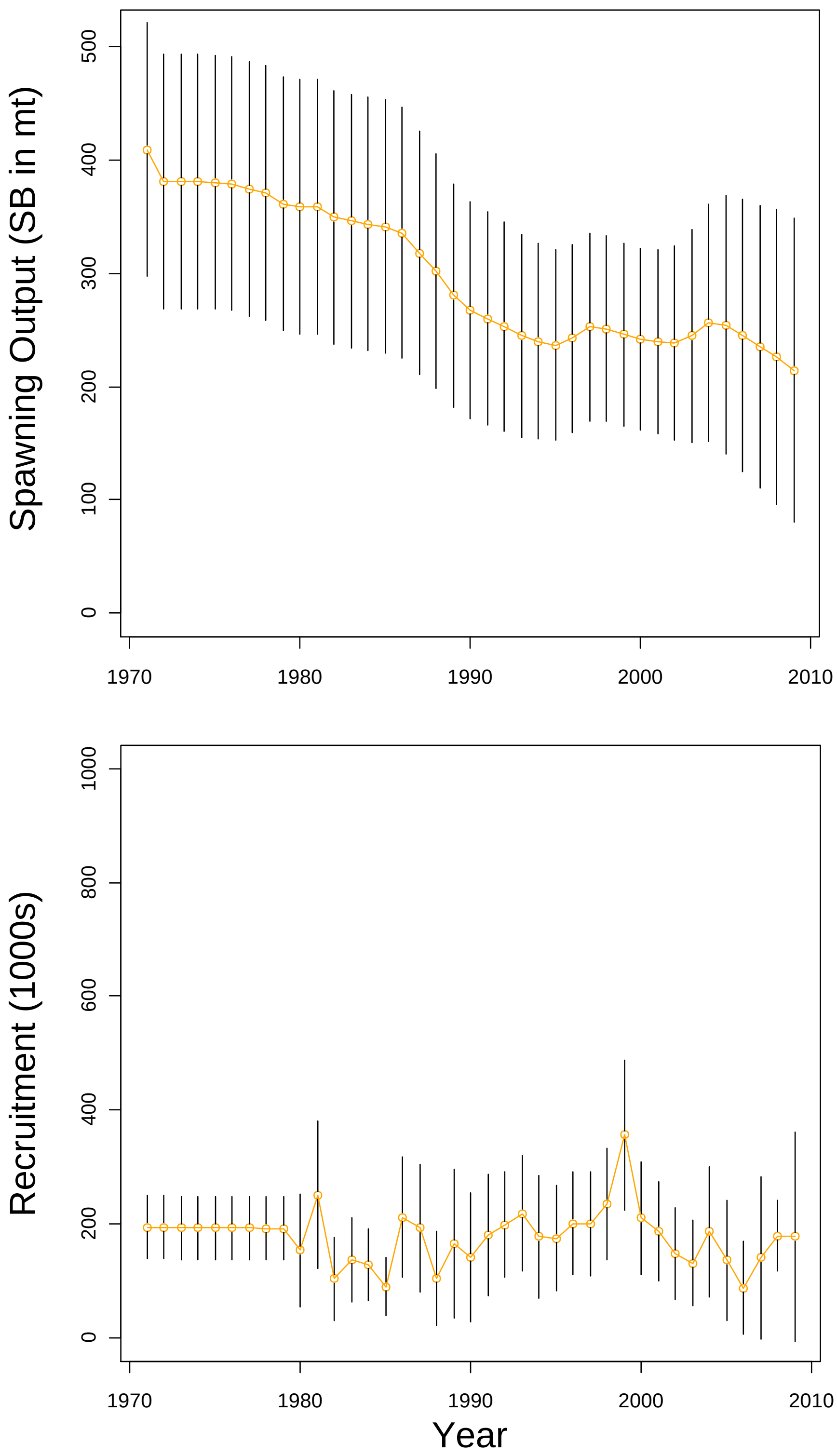

Figure 98. MPD time trajectories for spawning output (top panel) and recruitment trajectories (bottom panel) for the ORS. Vertical black lines are the asymptotic 95% confidence intervals.

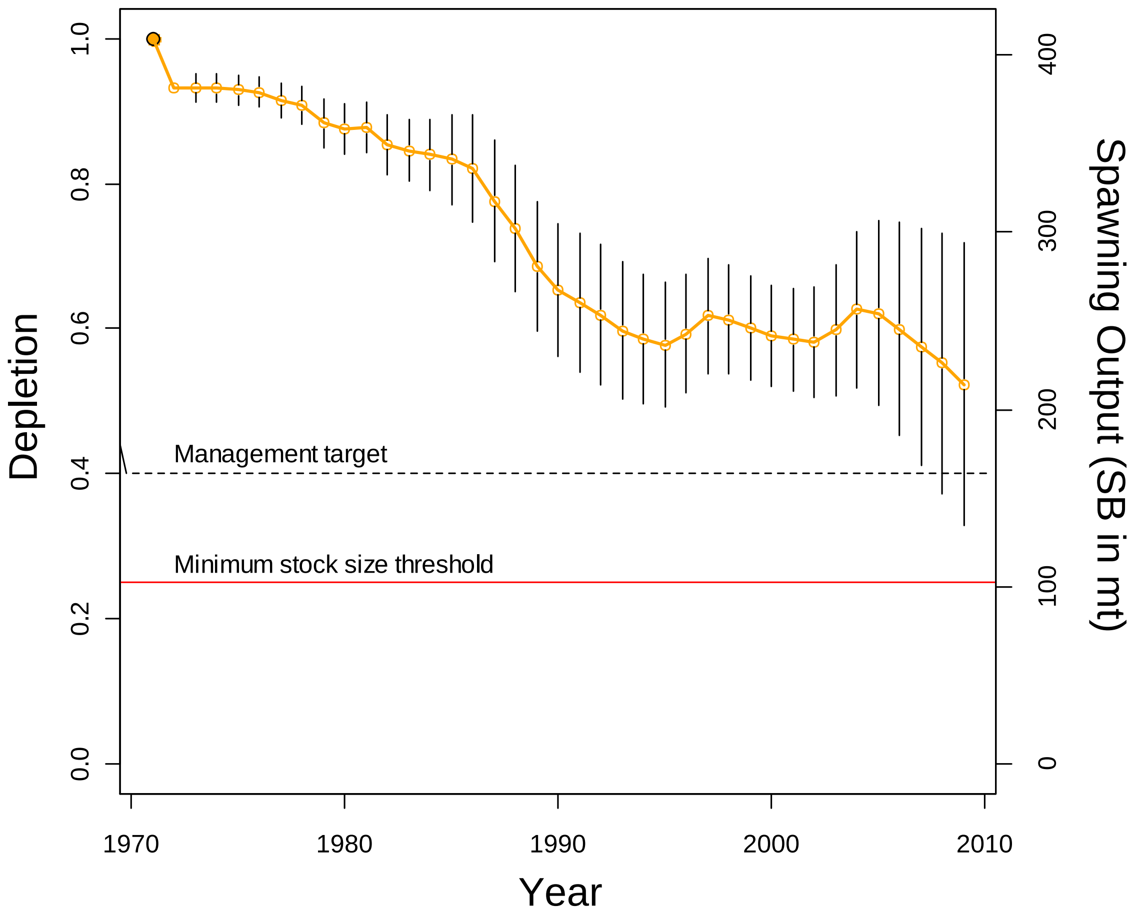

Figure 99. Time trajectories of depletion and spawning output compared to the target ($SB_{40\%}$) and limit reference ($SB_{25\%}$) points for the cabezon ORS.

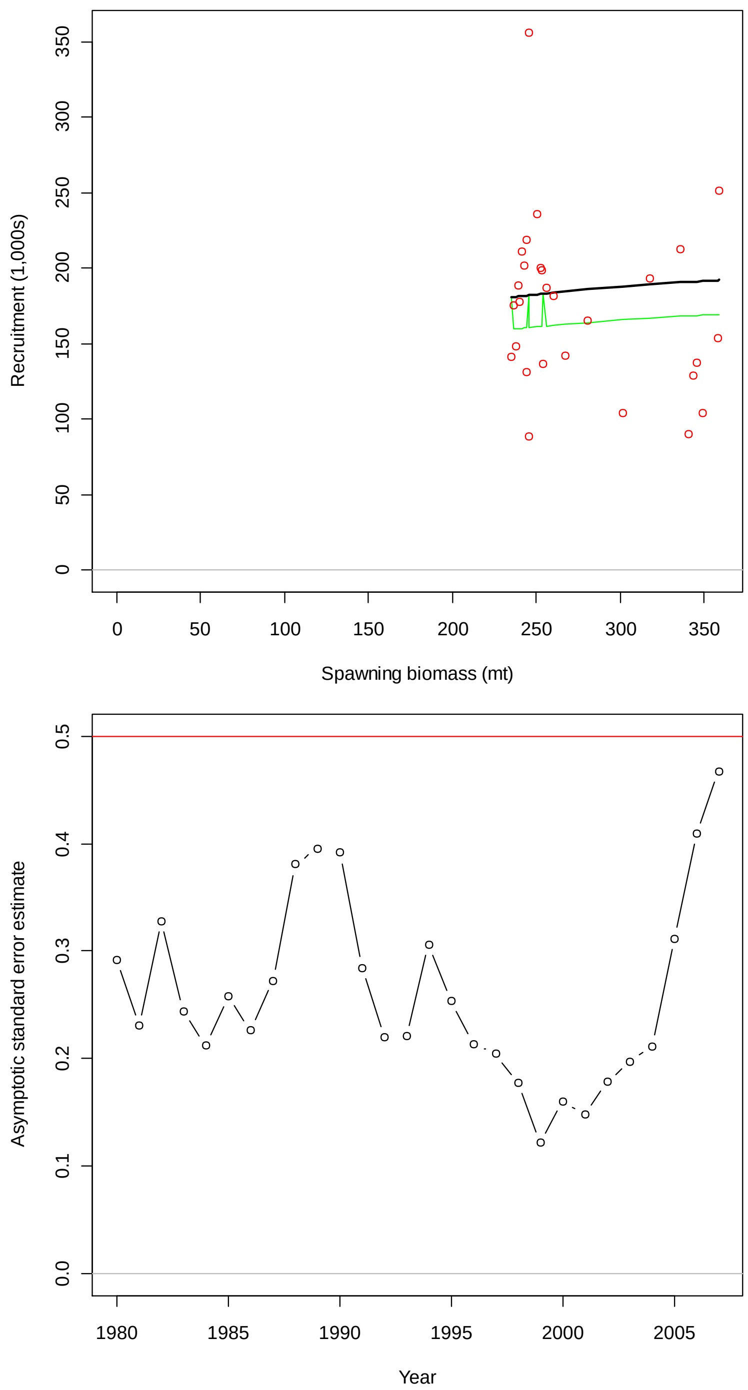

Figure 100. Spawner-recruit relationship (top panel) and the asymptotic standard deviations (bottom panel) for the ORS recruitment time series. Black line in top panel is the expected mean recruits; green line in same panel is the bias-adjusted expected recruits.

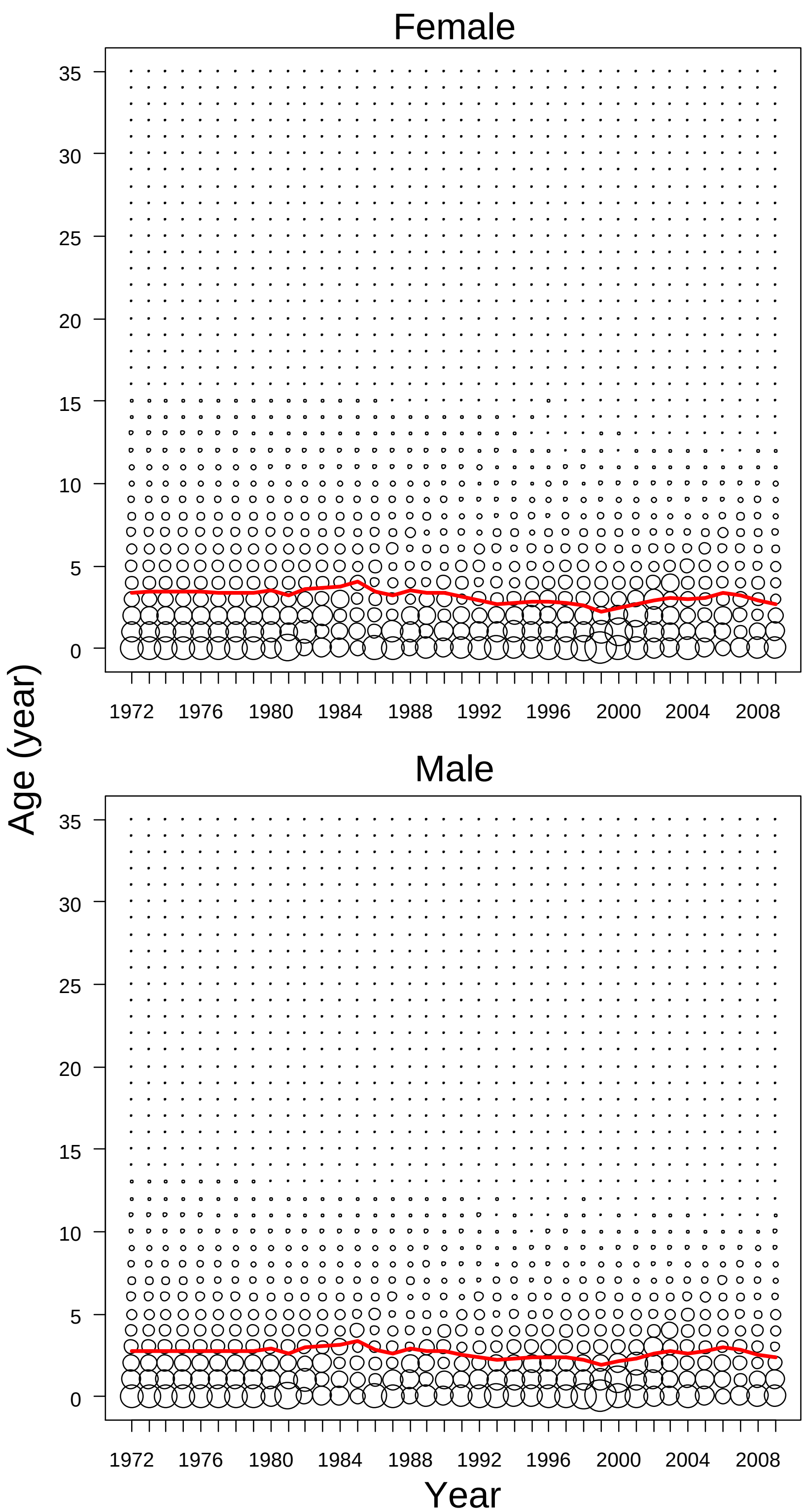

Figure 101. Numbers at age for females (top panel) and males (bottom panel) in the ORS. Red line shows the mean age by year.

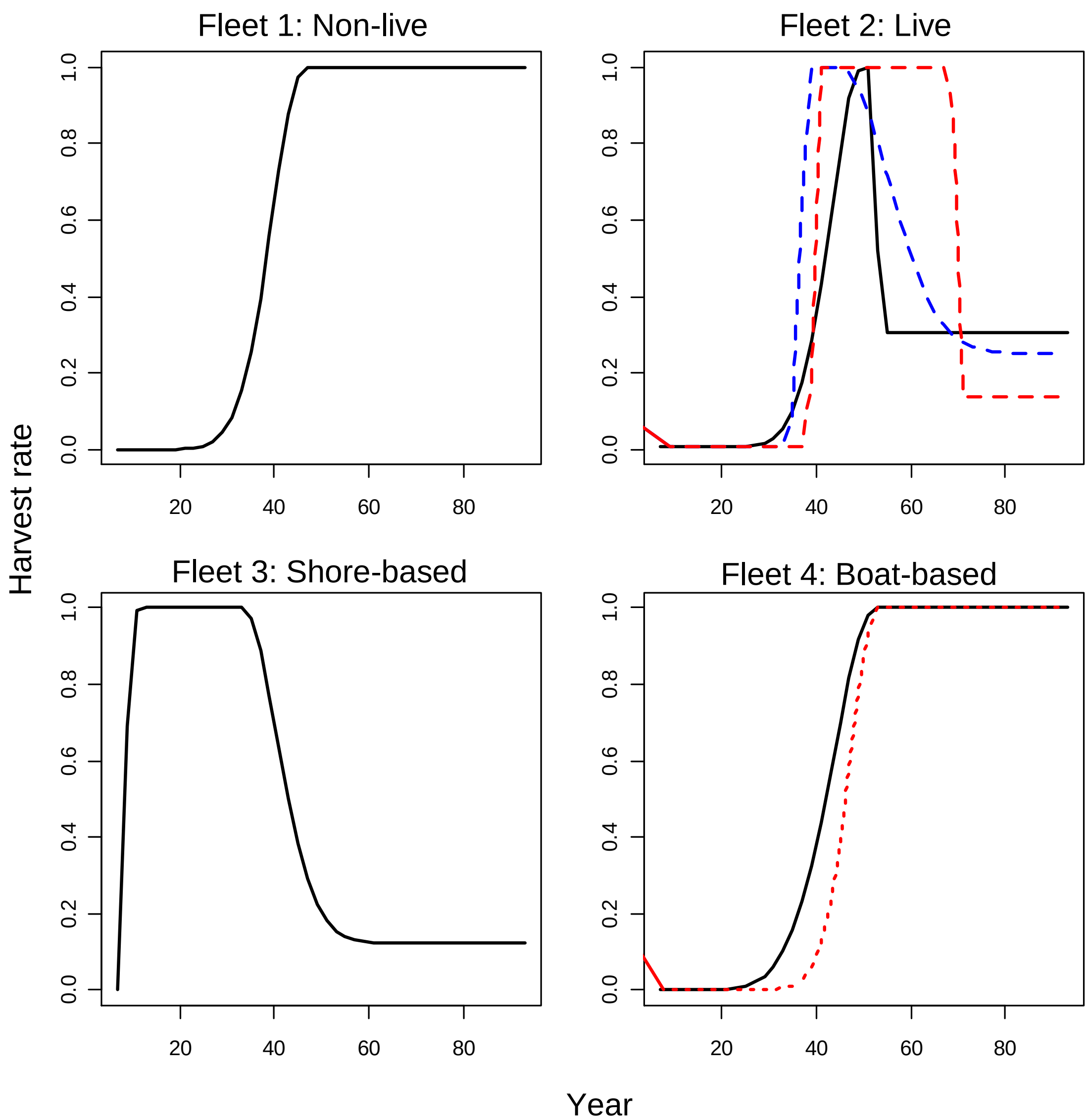

Figure 102. Selectivity at length for female and male cabezon by fishery fleet for the ORS. Black solid lines start selectivity in year 1916; blue broken lines start selectivity in year 2000 (fleet 2) and year 2003 (fleet 4); red dotted lines start selectivity in 2004.

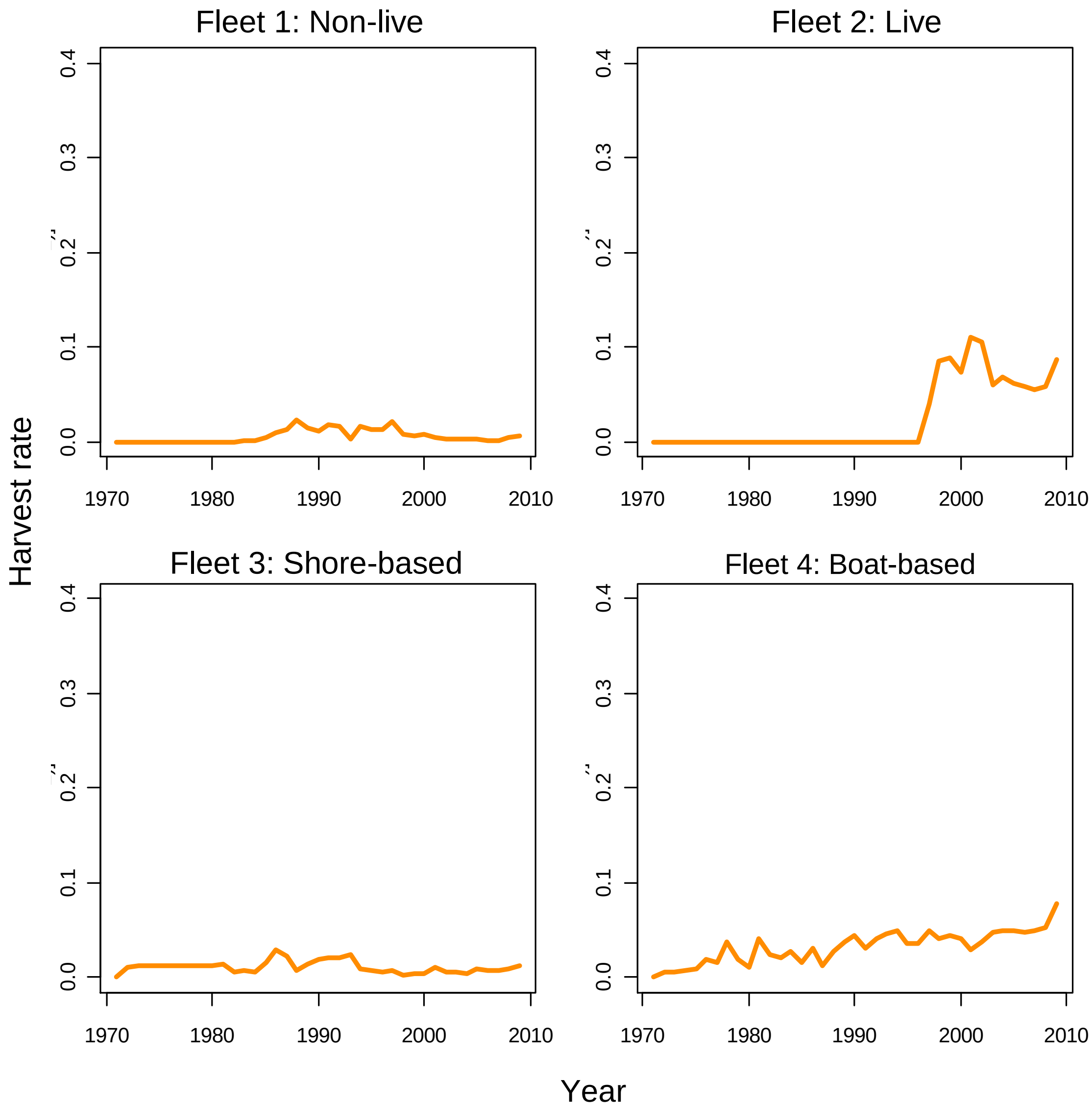

Figure 103. Time series of harvest rates by fishery fleet for the ORS.

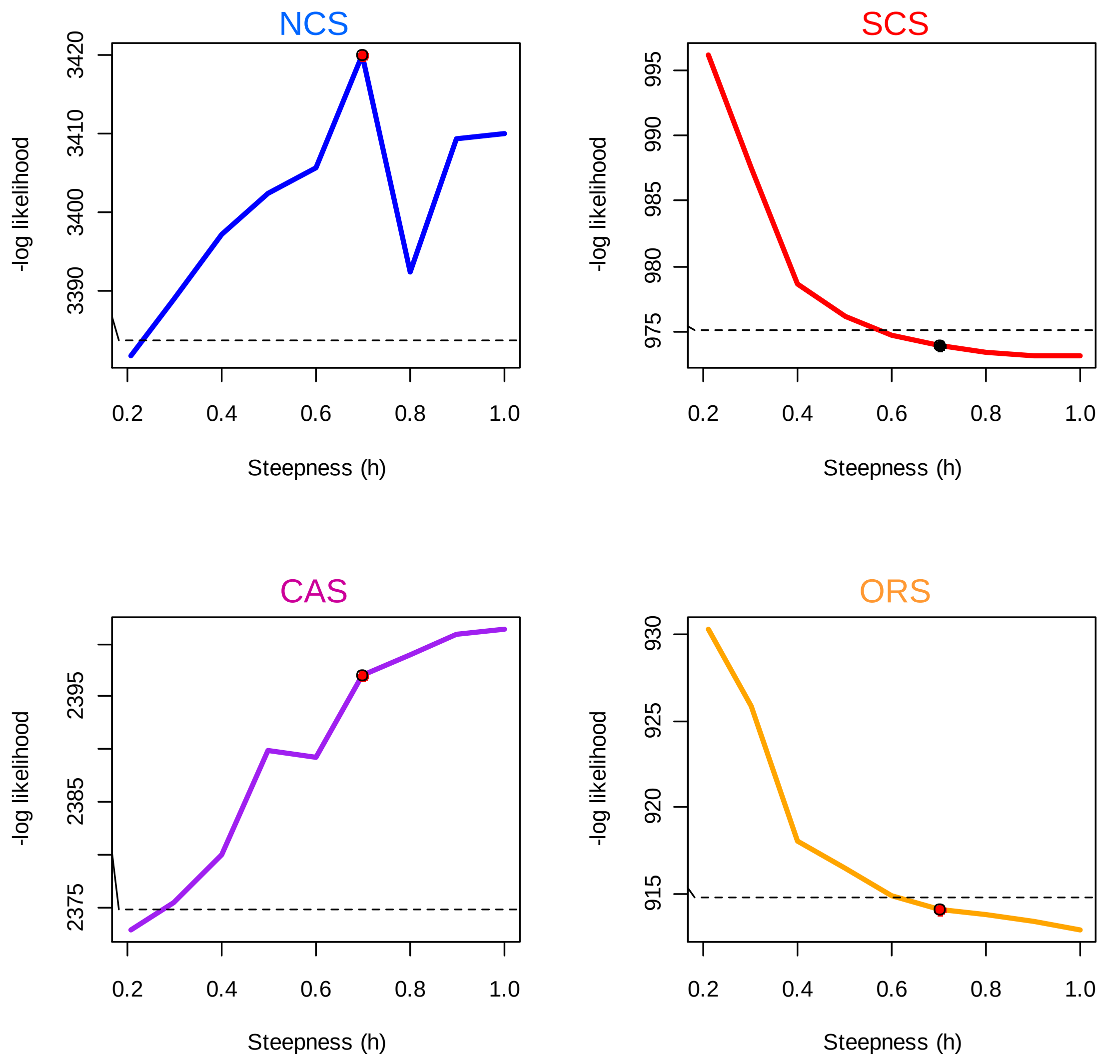

Figure 104. Recruitment compensation (steepness) likelihood profiles for each sub-stock. Red point show the assumed base case values. Broken black line indicates the likelihood value of significant difference.

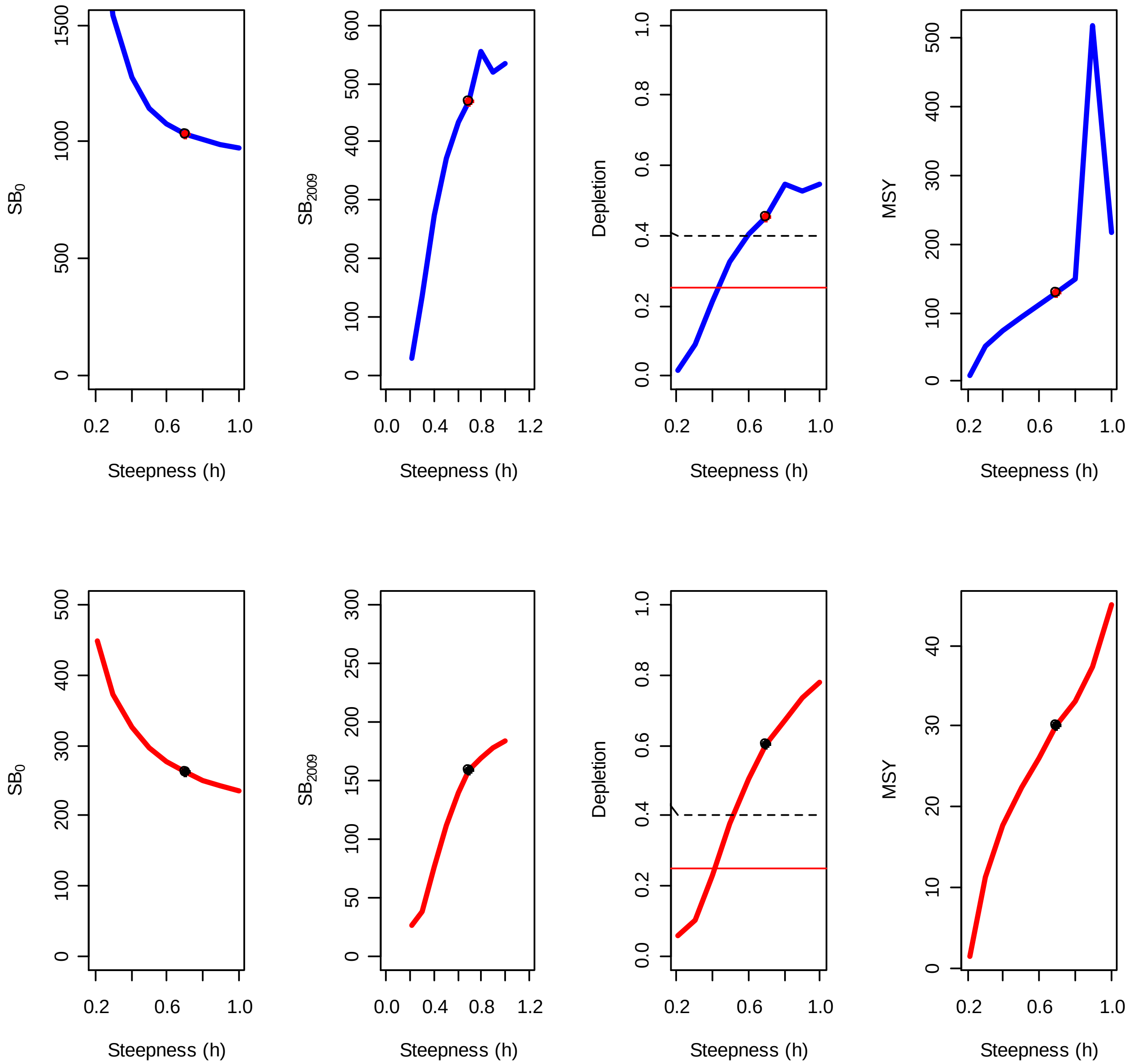

Figure 105. Values of initial spawning output (SB$_0$; left panels), current spawning output (SB$_{2009}$; middle left panels), depletion (middle right panels), and MSY (right panels) for the NCS (upper panels) and SCS (lower panels).

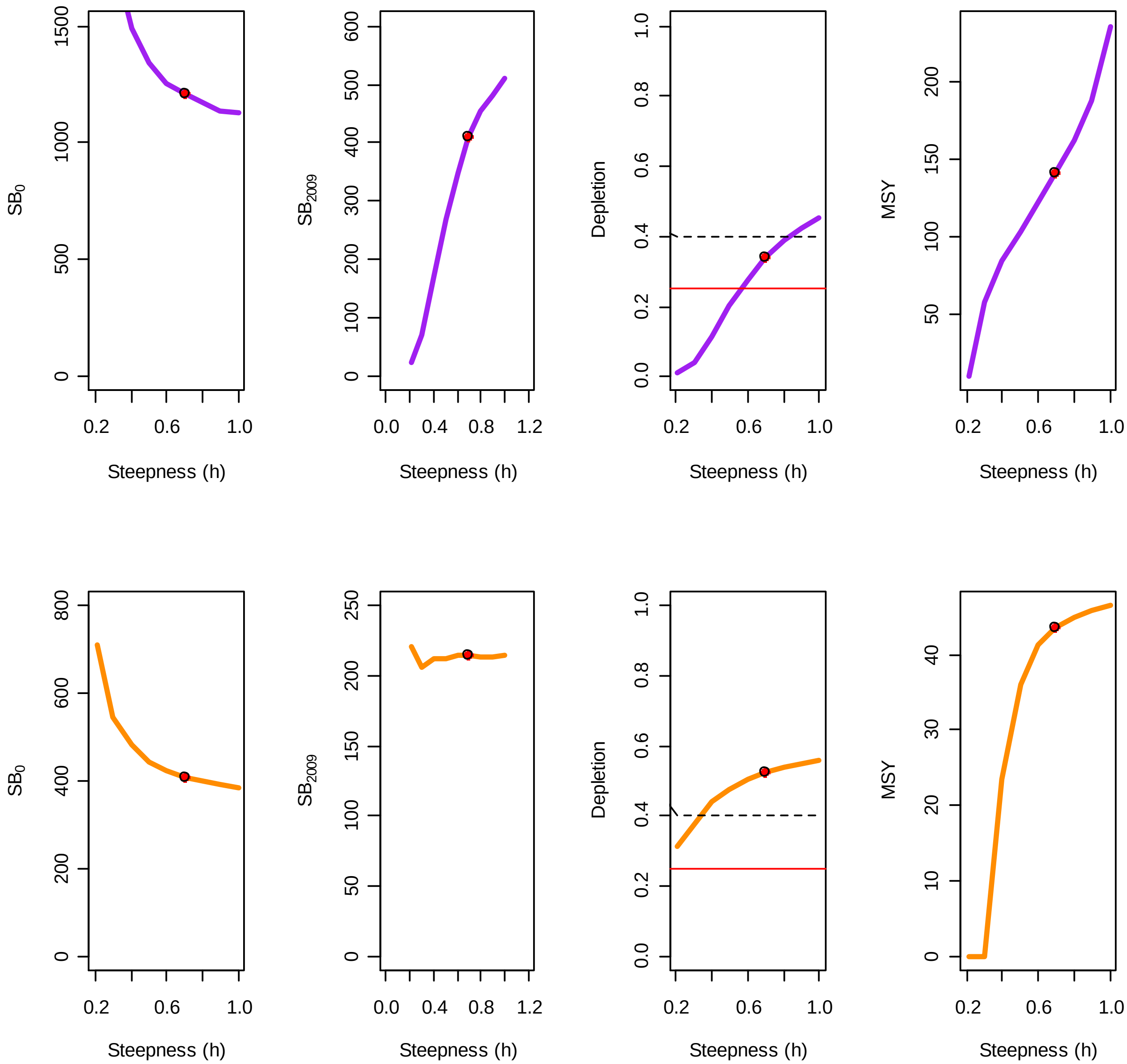

Figure 106. Values of initial spawning output (SB_0; left panels), current spawning output (SB_{2009}; middle left panels), depletion (middle right panels), and MSY (right panels) for the CAS (upper panels) and ORS (lower panels).

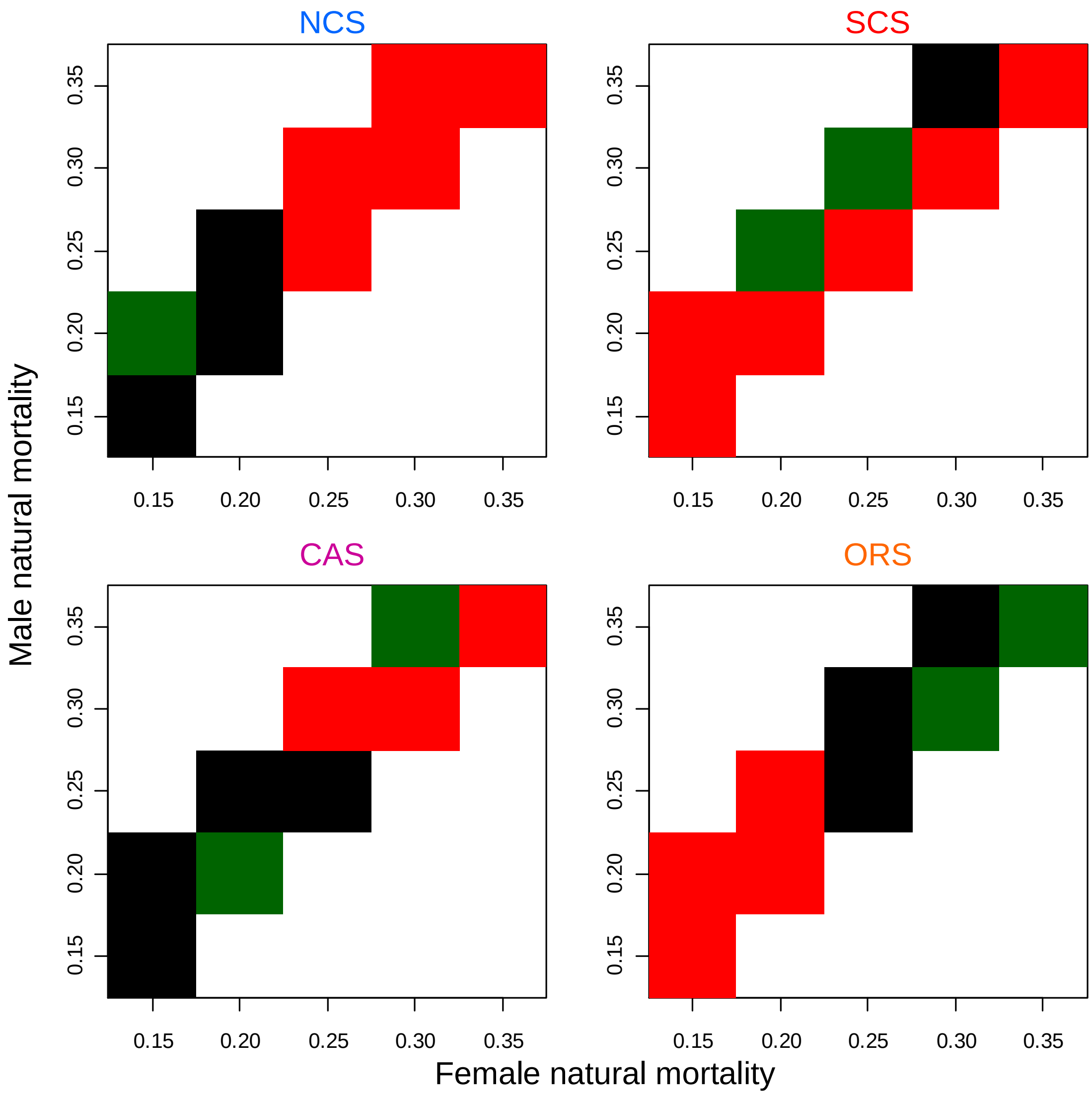

Figure 107. Likelihood profile for sex-specific natural mortality. Green values are within 1.92 likelihood units from the minimum. Black values are 1.92 to 10 likelihood units from the minimum. Red values are >10 likelihood units from the minimum.

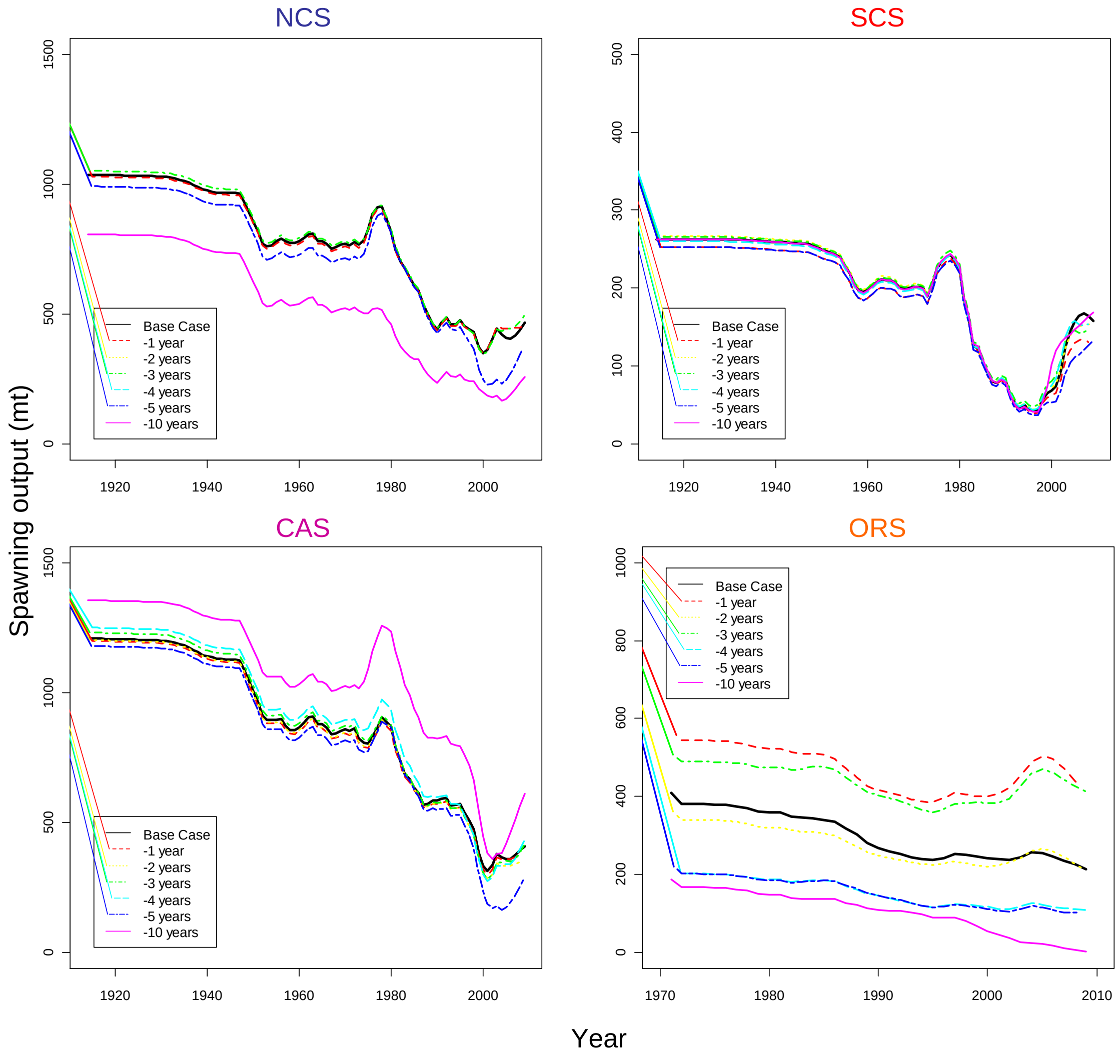

Figure 108. Spawning output trajectories estimated by the base case and retrospective analysis trials for each cabezon sub-stock.

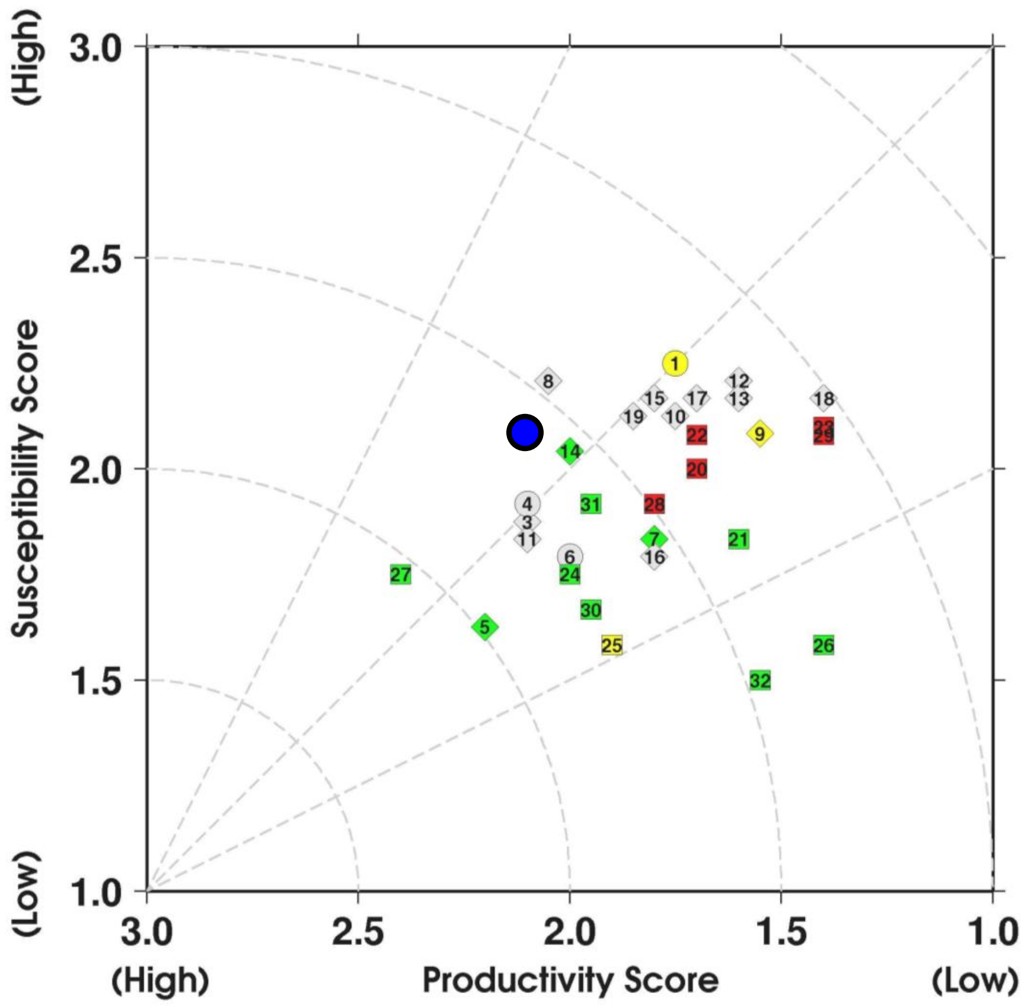

Figure 109. Productivity and susceptibility scores for cabezon (large blue point) compared with 31 other groundfish species. Grey points indicate species without assessment; red points indicate rebuilding stocks; yellow points indicate stocks that are in the precautionary zone ($0.25SSB_0 <$ SSB $<0.4SSB_0$); green points indicate assessed stocks above the target reference point. Figure provided by Field et al. (2009).

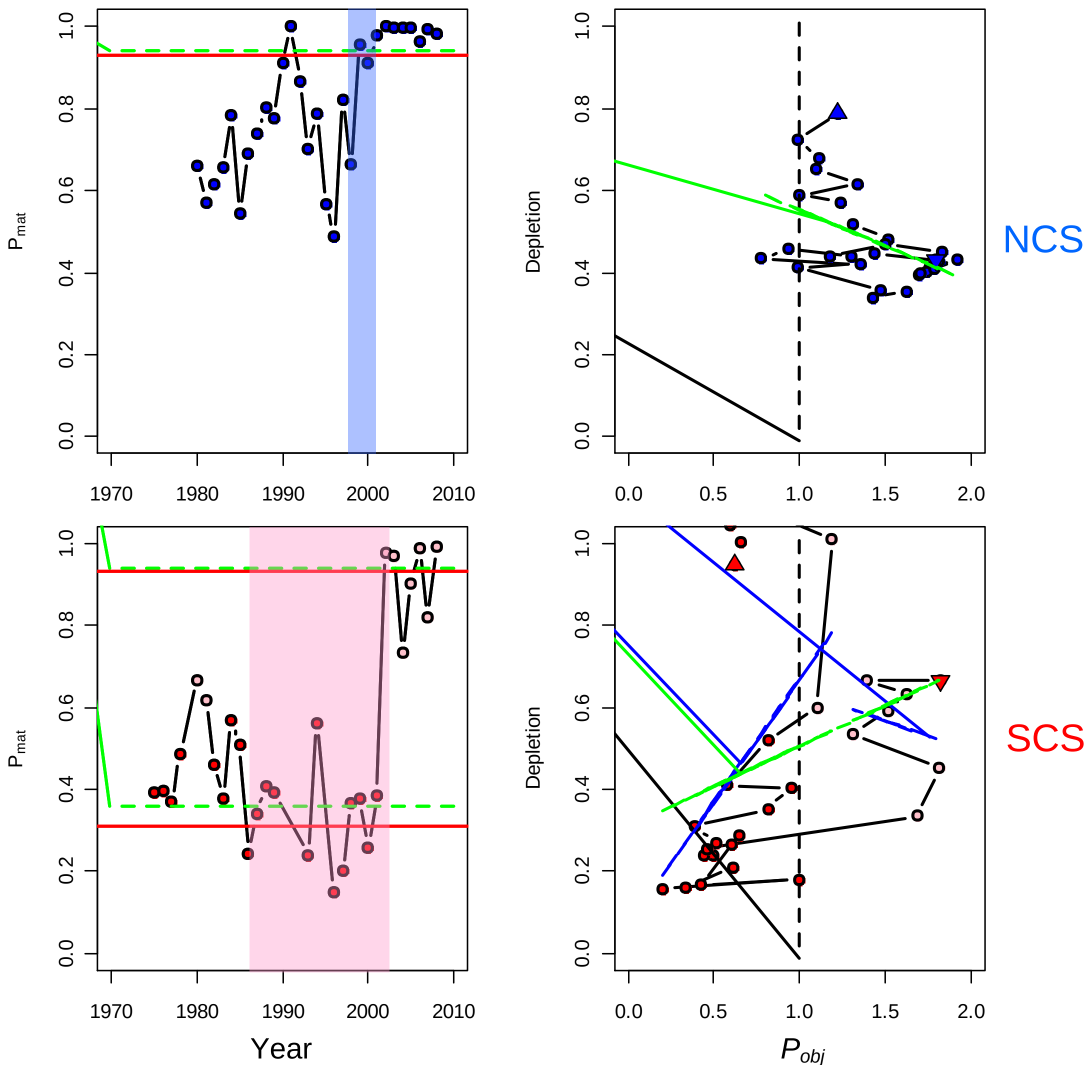

Figure 110. Relationship between P_x values and stock status for the NCS (top row) and SCS (bottom row). Left columns: Proportion of catch mature (P_{mat}) through time. Green broken line is the $SB_{40\%}$ proxy based on P_{mat}; red solid line is the $SB_{25\%}$ proxy based on P_{mat}. Shaded areas indicate years wherein the biomass falls below $SB_{40\%}$according to the sub-stock assessment. Left column: P_{obj} as it relates to depletion rate. Green line is the linear relationship. Blue lines are the linear relationship for different selectivity periods in the fishery.

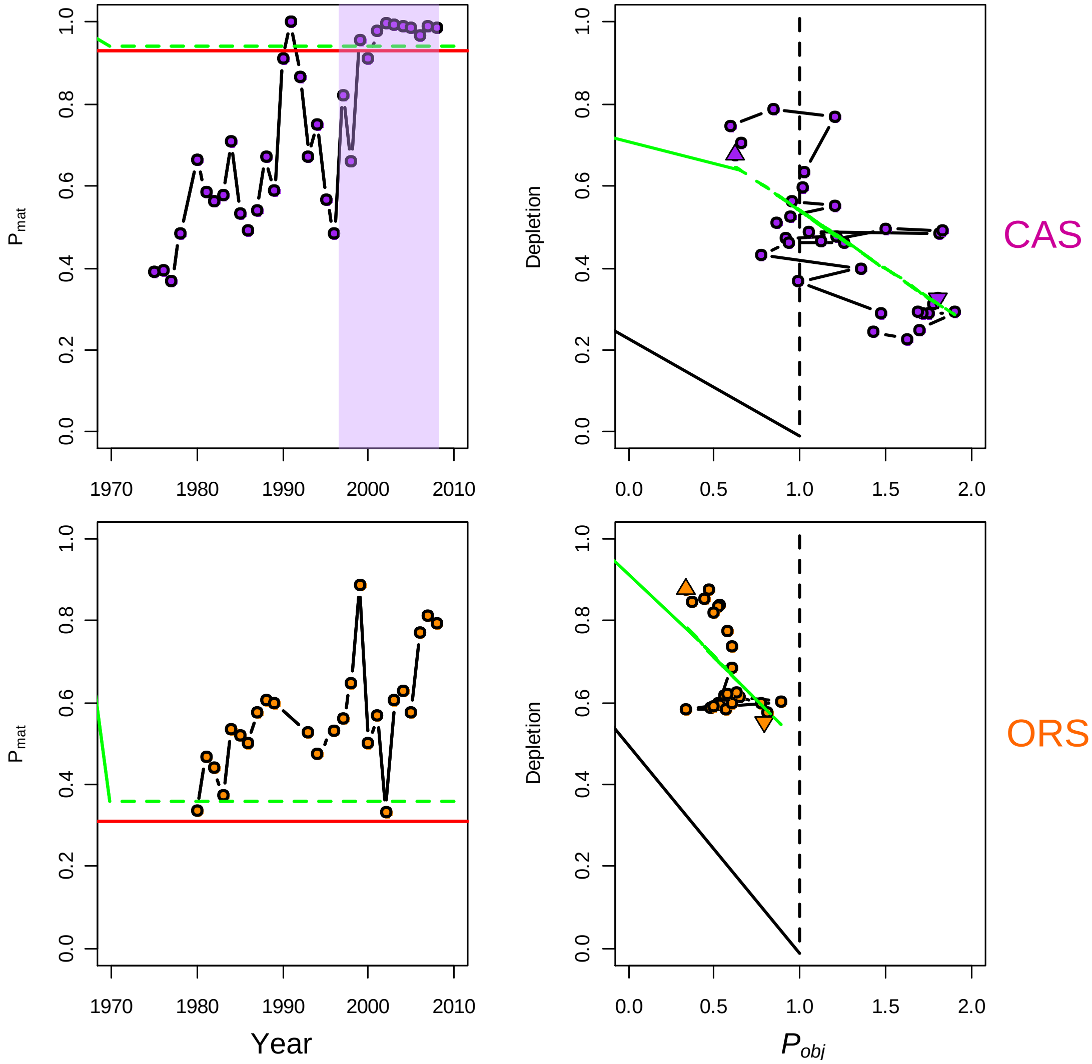

Figure 111. Relationship between P_x values and stock status for the CAS (top row) and ORS (bottom row). Left columns: Proportion of catch mature (P_{mat}) through time. Green broken line is the $SB_{40\%}$ proxy based on P_{mat}; red solid line is the $SB_{25\%}$ proxy based on P_{mat}. Shaded areas indicate years wherein the biomass falls below $SB_{40\%}$according to the sub-stock assessment. Left column: P_{obj} as it relates to depletion rate. Green line is the linear relationship.

Appendix A. Summary of California Management Measures Affecting Cabezon.

Year	Description	Effective Date
1982	Recreational & commercial size limit 12" (30.5 cm), TL	1/1/1982
Pre-1996	Recreational Regulations Recreational fillet length size limit of 12” (30.5 cm)	3/1/1996?
1999	Nearshore Fisheries Management Act gives Fish and Game Commission (FGC) additional authority to regulate fisheries (FG Code §8585.5)	1/1/1999
1999	After January 1, 1999 FGC may adopt regulations to regulate nearshore fish stock and fisheries (FG Code §8587.2)	1/1/1999
1999	Trawl caught dead nearshore (including cabezon) are exempt from size limits (FG Code §8588 (a))	1/1/1999
1999	Commercial size limit 14" (35.6 cm), TL (trawl caught dead nearshore fishes exempt)	1/1/1999
2000	Recreational size limit 14" (35.6 cm), TL	1/1/2000
2000	Recreational Regulations Shall not be filleted on a boat	3/1/2000
Pre-2003	Recreational Bag Limit of 10 fish w/in 20 fish aggregate	3/1/1984
1999	Nearshore fish stock defined with a nearshore fishery permit requirement to take cabezon	4/1/1999
2000	FGC fixes cabezon OY at 67,132 pounds (37.6%) recreational; 111,596 pounds (62.4%) commercial; Total = 178,728 pounds	10/2000
2001	Establishes a December 31, 1999 control date to qualify for the Restricted Access program (CCR Title 14 §150 (d))	10/13/2000
2000	FGC changes cabezon OY at 63,608 pounds (40.3%) recreational; 94,398 pounds (59.7%) commercial; Total = 158,006 pounds	12/2000
2001	Prohibit take from Thursday to Sunday, inclusive (except north of 40°10’ – near Cape Mendocino)	01/2001
2001	Recreational Regulations Central and Southern Management Areas; Recreational Fishery open year round; no depth restrictions, except no take in Cowcod Closure area in southern management area in waters 20 fm or greater.	1/1/2001
2001	Size limit increased to 15" (38.1 cm), TL (recreational and commercial)	3/1/2001
2001	FGC fixes cabezon OY at 63,608 pounds recreational; 94,398 pounds commercial; Total OY = 158,006 pounds in emergency regulations	9/1/2001
2001	FGC enacts emergency action to close commercial fishery for the remainder of the calendar year	9/24/2001
2001	Limitation on the number of hooks (150) used to take nearshore stocks and the number of hooks per line (15)	3/5/2001

2001	Defines nearshore fish stocks (including cabezon), nearshore fisheries, nearshore waters, and shallow nearshore rockfish (CCR Title 14 §1.90 (a)(b))	3/5/2001
2001	Prohibits the take of cabezon in the northern rockfish and lingcod management area during March and April or in the southern rockfish and lingcod management area in January and February (CCR Title 14 §150.16 (a)	3/5/2001
2001	Commercial seasonal closures for cabezon shall apply that are consistent with federal seasonal closures for minor nearshore rockfishes, as noticed in the Federal Register by the National Marine Fisheries Service or defined in Title 50, Code of Federal Regulations (CFR), Parts 600 and 600, for ocean waters south of 40°10' (CCR Title 14 §150.06 (c)	3/5/2001
2002	Finfish traps required to have rigid 5” rings in entrance	1/8/2002
2002	FGC fixes cabezon OY at 84,330 pounds (47.2%) recreational; 94,398 (52.8%) pounds commercial; Total OY = 178,728 pounds reaffirming emergency action	2/4/2002
2002	FGC enacts emergency action to close commercial fishery for the remainder of the calendar year	7/01/2002
2002	Recreational Regulations Recreational Area Mgmt areas changed	1/10/2002
2002	Recreational Regulations Emergency Sportfishing Closure for cabezon in waters deeper than 20 fm for all boat-based anglers south of 40º10' N lat.	7/29/2002
2003	FGC fixes cabezon OY at 84,330 pounds (47.2%) recreational; 94,398 (52.8%) pounds commercial; Total OY = 178,728 pounds	1/1/2003
2003	Recreational Regulations Recreational rockfish, cabezon, and greenling (RCG) complex; 10 fish bag-limit regulation established in the Central and Southern Management Areas	1/1/2003
2003	Recreational Regulations Northern Management Area (CA/OR border to 40º10' N lat.): recreational bag limit remains at 10 fish (outside the rockfish bag limit); Open year round; No depth Restriction North-Central, South-Central and Southern Management Areas (40º10' N lat. to US/Mexico border): recreational bag limit 3 fish with in the RCG bag limit; Open July-Dec; 20 fm or less	1/3/2003
2003	Cumulative trip limits set for two-month periods, includes a two month closure from March to April.	
2003	FGC regulatory changes enacted as follows: Seasons: Jan-Feb – open Mar-Apr – closed May-Dec – open (or until the TAC allocation has been reached) Cumulative trip limits per nearshore permittee for January and February set at 200 pounds	1/1/2003

2003	Participants must have a valid 2003-2004 nearshore fishery permit for one regional management area (CCR Title 14 § 52.04)	2/8/2003
2003	CCR Title 14 §150 (c) defines nearshore fishes (including cabezon) used for landings qualifications and their respective market category codes	3/10/2003
2003	Commercial RCAs 42° N lat. to 40°10' N lat. – closed 27 fm to 100 fm South of 40°10 N lat. January – June – closed 20 fm to 150 fm July-August – closed 20 fm to 150 fm, except between a line drawn due south from Point Fermin and a line drawn due west from Newport South Jerry, vessels fishing with hook and line and/or trap(or pot) gear may operate from shore to a boundary line approximating 50 fm September to December – 20 fm to 150 fm	5/7/2003
2003	Participants must have a valid 2003-2004 nearshore fishery permit for one management region.	4/1/2003
2003	FGC enacts emergency action to close commercial fishery for the remainder of the calendar year	7/10/2003
2003	Recreational Regulations Emergency sportfishing closure for cabezon statewide for all boat-based angers	12/8/2003
2003	Changes to Commercial RCAs 40°10' N lat to 34°27' N lat – closed 20 fm to 150 fm south of 34°27' N lat July-August – closed 20 fm to 150 fm (special open area in Pt. Fermin/Newport South Jetty area) September to December – closed 30 fm to 150 fm	9/5/2003
2003	Weekday commercial closures repealed	12/3/2003
2003	Changes to Commercial RCAs South of 42° N lat.– November to December – closed shoreline to 150 fm	11/26/2003
2003	Additional cabezon cumulative trip limit regulations affecting the commercial take are defined. Cumulative two-month trip limits for the entire year are listed (CCR Title 14 § 150.16 (e)(6)(A))	12/7/2003
2004	FGC fixes cabezon OY at 118,300 pounds (61%) recreational; 75,600 pounds (39%) commercial; Total OY = 193,300 pounds	12/3/2003
2004	Seasonal closure periods in alignment with federal nearshore rockfish (north and south of 40°10' N lat) (repealed and new subsection)	1/15/2004
2004	Recreational Regulations Northern Management Area (CA/OR border to 40º10' N lat.): recreational bag limit remains at 10 fish (outside the rockfish bag limit); Open year round; No depth Restriction	1/1/2004

	Central Management Area (40º10' N lat. to Point Conception): recreational bag limit 3 fish within the RCG bag limit; Open Jan-Feb (30 fm or less), May-Aug (20 fm or less), and Sep-Dec (30 fm or less) Southern Management Area (Point Conception to US/Mexico border): recreational bag limit 3 fish within the RCG bag limit; Open Mar-Dec; 60 fm or less	
2004	Recreational Regulations Northern Management Area (CA/OR border to 40º10' N lat.): recreational bag limit 3 fish within the RCG bag limit; Open Jun-Dec; 30 fm or less North-Central Management Area (40º10' N lat. to Point Lopez): recreational bag limit 3 fish within the RCG bag limit; Open Aug-Oct; 30 fm or less South-Central Management Area (40º10' N lat. to Point Lopez): recreational bag limit 3 fish within the RCG bag limit; Open Jun (30 fm or less), Aug (30 fm or less), Sep-Dec (20 fm or less) Southern Management Area (Point Conception to US/Mexico border): recreational bag limit 3 fish within the RCG bag limit; Open Jun-Aug (60 fm or less), Sep-Oct (30 fm or less), Nov-Dec (60 fm or less)	6/4/2004
2004	Commercial Regulations 42° N lat. to 40°10' N lat - closed 30 fm to 100 fm 40°10' N lat to 34°27' N lat. January to April – closed 30 fm to 150 fm May to August – closed 20 fm to 150 fm September to December – closed 30 fm to 150 fm South of 34°27' N lat. – closed 60 fm to 150 fm	1/8/2004
2004	FGC enacts emergency action to close commercial fishery for the remainder of the calendar year	9/4/2004
2005	FGC fixes cabezon OY at 92,800 pounds (61%) recreational; 59,300 pounds (39%) commercial; Total OY = 152,100 pounds	1/1/2005
2005	Commercial Regulations 42° N lat. to 40°10' N lat - closed 30 fm to 100 fm 40°10' N lat to 34°27' N lat. January to April – closed 30 fm to 150 fm May to August – closed 20 fm to 150 fm September to December – closed 30 fm to 150 fm South of 34°27' N lat. – closed 60 fm to 150 fm	1/1/2005
2005	Recreational Regulations 42° N lat to 40°10' N lat - Open Jul1–Oct 31 40 fm restriction, 3 cabezon sub bag limit 40°10' N lat. to 37°11' N lat. - Open Jul 1–Nov 30 20 fm restriction, 3 cabezon sub bag limit 37°11' N lat. to 36° N lat. - Open Jul 1–Nov 30	1/1/2005

	20 fm restriction, 3 cabezon sub bag limit 36° N lat. to 34°27’ N lat. - Open May 1–Sep 30 between 20-40 fm, 3 cabezon sub bag limit South of 34°27’ N lat. - Open Mar 1–Jun 30 between 30-60 fm; Jul 1-Sep 30, 40 fm restriction, 3 cabezon sub bag limit	
2005	Revised cumulative two month commercial trip limits established January – February – 300 lb/ 2 months March – April – closed May – June – 250 lb/2 months July – August – 150 lb/2 months September - October – 900 lb/2 months November - December – 100 lb/2 months	3/31/2005
2005	Recreational Regulations Recreational sub bag limit reduced from 3 fish to one fish	4/1/2005
2005	Recreational Regulations 42° N lat to 40°10’ N lat – extend season to May through Dec, 30 fm depth restriction 40°10 N lat. to 36° N lat. – extend season to July through Dec 36° N lat. to 34°27’ N lat – liberalize the RCA to 40 fm (instead of only open between 20 and 40) South of 34°27’ N lat. – extend season from March through December depth restrictions: March – status quo – open 30-60 fm April – August – 60 fm restriction Sept – Oct – 30 fm restriction Nov-Dec – 60 fm restriction	5/1/2005
2005	FGC enacts emergency action to close commercial fishery for the remainder of the calendar year	10/01/2005
2005	Recreational Regulations Emergency sportfishing closure – the Northern and North-Central Management Area closed Oct-Dec for all anglers	10/18/2005
2006	FGC fixes cabezon OY at 92,800 pounds (61%) recreational; 59,300 pounds (39%) commercial; Total OY = 152,100 pounds	1/1/2006
2006	Recreational Regulations 42° N lat to 40°10’ N lat - Open Jul 1–Oct 31 40 fm restriction, 1 cabezon sub bag limit 40°10’ N lat. to 37°11’ N lat. - Open Jul 1–Nov 30 20 fm restriction, 1 cabezon sub bag limit	1/1/2006

	37°11' N lat. to 36° N lat. - Open Jul 1–Nov 30 20 fm restriction, 1 cabezon sub bag limit 36° N lat. to 34°27' N lat. - Open May 1–Sep 30 between 20-40 fm, 1 cabezon sub bag limit South of 34°27' N lat. - Open Mar 1–Jun 30 between 30-60 fm; Jul 1-Sep 30, 40 fm restriction, 1 cabezon sub bag limit	
2006	Commercial Sep-Oct cumulative trip limit reduced from 900 lb to 200 lb (inseason) to remain within TAC	9/1/2006
2007	FGC fixes cabezon OY at 92,800 pounds (61%) recreational; 59,300 pounds (39%) commercial; Total OY = 152,100 pounds	1/1/2007
2007	Commercial RCAs – 42° N lat. to 40°10'N lat. - closed 30 fm to 100 fm 40°10'N lat. to 34°27' N lat – closed 30 fm to 150 fm South of 34°27' N lat. - closed 60 fm to 150 fm	1/1/2007
2007	Recreational Regulations 42° N lat. to 40°-10' N lat. – open May 1–Dec 31 30 fm restriction, 1 cabezon sub bag limit 40°10' N lat. to 37°11' N lat. – open Jun 1–Nov 30 30 fm restriction, 1 cabezon sub bag limit 37°11' N lat. to 34°27' N lat. – open May 1–Nov 30 40 fm restriction, 1 cabezon sub bag limit South of 34°27 N lat. – open Mar1–Dec 31 60 fm restriction, 1 cabezon sub bag limit	1/1/2007
2007	Commercial September-October cumulative trip limit reduced from 900 lb to 200 lb (inseason) to remain within TAC	9/1/2007
2007	Recreational Regulations Emergency sportfishing closure north of 37°11' N lat (North and North-Central management Areas)	10/1/2007
2008	FGC fixes cabezon OY at 92,800 pounds (61%) recreational; 59,300 pounds (39%) commercial; Total OY = 152,100 pounds	1/1/2008
2008	Recreational Regulations Emergency sportfishing regulations – changed the maximum depth restriction north of 37°11' N lat. to 20 fm (from 30 fm)	5/10/2008
2008	Commercial September-October cumulative trip limit reduced from 900 lb to 300 lb (inseason) to remain within TAC	9/1/2008
	Commercial RCA 42° N lat. to 40°10' N lat – close 30 fm to 100fm	
2008	Recreational Regulations Emergency sportfishing closure north of Point Arena (38°57.5' N lat.) and created a new management area (split the North-Central into two areas)	9/2/2008

2009	FGC fixes cabezon OY at 92,800 pounds (61%) recreational; 59,300 pounds (39%) commercial; Total OY = 152,100 pounds	3/1/2009
2009	Change to commercial RCA – 42° N lat. to 40°10' N lat. – close 20 fm -100 fm	3/1/2009
2009	Recreational Regulations 42° N lat. to 40°-10' N lat. – open May 15–Sep 15 20 fm restriction, 2 cabezon sub bag limit 40°10' N lat. to 38°57.5' N lat. – open May 15–Aug 15 20 fm restriction, 2 cabezon sub bag limit 38°57.5' N lat. to 37°11' N lat. – open Jun 13–Oct 31 30 fm restriction, 2 cabezon sub bag limit 37°11' N lat. to 34°27' N lat. – open May 1–Nov 15 40 fm restriction, 2 cabezon sub bag limit South of 34°27 N lat. – open Mar 1–Dec 31 60 fm restriction, 2 cabezon sub bag limit	3/1/2009
	Emergency closures enacted by the Fish and Game Commission for the commercial cabezon statewide fishery 2001 – closed from Sept. 21 to Dec. 31 2002 – closed from July 1 to Dec. 31 2003 – closed from July 10 to Dec. 31 2004 – closed from Sept. 4 to Dec. 31 2005 – closed from Oct. 1 to Dec. 31	

Appendix B. Summary of Oregon Management Measures Affecting Cabezon.

Year	Effective Jan. 1 (regulations set preseason)	Inseason Changes and Effective Dates
2008	Rockfish, cabezon (16" min.), greenling (10" min.): 6 Stonewall Bank YRCA: Closed for P. halibut and most marine species (open for salmon and offshore pelagic species). North of Humbug Mt.: Retention of any groundfish species other than sablefish is prohibited on all-depth P. halibut days when P. halibut is aboard vessel. North of Cape Falcon: Retention of any groundfish species other than sablefish and Pacific cod is prohibited on all-depth P. halibut days when P. halibut is aboard vessel.	7/7 Rockfish et al bag limit reduced from 6 to 5 and closed outside 20-fm line through Dec. 31; flatfish closed outside 40-fm line through Dec. 31 8/21 Cabezon prohib. for boats 9/7 Return to preseason regs., i.e., rockfish et al bag limit 6 and waters closed offshore of 40-fm line through Sept. 30
2007	Rockfish, cabezon (16" min.), greenling (10" min.): 6 Stonewall Bank YRCA: Closed for P. halibut and most marine species (open for salmon and offshore pelagic species). North of Humbug Mt.: Retention of any groundfish species other than sablefish is prohibited on all-depth P. halibut days when P. halibut is aboard vessel. North of Cape Falcon: Retention of any groundfish species other than sablefish and Pacific cod is prohibited on all-depth P. halibut days when P. halibut is aboard vessel.	8/11 Cabezon prohib. for boats
2006	Rockfish, cabezon (16" min.), greenling (10" min.), flounder, sole and other marine species not listed: 6 North of Humbug Mt.: Retention of any groundfish species other than sablefish is prohibited on all-depth P. halibut days when P. halibut is aboard vessel. North of Cape Falcon: Retention of any groundfish species other than sablefish and Pacific cod is prohibited on all-depth P. halibut days when P. halibut is aboard vessel.	9/23 Cabezon prohib. for boats

Year	Effective Jan. 1 (regulations set preseason)	Inseason Changes and Effective Dates
2005	Rockfish, cabezon (16" min.), greenling (10" min.), flounder, sole and other marine species not listed: 8 North of Humbug Mt.: Retention of any groundfish species other than sablefish is prohibited on all-depth P. halibut days when P. halibut is aboard vessel.	7/16 Rockfish *et al* bag limit reduced to 5 8/11 Cabezon prohib. for boats 10/18 P. halibut and groundfish closed <40 fm for boats
2004	Rockfish, cabezon (16" min.), greenling (10" min.): 10 40-fm curve: Seaward closed June 1-Sept. 30.	8/18 Cabezon prohib.
2003	Rockfish, cabezon (15" min.), greenling, flounder, sole and other marine species not listed: 10	11/21 ocean closed to GF outside 27-fm line
2002 through 2000	Rockfish: 10 Other fish: 25	
1999 through 1994	Rockfish: 15 Other fish: 25	
1993 through 1978	Rockfish, cabezon and greenling: 15 Other fish: 25	Effective 4/1/1978
1977	Other fish: 25, no more than 5 lingcod and 2 halibut	
1976	Other fish: 25, no more than 5 lingcod and 2 halibut	No bag limits prior 1976

Appendix C-1. Data file for NCS.

NCS cabezon data file 2009, SS v3.03a, May 2009
1916 #_styr
2008 #_endyr
1 #N_seasons_per_year
12 #vector_with_N_months_in_each_season
1 #spawning_season_-_spawning_will_occur_at_beginning_of_this_season
7 #N_fishing_fleets
7 #N_surveys_data_type_numbers_below_must_be_sequential_with_the_N_fisheries4
1 #Number of areas

fleet1%fleet2%fleet3%fleet4%fleet5%fleet6%fleet7%survey1%survey2%survey3%survey4%survey5%survey6%survey7
0.5 0.5 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 1 1 1 1 1 1 1 1 1 1 1 1 1 #_area_assignments_for_each_fishery_and_survey
1 1 1 1 1 1 1 # Units for catch by fishing fleet: 1=Biomass(mt),2=Numbers(1000s)
0.01 0.01 0.01 0.01 0.01 0.01 0.01 # SE of log(catch) by fleet for equilibrium and continuous options

2 #number_of_genders(1 2)
35 #accumulator_age _model_always_starts_with_age_0

#Catch (mt)
#Fleet1 Fleet2 Fleet3 Fleet4 Fleet5 Fleet6 Fleet7
#CommNL CommL MM Shore PBR CPFV age-samplsYear Season
0 0 0 0 0 0 0 #initial_equilibrium
93 # Number of lines catch data - FINAL CATCHES w/discards

0.03	0.00	0.33	0.71	0.00	0.00	0	1916	1
0.15	0.00	0.33	0.71	0.00	0.00	0	1917	1
0.08	0.00	0.33	0.71	0.00	0.00	0	1918	1
0.00	0.00	0.33	0.71	0.00	0.00	0	1919	1
0.00	0.00	0.33	0.71	0.00	0.00	0	1920	1
0.00	0.00	0.33	0.71	0.00	0.00	0	1921	1
0.00	0.00	0.33	0.71	0.00	0.00	0	1922	1
0.00	0.00	0.33	0.71	0.00	0.00	0	1923	1
0.00	0.00	0.33	0.71	0.00	0.00	0	1924	1
1.52	0.00	0.33	0.71	0.00	0.00	0	1925	1
0.00	0.00	0.33	0.71	0.00	0.00	0	1926	1
0.34	0.00	0.33	0.71	0.00	0.00	0	1927	1
1.19	0.00	0.33	0.71	0.00	0.00	0	1928	1
0.54	0.00	0.33	0.71	0.49	0.98	0	1929	1
0.47	0.00	0.49	1.06	0.73	1.47	0	1930	1
0.51	0.00	0.66	1.41	0.98	1.96	0	1931	1
2.12	0.00	0.82	1.76	1.22	2.44	0	1932	1
1.90	0.00	0.99	2.11	1.46	2.93	0	1933	1
2.37	0.00	1.15	2.47	1.71	3.42	0	1934	1
4.71	0.00	1.31	2.82	1.95	3.90	0	1935	1
8.33	0.00	1.85	3.96	2.74	5.48	0	1936	1
3.71	0.00	1.60	3.42	2.37	4.74	0	1937	1
2.46	0.00	3.05	6.54	4.53	9.06	0	1938	1
1.82	0.00	1.74	3.72	2.58	5.15	0	1939	1
1.51	0.00	2.53	5.43	3.76	7.53	0	1940	1
6.02	0.00	1.93	5.17	0.00	5.72	0	1941	1
1.04	0.00	1.93	5.17	0.00	5.72	0	1942	1
3.41	0.00	1.93	5.17	0.00	5.72	0	1943	1
1.75	0.00	1.93	5.17	0.00	5.72	0	1944	1
1.95	0.00	1.93	5.17	0.00	5.72	0	1945	1
3.54	0.00	1.93	5.17	0.00	5.72	0	1946	1
2.05	0.00	7.65	20.50	11.36	22.72	0	1947	1
3.71	0.00	10.25	27.46	15.22	30.43	0	1948	1
7.27	0.00	9.38	25.13	13.92	27.85	0	1949	1
9.54	0.00	10.77	28.86	15.99	31.98	0	1950	1
10.80	0.00	12.76	34.18	18.94	37.89	0	1951	1
15.60	0.00	6.65	17.82	9.87	19.75	0	1952	1
6.02	0.00	4.68	12.54	6.95	13.90	0	1953	1
2.82	0.00	3.48	9.33	5.17	10.34	0	1954	1
3.14	0.00	3.10	8.30	9.19	9.19	0	1955	1
5.57	0.00	6.78	18.17	20.14	20.14	0	1956	1
5.63	0.00	6.06	16.25	18.01	18.01	0	1957	1
8.79	0.00	4.18	11.48	12.41	12.41	0	1958	1

4.30	0.00	3.33	14.97	9.88	9.88	0	1959	1
1.39	0.00	1.56	11.48	12.24	4.93	0	1960	1
2.24	0.00	1.53	11.48	9.93	4.00	0	1961	1
1.12	0.00	2.39	18.95	15.55	6.27	0	1962	1
1.27	0.00	5.29	41.89	34.39	13.85	0	1963	1
2.33	0.00	2.98	16.85	19.36	7.80	0	1964	1
3.36	0.00	4.01	22.66	26.04	10.49	0	1965	1
5.66	0.00	4.94	27.96	32.12	12.94	0	1966	1
6.44	0.00	2.58	14.59	16.77	6.76	0	1967	1
9.06	0.00	2.22	12.55	14.43	5.81	0	1968	1
11.68	0.00	2.35	13.28	15.26	6.15	0	1969	1
4.76	0.00	3.75	21.22	24.39	9.83	0	1970	1
2.03	0.00	2.23	12.62	14.50	5.84	0	1971	1
2.62	0.00	4.94	27.92	32.08	12.93	0	1972	1
2.05	0.00	4.78	27.07	31.10	12.53	0	1973	1
6.69	0.00	4.23	23.93	27.50	11.08	0	1974	1
3.30	0.00	2.52	14.24	16.36	6.59	0	1975	1
8.60	0.00	3.75	17.65	24.35	9.81	0	1976	1
5.40	0.00	6.76	17.90	24.68	9.94	0	1977	1
12.57	0.00	10.96	29.00	39.99	16.11	0	1978	1
22.61	0.00	6.22	16.47	22.71	9.15	0	1979	1
23.66	0.00	10.87	36.54	44.59	11.52	0	1980	1
28.95	0.00	7.20	13.58	69.75	10.05	0	1981	1
28.79	0.00	3.45	30.33	28.34	11.62	0	1982	1
10.78	0.00	8.03	36.73	33.06	9.80	0	1983	1
8.63	0.00	10.77	10.88	45.59	4.18	0	1984	1
11.95	0.00	4.72	10.98	24.33	3.05	0	1985	1
7.36	0.00	5.98	36.00	56.88	8.02	0	1986	1
3.82	0.00	4.92	14.95	55.70	7.74	0	1987	1
5.42	0.00	8.78	26.42	41.49	7.59	0	1988	1
11.16	0.00	3.98	26.94	45.82	4.25	0	1989	1
11.45	0.00	3.50	14.94	28.31	5.40	0	1990	1
5.94	0.00	3.66	15.60	29.56	5.64	0	1991	1
16.62	0.00	7.74	33.05	62.63	11.96	0	1992	1
19.19	0.40	2.03	25.64	47.63	5.62	0	1993	1
9.33	26.52	1.20	12.59	29.26	3.07	0	1994	1
11.60	70.60	0.74	20.46	45.33	5.55	0	1995	1
8.10	97.07	1.96	29.64	34.96	5.53	0	1996	1
21.70	101.64	2.04	39.87	9.89	5.46	0	1997	1
14.34	148.99	0.66	46.66	21.23	7.92	0	1998	1
8.77	104.71	0.47	5.16	21.34	7.37	0	1999	1
5.48	91.06	0.32	9.80	15.22	5.65	0	2000	1
3.29	56.69	5.86	3.12	27.79	8.69	0	2001	1
5.08	39.62	0.47	12.12	18.03	3.73	0	2002	1
3.88	36.80	1.49	14.11	66.20	12.06	0	2003	1
3.21	45.44	2.75	9.54	21.37	6.72	0	2004	1
3.83	27.83	1.95	3.53	24.54	9.92	0	2005	1
3.92	25.25	0.25	1.74	14.38	5.33	0	2006	1
3.36	22.98	1.94	1.49	10.67	4.22	0	2007	1
2.03	17.81	0.77	6.27	8.51	4.08	0	2008	1

#Abundance_Indices -CPFV logbook for northern California- excluded 2000 on due to regs
150 #_N_observations

#Year	Season	Type	Value	CV		
1960	1	8	0.011	0.1314	#CPFV	1960-1999
1961	1	8	0.0104	0.1295		
1962	1	8	0.0116	0.1489		
1963	1	8	0.0189	0.145		
1964	1	8	0.0193	0.1391		
1965	1	8	0.0231	0.1264		
1966	1	8	0.0228	0.1357		
1967	1	8	0.0132	0.1293		
1968	1	8	0.0083	0.1385		
1969	1	8	0.007	0.152		
1970	1	8	0.0112	0.1368		
1971	1	8	0.0082	0.1412		
1972	1	8	0.0146	0.1104		
1973	1	8	0.0126	0.1096		
1974	1	8	0.0115	0.1133		
1975	1	8	0.0069	0.1113		

1976	1	8	0.0086	0.1204	
1977	1	8	0.0084	0.1359	
1978	1	8	0.0158	0.1156	
1980	1	8	0.0116	0.1198	
1981	1	8	0.007	0.1357	
1982	1	8	0.0055	0.1374	
1983	1	8	0.0062	0.1383	
1984	1	8	0.0029	0.1493	
1985	1	8	0.0021	0.1685	
1986	1	8	0.0043	0.1965	
1987	1	8	0.0068	0.15	
1988	1	8	0.0081	0.1375	
1989	1	8	0.0068	0.1589	
1990	1	8	0.0051	0.1221	
1991	1	8	0.0039	0.1579	
1992	1	8	0.0055	0.1452	
1993	1	8	0.0036	0.1514	
1994	1	8	0.0023	0.1877	
1995	1	8	0.0021	0.1782	
1996	1	8	0.0037	0.161	
1997	1	8	0.0045	0.1423	
1998	1	8	0.0041	0.1497	
1999	1	8	0.0052	0.1606	
2000	1	9	0.001973241	0.1905504	#CPFV 2000-2008
2001	1	9	0.00419535	0.1804157	
2002	1	9	0.001621111	0.2366469	
2003	1	9	0.007002323	0.1478856	
2004	1	9	0.005998673	0.1550706	
2005	1	9	0.006397351	0.1678667	
2006	1	9	0.00338893	0.1805034	
2007	1	9	0.003429973	0.1940449	
2008	1	9	0.004212459	0.181244	
1960	1	10	0.011189686	0.1403355	#CPFV 1960-2008
1961	1	10	0.010454995	0.1287348	
1962	1	10	0.011803248	0.1573131	
1963	1	10	0.018824835	0.1473084	
1964	1	10	0.01954609	0.1436568	
1965	1	10	0.023159354	0.1232461	
1966	1	10	0.023269051	0.1289916	
1967	1	10	0.013506577	0.1255457	
1968	1	10	0.008479818	0.1362345	
1969	1	10	0.007234217	0.1589584	
1970	1	10	0.011299674	0.1328118	
1971	1	10	0.008333628	0.1283073	
1972	1	10	0.014670537	0.1058603	
1973	1	10	0.012657511	0.1089924	
1974	1	10	0.011692142	0.1058872	
1975	1	10	0.007025193	0.1062976	
1976	1	10	0.008695207	0.1138991	
1977	1	10	0.008576544	0.1340326	
1978	1	10	0.01610517	0.1095806	
1980	1	10	0.011939013	0.1206656	
1981	1	10	0.007125414	0.1318622	
1982	1	10	0.005638644	0.1389786	
1983	1	10	0.006232833	0.1411077	
1984	1	10	0.002871991	0.1435943	
1985	1	10	0.00213849	0.1631991	
1986	1	10	0.004334673	0.1906836	
1987	1	10	0.006791934	0.1382016	
1988	1	10	0.008114207	0.1351386	
1989	1	10	0.006791293	0.1469791	
1990	1	10	0.005022444	0.1199596	
1991	1	10	0.00394981	0.1423868	
1992	1	10	0.005579659	0.1413498	
1993	1	10	0.003614237	0.1467767	
1994	1	10	0.002305334	0.1949135	
1995	1	10	0.00210529	0.1741876	
1996	1	10	0.003781507	0.1580962	
1997	1	10	0.00449938	0.1419203	
1998	1	10	0.004014023	0.1521422	

1999	1	10	0.005113424	0.1441433	
2000	1	10	0.003388209	0.1651355	
2001	1	10	0.00682279	0.1645581	
2002	1	10	0.002677995	0.21337	
2003	1	10	0.011514264	0.1280046	
2004	1	10	0.009188242	0.1323926	
2005	1	10	0.009875835	0.1309226	
2006	1	10	0.005257004	0.1443985	
2007	1	10	0.005668318	0.1535073	
2008	1	10	0.006790803	0.1421037	
1977	1	11	0.6282	0.3117	#TENERA adult
1978	1	11	0.9299	0.6584	
1979	1	11	0.8947	0.1842	
1980	1	11	0.7827	0.4417	
1981	1	11	0.5391	0.5321	
1982	1	11	0.7835	0.5442	
1983	1	11	0.5204	0.5568	
1984	1	11	0.252	0.7899	
1985	1	11	0.5272	0.4939	
1986	1	11	1.6052	0.5201	
1987	1	11	0.7935	0.6916	
1988	1	11	0.9752	0.4046	
1989	1	11	0.9113	0.3631	
1990	1	11	0.8514	0.3892	
1991	1	11	1.1086	0.2669	
1992	1	11	0.6737	0.4345	
1993	1	11	0.36	1.0358	
1994	1	11	0.3001	0.183	
1995	1	11	0.3806	0.5293	
1996	1	11	0.3287	1.0193	
1997	1	11	0.5408	0.3845	
1999	1	11	0	1.8341	
2000	1	11	0.2644	0.3253	
2001	1	11	0.2667	0.44	
2002	1	11	0.2339	0.2249	
2003	1	11	0.3397	0.2538	
2004	1	11	0.5032	0.2911	
2005	1	11	0.324	0.1774	
2006	1	11	0.4918	0.3489	
2007	1	11	0.1668	0.447	
2008	1	11	0.3515	0.2369	
1999	1	12	0.0880	0.256873	#PISCO Adults
2000	1	12	0.0731	0.2851443	
2001	1	12	0.1029	0.2512754	
2002	1	12	0.0569	0.2174249	
2003	1	12	0.1112	0.1100548	
2004	1	12	0.0591	0.1746166	
2005	1	12	0.0553	0.1824315	
2006	1	12	0.0547	0.1735423	
2007	1	12	0.0550	0.1277854	
2008	1	12	0.0631	0.1163246	
1999	1	13	0.088	0.2569	#PISCO
2000	1	13	0.0731	0.2851	
2001	1	13	0.1029	0.2513	
2002	1	13	0.0568	0.2174	
2003	1	13	0.1112	0.1101	
2004	1	13	0.0591	0.1746	
2005	1	13	0.0553	0.1824	
2006	1	13	0.0547	0.1735	
2007	1	13	0.055	0.1278	
2008	1	13	0.0631	0.1163	
2006	1	14	0.2755	0.4435	#SLO
2007	1	14	0.2769	0.5095	
2008	1	14	1.1772	0.2981	

#_Discard_Biomass
1 #_(1=biomass _2=fraction)
0 #_N_observations

#_Mean_BodyWt
102

# Year	Seas	Type	Partition	Value	CV
1980	1	3	2	0.826	1.447
1981	1	3	2	0.707	0.802
1982	1	3	2	0.732	0.833
1983	1	3	2	0.746	0.815
1984	1	3	2	1.124	0.846
1985	1	3	2	0.558	0.975
1986	1	3	2	0.905	0.830
1987	1	3	2	0.775	0.834
1988	1	3	2	1.267	0.914
1989	1	3	2	0.625	0.709
1993	1	3	2	0.551	0.978
1994	1	3	2	0.936	0.672
1995	1	3	2	0.290	0.415
1996	1	3	2	0.542	0.722
1997	1	3	2	0.736	0.890
1998	1	3	2	0.686	0.618
1999	1	3	2	0.233	1.199
2000	1	3	2	0.540	0.105
2001	1	3	2	1.111	0.573
2002	1	3	2	0.348	0.706
2003	1	3	2	1.105	0.902
2004	1	3	2	1.061	0.981
2005	1	3	2	1.203	0.717
2006	1	3	2	0.657	0.741
2007	1	3	2	1.663	0.990
2008	1	3	2	0.624	0.948
1980	1	4	2	1.156	0.839
1981	1	4	2	0.804	0.522
1982	1	4	2	1.100	0.772
1983	1	4	2	0.976	0.548
1984	1	4	2	1.021	0.637
1985	1	4	2	0.710	0.628
1986	1	4	2	1.039	0.568
1987	1	4	2	0.668	0.769
1988	1	4	2	0.740	0.738
1989	1	4	2	0.976	1.112
1993	1	4	2	1.056	0.683
1994	1	4	2	0.996	0.782
1995	1	4	2	1.057	0.691
1996	1	4	2	0.967	0.466
1997	1	4	2	1.147	0.498
1998	1	4	2	1.143	0.441
1999	1	4	2	0.864	0.469
2000	1	4	2	0.954	0.681
2001	1	4	2	0.960	0.477
2002	1	4	2	1.221	0.584
2003	1	4	2	1.620	0.487
2004	1	4	2	2.041	0.400
2005	1	4	2	1.564	0.623
2006	1	4	2	1.888	0.627
2007	1	4	2	1.400	0.214
2008	1	4	2	1.374	0.249
1980	1	5	2	1.736	0.503
1981	1	5	2	2.353	0.960
1982	1	5	2	1.738	0.448
1983	1	5	2	1.811	0.491
1984	1	5	2	1.533	0.445
1985	1	5	2	1.730	0.426
1986	1	5	2	1.493	0.479
1987	1	5	2	1.512	0.489
1988	1	5	2	1.580	0.515
1989	1	5	2	1.452	0.604
1993	1	5	2	1.358	0.522
1994	1	5	2	1.380	0.649
1995	1	5	2	1.532	0.682
1996	1	5	2	1.473	0.599
1997	1	5	2	1.052	0.439

1998	1	5	2	1.564	0.500
1999	1	5	2	1.435	0.401
2000	1	5	2	1.658	0.335
2001	1	5	2	1.830	0.343
2002	1	5	2	2.013	0.588
2003	1	5	2	1.859	0.395
2004	1	5	2	2.310	0.492
2005	1	5	2	2.359	0.416
2006	1	5	2	2.121	0.438
2007	1	5	2	2.237	0.422
2008	1	5	2	2.098	0.483
1947	1	6	2	2.268	0.500
1948	1	6	2	2.268	0.500
1949	1	6	2	2.268	0.500
1950	1	6	2	2.268	0.500
1951	1	6	2	2.268	0.500
1980	1	6	2	1.813	0.353
1981	1	6	2	1.850	0.326
1983	1	6	2	2.700	0.498
1985	1	6	2	1.700	0.446
1986	1	6	2	2.048	0.928
1988	1	6	2	1.850	0.691
1989	1	6	2	1.125	0.319
1994	1	6	2	1.533	0.425
1995	1	6	2	2.793	0.266
1996	1	6	2	1.771	0.719
1999	1	6	2	2.110	0.095
2000	1	6	2	2.118	0.467
2001	1	6	2	1.206	0.320
2003	1	6	2	2.378	0.536
2004	1	6	2	2.225	0.201
2005	1	6	2	2.661	0.300
2006	1	6	2	2.588	0.453
2007	1	6	2	2.293	0.383
2008	1	6	2	2.331	0.439

Population size structure
1 # Length bin method: 1=Use data bins
Lower edge of bins

#6	8	10	12	14	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	90	92	

0.0001 # Minimum proportion for compressing tails of observed compositional data
0.0001 # Constant added to expected frequencies
0 # Combine males and females at and below this bin number
44 #_N_length_bins
#_lower_edge_of_length_bins

6	8	10	12	14	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	90	92	
134	#N_observations	(counts	-	samples	are	trips)					
#Year	Seas	Fleet	sexes	Mkt	Nsamp	begin	data:	females	then	males	

#Fleet 1 Not live fish fishery

1995	1	1	0	0	71	0	0	0	0	0	0
	0	0	0	0	255	211	378	410	330	438	294
	301	165	505	64	41	109	73	35	2	22	3
	0	0	3	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1996	1	1	0	0	231	0	0	0	0	0	0
	0	2	2	28	86	243	509	597	506	442	309
	204	170	150	156	134	77	50	32	21	19	0
	2	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1997	1	1	0	0	102	0	0	0	0	0	0
	0	0	0	4	23	85	450	706	594	706	527
	490	608	150	359	182	184	103	89	147	141	141
	0	77	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1998	1	1	0	0	26	0	0	0	0	0	0
	0	0	0	0	28	28	257	406	753	601	548
	875	214	66	100	182	0	26	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1999	1	1	0	0	8	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	134	542	456
	412	414	230	75	0	80	0	55	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2000	1	1	0	0	8	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	338	518
	253	253	308	196	237	55	140	140	0	55	0
	0	0	70	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
#Fleet 2 Live fish fishery											
1997	1	2	0	0	16	0	0	0	0	0	0
	0	0	0	0	0	0	0	96	1440	1632	2496
	1632	2112	864	960	576	576	288	192	96	192	0
	96	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1998	1	2	0	0	111	0	0	0	0	0	0
	0	0	0	0	476	2443	7430	10842	20456	23249	18562
	12723	11932	4637	3847	2460	1442	666	954	815	312	133
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1999	1	2	0	0	174	0	0	0	0	0	0
	0	0	0	48	0	65	26	281	2590	16100	15080
	10976	8326	5929	3277	2809	1864	1327	1173	458	535	207
	68	6	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2000	1	2	0	0	323	0	0	0	0	0	0
	0	0	0	0	16	42	87	128	5872	13902	12400
	10458	6570	5997	4051	2499	1541	1602	648	363	255	114

	121	21	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2001	1	2	0	0	156	0	0	0	0	0	0
	0	0	0	0	0	0	0	12	878	3910	9455
	8455	6143	4749	2930	1664	845	833	285	246	160	48
	0	12	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	2	0	0	33	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1934	4961
	3071	2582	2326	2533	1369	1406	1075	580	451	360	202
	0	64	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	2	0	0	9	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	408
	662	234	152	226	10	614	610	1830	0	610	610
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	2	0	0	36	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	192	1375
	2183	916	208	101	6	274	245	306	378	123	70
	115	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	2	0	0	28	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	59	1472
	885	1003	678	479	0	114	331	138	114	67	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2006	1	2	0	0	31	0	0	0	0	0	0
	0	0	0	0	0	64	215	64	128	386	2401
	2380	1236	1605	1279	606	388	572	194	486	325	0
	0	0	0	32	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2007	1	2	0	0	50	0	0	0	0	0	0
	0	0	0	0	0	0	0	6	0	97	663
	756	393	239	285	130	120	173	108	210	101	67
	45	0	31	10	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						

2008	1	2	0	0	29	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	44	0	628
	657	878	594	287	91	135	68	92	69	23	23
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						

#Fleet 3 Manmade mode

1980	1	3	0	0	33	0	0	0	0	0	1
	1	3	2	4	8	4	3	3	4	1	2
	1	2	1	1	1	1	1	0	1	1	0
	0	0	0	0	0	0	0	0	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1981	1	3	0	0	27	0	0	0	0	0	0
	0	2	0	3	9	4	8	4	4	2	1
	1	0	2	1	2	0	0	0	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1982	1	3	0	0	20	0	0	0	0	0	2
	1	1	0	1	0	4	2	3	1	1	2
	1	0	1	0	0	0	1	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1983	1	3	0	0	24	0	0	0	0	0	1
	0	2	0	6	4	2	2	3	4	3	0
	2	2	1	1	0	0	1	0	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1984	1	3	0	0	25	0	0	0	0	0	2
	0	0	2	1	0	2	2	5	1	3	0
	1	1	0	2	2	1	1	1	0	1	0
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1985	1	3	0	0	26	0	0	1	0	0	1
	2	2	4	7	2	2	7	2	2	0	1
	0	2	1	0	2	0	0	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1986	1	3	0	0	28	0	0	0	0	1	0
	0	1	0	3	3	4	5	3	1	2	1
	2	0	1	1	2	1	1	1	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1987	1	3	0	0	27	0	0	0	0	1	2
	3	1	1	1	3	1	5	3	0	3	5
	1	0	2	0	2	1	0	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1988	1	3	0	0	24	0	1	0	2	0	2
	1	1	1	0	3	5	3	4	1	2	0
	1	1	3	2	2	1	4	0	1	0	0
	3	0	2	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1989	1	3	0	0	8	0	0	0	0	0	0
	0	0	1	1	0	2	0	1	0	1	0
	1	0	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1993	1	3	0	0	20	0	0	0	1	0	2
	0	5	2	2	4	2	2	4	0	2	1
	0	0	1	0	0	1	0	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1994	1	3	0	0	5	0	0	0	0	0	0
	0	0	1	0	0	1	0	0	1	0	1
	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	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1996	1	3	0	0	13	0	0	1	1	1	1
	0	2	0	1	1	0	2	2	1	0	3
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1997	1	3	0	0	4	0	0	0	0	0	0
	0	2	0	1	1	0	0	0	0	0	1
	0	1	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1998	1	3	0	0	3	0	0	0	0	0	0
	0	0	1	1	0	0	0	0	1	2	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1999	1	3	0	0	4	0	0	1	0	0	0
	0	3	1	0	0	0	0	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2000	1	3	0	0	2	0	0	0	0	0	0
	0	0	0	0	0	1	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2001	1	3	0	0	7	0	0	0	0	0	1
	2	2	1	2	2	1	4	1	0	0	0
	1	1	2	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	3	0	0	5	0	0	0	1	0	0
	1	0	1	0	1	1	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	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	3	0	0	4	0	0	0	0	0	0
	0	0	0	0	0	1	1	0	0	1	0
	0	0	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	3	0	0	12	0	0	0	0	0	0
	0	2	1	3	0	2	2	1	1	0	1
	0	1	0	0	0	0	2	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	3	0	0	18	0	0	0	0	0	0
	1	0	2	1	1	2	3	1	0	1	2
	5	1	0	0	1	3	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2006	1	3	0	0	6	0	0	0	0	0	0
	0	0	0	1	2	2	0	0	1	0	0

	0	0	1	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2007	1	3	0	0	11	0	0	0	0	0	0
	1	1	1	1	2	0	1	0	0	0	0
	0	0	1	2	0	0	0	0	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2008	1	3	0	0	16	0	0	0	0	0	0
	0	1	1	2	3	3	3	1	0	0	1
	0	0	2	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
#Fleet 4 Beach/bank mode											
1980	1	4	0	0	29	0	0	0	0	1	1
	0	0	0	0	3	3	2	5	2	5	1
	3	5	3	3	1	2	0	1	2	0	0
	0	0	0	0	1	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1981	1	4	0	0	28	0	0	0	0	0	0
	0	0	2	2	0	7	5	7	5	9	4
	2	2	3	1	0	1	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1982	1	4	0	0	45	0	0	0	0	1	0
	0	1	3	3	5	3	4	5	5	4	5
	3	6	5	4	3	1	2	0	0	0	2
	1	0	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1983	1	4	0	0	53	0	0	0	0	0	0
	0	2	2	2	6	5	3	11	8	20	10
	16	6	6	3	3	2	0	2	1	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1984	1	4	0	0	22	0	0	0	0	0	0
	1	0	1	2	1	1	3	1	1	4	2
	2	2	1	1	2	0	3	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1985	1	4	0	0	26	0	0	2	0	2	0
	0	3	1	3	1	2	3	5	8	5	1
	2	4	1	0	0	1	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1986	1	4	0	0	30	0	0	0	0	0	0
	0	0	3	2	3	0	5	8	4	5	3
	7	6	7	2	2	1	0	0	3	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1987	1	4	0	0	17	0	0	1	1	1	0
	2	2	1	0	1	0	1	2	1	4	3
	0	0	0	1	0	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1988	1	4	0	0	5	0	0	0	0	0	0
	1	0	0	0	0	1	0	1	0	0	0
	0	1	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1989	1	4	0	0	8	0	0	0	0	0	2
	0	5	1	0	0	0	0	2	0	0	0
	1	1	1	0	0	0	1	1	0	1	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1993	1	4	0	0	40	0	0	0	0	1	0
	1	0	2	0	2	1	2	8	9	10	6
	9	3	4	2	2	1	0	1	2	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1994	1	4	0	0	15	0	0	0	0	0	1
	1	0	0	1	0	1	1	1	2	6	1
	0	3	1	0	2	1	0	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1996	1	4	0	0	36	0	0	0	0	0	0
	0	0	0	1	1	3	6	5	15	10	9
	6	4	3	2	0	2	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1997	1	4	0	0	26	0	0	0	0	0	0
	0	0	2	1	1	2	2	7	6	7	9
	7	6	5	2	2	1	1	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1998	1	4	0	0	29	0	0	0	0	0	0
	0	0	0	1	1	0	5	4	8	8	11
	6	9	5	1	0	3	3	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1999	1	4	0	0	19	0	0	0	0	0	0
	0	0	0	2	0	3	6	10	5	4	3
	4	1	0	2	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2000	1	4	0	0	13	0	0	0	0	0	0
	1	0	0	0	1	2	0	1	6	1	2
	3	0	0	1	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2001	1	4	0	0	8	0	0	0	0	0	0
	0	0	0	2	0	0	0	1	0	2	0
	1	3	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	4	0	0	9	0	0	0	0	0	0
	0	1	0	1	0	0	0	1	2	0	3
	3	1	1	1	1	1	0	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	4	0	0	4	0	0	0	0	0	0
	0	0	0	0	0	0	1	2	0	1	0
	2	0	3	0	2	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	4	0	0	13	0	0	0	0	0	0
	0	0	0	0	0	0	2	0	1	0	3
	4	1	2	2	0	2	4	0	1	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	4	0	0	10	0	0	0	0	0	0
	0	0	0	0	0	0	1	0	1	2	2
	2	2	0	2	0	0	1	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2006	1	4	0	0	4	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	1
	2	1	0	1	0	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2007	1	4	0	0	4	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	1
	0	1	2	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2008	1	4	0	0	8	0	0	0	0	0	0
	0	0	0	1	0	0	2	0	0	2	1
	2	0	1	0	1	1	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
#Fleet 5 PBR											
1980	1	5	0	0	46	0	0	0	0	0	0
	0	0	0	0	1	4	0	2	2	3	4
	3	7	12	6	6	6	1	3	2	5	2
	2	1	1	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1981	1	5	0	0	27	0	0	0	0	0	1
	0	0	0	0	0	1	2	0	1	3	5
	3	3	2	4	4	6	6	3	2	3	2
	2	0	1	1	0	0	0	0	0	0	0
	0	0	0	2	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1982	1	5	0	0	26	0	0	0	0	0	0
	0	0	0	0	0	0	0	2	2	1	1
	3	4	5	3	5	2	0	1	3	3	2
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						

1983	1	5	0	0	29	0	0	0	0	0	0
	0	0	0	1	0	0	1	1	1	4	4
	3	2	6	1	3	1	6	4	2	2	3
	0	1	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1984	1	5	0	0	43	0	0	0	0	0	0
	0	0	1	0	0	0	1	1	2	12	11
	8	6	4	7	11	5	5	6	2	3	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1985	1	5	0	0	26	0	0	0	0	0	0
	0	0	0	1	0	0	0	0	0	2	1
	7	1	6	4	4	2	3	2	4	2	1
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1986	1	5	0	0	51	0	0	0	0	0	0
	0	0	0	0	0	0	1	4	7	7	5
	6	10	6	4	5	7	4	4	1	2	1
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1987	1	5	0	0	37	0	0	0	0	0	0
	0	0	1	0	0	0	1	0	3	4	5
	8	4	8	8	2	2	3	3	2	2	1
	0	1	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1988	1	5	0	0	25	0	0	0	0	0	0
	0	0	1	0	0	0	0	0	0	4	3
	7	5	4	2	5	1	2	3	2	0	0
	0	1	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1989	1	5	0	0	29	0	0	0	1	0	0
	0	0	0	0	1	3	3	3	3	4	4
	6	5	7	3	4	2	4	1	5	1	0
	1	1	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1993	1	5	0	0	85	0	0	0	0	0	0
	0	2	0	1	3	0	2	7	12	10	27
	23	23	8	3	6	6	8	2	3	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1994	1	5	0	0	40	0	0	0	0	0	0
	0	0	0	0	2	1	0	3	5	10	7
	8	5	4	6	0	0	2	1	3	2	2
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1996	1	5	0	0	56	0	0	0	0	0	0
	0	0	1	2	0	1	7	9	9	4	14
	8	12	8	8	6	5	6	4	2	2	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1997	1	5	0	0	16	0	0	0	0	0	0
	0	0	0	0	1	2	0	3	4	0	4
	2	3	1	2	0	0	0	0	0	0	0
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	0	0	0	0	0						
1998	1	5	0	0	37	0	0	0	0	0	0
	1	1	0	1	0	0	2	3	3	7	11
	9	7	3	2	8	2	1	1	2	0	0
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	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1999	1	5	0	0	46	0	0	0	0	0	0
	0	0	0	0	0	0	0	5	4	4	8
	12	6	7	4	5	3	3	2	2	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2000	1	5	0	0	33	0	0	0	0	0	0
	0	0	0	0	0	0	0	1	2	2	4
	3	8	7	5	7	3	0	1	3	0	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2001	1	5	0	0	22	0	0	0	0	0	0
	0	0	0	0	1	0	0	0	4	0	4
	3	3	5	10	2	7	3	1	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	5	0	0	16	0	0	0	0	0	0
	0	0	0	0	0	0	1	0	1	3	4
	3	6	3	2	1	3	0	1	0	1	1
	1	0	1	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	5	0	0	62	1	0	0	1	0	0
	0	0	0	0	0	0	0	0	2	2	9
	9	8	14	12	13	8	7	6	1	2	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	5	0	0	237	1	0	0	0	0	0
	0	0	0	0	0	0	1	3	5	7	23
	48	46	55	60	63	54	31	28	25	12	9
	1	2	2	2	1	0	1	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	5	0	0	439	0	0	0	0	0	0
	0	0	0	0	1	1	3	7	2	16	34
	53	85	91	99	102	106	90	61	41	32	19
	11	4	7	1	0	0	0	0	1	1	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2006	1	5	0	0	412	0	0	0	0	0	0
	1	0	0	0	1	0	2	4	10	13	36
	64	69	72	72	71	62	67	49	51	26	8
	8	2	2	1	0	0	0	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2007	1	5	0	0	303	0	0	0	0	0	1
	0	0	0	0	0	2	2	2	7	19	25
	50	47	47	59	67	48	50	34	27	18	11
	8	2	3	2	0	0	0	0	0	0	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2008	1	5	0	0	256	0	0	0	0	1	0
	0	0	0	0	0	1	2	5	4	19	38
	47	52	63	59	48	40	28	36	14	12	8
	7	4	2	1	0	1	0	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
#Fleet 6 CPFV											
1980	1	6	0	0	5	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	1	2	0	2	0	0	1	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1981	1	6	0	0	2	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	1	1	0	0	0	1	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1982	1	6	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1983	1	6	0	0	3	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	1	0	1	0	0	0	0	0	1
	0	0	1	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1985	1	6	0	0	8	0	0	0	0	0	0
	0	0	0	0	1	0	0	0	0	1	1
	2	0	2	0	2	1	2	2	2	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1986	1	6	0	0	9	0	0	0	0	0	0
	0	1	0	1	1	0	0	0	2	0	5
	2	1	3	2	2	1	3	2	1	1	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1987	1	6	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1988	1	6	0	0	6	0	0	0	0	0	0
	1	0	0	0	0	0	1	1	0	0	0
	1	0	1	0	3	3	0	0	0	2	0
	0	0	0	0	0	1	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1989	1	6	0	0	2	0	0	0	0	0	0
	0	0	0	0	0	0	0	1	0	0	0
	0	2	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						

1994	1	6	0	0	3	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	2
	1	0	0	1	0	2	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1996	1	6	0	0	16	0	0	0	0	0	0
	0	0	0	0	0	1	2	1	3	1	5
	1	4	3	4	2	2	1	1	3	0	1
	0	0	0	0	1	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1997	1	6	0	0	28	0	0	0	0	0	0
	0	0	0	1	0	0	0	1	5	16	6
	8	5	1	9	1	0	2	0	1	0	1
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1998	1	6	0	0	29	0	0	0	0	0	0
	0	0	0	0	1	0	1	1	4	9	7
	8	2	6	5	2	1	1	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1999	1	6	0	0	9	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	1	1	0	2	2	1	0	0	0	1	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2000	1	6	0	0	11	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	1
	3	1	0	2	2	3	1	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2001	1	6	0	0	24	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	1	9
	8	11	4	12	11	7	3	5	2	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	6	0	0	5	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	4	2	1	2	1	0	0	0	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	6	0	0	34	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	1	10
	10	12	14	16	5	13	5	3	2	2	1
	1	0	0	0	0	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	6	0	0	23	0	0	0	0	0	0
	0	0	0	0	1	1	0	1	1	0	2
	5	4	4	6	5	3	2	0	0	1	0
	0	0	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	6	0	0	37	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	3
	4	6	9	6	7	11	5	1	3	3	0
	1	3	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2006	1	6	0	0	34	0	0	0	0	0	0
	0	0	0	0	0	1	0	0	0	0	3
	5	7	7	8	9	6	6	4	0	3	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2007	1	6	0	0	40	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	2
	6	3	7	3	9	7	4	7	5	3	3
	0	1	0	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2008	1	6	0	0	38	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	3
	7	9	6	3	5	3	7	2	0	1	2
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1987	1	6	0	0	4	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	0
	3	2	3	2	5	3	3	2	2	5	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1988	1	6	0	0	21	0	0	0	0	0	0
	0	0	0	0	1	2	2	0	1	3	4
	6	6	8	16	4	5	10	2	2	4	0
	1	2	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1989	1	6	0	0	21	0	0	0	0	0	0
	0	0	0	0	0	1	1	2	3	8	2
	8	8	3	8	7	8	4	4	4	1	1
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1990	1	6	0	0	6	0	0	0	0	0	0
	0	0	0	0	0	0	0	1	0	0	0
	3	1	1	1	1	1	0	0	1	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1991	1	6	0	0	13	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	2
	3	2	1	2	1	0	1	1	3	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1992	1	6	0	0	16	0	0	0	0	0	0
	0	0	0	0	0	0	0	1	3	6	1
	5	4	2	2	2	2	0	1	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1993	1	6	0	0	12	0	0	0	0	0	0
	0	0	0	0	0	0	0	2	3	2	4
	6	3	3	1	3	2	2	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1994	1	6	0	0	16	0	0	0	0	0	0
	0	0	0	0	0	0	2	0	6	7	2
	4	5	4	4	1	0	2	2	0	0	1
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1995	1	6	0	0	18	0	0	0	0	0	0
	0	0	0	0	0	1	1	1	1	6	3
	7	3	6	1	2	3	0	1	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1996	1	6	0	0	31	0	0	0	0	0	0
	0	0	1	0	0	1	6	14	10	11	13
	10	8	7	7	7	6	3	0	1	0	1

	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1997	1	6	0	0	30	0	0	0	0	0	0
	0	0	0	1	0	0	0	1	5	16	6
	9	6	1	9	1	0	2	0	1	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1998	1	6	0	0	23	0	0	0	0	0	0
	0	0	0	0	1	0	1	1	3	7	6
	8	2	5	4	2	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	6	0	0	11	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	3	2	1
	2	0	1	2	1	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	6	0	0	18	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	2	3	0
	3	1	3	0	5	2	2	3	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	6	0	0	5	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	2	1	2	0	0	0	1
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2006	1	6	0	0	3	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	2	0	0	3	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2007	1	6	0	0	3	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	0
	0	2	0	1	1	1	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						

2008	1	6	0	0	3	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	1
	1	1	0	0	0	0	2	0	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
20	#_N_age_bins										
1	2	3	4	5	6	7	8	9	10	11	12
	13	14	15	16	17	18	19	20			
2	#_N_ageerror_definitions										
#Female											
-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1									
0.479363	0.479363	0.547477	0.604513	0.652275	0.69227	0.725762	0.753807	0.777291	0.796957	0.813425	0.827214
	0.838762	0.848431	0.856529	0.863309	0.868987	0.873741	0.877723	0.881057	0.883849	0.886186	0.888144
	0.889783	0.891156	0.892306	0.893268	0.894074	0.894749	0.895314	0.895788	0.896184	0.896516	0.896794
	0.897027	0.897221									
#Male											
-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1									
0.571868	0.571868	0.297421	0.206562	0.161637	0.135119	0.117833	0.105851	0.0972099	0.0908204	0.0860316	0.0824308
	0.0797446	0.0777855	0.0764214	0.0755572	0.0751234	0.0750688	0.0753554	0.0759549	0.0768471	0.0780175	0.0794561
	0.0811573	0.0831183	0.0853394	0.0878231	0.0905741	0.0935993	0.0969071	0.100508	0.104414	0.108639	0.113197
	0.118107	0.123388									
147	#_N_Agecomp_obs										
2	#_Lbin_method:		1=poplenbins		2=datalenbins		3=lengths				
0	#_combinemales		into	females	at	or	below	this	bin	number	
#Conditional_Age-at_Length			1	2	3	4	5	6	7	8	9
	10	11	12	13	14	15	16	17	18	19	20
	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20		
#Joanna's data											
#Yr	Seas	Flt/Survey	Gender	Part	Ageerr	Lbin_lo	Lbin_hi	Nsamp	1	2	3
	4	5	6	7	8	9	10	11	12	13	14
	15	16	17	18	19	20	1	2	3	4	5
	6	7	8	9	10	11	12	13	14	15	16
	17	18	19	20							
#Females											
1996	1	7	1	0	1	12	12	1	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	1	0	1	13	13	5	0	0	2
	3	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	1	0	1	14	14	8	0	1	5
	0	0	2	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	1	0	1	15	15	7	0	0	3
	0	2	2	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	1	0	1	16	16	3	0	0	0
	1	2	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							

1996	1	7	1	0	1	17	17	4	0	0	1
	1	1	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	1	0	1	18	18	1	0	0	0
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	1	0	1	19	19	1	0	0	0
	0	0	0	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	1	0	1	21	21	1	0	0	0
	0	0	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	1	0	1	22	22	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	0	0	0							
1996	1	7	1	0	1	23	23	2	0	0	0
	0	0	1	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	1	0	1	12	12	1	0	0	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	1	0	1	13	13	7	0	0	5
	1	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	1	0	1	14	14	4	0	0	2
	1	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	1	0	1	15	15	12	0	0	1
	3	3	4	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	1	0	1	16	16	6	0	0	0
	2	3	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	1	0	1	17	17	7	0	0	0
	3	3	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							
1997	1	7	1	0	1	18	18	5	0	0	0
	1	2	1	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	1	0	1	19	19	4	0	0	0
	1	2	0	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							

1997	1	7	1	0	1	20	20	2	0	0	0
	0	0	1	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	1	0	1	21	21	1	0	0	0
	0	0	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	1	0	1	12	12	1	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	1	0	1	13	13	1	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	1	0	1	14	14	5	0	0	1
	1	2	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	1	0	1	15	15	7	0	0	1
	3	2	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	1	0	1	16	16	5	0	0	0
	2	3	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	1	0	1	17	17	4	0	0	0
	0	4	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	1	0	1	18	18	1	0	0	0
	0	0	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	1	0	1	19	19	3	0	0	0
	1	0	0	2	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1999	1	7	1	0	1	17	17	1	0	0	0
	0	0	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1999	1	7	1	0	1	18	18	4	0	0	0
	0	0	3	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	3	3	2	2	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	4	4	5	5	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							

2000	1	7	1	0	1	5	5	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	6	6	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	11	11	1	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	13	13	1	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	15	15	6	0	0	1
	2	2	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	16	16	5	0	0	0
	2	2	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	17	17	8	0	0	0
	2	1	3	2	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	18	18	11	0	0	2
	1	2	4	2	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	19	19	11	0	0	1
	2	3	2	3	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	20	20	7	0	0	0
	0	3	1	2	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	21	21	11	0	0	0
	1	3	5	1	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	22	22	7	0	0	0
	0	1	1	3	1	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	23	23	9	0	0	0
	0	1	0	3	1	3	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							
2000	1	7	1	0	1	24	24	11	0	0	0
	0	0	3	4	3	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							

2000	1	7	1	0	1	25	25	8	0	0	0
	0	1	0	1	1	4	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							
2000	1	7	1	0	1	26	26	1	0	0	0
	0	0	0	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	27	27	3	0	0	0
	0	0	0	0	1	1	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	28	28	1	0	0	0
	0	0	0	0	0	0	0	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	29	29	2	0	0	0
	0	0	0	0	0	0	1	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							
2000	1	7	1	0	1	31	31	1	0	0	0
	0	0	0	0	0	0	0	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	32	32	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	4	4	3	3	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	5	5	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	6	6	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	7	7	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	9	9	1	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	17	17	1	0	0	0
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	18	18	2	0	0	0
	0	2	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							

2001	1	7	1	0	1	19	19	2	0	0	0
	0	0	1	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	20	20	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	0	0	0							
2001	1	7	1	0	1	21	21	2	0	0	0
	0	0	0	2	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	22	22	2	0	0	0
	0	0	1	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	23	23	3	0	0	0
	0	0	0	1	1	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	25	25	2	0	0	0
	0	0	1	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							
2001	1	7	1	0	1	30	30	1	0	0	0
	0	0	0	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	6	6	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	18	18	1	0	0	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	19	19	1	0	0	0
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	20	20	2	0	0	0
	0	1	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	21	21	3	0	0	0
	0	2	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	22	22	1	0	0	0
	0	0	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	23	23	4	0	0	0
	0	1	0	0	2	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							

2002	1	7	1	0	1	24	24	4	0	0	0
	0	0	2	0	0	0	0	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	25	25	3	0	0	0
	0	0	0	0	1	0	0	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	26	26	3	0	0	0
	0	0	0	0	0	2	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	27	27	3	0	0	0
	0	0	0	0	0	1	0	0	0	1	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	28	28	3	0	0	0
	0	0	0	0	0	1	1	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							
2000	1	7	1	0	1	19	19	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	0	0	0							
#Males											
1996	1	7	2	0	2	12	12	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	2	0	2	13	13	5	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	1	1	1	0
	2	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	2	0	2	14	14	4	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	2	1	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	2	0	2	15	15	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	2	0	2	19	19	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	1	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	2	0	2	21	21	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	2	0	2	12	12	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	2	0	2	13	13	4	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	1	1

	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	2	0	2	14	14	18	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	7	6	3
	2	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	2	0	2	15	15	16	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	2	9	2
	2	1	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	2	0	2	16	16	7	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	2	2	0
	1	2	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	2	0	2	17	17	7	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	2	1
	3	0	0	0	1	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	2	0	2	18	18	9	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	1
	1	2	1	3	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	2	0	2	19	19	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	1	0	0	1	0	0	0	0	0
	0	0	0	0							
1998	1	7	2	0	2	12	12	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	2	0	2	13	13	7	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	3	2	2
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	2	0	2	14	14	6	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	3	2
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	2	0	2	15	15	4	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	1	2
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	2	0	2	16	16	7	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	5
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	2	0	2	17	17	7	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	2
	2	0	2	0	0	0	0	0	0	0	0
	0	0	0	0							
1999	1	7	2	0	2	15	15	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	1
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1999	1	7	2	0	2	16	16	3	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	1

	0	2	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1999	1	7	2	0	2	17	17	3	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	1
	1	1	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1999	1	7	2	0	2	18	18	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	1	0	1	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	4	4	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	5	5	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	9	9	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	10	10	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	12	12	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	13	13	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	14	14	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	2	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	15	15	3	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	1
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	16	16	10	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	2	2	1
	4	1	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	17	17	13	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	2	1
	4	6	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	18	18	10	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	5	2
	1	1	1	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	19	19	8	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	1

	2	3	0	1	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	20	20	10	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	3	3	1	1	1	0	1	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	21	21	4	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	1	2	1	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	22	22	6	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	1	1	1	0	2	0	0	0	1	0	0
	0	0	0	0							
2000	1	7	2	0	2	23	23	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	1	1	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	24	24	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	1	0	0	0	0	0
	0	0	0	0							
2001	1	7	2	0	2	3	3	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	2	0	2	6	6	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	2	0	2	16	16	3	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	2	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	2	0	2	17	17	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	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	2	0	2	18	18	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	0	0
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	2	0	2	19	19	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	1
	0	0	1	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	2	0	2	20	20	4	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	0
	1	2	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	2	0	2	21	21	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
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	2	0	2	23	23	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

	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	2	0	2	16	16	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	2	0	2	17	17	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	2	0	2	18	18	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
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	2	0	2	19	19	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	1	0	0	1	0	0	0	0	0
	0	0	0	0							
2002	1	7	2	0	2	21	21	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	1	0	0	0	0	0
	0	0	0	0							
#Unsexed											
1991	1	7	0	0	1	2	2	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1993	1	7	0	0	1	3	3	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	0	0	1	3	3	5	5	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	0	0	1	4	4	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	0	0	1	1	1	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	0	0	1	2	2	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	0	0	1	3	3	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	0	0	1	6	6	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	0	0	1	21	21	2	0	0	0
	0	0	0	0	1	0	1	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	0	0	1	24	24	2	0	0	0
	0	0	0	0	1	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	0	0	1	25	25	1	0	0	0
	0	0	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							

0	#_N_MeanSize-at-Age_obs							
#Yr	Seas	Flt	Svy	Gender	Part	Ageerr	Ignore	datavector(female-male)
#	samplesize(female-male)							
0	#_N_environ_variables							
0	#_N_environ_obs							
0	#	N	sizefreq	methods	to	read		
#Sizefreq	N	bins	per	method				
#Sizetfreq	units(bio	num)	per	method				
#Sizefreq	scale(kg	lbs	cm	inches)	per	method		
#Sizefreq	mincomp	per	method					
#Sizefreq	N	obs	per	method				
#_Sizefreq bins								
#_Year	season	Fleet	Partition	Gender	SampleSize		<data>	
0	#	no	tag	data				
0	#	no	morphcomp		data			

999
ENDDATA

Appendix C-2. Control file for NCS.

```
# NCS cabezon control file, SS v3.03a, May 2009
# Morph setup
1             # Number of growth patterns
1             # N sub morphs within growth patterns
2             #_Nblock_Patterns
1 2           #_Blocks_per_pattern
1999 2008                #Accounts for change in commerical regs (size limits)
2000 2004 2005 2008    #Accounts for change in recreational regs (size & bag limits)

# Mortality and growth specifications
0.5           # Fraction female at birth
0             # M setup: 0=single Par,1=N_breakpoints,2=Lorenzen,3=agespecific;_4=agespec_withseasinterpolate
#2            # Number of M breakpoints
#0 0          # Ages at M breakpoints
1             # Growth model: 1=VB with L1 and L2, 2=VB with A0 and Linf, 3=Richards, 4=Read vector of L@A
0             # Age for growth Lmin
999           # Age for growth Lmax or 999 = Linf
0             # SD constant added to LAA (0.1 mimics SS2 v1.x for compatibility only)
0             # Variability about growth: 0=CV~f(LAA) [mimic v1.xx], 1=CV~f(A), 2=SD~f(LAA), 3=SD~f(A)
1             # Maturity option: 1=length logistic, 2=age logistic, 3=read age-maturity matrix by growth_pattern
1             # First age allowed to mature
1   #_fecundity option:(1)eggs=Wt*(a+b*Wt);(2)eggs=a*L^b;(3)eggs=a*Wt^b
0   #_hermaphroditism option:  0=none; 1=age-specific fxn
1   #_parameter_offset_approach (1=none, 2= M, G, CV_G as offset from female-GP1, 3=like SS2 V1.x)
1   #_env/block/dev_adjust_method (1=standard; 2=with logistic trans to keep within base parm bounds)

#_LO       HI        INIT                PRIOR     PR_type SD          PHASE env-var use_dev dev_minyr dev_maxyr
dev_stddev Block Block_Fxn
0.02       0.5        0.25       0.25      0         0.08      -4         0         0         0         0         0.5
0          0          #          NatM_p_2_Fem_GP:1 old
1          40         13.97      14        0         1         3          0         0         0         0         0.5
0          0          #          L_at_Amin_Fem_GP_1
20         90         59.0       58        0         100       2          0         0         0         0         0.5
0          0          #          L_at_Amax_Fem_GP_1
0.05       0.3        0.17       0.185     0         0.8       3          0         0         0         0         0.5
0          0          #          VonBert_K_Fem_GP_1
0.01       0.5        0.14       0.139     0         0.8       3          0         0         0         0         0.5
0          0          #          CV_young_Fem_GP_1
0.01       0.5        0.1    0.1           0         0.8       3          0         0         0         0         0.5
0          0          #          CV_old_Fem_GP_1

0.02       0.5        0.3        0.3       0         0.08      -4         0         0         0         0         0.5
0          0          #          NatM_p_1_Mal_GP:1 old
1          40         12.57      13   0          1         3          0         0         0         0.5       0
0          #          L_at_Amin_Mal_GP_1
20         90         41.8       41.8  0     100       2          0         0         0         0.5       0
0          #          L_at_Amax_Mal_GP_1
0.05       0.6        0.45       0.45      0         0.8       3          0         0         0         0         0.5
0          0          #          VonBert_K_Mal_GP_1
0.01       0.5        0.17       0.17      0         0.8       3          0         0         0         0         0.5
0          0          #          CV_young_Mal_GP_1
0.01       0.5        0.14       0.1       0         0.8       3          0         0         0         0         0.5
0          0          #          CV_old_Mal_GP_1

# Add 2+2*gender lines to read the wt-Len and mat-Len parameters
-3         3          0.000009204          0.000009204         0         0.8       -3        0         0         0
           0          0.5        0         0         #Female wt-len-1
-3         4              3.187      3.187  0          3         -3        0         0         0         0         0.5
           0          0          #Female wt-len-2
-3         40         34.6            35    0          10        -3        0         0         0         0         0.5
           0          0          #Female mat-len-1
-3         3              -0.7       -0.7   0          0.8       -3        0         0         0         0         0.5
           0          0          #Female mat-len-2
-3         3               1           1    0          0.8       -3        0         0         0         0         0.5
           0          0          #Female eggs/gm intercept
-3         3               0           0    0          0.8       -3        0         0         0         0         0.5
           0          0          #Female eggs/gm slope
```

```
-3          3          0.00001163     0.00001163      0          0.8        -3         0          0          0          0
            0.5        0           0           #Male wt-len-1
-3          4              3.118      3.190852        0          3          -3         0          0          0          0
            0.5        0           0           #Male wt-len-2

-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 0 0 -1 99 -3 0 0 0 0 0.5 0 0 #_recrdistribution_by_season 1
 0 2 1 1 -1 99 -3 0 0 0 0 0.5 0 0 #_cohort_growth_deviation
# Seasonal effects on biology parameters (0=none)
 0 0 0 0 0 0 0 0 0 0

#_Spawner-Recruitment
3 #_SR_function
#_LO   HI    INIT PRIOR PR_type SD PHASE
  3    30    6.6    12  -1    10    2  # SR_R0
0.2    1    0.7  0.71   0   0.8   -3  # SR_steep
  0    1    0.5   1.1   0    1   -1    # SR_sigmaR
  0    5     0     0   0     1   -3    # SR_envlink
  0    5     0     0   0     1   -3    # SR_R1_offset
  0    2     0    1    0    50  -50   # Autocorrelation placeholder (Future implementation)
0 #_SR_env_link
0 #_SR_env_target_1=devs;_2=R0;_3=steepness
1 # do_recr_dev:  0=none; 1=devvector; 2=simple deviations
# Recruitment residuals
1970        # Start year recruitment residuals
2006        # End year recruitment residuals
1           # Phase
1           # Read 13 advanced recruitment options: 0=no, 1=yes
0           # first year for early rec devs
-4          # phase for early rec devs
5           # Phase for forecast recruit deviations
100         # Lambda for forecast recr devs before endyr+1
1979        #_last_yr_nobias_adj_in_MPD
1980        # first year of full bias correction (linear ramp up from this year minus the plus-age to this year)
2004        # last year for full bias correction in_MPD
2005        #_first_recent_yr_nobias_adj_in_MPD
1           #_max_bias_adj_in_MPD (1.0 to mimic pre-2009 models)
0           #_placeholder
-15         # Lower bound rec devs
15          # Upper bound rec devs
0      # read intitial values for rec devs

# Fishing mortality setup
0.1         # F ballpark for tuning early phases
2008        # F ballpark year
1           # F method:  1=Pope's; 2=Instan. F; 3=Hybrid (recommended)
0.9         # max F or harvest rate, depends on F_Method
#init_F_setup,       for        each       fleet
#LO        HI        INIT       PRIOR      P_TYPE SD          PHASE
 0          1          0         0.0001      0          99          -1   #1  InitF_FISHERY1_Comm_Non-Live
 0          1          0         0.0001      0          99          -1   #2  InitF_FISHERY2_Comm_Live
 0          1          0         0.0001      0          99          -1   #3  InitF_FISHERY3_Rec_MM
 0          1          0         0.0001      0          99          -1   #4  InitF_FISHERY4_Rec_BB
 0          1          0         0.0001      0          99          -1   #5  InitF_FISHERY5_Rec_PBR
 0          1          0         0.0001      0          99          -1   #6  InitF_FISHERY6_Rec_CPFV
 0          1          0         0.0001      0          99          -1   #7  InitF_FISHERY7_Ghost
#_Q_setup
#_add_parm_row_for_each_positive_entry_below(row_then_column)
# 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          #1  InitF_FISHERY1_Comm_Non-Live
 0          0          0          0          1          0          #2  InitF_FISHERY2_Comm_Live
 0          0          0          0          1          0          #3  InitF_FISHERY3_Rec_MM
 0          0          0          0          1          0          #4  InitF_FISHERY4_Rec_BB
 0          0          0          0          1          0          #5  InitF_FISHERY5_Rec_PBR
 0          0          0          0          1          0          #6  InitF_FISHERY6_Rec_CPFV
 0          0          0          0          1          0          #7  InitF_FISHERY7_Ghost
 0          0          0          0          0          0          #8  InitF_SURVEY1_CPFV 1960-1999
```

```
 0  0  0  0  0  0  #9  InitF_SURVEY2_CPFV 2000-2008
 0  0  0  0  0  0  #10 InitF_SURVEY3_CPFV 1960-2008
 0  0  0  0  0  0  #11 InitF_SURVEY4_TENERA_adult
 0  0  0  0  0  0  #12 InitF_SURVEY5_PISCO_adult
 0  0  0  0  0  0  #13 InitF_SURVEY6_PISCO_MONTEREY_SMURFs
 0  0  0  0  0  0  #14 InitF_SURVEY7_SLO_SMURFs

#_size_selex_types
#_Pattern Discard Male Special
 24 0 0 0 #1  Comm_Non-Live
 24 0 0 0 #2  Comm_Live
 24 0 0 0 #3  Rec_MM
 24 0 0 0 #4  Rec_BB
 24 0 0 0 #5  Rec_PBR
 24 0 0 0 #6  Rec_CPFV
 0 0 0 0  #7  CA_age_samples
 5 0 0 6  #8  CPFV 1960-1999
 5 0 0 6  #9  CPFV 2000-2008
 5 0 0 6  #10 CPFV 1960-2008
 30 0 0 0 #11 TENERA adult
 30 0 0 0 #12 PISCO Adults
 33 0 0 0 #13 PISCO SMURFS (Monterey)
 33 0 0 0 #14 SMURFS (SLO)

#_age_selex_types
#_Pattern Discard Male Special
 10 0 0 0 #1  Comm_Non-Live
 10 0 0 0 #2  Comm_Live
 10 0 0 0 #3  Rec_MM
 10 0 0 0 #4  Rec_BB
 10 0 0 0 #5  Rec_PBR
 10 0 0 0 #6  Rec_CPFV
 10 0 0 0 #7  CA_age_samples
 10 0 0 0 #8  CPFV_CPUE
 10 0 0 0 #9  CPFV 2000-2008
 10 0 0 0 #10 CPFV 1960-2008
 10 0 0 0 #11 TENERA adult
 10 0 0 0 #12 PISCO Adults
 10 0 0 0 #13 PISCO SMURFS (Monterey)
 10 0 0 0 #14 SMURFS (SLO)

#_LO  HI  INIT  PRIOR  PR_type  SD PHASE env-var use_dev dev_minyr dev_maxyr
dev_stddev Block Block_Fxn
#FLEET 1 NOT THE LIVE FISH FISHERY
   10  91  31  31  1  0.05  2  0  0  0  0  0.5
   0  0  # PEAK
 -5.0  3.0  -2.8  -2.8  1  0.05  3  0  0  0  0  0.5
   0  0  # TOP:_width of plateau
 -4.0  12.0  4.1  4.1  1  0.05  3  0  0  0  0  0.5  0
0  # Asc_width
  -10  6.0  4  -1.0  1  0.05  -3  0  0  0  0  0.5
   0  0  # Desc_width
-15.0  15.0  -10  -5.0  1  0.05  -2  0  0  0  0  0.5
   0  0  # INIT:_selectivity_at_fist_bin
 -5.0  15.0  10  -0.3  1  0.05  -2  0  0  0  0  0.5
   0  0  # FINAL:_selectivity_at_last_bin

#FLEET 2 LIVE FISH FISHERY
   10  91  38.2  38.2  1  0.05  2  0  0  0  0  0.5  1  2  #
PEAK
 -5.0  3.0  -0.3  -0.3  1  0.05  3  0  0  0  0  0.5
   1  2  # TOP:_width of plateau
 -4.0  12.0  2.3  2.3  1  0.05  3  0  0  0  0  0.5  1
2  # Asc_width
  -10  6.0  3  3.0  1  0.05  3  0  0  0  0  0.5  1
2  # Desc_width
-15.0  5.0  -5  -5.0  1  0.05  -2  0  0  0  0  0.5
   0  0  # INIT:_selectivity_at_fist_bin
 -5.0  15.0  -3.5  -3.5  1  0.05  2  0  0  0  0  0.5
   1  2  # FINAL:_selectivity_at_last_bin
```

```
#FLEET 3 Man Made
  10    91    10.8    10.8    1    0.05    2    0    0    0    0    0.5
        0     0  # PEAK
 -5.0   3.0   -0.5    -0.5    1    0.05    3    0    0    0    0    0.5
        0     0  # TOP:_width of plateau
 -4.0   12.0  -0.6    -0.6    1    0.05    3    0    0    0    0    0.5
        0     0  # Asc_width
  -10   6.0    -2     -2.0    1    0.05    3    0    0    0    0    0.5
        0     0  # Desc_width
-15.0   15.0   -10    -5.0    1    0.05    -2   0    0    0    0    0.5
        0     0  # INIT:_selectivity_at_fist_bin
 -5.0   15.0  -0.5    -0.5    1    0.05    2    0    0    0    0    0.5
        0     0  # FINAL:_selectivity_at_last_bin

#FLEET 4 Beach Bank
  10    91    33.7    33.7    1    0.05    2    0    0    0    0    0.5
        0     0  # PEAK
 -5.0   3.0   -2.8    -2.8    1    0.05    3    0    0    0    0    0.5
        0     0  # TOP:_width of plateau
 -4.0   12.0   4.1     4.1  1  0.05    3    0    0    0    0    0.5    0
0  # Asc_width
  -10   6.0    -1     -1.0    1    0.05    3    0    0    0    0    0.5
        0     0  # Desc_width
-15.0   15.0   -10    -5.0    1    0.05    -2   0    0    0    0    0.5
        0     0  # INIT:_selectivity_at_fist_bin
 -5.0   15.0  -0.3    -0.3    1    0.05    2    0    0    0    0    0.5
        0     0  # FINAL:_selectivity_at_last_bin

#FLEET 5 PBR
  10    91     45      45     1    0.05    2    0    0    0    0    0.5
        2     2  # PEAK
 -5.0   3.0   -2.8    -2.8    1    0.05    3    0    0    0    0    0.5
        2     2  # TOP:_width of plateau
 -4.0   12.0   4.1     4.1  1  0.05    3    0    0    0    0    0.5    2
2  # Asc_width
  -10   6.0     4     -1.0    1    0.05    -3   0    0    0    0    0.5
        0     0  # Desc_width
-15.0   15.0   -10    -5.0    1    0.05    -2   0    0    0    0    0.5
        0     0  # INIT:_selectivity_at_fist_bin
 -5.0   15.0   10     -0.3    1    0.05    -2   0    0    0    0    0.5
        0     0  # FINAL:_selectivity_at_last_bin

#FLEET 6 CPFV
  10    91     45      45     1    0.05    2    0    0    0    0    0.5
        2     2  # PEAK
 -5.0   3.0   -2.8    -2.8    1    0.05    3    0    0    0    0    0.5
        2     2  # TOP:_width of plateau
 -4.0   12.0   4.1     4.1  1  0.05    3    0    0    0    0    0.5    2
2  # Asc_width
  -10   6.0     4     -1.0    1    0.05    -3   0    0    0    0    0.5
        0     0  # Desc_width
-15.0   15.0   -10    -5.0    1    0.05    -2   0    0    0    0    0.5
        0     0  # INIT:_selectivity_at_fist_bin
 -5.0   15.0   10     -0.3    1    0.05    -2   0    0    0    0    0.5
        0     0  # FINAL:_selectivity_at_last_bin

#FLEET 7 CA_age_samples

#Survey 1: CPFV CPUE 1960-1999
  1   44   1    1    0    10  -3   0    0    0    0    0.5    0    0
        #min Len bin - fixed
  1    100    44    50    0    10  -4   0    0    0    0    0.5    0
0       #max Len bin fixed

#Survey 2: CPFV CPUE 2000-2008
  1    44    1    1    0    10    -3    0    0    0    0    0.5
       0     0     #min Len bin - fixed
  1    100   44    50   0    10    -4    0    0    0    0    0.5
       0     0     #max Len bin fixed
```

```
#Survey 3: CPFV CPUE 1960-2008
   1        44      1       1       0       10      -3      0       0       0       0       0.5
            0       0       #min Len bin - fixed
   1        100     44      50      0       10      -4      0       0       0       0       0.5
            0       0       #max Len bin fixed

#Survey 4: TENERA adult
#Survey 5: PISCO adult
#Survey 6: PISCO SMURFS
#Survey 7: SMURFS (SLO)

1           #_Custom_block_setup SELECTIVITY BLOCK: 1999-2008
#FLEET 1 NOT THE LIVE FISH FISHERY
#   10      91      31      31      1       0.05    2       # PEAK
# -5.0      3.0     -2.8    -2.8    1       0.05    3       # TOP:_width of plateau
# -4.0      12.0    4.1     4.1  1   0.05   3       # Asc_width
#  -10      6.0     4       -1.0    1       0.05    -3      # Desc_width
# -5.0      15.0    10      -0.3    1       0.05    -2      # FINAL:_selectivity_at_last_bin
#FLEET 2 LIVE FISH FISHERY
  10     91   38.2    38.2  1    0.05   3           # PEAK
 -5.0       3.0     -0.3    -0.3    1       0.05    4       # TOP:_width of plateau
 -4.0       12.0    2.3     2.3  1   0.05   4       # Asc_width
  -10       6.0     3       3.0  1   0.05   4       # Desc_width
 -5.0       15.0    -3.5    -3.5    1       0.05    3       # FINAL:_selectivity_at_last_bin
#FLEET 5 PBR
  10        91      45      45      1       0.05    3       # PEAK
  10        91      45      45      1       0.05    3       # PEAK
 -5.0       3.0     -2.8    -2.8    1       0.05    4       # TOP:_width of plateau
 -5.0       3.0     -2.8    -2.8    1       0.05    4       # TOP:_width of plateau
 -4.0       12.0    4.1     4.1  1   0.05   4       # Asc_width
 -4.0       12.0    4.1     4.1  1   0.05   4       # Asc_width
#  -10      6.0     4       -1.0    1       0.05    -3      # Desc_width
# -5.0      15.0    10      -0.3    1       0.05    -2      # FINAL:_selectivity_at_last_bin
#FLEET 6 CPFV
  10        91      45      45      1       0.05    3       # PEAK
  10        91      45      45      1       0.05    3       # PEAK
 -5.0       3.0     -2.8    -2.8    1       0.05    4       # TOP:_width of plateau
 -5.0       3.0     -2.8    -2.8    1       0.05    4       # TOP:_width of plateau
 -4.0       12.0    4.1     4.1  1   0.05   4       # Asc_width
 -4.0       12.0    4.1     4.1  1   0.05   4       # Asc_width
#  -10      6.0     4       -1.0    1       0.05    -3      # Desc_width
# -5.0      15.0    10      -0.3    1       0.05    -2      # FINAL:_selectivity_at_last_bin
2           #separt_adj_method

# Tag loss and Tag reporting parameters go next
0  # TG_custom:  0=no read; 1=read if tags exist
#_Cond -6 6 1 1 2 0.01 -4 0 0 0 0 0 0 0  #_placeholder if no parameters
### Likelihood related quantities ###
1           # Do variance adjustments
#1  Comm: Non-live Fishery
#2  Comm: Live Fishery
#3  Rec: Man-made
#4  Rec: Beach/bank
#5  Rec: PBR
#6  Rec: CPFV
#7  CA age samples
#8  CPFV CPUE survey 1960-1999
#9  CPFV CPUE survey 2000-2008
#10 CPFV CPUE survey 1960-2008
#11 TENERA adult survey
#12 PISCO adult survey
#13 PISCO SMURFS
#14 SLO SMURFS
#           1       2       3       4       5       6       7       8       9       10      11
            12      13      14
            0       0       0       0       0       0       0       0.28    0.37    0.29    0.75
            0.34    0.47    0.79    #_add_to_survey_CV
            0       0       0       0       0       0       0       0       0       0       0
            0       0       0       #_add_to_discard_stddev
```

```
0    0    0    0    0    0    0    0    0    0    0
0    0    0    #_add_to_bodywt_CV
0.84 0.87 1.17 1.49 1.45 1.91 1    1    1    1    1
1    1    1    #_mult_by_lencomp_N
1    1    1    1    1    1    10.5 1    1    1    1
1    1    1    #_mult_by_agecomp_N
1    1    1    1    1    1    1    1    1    1    1
1    1    1    #_mult_by_size-at-age_N

30   #  DF For discard T-distribution
30   #  DF For meanbodywt T-distribution
1    #_maxlambdaphase
0    #_sd_offset
6    # N changes to default Lambdas = 1.0
######################################
#Example of changes to default lambda
#3 # number of changes to make to default Lambdas (default value is 1.0)
# Like_comp codes:  1=surv; 2=disc; 3=mnwt; 4=length; 5=age; 6=SizeFreq; 7=sizeage; 8=catch;
# 9=init_equ_catch; 10=recrdev; 11=parm_prior; 12=parm_dev; 13=CrashPen; 14=Morphcomp; 15=Tag-comp; 16=Tag-negbin
#like_comp fleet/survey  phase  value  sizefreq_method
# 1  8 1 0 1 #_CPUE/survey:_1 CPFV Logbook 1960-1999
  1  9 1 0 1 #_CPUE/survey:_2 CPFV Logbook 2000-2008
  1 10 1 0 1 #_CPUE/survey:_3 CPFV Logbook 1960-2008
  1 11 1 0 1 #_CPUE/survey:_4 TENREA Adult
  1 12 1 0 1 #_CPUE/survey:_5 PISCO Adult
  1 13 1 0 1 #_CPUE/survey:_6 PISCO SMURF
  1 14 1 0 1 #_CPUE/survey:_7 SLO SMURF
#  4 1 1 0 1 #_lencomp:_FLEET 1
#  4 2 1 0 1 #_lencomp:_FLEET 2
#  4 3 1 0 1 #_lencomp:_FLEET 3
#  4 4 1 0 1 #_lencomp:_FLEET 4
#  4 5 1 0 1 #_lencomp:_FLEET 5
#  4 6 1 0 1 #_lencomp:_FLEET 6
#  5 7 1 0 1 #_Cond_age:_Females, Males, & Unsexed
#  1 1 1 0 1 #_init_equ_catch
#  1 1 1 0 1 #_recruitments
#  1 1 1 0 1 #_parameter-priors
#  1 1 1 0 1 #_parameter-dev-vectors
#  1 1 1 0 1 #_crashPenLambda
######################################

0 # (0/1) read specs for more stddev reporting
# 1 1 -1 5 1 5 # selex type, len/age, year, N selex bins, Growth pattern, N growth ages
# 3 9 15 21 27 # vector with selex std bin picks (-1 in first bin to self-generate)
# 1 2 14 26 40 # vector with growth std bin picks (-1 in first bin to self-generate)

999 # end of control file
```

Appendix D-1. Data file for SCS.

```
# SCS cabezon data file 2009, SS v3.03a, May 2009
1916 #_styr
2008 #_endyr
1       #N_seasons_per_year
12      #vector_with_N_months_in_each_season
1       #spawning_season_-_spawning_will_occur_at_beginning_of_this_season
7       #N_fishing_fleets
6       #N_surveys_data_type_numbers_below_must_be_sequential_with_the_N_fisheries4
1       #Number of areas

fleet1%fleet2%fleet3%fleet4%fleet5%fleet6%fleet7%survey1%survey2%survey3%survey4%survey5%survey6
0.5 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 1 1 1 1 1 1 1 1 1 1 1 1     #_area_assignments_for_each_fishery_and_survey
1 1 1 1 1 1 1                 # Units for catch by fishing fleet: 1=Biomass(mt),2=Numbers(1000s)
0.01 0.01 0.01 0.01 0.01 0.01 0.01  # SE of log(catch) by fleet for equilibrium and continuous options

2       #number_of_genders(1 / 2)
35      #accumulator_age;_model_always_starts_with_age_0

#Catch  (mt)
#Fleet1 Fleet2  Fleet3  Fleet4  Fleet5  Fleet6 Fleet7
#CommNL         CommL   MM      Shore   PBR     CPFV    age-samplsYear  Season
0       0       0       0       0       0       0       #initial_equilibrium
93 # Number of lines catch data  - FINAL CATCHES w/discards
0.00    0.00    0.02    0.02    0.00    0.00    0       1916    1
0.00    0.00    0.02    0.02    0.00    0.00    0       1917    1
0.00    0.00    0.02    0.02    0.00    0.00    0       1918    1
0.00    0.00    0.02    0.02    0.00    0.00    0       1919    1
0.00    0.00    0.02    0.02    0.00    0.00    0       1920    1
0.00    0.00    0.02    0.02    0.00    0.00    0       1921    1
0.00    0.00    0.02    0.02    0.00    0.00    0       1922    1
0.00    0.00    0.02    0.02    0.00    0.00    0       1923    1
0.00    0.00    0.02    0.02    0.00    0.00    0       1924    1
0.00    0.00    0.02    0.02    0.00    0.00    0       1925    1
0.00    0.00    0.02    0.02    0.00    0.00    0       1926    1
0.00    0.00    0.02    0.02    0.00    0.00    0       1927    1
0.00    0.00    0.02    0.02    0.02    0.04    0       1928    1
0.00    0.00    0.05    0.04    0.03    0.08    0       1929    1
0.00    0.00    0.07    0.06    0.05    0.12    0       1930    1
0.00    0.00    0.09    0.08    0.06    0.16    0       1931    1
0.00    0.00    0.11    0.10    0.08    0.20    0       1932    1
0.03    0.00    0.14    0.12    0.09    0.24    0       1933    1
0.00    0.00    0.16    0.14    0.11    0.27    0       1934    1
0.07    0.00    0.18    0.16    0.13    0.31    0       1935    1
0.01    0.00    0.26    0.23    0.18    0.44    0       1936    1
0.00    0.00    0.17    0.15    0.12    0.29    0       1937    1
0.00    0.00    0.48    0.43    0.33    0.83    0       1938    1
0.00    0.00    0.18    0.16    0.12    0.31    0       1939    1
0.03    0.00    0.17    0.15    0.12    0.29    0       1940    1
0.04    0.00    0.36    0.32    0.25    0.61    0       1941    1
0.00    0.00    0.36    0.32    0.25    0.61    0       1942    1
0.00    0.00    0.36    0.32    0.25    0.61    0       1943    1
0.02    0.00    0.36    0.32    0.25    0.61    0       1944    1
0.00    0.00    0.36    0.32    0.25    0.61    0       1945    1
0.00    0.00    0.36    0.32    0.25    0.61    0       1946    1
0.01    0.00    1.09    0.98    0.75    1.89    0       1947    1
0.01    0.00    1.23    1.10    0.85    2.12    0       1948    1
0.01    0.00    1.60    1.44    1.11    2.76    0       1949    1
0.29    0.00    1.25    1.12    0.86    2.15    0       1950    1
0.02    0.00    1.15    1.03    0.79    1.98    0       1951    1
0.05    0.00    1.54    1.38    1.06    2.66    0       1952    1
0.02    0.00    2.30    2.06    1.58    3.95    0       1953    1
0.00    0.00    5.24    4.70    3.61    9.04    0       1954    1
0.01    0.00    5.06    4.53    3.49    8.71    0       1955    1
0.06    0.00    5.74    5.14    8.05    9.88    0       1956    1
```

0.36	0.00	4.19	3.76	5.88	7.22	0	1957	1
0.07	0.00	2.83	2.53	3.97	4.87	0	1958	1
0.01	0.00	0.72	0.65	1.02	1.25	0	1959	1
0.00	0.00	0.35	0.31	0.49	0.60	0	1960	1
0.01	0.00	0.41	0.37	0.58	0.71	0	1961	1
0.00	0.00	1.26	1.13	1.77	2.17	0	1962	1
0.01	0.00	2.54	2.27	3.56	4.37	0	1963	1
0.07	0.00	2.02	1.81	2.83	3.48	0	1964	1
0.02	0.00	2.09	1.87	7.20	3.60	0	1965	1
0.05	0.00	3.20	2.86	11.01	5.51	0	1966	1
0.04	0.00	1.65	2.42	5.70	2.85	0	1967	1
0.06	0.00	1.18	1.73	4.06	2.03	0	1968	1
0.04	0.00	1.13	1.65	3.88	1.94	0	1969	1
0.09	0.00	1.44	2.10	4.95	2.47	0	1970	1
0.02	0.00	1.49	2.17	10.23	2.56	0	1971	1
0.04	0.00	4.33	6.34	29.84	7.46	0	1972	1
0.02	0.00	1.73	2.54	11.94	2.99	0	1973	1
0.07	0.00	1.77	2.59	12.18	3.04	0	1974	1
0.03	0.00	2.62	3.84	18.08	4.52	0	1975	1
0.09	0.00	1.74	2.55	11.98	3.00	0	1976	1
0.11	0.00	1.12	1.65	7.74	1.94	0	1977	1
0.32	0.00	1.66	2.43	11.43	2.86	0	1978	1
0.21	0.00	1.24	1.82	8.55	2.14	0	1979	1
3.57	0.00	3.04	21.47	26.82	3.13	0	1980	1
0.26	0.00	0.30	10.42	26.38	3.77	0	1981	1
0.15	0.00	0.38	3.63	58.15	1.77	0	1982	1
0.19	0.00	0.80	4.65	12.90	1.72	0	1983	1
0.05	0.00	1.47	9.81	28.22	0.70	0	1984	1
0.12	0.00	1.69	6.74	25.29	0.49	0	1985	1
0.19	0.00	1.31	15.32	32.15	1.64	0	1986	1
0.30	0.00	1.85	7.38	33.62	3.42	0	1987	1
0.51	0.00	1.39	4.16	11.73	1.47	0	1988	1
0.47	0.00	2.84	6.56	12.95	2.82	0	1989	1
0.62	0.00	2.24	6.78	32.46	5.24	0	1990	1
1.64	0.00	2.08	6.32	30.25	4.89	0	1991	1
0.47	0.00	1.21	3.66	17.51	2.83	0	1992	1
0.40	0.00	0.15	0.33	3.26	1.20	0	1993	1
0.72	5.62	0.49	0.77	10.77	1.28	0	1994	1
0.81	9.90	0.57	1.32	1.71	0.69	0	1995	1
0.47	10.73	1.09	0.29	9.38	2.64	0	1996	1
0.63	12.01	1.21	0.63	3.60	1.74	0	1997	1
0.68	16.98	0.83	2.15	5.05	2.23	0	1998	1
0.33	14.36	0.78	2.45	10.82	0.58	0	1999	1
0.87	21.98	0.17	0.41	4.52	1.58	0	2000	1
0.62	13.85	0.70	2.30	3.30	2.23	0	2001	1
0.36	6.52	0.13	3.11	6.76	1.76	0	2002	1
0.68	5.54	0.34	1.61	6.39	1.34	0	2003	1
0.20	5.65	0.87	2.24	1.94	1.89	0	2004	1
0.44	3.63	0.55	6.04	1.59	1.49	0	2005	1
0.31	3.69	0.40	1.59	1.81	1.70	0	2006	1
0.07	3.23	0.05	1.55	4.21	2.63	0	2007	1
0.15	3.74	0.64	1.83	0.89	2.85	0	2008	1

#Abundance_Indices
168 #_N_observations

#Year	Season	Type	Value	CV	
1960	1	8	0.000452314	0.2832594	#CPFV 1960-1999
1961	1	8	0.001137818	0.2153741	
1962	1	8	0.003200635	0.1623748	
1963	1	8	0.005207429	0.163968	
1964	1	8	0.004708524	0.1546894	
1965	1	8	0.003454028	0.1426449	
1966	1	8	0.005310159	0.1289376	
1967	1	8	0.00295466	0.1215879	
1968	1	8	0.001747249	0.1365701	
1969	1	8	0.002038152	0.1537628	
1970	1	8	0.002294708	0.1297591	
1971	1	8	0.002429784	0.1374047	
1972	1	8	0.005203361	0.1342096	
1973	1	8	0.002669626	0.1350328	

1974	1	8	0.003356827	0.1397297	
1975	1	8	0.004128903	0.1279682	
1976	1	8	0.002363132	0.1212524	
1977	1	8	0.001723166	0.1280545	
1978	1	8	0.002312066	0.1336883	
1980	1	8	0.002157117	0.1248343	
1981	1	8	0.001987522	0.1234024	
1982	1	8	0.001285069	0.1320386	
1983	1	8	0.001306797	0.1565492	
1984	1	8	0.000343328	0.1914159	
1985	1	8	0.000844097	0.1586893	
1986	1	8	0.00246611	0.1466684	
1987	1	8	0.003709234	0.1214355	
1988	1	8	0.003489054	0.1275649	
1989	1	8	0.004188435	0.1196436	
1990	1	8	0.005298528	0.1116753	
1991	1	8	0.003296344	0.117396	
1992	1	8	0.001690471	0.1164691	
1993	1	8	0.001184995	0.1423761	
1994	1	8	0.000635505	0.2208527	
1995	1	8	0.000984728	0.1545501	
1996	1	8	0.002077128	0.1150459	
1997	1	8	0.00161451	0.103947	
1998	1	8	0.000783863	0.1728826	
1999	1	8	0.000591253	0.2027761	
2000	1	9	0.000949932	0.1781485	#CPFV 2000-2008
2001	1	9	0.00099995	0.2002925	
2002	1	9	0.000446063	0.2449126	
2003	1	9	0.000597964	0.2731998	
2004	1	9	0.000535188	0.2288712	
2005	1	9	0.000466744	0.2308095	
2006	1	9	0.000712774	0.1960171	
2007	1	9	0.000663963	0.2141304	
2008	1	9	0.000571155	0.207621	
1960	1	10	0.000470536	0.277252	#CPFV 1960-2008
1961	1	10	0.001208953	0.2224335	
1962	1	10	0.003406825	0.163965	
1963	1	10	0.005626631	0.1707729	
1964	1	10	0.005176841	0.1398065	
1965	1	10	0.003776024	0.1292879	
1966	1	10	0.005858958	0.1337603	
1967	1	10	0.003268861	0.1164255	
1968	1	10	0.001897916	0.1339299	
1969	1	10	0.002176078	0.1519568	
1970	1	10	0.002477159	0.1324957	
1971	1	10	0.00258813	0.1522869	
1972	1	10	0.005728542	0.1350124	
1973	1	10	0.002896862	0.1349098	
1974	1	10	0.003643093	0.1368207	
1975	1	10	0.004523044	0.1225044	
1976	1	10	0.002518716	0.1248367	
1977	1	10	0.001844795	0.1276191	
1978	1	10	0.002478905	0.129705	
1980	1	10	0.002318204	0.1223473	
1981	1	10	0.002127032	0.1154456	
1982	1	10	0.001353648	0.1356315	
1983	1	10	0.001378662	0.1547292	
1984	1	10	0.000351147	0.1907344	
1985	1	10	0.000876894	0.165969	
1986	1	10	0.002607573	0.152497	
1987	1	10	0.004085936	0.1076187	
1988	1	10	0.003796372	0.125861	
1989	1	10	0.004584953	0.1132214	
1990	1	10	0.005826888	0.1108954	
1991	1	10	0.003588858	0.1128685	
1992	1	10	0.001826133	0.1123283	
1993	1	10	0.001248646	0.1493557	
1994	1	10	0.000663145	0.2172859	
1995	1	10	0.001036	0.1611227	
1996	1	10	0.002284409	0.1087476	

1997	1	10	0.001771288	0.1120026	
1998	1	10	0.000833307	0.1645284	
1999	1	10	0.000623416	0.2002253	
2000	1	10	0.000949932	0.1781485	
2001	1	10	0.001075176	0.1454224	
2002	1	10	0.000525332	0.2320693	
2003	1	10	0.000642323	0.2340119	
2004	1	10	0.000582414	0.1937882	
2005	1	10	0.000467995	0.2330727	
2006	1	10	0.000760891	0.165078	
2007	1	10	0.000727296	0.1900022	
2008	1	10	0.000616015	0.1868014	
1978	1	11	0.016469	0.716219	#CalCOFI:manta
1980	1	11	0.003682	1.525368	
1981	1	11	0.001965	0.353765	
1983	1	11	0.000745	0.862236	
1984	1	11	0.001515	0.385216	
1985	1	11	0.004325	0.427435	
1986	1	11	0.001908	0.449719	
1987	1	11	0.001061	0.611327	
1988	1	11	0.002251	0.550732	
1989	1	11	0.004629	0.474342	
1990	1	11	0.000755	0.600677	
1991	1	11	0.002051	0.597394	
1992	1	11	0.000855	0.788863	
1993	1	11	0.000471	0.513378	
1994	1	11	0.000133	0.866171	
1995	1	11	0.002915	0.522748	
1996	1	11	0.002699	0.454805	
1997	1	11	0.002193	0.408187	
1998	1	11	0.000189	0.50679	
1999	1	11	0.002981	0.40929	
2000	1	11	0.002236	0.532012	
2001	1	11	0.001094	0.486084	
2002	1	11	0.003644	0.400154	
2003	1	11	0.007146	0.461904	
2004	1	11	0.002537	0.527275	
2005	1	11	0.001678	0.397993	
2006	1	11	0.006018	0.362456	
2007	1	11	0.001973	0.45983	
2008	1	11	0.004615	0.592653	
1972	1	12	9.91E-04	0.3375879	#Edison Impingement
1973	1	12	1.92E-03	0.278647	
1974	1	12	1.13E-03	0.2066957	
1975	1	12	2.27E-03	0.1251556	
1976	1	12	1.68E-03	0.1312414	
1977	1	12	9.64E-04	0.2322483	
1978	1	12	7.53E-04	0.1857204	
1979	1	12	4.89E-04	0.2186301	
1980	1	12	6.75E-04	0.1667745	
1981	1	12	6.36E-04	0.2232059	
1982	1	12	5.22E-04	0.273381	
1983	1	12	4.54E-04	0.2476573	
1984	1	12	7.14E-04	0.2283976	
1985	1	12	5.54E-04	0.1997272	
1986	1	12	3.08E-04	0.2069409	
1987	1	12	5.98E-04	0.2040686	
1988	1	12	1.44E-04	0.3873733	
1989	1	12	5.16E-04	0.2642365	
1990	1	12	3.37E-04	0.2750285	
1991	1	12	4.64E-04	0.2425585	
1992	1	12	2.82E-04	0.2307056	
1993	1	12	1.10E-04	0.3610428	
1994	1	12	1.43E-04	0.3517632	
1995	1	12	1.10E-04	0.4753732	
1996	1	12	6.73E-05	0.4754682	
1997	1	12	1.52E-04	0.3397869	
1998	1	12	6.24E-05	0.4211199	
1999	1	12	8.50E-04	0.1974443	
2000	1	12	3.07E-04	0.3912762	

2001	1	12	1.95E-04	0.5737525	
2002	1	12	6.06E-04	0.4017963	
2003	1	12	8.96E-04	0.4861232	
2004	1	12	3.48E-04	0.6324122	
2005	1	12	5.65E-05	0.6582139	
2006	1	12	4.90E-04	0.782376	
2007	1	12	3.19E-04	0.5970551	
2008	1	12	7.40E-04	0.5104997	
2000	1	13	0.035797214	0.7051926	#PISCO Adults Survey
2003	1	13	0.016455171	0.7052816	
2004	1	13	0.02684791	0.5719691	
2005	1	13	0.008466561	0.7052987	
2006	1	13	0.020918165	0.519804	
2008	1	13	0.008362464	0.7052989	

#_Discard_Biomass
1 #_(1=biomass;_2=fraction)
0 #_N_observations

#_Mean_BodyWt
86

# Year	Seas	Type	Partition	Value	CV
1980	1	3	2	0.48	0.562
1981	1	3	2	0.4	0.707
1982	1	3	2	0.475	0.316
1983	1	3	2	0.583	0.723
1984	1	3	2	0.433	0.611
1987	1	3	2	0.84	0.602
1989	1	3	2	0.892	0.922
1996	1	3	2	0.443	0.322
1999	1	3	2	0.309	0.596
2000	1	3	2	0.067	1.447
2004	1	3	2	1	0.849
2005	1	3	2	0.8	0.955
2006	1	3	2	0.781	0.514
2007	1	3	2	0.575	0.184
2008	1	3	2	1.033	0.895
1980	1	4	2	1.219	0.589
1981	1	4	2	0.8	0.563
1982	1	4	2	0.829	0.59
1983	1	4	2	0.757	0.605
1984	1	4	2	0.913	0.252
1985	1	4	2	0.82	0.558
1986	1	4	2	0.934	0.878
1987	1	4	2	1.129	0.607
1988	1	4	2	1.2	0.589
1989	1	4	2	1.493	0.607
1993	1	4	2	0.975	0.616
1995	1	4	2	0.486	0.678
1996	1	4	2	0.583	0.216
1997	1	4	2	0.365	0.058
1998	1	4	2	0.993	0.435
1999	1	4	2	0.733	0.495
2000	1	4	2	0.713	0.734
2001	1	4	2	0.963	0.393
2002	1	4	2	1.44	0.746
2005	1	4	2	0.833	0.493
1980	1	5	2	1.406	0.545
1981	1	5	2	1.363	0.567
1982	1	5	2	1.131	0.628
1983	1	5	2	0.848	0.599
1984	1	5	2	1.098	0.477
1985	1	5	2	1.235	0.815
1986	1	5	2	0.884	0.727
1987	1	5	2	1.147	0.714
1988	1	5	2	0.793	0.412
1989	1	5	2	1.181	0.61
1993	1	5	2	0.532	0.387
1994	1	5	2	1.144	0.516
1995	1	5	2	0.59	0.434

1996	1	5	2	0.969	1.029
1997	1	5	2	1.21	0.701
1998	1	5	2	0.781	0.39
1999	1	5	2	0.971	0.663
2000	1	5	2	1.004	0.995
2001	1	5	2	0.584	0.323
2002	1	5	2	0.867	0.636
2003	1	5	2	1.03	0.49
2004	1	5	2	1.362	0.844
2005	1	5	2	1.282	0.699
2006	1	5	2	1.252	0.553
2007	1	5	2	1.347	0.586
2008	1	5	2	1.301	0.557
1980	1	6	2	1.025	0.65
1981	1	6	2	1.086	0.543
1982	1	6	2	0.778	0.922
1983	1	6	2	0.816	0.725
1984	1	6	2	1.1	0.519
1985	1	6	2	0.55	0.55
1986	1	6	2	0.587	0.381
1987	1	6	2	1.242	0.474
1988	1	6	2	0.5	0.623
1989	1	6	2	0.708	0.729
1993	1	6	2	0.85	0.898
1994	1	6	2	1.232	0.485
1995	1	6	2	0.375	0.283
1996	1	6	2	0.675	0.552
1997	1	6	2	0.677	0.406
1998	1	6	2	1.284	0.588
1999	1	6	2	0.487	0.505
2000	1	6	2	0.62	0.283
2002	1	6	2	1.391	0.973
2003	1	6	2	2.002	0.754
2004	1	6	2	2.026	0.516
2005	1	6	2	1.416	0.274
2006	1	6	2	1.521	0.502
2007	1	6	2	2.416	0.519
2008	1	6	2	2.216	0.523

Population size structure
1 # Length bin method: 1=Use data bins
Lower edge of bins

#6	8	10	12	14	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	90	92	

0.0001 # Minimum proportion for compressing tails of observed compositional data
0.0001 # Constant added to expected frequencies
0 # Combine males and females at and below this bin number
44 #_N_length_bins
#_lower_edge_of_length_bins

6	8	10	12	14	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	90	92	

109 #N_observations

#Year	Seas	Fleet	sexes	Mkt	Nsamp	begin	data:	females	then	males	
#Fleet 2 Live fish fishery											
2002	1	2	0	0	4	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	228
	57	57	57	171	114	0	57	57	57	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	2	0	0	2	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	159
	264	201	393	21	255	21	0	0	117	0	117

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	2	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	195
	156	78	39	0	39	39	39	39	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2006	1	2	0	0	3	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	80	880
	560	560	240	240	160	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2008	1	2	0	0	9	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	66	302
	144	82	250	376	710	388	0	16	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
#Fleet 3 Manmade mode											
1980	1	3	0	0	7	0	0	0	0	0	0
	1	1	1	0	0	0	1	2	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1981	1	3	0	0	2	0	0	0	0	0	0
	0	0	1	0	0	0	0	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1982	1	3	0	0	4	0	0	0	0	0	0
	0	0	0	1	0	1	0	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1983	1	3	0	0	5	0	0	0	0	0	0
	1	0	0	0	2	1	0	0	0	0	1
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						

1984	1	3	0	0	8	0	0	1	0	1	1
	0	0	1	0	0	3	1	1	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1985	1	3	0	0	5	0	0	0	1	1	1
	0	0	0	1	2	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1986	1	3	0	0	1	0	0	0	0	0	0
	0	0	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1987	1	3	0	0	6	0	0	0	0	0	0
	0	0	0	0	1	2	1	0	1	1	1
	1	0	1	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1988	1	3	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1989	1	3	0	0	8	0	1	0	0	0	2
	0	0	1	0	0	1	1	2	1	1	1
	1	0	0	0	0	1	0	0	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1993	1	3	0	0	1	0	0	0	0	0	0
	0	0	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1996	1	3	0	0	2	0	0	0	0	0	0
	0	1	0	1	0	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1999	1	3	0	0	5	0	0	0	0	1	0
	0	1	1	2	0	2	0	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2000	1	3	0	0	2	0	0	2	4	3	0
	0	0	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	3	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	3	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	3	0	0	4	0	0	0	0	0	1
	0	0	0	0	0	1	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	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	3	0	0	7	0	0	0	0	0	0
	0	0	1	0	1	1	1	1	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	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2006	1	3	0	0	6	0	0	0	0	0	0
	0	1	0	0	1	0	0	0	2	1	2
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2007	1	3	0	0	2	0	0	0	0	0	0
	0	0	0	0	0	0	0	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2008	1	3	0	0	5	0	0	0	0	0	0
	0	0	0	0	0	0	2	1	0	0	1
	0	0	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
#Fleet 4 Beach/bank mode											
1980	1	4	0	0	6	0	0	0	0	0	0
	0	0	1	1	0	1	1	1	0	0	0
	0	2	1	1	1	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1981	1	4	0	0	8	0	0	0	0	0	0
	0	0	0	2	0	0	0	1	4	0	0
	0	1	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1982	1	4	0	0	5	0	0	0	0	0	0
	0	0	0	0	0	0	2	1	2	1	0
	0	0	0	0	0	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1983	1	4	0	0	7	0	0	0	0	0	0
	1	0	0	0	1	0	0	0	1	2	0
	0	1	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1984	1	4	0	0	8	0	0	0	0	0	0
	0	0	0	0	0	0	0	1	3	1	1
	0	2	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1985	1	4	0	0	10	0	0	0	0	0	0
	0	0	0	0	1	4	1	2	1	3	3
	2	2	0	0	0	0	0	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1986	1	4	0	0	12	0	0	0	0	0	0
	1	0	0	1	1	1	3	1	4	3	2

	1	0	2	0	1	0	0	0	0	0	0
	0	0	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1987	1	4	0	0	5	0	0	0	0	0	0
	0	0	0	0	0	0	2	0	1	0	1
	1	0	0	0	1	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1988	1	4	0	0	2	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	0	0
	0	0	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1989	1	4	0	0	3	0	0	0	0	0	0
	0	0	0	0	0	1	0	0	1	0	1
	2	1	5	1	0	0	1	0	0	0	0
	0	0	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1993	1	4	0	0	2	0	0	0	0	0	0
	0	0	0	0	0	0	1	0	0	0	0
	0	1	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1996	1	4	0	0	2	0	0	0	0	0	0
	0	0	0	0	0	1	1	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1997	1	4	0	0	1	0	0	0	0	0	0
	0	0	0	0	2	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1998	1	4	0	0	5	0	0	0	0	0	0
	0	0	0	0	1	2	1	3	1	0	0
	0	2	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						

1999	1	4	0	0	4	0	0	0	0	0	0
	0	0	0	0	1	2	0	2	0	2	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2000	1	4	0	0	2	0	0	0	0	0	0
	0	0	1	0	1	0	0	0	0	1	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2001	1	4	0	0	3	0	0	0	0	0	0
	0	0	0	0	0	1	1	0	0	1	1
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	4	0	0	2	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	0	1
	0	0	0	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	4	0	0	2	0	0	0	0	0	0
	0	0	0	0	0	0	0	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	4	0	0	4	0	0	0	0	0	0
	0	0	0	0	1	0	0	1	2	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	4	0	0	2	0	0	0	0	0	0
	0	0	0	0	0	1	0	1	1	0	1
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
#Fleet 5 PBR											
1980	1	5	0	0	60	0	0	0	0	0	0
	0	0	0	2	5	6	10	8	19	17	9
	11	9	15	12	6	10	13	6	6	8	1
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1981	1	5	0	0	25	0	0	0	0	0	0
	0	0	0	0	1	0	2	6	3	3	3
	4	3	5	4	1	0	1	4	0	1	2
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1982	1	5	0	0	24	0	0	0	0	0	0
	0	0	0	1	3	5	3	2	5	3	3
	3	2	4	0	2	2	4	3	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1983	1	5	0	0	28	0	0	0	0	0	0
	0	0	1	1	0	4	10	3	6	5	2
	2	2	2	2	0	1	0	0	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1984	1	5	0	0	34	0	0	0	0	0	0
	0	0	2	0	0	2	2	5	7	5	5
	6	6	2	3	2	4	2	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1985	1	5	0	0	18	0	0	0	0	0	0
	0	0	0	0	4	3	1	0	2	2	5
	2	4	1	1	0	0	2	2	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	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1986	1	5	0	0	20	0	0	0	0	0	0
	0	0	3	5	3	4	2	4	2	2	1
	4	1	3	1	1	1	2	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1987	1	5	0	0	10	0	0	0	0	0	0
	0	0	0	0	1	3	1	2	1	1	0
	1	2	0	0	1	1	1	1	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1988	1	5	0	0	9	0	0	0	0	0	0
	0	0	0	0	0	1	4	1	0	3	2
	1	0	2	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1989	1	5	0	0	14	0	0	0	0	0	0
	0	0	1	0	3	0	2	1	1	3	3
	1	0	3	2	2	1	2	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1993	1	5	0	0	10	0	0	0	0	0	0
	0	0	1	0	2	1	4	4	1	1	0
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1994	1	5	0	0	13	0	0	0	0	0	0
	0	0	0	0	1	1	2	3	3	1	0
	2	0	1	0	2	0	0	1	1	0	2
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1996	1	5	0	0	11	0	0	0	0	0	0
	0	0	0	1	1	3	6	5	1	0	3
	0	0	0	0	0	0	0	0	0	0	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1997	1	5	0	0	9	0	0	0	0	0	0
	0	0	0	0	0	0	1	4	1	1	0
	0	0	0	1	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1998	1	5	0	0	10	0	0	0	0	0	0
	0	0	0	0	2	1	0	6	6	3	0
	2	2	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1999	1	5	0	0	23	0	0	0	0	0	0
	1	0	1	1	0	3	1	6	11	9	6
	2	2	1	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2000	1	5	0	0	6	0	0	0	0	0	0
	0	0	0	0	2	2	1	0	0	0	0

	1	0	0	0	0	2	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2001	1	5	0	0	6	0	0	0	0	0	0
	0	0	0	1	0	0	2	1	2	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	5	0	0	18	0	0	0	0	0	0
	0	0	0	0	0	0	6	5	5	1	1
	0	1	2	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	5	0	0	20	0	0	0	0	0	0
	0	0	0	0	0	1	1	5	6	5	3
	4	0	1	1	0	1	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	5	0	0	76	0	0	0	0	0	0
	0	0	0	1	0	2	7	9	13	10	12
	19	10	9	7	5	4	3	3	0	1	0
	0	0	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	5	0	0	55	0	0	0	0	0	0
	0	0	0	1	1	5	1	8	8	12	6
	6	7	4	2	5	4	1	1	0	2	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2006	1	5	0	0	75	0	0	0	0	0	0
	0	0	0	0	1	4	2	10	13	12	29
	12	10	10	3	1	2	2	0	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2007	1	5	0	0	60	0	0	0	0	0	0
	0	0	0	0	2	5	3	2	5	9	15
	9	9	9	4	5	2	1	0	0	2	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						

2008	1	5	0	0	46	0	0	0	0	0	0
	0	0	0	0	0	1	2	8	5	8	7
	10	5	3	3	1	0	4	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
#Fleet 6 CPFV											
1975	1	6	0	0	32	0	0	0	0	0	0
	1	0	1	2	7	6	11	13	7	10	3
	6	4	2	2	2	0	1	0	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1976	1	6	0	0	63	0	0	0	1	0	0
	0	1	1	5	6	11	18	9	6	8	5
	8	3	4	2	2	4	0	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1977	1	6	0	0	44	0	0	0	0	1	0
	0	0	0	5	9	10	11	5	7	7	4
	3	4	1	3	3	0	1	1	0	0	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1978	1	6	0	0	51	0	0	0	1	0	0
	2	1	0	5	5	7	12	8	11	8	5
	9	8	3	3	4	0	4	4	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1986	1	6	0	0	60	0	0	0	0	0	0
	1	1	6	15	13	16	14	4	3	3	3
	0	2	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1987	1	6	0	0	64	0	0	0	0	0	0
	0	0	2	1	13	12	25	13	12	9	10
	3	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1988	1	6	0	0	40	0	0	0	0	0	0
	0	0	1	4	3	5	8	10	8	6	8
	10	1	1	0	0	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1989	1	6	0	0	63	0	0	0	0	0	1
	0	2	6	15	15	8	9	8	6	8	3
	1	3	1	1	4	2	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1980	1	6	0	0	13	0	0	0	0	0	0
	0	0	0	0	2	0	5	0	1	0	3
	0	0	1	0	0	2	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1981	1	6	0	0	14	0	0	0	0	0	0
	0	0	1	0	0	1	1	0	2	1	2
	0	0	3	1	1	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1982	1	6	0	0	9	0	0	0	0	0	0
	0	0	0	0	1	4	1	1	0	0	0
	1	0	0	0	0	0	0	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1983	1	6	0	0	19	0	0	0	0	0	0
	0	0	1	1	1	0	2	5	4	0	3
	0	0	0	1	0	0	0	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1984	1	6	0	0	8	0	0	0	0	0	0
	0	0	0	0	0	0	1	1	1	1	1
	0	0	2	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1985	1	6	0	0	7	0	0	0	0	0	0
	0	1	0	1	1	1	0	0	3	0	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1986	1	6	0	0	13	0	0	0	0	0	0
	0	0	1	0	3	0	5	1	3	2	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1987	1	6	0	0	9	0	0	0	0	0	0
	0	0	0	0	0	0	1	1	1	0	1
	2	2	1	1	0	1	0	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1988	1	6	0	0	5	0	0	0	0	0	0
	0	0	1	1	1	1	1	0	2	0	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1989	1	6	0	0	12	0	0	0	1	0	0
	0	0	0	3	1	1	0	1	2	1	1
	0	1	0	0	0	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1993	1	6	0	0	2	0	0	0	0	0	0
	0	0	0	1	0	0	0	0	0	0	0
	0	0	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1994	1	6	0	0	5	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	1	1
	1	0	0	0	0	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1996	1	6	0	0	11	0	0	0	0	0	0
	0	1	2	0	1	0	1	5	1	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	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1997	1	6	0	0	4	0	0	0	0	0	0
	0	0	0	0	0	1	2	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1998	1	6	0	0	8	0	0	0	0	0	0
	0	0	0	0	0	0	0	2	1	2	0

	2	0	0	1	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1999	1	6	0	0	5	0	0	0	0	0	0
	0	0	0	0	2	0	1	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	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2000	1	6	0	0	4	0	0	0	0	0	0
	0	0	0	0	0	0	1	1	1	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2001	1	6	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	6	0	0	7	0	0	0	0	0	0
	0	0	1	0	0	0	0	1	0	1	1
	2	1	0	0	0	0	0	0	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	6	0	0	7	0	0	0	0	0	0
	0	0	0	0	0	0	1	0	1	1	0
	1	0	0	1	1	0	0	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	6	0	0	14	0	0	0	0	0	0
	0	0	0	0	0	0	0	1	2	1	1
	1	3	1	2	1	3	0	2	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	6	0	0	8	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	2
	3	0	1	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						

2006	1	6	0	0	15	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	6
	1	3	1	0	2	0	0	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2007	1	6	0	0	19	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	2
	2	3	4	0	3	2	2	0	0	1	2
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2008	1	6	0	0	17	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	5
	1	1	1	2	3	2	0	1	1	0	0
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	6	0	0	4	0	0	0	0	0	0
	0	0	0	0	0	1	0	0	1	1	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	6	0	0	48	0	0	0	0	0	0
	0	0	2	1	6	2	5	9	10	23	21
	25	14	15	4	6	4	3	0	1	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	6	0	0	19	0	0	0	0	0	0
	1	0	0	0	2	2	1	3	5	2	7
	7	4	6	8	4	6	5	3	1	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	6	0	0	39	0	0	0	0	0	0
	1	1	1	4	1	8	12	9	8	8	4
	4	2	4	7	2	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
20	#_N_age_bins										
1	2	3	4	5	6	7	8	9	10	11	12
	13	14	15	16	17	18	19	20			
2	#_N_ageerror_definitions										

#Female											
-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1									
0.479363	0.479363	0.547477	0.604513	0.652275	0.69227	0.725762	0.753807	0.777291	0.796957	0.813425	0.827214
	0.838762	0.848431	0.856529	0.863309	0.868987	0.873741	0.877723	0.881057	0.883849	0.886186	0.888144
	0.889783	0.891156	0.892306	0.893268	0.894074	0.894749	0.895314	0.895788	0.896184	0.896516	0.896794
	0.897027	0.897221									
#Male											
-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1									
0.571868	0.571868	0.297421	0.206562	0.161637	0.135119	0.117833	0.105851	0.0972099	0.0908204	0.0860316	0.0824308
	0.0797446	0.0777855	0.0764214	0.0755572	0.0751234	0.0750688	0.0753554	0.0759549	0.0768471	0.0780175	0.0794561
	0.0811573	0.0831183	0.0853394	0.0878231	0.0905741	0.0935993	0.0969071	0.100508	0.104414	0.108639	0.113197
	0.118107	0.123388									
16	#_N_Agecomp_obs										
2	#_Lbin_method:		1=poplenbins		2=datalenbins		3=lengths				
0	#_combinemales		into	females	at	or	below	this	bin	number	
#Conditional_Age-at_Length			1	2	3	4	5	6	7	8	9
	10	11	12	13	14	15	16	17	18	19	20
	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20		
#Joanna's data											
#Yr	Seas	Flt	Survey	Gender	Part	Ageerr	Lbin_lo	Lbin_hi	1	2	3
	4	5	6	7	8	9	10	11	12	13	14
	15	16	17	18	19	20	1	2	3	4	5
	6	7	8	9	10	11	12	13	14	15	16
	17	18	19	20							
#Females											
2002	1	7	1	0	1	16	16	1	0	0	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	17	17	8	0	0	3
	3	2	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	18	18	2	0	0	0
	2	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	19	19	6	0	0	0
	4	1	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	20	20	6	0	0	0
	4	1	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	21	21	1	0	0	0
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	22	22	4	0	0	0
	0	1	0	3	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	23	23	11	0	0	0
	0	3	3	1	3	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	24	24	3	0	0	0
	0	1	0	0	1	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	25	25	8	0	0	0
	0	1	0	4	1	2	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	26	26	2	0	0	0
	0	0	0	0	2	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	27	27	2	0	0	0
	0	0	0	0	0	1	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							
2002	1	7	1	0	1	28	28	1	0	0	0
	0	0	0	0	0	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
#Males											
2002	1	7	2	0	2	16	16	3	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	2	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	2	0	2	17	17	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	2
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	2	0	2	19	19	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	0
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0							

0 # N_size-at-age_observations;_values_on_row1;_N_on_row2
0 # Total number of environmental variables
0 # Total number of environmental observations
0 # No Weight frequency data; N sizefreq methods to read
0 # No tagging data
0 # No morph composition data

999
ENDDATA

Appendix D-2. Control file for SCS.

cabezon control file, SS v3.03a, May 2009
updated 30 July 09
Selectivity values for the Commercial fisheries set to the coastwide CA model

Morph setup
1 # Number of growth patterns
1 # N sub morphs within growth patterns
2 #_Nblock_Patterns
1 1 #_Blocks_per_pattern
1999 2008 #Accounts for change in commerical regs (size limits)
2000 2008 #Accounts for change in recreational regs (size & bag limits)

Mortality and growth specifications
0.5 # Fraction female at birth
0 # M setup: 0=single Par,1=N_breakpoints,2=Lorenzen,3=agespecific;_4=agespec_withseasinterpolate
#2 # Number of M breakpoints
#0 0 # Ages at M breakpoints
1 # Growth model: 1=VB with L1 and L2, 2=VB with A0 and Linf, 3=Richards, 4=Read vector of L@A
0 # Age for growth Lmin
999 # Age for growth Lmax or 999 = Linf
0 # SD constant added to LAA (0.1 mimics SS2 v1.x for compatibility only)
0 # Variability about growth: 0=CV~f(LAA) [mimic v1.xx], 1=CV~f(A), 2=SD~f(LAA), 3=SD~f(A)
1 # Maturity option: 1=length logistic, 2=age logistic, 3=read age-maturity matrix by growth_pattern
1 # First age allowed to mature
1 #_fecundity option:(1)eggs=Wt*(a+b*Wt);(2)eggs=a*L^b;(3)eggs=a*Wt^b
0 #_hermaphroditism option: 0=none; 1=age-specific fxn
1 #_parameter_offset_approach (1=none, 2= M, G, CV_G as offset from female-GP1, 3=like SS2 V1.x)
1 #_env/block/dev_adjust_method (1=standard; 2=with logistic trans to keep within base parm bounds)

#_LO HI INIT PRIOR PR_type SD PHASE env-var use_dev dev_minyr dev_maxyr
dev_stddev Block Block_Fxn
#0.02 0.5 0.25 0.25 0 1 -3 0 0 0 0 0.5
0 0 # NatM_p_1_Fem_GP:1 young
0.02 0.5 0.25 0.25 0 1 -4 0 0 0 0 0.5
0 0 # NatM_p_2_Fem_GP:1 old
1 40 12.42 12.5 0 1 -3 0 0 0 0 0.5
0 0 # L_at_Amin_Fem_GP_1
20 90 64.0 63.9 0 16 -2 0 0 0 0 0.5
0 0 # L_at_Amax_Fem_GP_1
0.05 0.3 0.126 0.13 0 0.02 -3 0 0 0 0 0.5
0 0 # VonBert_K_Fem_GP_1
0.01 0.5 0.158 0.16 0 0.8 -3 0 0 0 0 0.5
0 0 # CV_young_Fem_GP_1
0.01 0.5 0.117 0.117 0 0.8 -3 0 0 0 0 0.5 0
0 # CV_old_Fem_GP_1

#0.02 0.5 0.3 0.3 0 1 -3 0 0 0 0 0.5
0 0 # NatM_p_1_Mal_GP:1 young
0.02 0.5 0.3 0.3 0 1 -4 0 0 0 0 0.5
0 0 # NatM_p_1_Mal_GP:1 old
1 40 11.67 11.7 0 1 -3 0 0 0 0 0.5 0
0 # L_at_Amin_Mal_GP_1
20 90 43.5 43.4 0 6 -2 0 0 0 0 0.5 0
0 # L_at_Amax_Mal_GP_1
0.05 0.6 0.228 0.23 0 0.04 -3 0 0 0 0 0.5
0 0 # VonBert_K_Mal_GP_1
0.01 0.5 0.33 0.33 0 0.8 -3 0 0 0 0 0.5
0 0 # CV_young_Mal_GP_1
0.01 0.5 0.06 0.06 0 0.8 -3 0 0 0 0 0.5
0 0 # CV_old_Mal_GP_1

Add 2+2*gender lines to read the wt-Len and mat-Len parameters
-3 3 0.00001236 0.00001236 0 0.8 -3 0 0 0
0 0.5 0 0 #Female wt-len-1

-3 4 3.113 3.113 0 3 -3 0 0 0 0 0.5
0 0 #Female wt-len-2
-3 40 34.6 35 0 30 -3 0 0 0 0 0.5
0 0 #Female mat-len-1
-3 3 -0.7 -0.7 0 0.8 -3 0 0 0 0 0.5
0 0 #Female mat-len-2
-3 3 1 1 0 0.8 -3 0 0 0 0 0.5
0 0 #Female eggs/gm intercept
-3 3 0 0 0 0.8 -3 0 0 0 0 0.5
0 0 #Female eggs/gm slope
-3 3 0.00001989 0.00001989 0 0.8 -3 0 0 0 0
0.5 0 0 #Male wt-len-1
-3 4 2.997 2.997 0 3 -3 0 0 0 0 0.5
0 0 #Male wt-len-2

-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 0 0 -1 99 -3 0 0 0 0 0.5 0 0 #_recrdistribution_by_season 1
0 2 1 1 -1 99 -3 0 0 0 0 0.5 0 0 #_cohort_growth_deviation
Seasonal effects on biology parameters (0=none)
0 0 0 0 0 0 0 0 0 0

#_Spawner-Recruitment
3 #_SR_function
#_LO HI INIT PRIOR PR_type SD PHASE
3 30 5.5 12 -1 10 2 # SR_R0
0.2 1 0.7 0.71 0 0.8 -3 # SR_steep
0 1 0.7 1.1 0 1 -1 # SR_sigmaR
0 5 0 0 0 1 -3 # SR_envlink
0 5 0 0 0 1 -3 # SR_R1_offset
0 2 0 1 0 50 -50 # Autocorrelation placeholder (Future implementation)
0 #_SR_env_link
0 #_SR_env_target_1=devs;_2=R0;_3=steepness
1 #do_recr_dev: 0=none; 1=devvector; 2=simple deviations
Recruitment residuals
1970 # Start year recruitment residuals
2006 # End year recruitment residuals
1 # Phase
1 # Read 13 advanced recruitment options: 0=no, 1=yes
0 # first year for early rec devs
-4 # phase for early rec devs
5 # Phase for forecast recruit deviations
100 # Lambda for forecast recr devs before endyr+1
1979 #_last_yr_nobias_adj_in_MPD
1980 # first year of full bias correction (linear ramp up from this year minus the plus-age to this year)
2004 # last year for full bias correction in_MPD
2005 #_first_recent_yr_nobias_adj_in_MPD
1 #_max_bias_adj_in_MPD (1.0 to mimic pre-2009 models)
0 #_placeholder
-15 # Lower bound rec devs
15 # Upper bound rec devs
0 # read intitial values for rec devs

Fishing mortality setup
0.1 # F ballpark for tuning early phases
2008 # F ballpark year
1 # F method: 1=Pope's; 2=Instan. F; 3=Hybrid (recommended)
0.9 # max F or harvest rate, depends on F_Method
#init_F_setup, for each fleet
#LO HI INIT PRIOR P_TYPE SD PHASE
0 1 0 0.0001 0 99 -1 #1 InitF_FISHERY1_Comm_Non-Live
0 1 0 0.0001 0 99 -1 #2 InitF_FISHERY2_Comm_Live
0 1 0 0.0001 0 99 -1 #3 InitF_FISHERY3_Rec_MM
0 1 0 0.0001 0 99 -1 #4 InitF_FISHERY4_Rec_BB
0 1 0 0.0001 0 99 -1 #5 InitF_FISHERY5_Rec_PBR
0 1 0 0.0001 0 99 -1 #6 InitF_FISHERY6_Rec_CPFV
0 1 0 0.0001 0 99 -1 #7 InitF_FISHERY7_Ghost

#_Q_setup
#_add_parm_row_for_each_positive_entry_below(row_then_column)

```
# 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 #1  InitF_FISHERY1_Comm_Non-Live
 0 0 0 0 1 0 #2  InitF_FISHERY2_Comm_Live
 0 0 0 0 1 0 #3  InitF_FISHERY3_Rec_MM
 0 0 0 0 1 0 #4  InitF_FISHERY4_Rec_BB
 0 0 0 0 1 0 #5  InitF_FISHERY5_Rec_PBR
 0 0 0 0 1 0 #6  InitF_FISHERY6_Rec_CPFV
 0 0 0 0 1 0 #7  InitF_FISHERY7_Ghost
 0 0 0 0 0 0 #8  InitF_SURVEY1_CPFV 1960-1999
 0 0 0 0 0 0 #9  InitF_SURVEY2_CPFV 2000-2008
 0 0 0 0 0 0 #10 InitF_SURVEY3_CPFV 1960-2008
 0 0 0 0 0 0 #11 InitF_SURVEY4_CalCOFI manta tows
 0 0 0 0 0 0 #12 InitF_SURVEY5_Edison Impingement
 0 0 0 0 0 0 #13 InitF_SURVEY6_PISCO_adult

#_size_selex_types
#_Pattern Discard Male Special
 24 0 0 0 # 1  Comm_Non-Live
 24 0 0 0 # 2 Comm_Live
 24 0 0 0 # 3 Rec_MM
 24 0 0 0 # 4 Rec_BB
 24 0 0 0 # 5  Rec_PBR
 24 0 0 0 # 6  Rec_CPFV
 0 0 0 0  # 7  CA_age_samples
 5 0 0 6  # 8  CPFV 1960-1999
 5 0 0 6  # 9  CPFV 2000-2008
 5 0 0 6  #10 CPFV 1960-2008
 33 0 0 0 #11 CalCOFI
 33 0 0 0 #12 Edison impingement
 30 0 0 0 #13 PISCO Adults

#_age_selex_types
#_Pattern Discard Male Special
 10 0 0 0 #1  Comm_Non-Live
 10 0 0 0 #2  Comm_Live
 10 0 0 0 #3  Rec_MM
 10 0 0 0 #4  Rec_BB
 10 0 0 0 #5  Rec_PBR
 10 0 0 0 #6  Rec_CPFV
 10 0 0 0 #7  CA_age_samples
 10 0 0 0 #8  CPFV_CPUE
 10 0 0 0 #9  CPFV 2000-2008
 10 0 0 0 #10 CPFV 1960-2008
 10 0 0 0 #11 CalCOFI
 10 0 0 0 #12 Edison Impingement
 10 0 0 0 #13 PISCO Adults

#_LO HI INIT PRIOR PR_type SD PHASE env-var use_dev dev_minyr dev_maxyr
dev_stddev Block Block_Fxn
#FLEET 1 NOT THE LIVE FISH FISHERY
 10 91 35.543 35 1 0.05 -2 0 0 0 0 0.5
 0 0  # PEAK
 -5.0 3.0 -0.978  -0.99 1 0.05 -3 0 0 0 0 0.5
 0 0  # TOP:_width of plateau
 -4.0 12.0 3.467 3.4  1 0.05 -3 0 0 0 0 0.5 0
 0  # Asc_width
 -10 6.0 4 -1.0 1 0.05 -3 0 0 0 0 0.5
 0 0  # Desc_width
-15.0 15.0 -10 -5.0 1 0.05 -2 0 0 0 0 0.5
 0 0  # INIT:_selectivity_at_fist_bin
 -5.0 15.0 10 -0.3 1 0.05 -2 0 0 0 0 0.5
 0 0  # FINAL:_selectivity_at_last_bin
#FLEET 2 LIVE FISH FISHERY
 10 91 38.282 38 1 0.05 -2 0 0 0 0 0.5 1 2  # PEAK
 -5.0 3.0 -0.572 -0.3 1 0.05 -3 0 0 0 0 0.5
 1 2  # TOP:_width of plateau
 -4.0 12.0 3.367 2.3  1 0.05 -3 0 0 0 0 0.5 1
 2  # Asc_width
```

-10 6.0 -1.997 3.0 1 0.05 -3 0 0 0 0 0.5 1
2 # Desc_width
-15.0 5.0 -5 -5.0 1 0.05 -2 0 0 0 0 0.5
0 0 # INIT:_selectivity_at_fist_bin
-5.0 15.0 6.243 -3.5 1 0.05 -2 0 0 0 0 0.5
1 2 # FINAL:_selectivity_at_last_bin
#FLEET 3 Man Made
10 91 10.8 10.8 1 0.05 2 0 0 0 0 0.5
0 0 # PEAK
-5.0 3.0 -0.5 -0.5 1 0.05 3 0 0 0 0 0.5
0 0 # TOP:_width of plateau
-4.0 12.0 -0.6 -0.6 1 0.05 3 0 0 0 0 0.5
0 0 # Asc_width
-10 6.0 -2 -2.0 1 0.05 3 0 0 0 0 0.5
0 0 # Desc_width
-15.0 15.0 -10 -5.0 1 0.05 -2 0 0 0 0 0.5
0 0 # INIT:_selectivity_at_fist_bin
-5.0 15.0 -0.5 -0.5 1 0.05 2 0 0 0 0 0.5
0 0 # FINAL:_selectivity_at_last_bin
#FLEET 4 Shore
10 91 33.7 33.7 1 0.05 2 0 0 0 0 0.5
0 0 # PEAK
-5.0 3.0 -2.8 -2.8 1 0.05 3 0 0 0 0 0.5 0
0 # TOP:_width of plateau
-4.0 12.0 4.1 4.1 1 0.05 3 0 0 0 0 0.5 0
0 # Asc_width
-10 6.0 -1 -1.0 1 0.05 3 0 0 0 0 0.5
0 0 # Desc_width
-15.0 15.0 -10 -5.0 1 0.05 -2 0 0 0 0 0.5
0 0 # INIT:_selectivity_at_fist_bin
-5.0 15.0 -0.3 -0.3 1 0.05 2 0 0 0 0 0.5
0 0 # FINAL:_selectivity_at_last_bin
#FLEET 5 PBR
10 91 45 45 1 0.05 2 0 0 0 0 0.5
2 2 # PEAK
-5.0 3.0 -2.8 -2.8 1 0.05 3 0 0 0 0 0.5
2 2 # TOP:_width of plateau
-4.0 12.0 4.1 4.1 1 0.05 3 0 0 0 0 0.5 2
2 # Asc_width
-10 6.0 4 -1.0 1 0.05 -3 0 0 0 0 0.5
0 0 # Desc_width
-15.0 15.0 -10 -5.0 1 0.05 -2 0 0 0 0 0.5
0 0 # INIT:_selectivity_at_fist_bin
-5.0 15.0 10 -0.3 1 0.05 -2 0 0 0 0 0.5
0 0 # FINAL:_selectivity_at_last_bin
#FLEET 6 CPFV
10 91 45 45 1 0.05 2 0 0 0 0 0.5
2 2 # PEAK
-5.0 3.0 -2.8 -2.8 1 0.05 3 0 0 0 0 0.5
2 2 # TOP:_width of plateau
-4.0 12.0 4.1 4.1 1 0.05 3 0 0 0 0 0.5 2
2 # Asc_width
-10 6.0 4 -1.0 1 0.05 -3 0 0 0 0 0.5
0 0 # Desc_width
-15.0 15.0 -10 -5.0 1 0.05 -2 0 0 0 0 0.5
0 0 # INIT:_selectivity_at_fist_bin
-5.0 15.0 10 -0.3 1 0.05 -2 0 0 0 0 0.5
0 0 # FINAL:_selectivity_at_last_bin
#FLEET 7 CA_age_samples

#Survey 1: CPFV CPUE 1960-1999
1 44 1 1 0 10 -3 0 0 0 0 0.5 0 0
#min Len bin - fixed
1 100 44 50 0 10 -4 0 0 0 0 0.5 0
0 #max Len bin fixed

#Survey 2: CPFV CPUE 2000-2008
1 44 1 1 0 10 -3 0 0 0 0 0.5
0 0 #min Len bin - fixed

```
  1        100      44       50       0        10      -4       0        0        0        0        0.5
           0        0        #max Len bin fixed

#Survey 3: CPFV CPUE 1960-2008
  1        44       1        1        0        10      -3       0        0        0        0        0.5
           0        0        #min Len bin - fixed
  1        100      44       50       0        10      -4       0        0        0        0        0.5
           0        0        #max Len bin fixed

#Survey 4: CalCOFI
#Survey 5: Edison Impingement
#Survey 6: PISCO adult

1   #_Custom_block_setup SELECTIVITY BLOCK: 1999-2008
#FLEET 2 LIVE FISH FISHERY
  10       91       39.0307          38       1        0.05     -3   # PEAK
 -5.0      3.0      -0.601767        -0.3     1        0.05     -4   # TOP:_width of plateau
 -4.0      12.0     2.02299          2.3      1        0.05     -4   # Asc_width
 -10       6.0      2.56787          3.0      1        0.05     -4   # Desc_width
 -5.0      15.0     -0.816397        -3.5     1        0.05     -3   # FINAL:_selectivity_at_last_bin
#FLEET 5 PBR
  10       91       45       45       1        0.05     3        # PEAK
 -5.0      3.0      -2.8     -2.8     1        0.05     4        # TOP:_width of plateau
 -4.0      12.0     4.1      4.1      1        0.05     4        # Asc_width
#  -10     6.0      4        -1.0     1        0.05     -3       # Desc_width
# -5.0     15.0     10       -0.3     1        0.05     -2       # FINAL:_selectivity_at_last_bin
#FLEET 6 CPFV
  10       91       45       45       1        0.05     2        # PEAK
 -5.0      3.0      -2.8     -2.8     1        0.05     3        # TOP:_width of plateau
 -4.0      12.0     4.1      4.1      1        0.05     3        # Asc_width
#  -10     6.0      4        -1.0     1        0.05     -3       # Desc_width
# -5.0     15.0     10       -0.3     1        0.05     -2       # FINAL:_selectivity_at_last_bin

2    #separt_adj_method

# Tag loss and Tag reporting parameters go next
0  # TG_custom:  0=no read; 1=read if tags exist
#_Cond -6 6 1 1 2 0.01 -4 0 0 0 0 0 0 0  #_placeholder if no parameters

### Likelihood related quantities ###
1 # Do variance adjustments
#1  Comm: Non-live Fishery
#2  Comm: Live Fishery
#3  Rec: Man-made
#4  Rec: Beach/bank
#5  Rec: PBR
#6  Rec: CPFV
#7  CA age samples
#8  CPFV CPUE survey 1960-1999
#9  CPFV CPUE survey 2000-2008
#10 CPFV CPUE survey 1960-2008
#11 CalCOFI
#12 Edison Impingement
#13 PISCO adult survey
#        1        2        3        4        5        6        7        8        9        10       11
         12       13
#        0        0        0        0        0        0        0        0        0        0        0
         0        0        #_add_to_survey_CV
         0        0        0        0        0        0        0        0.28     0.43     0.29     0.1
         0.55     1.3      #_add_to_survey_CV
         0        0        0        0        0        0        0        0        0        0        0
         0        0        #_add_to_discard_stddev
         0        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        1        #_mult_by_lencomp_N
         1        3.7      1.6      2.5      1.3      1.2      1        1        1        1        1
         1        1        #_mult_by_lencomp_N
         1        1        1        1        1        1        1.3      1        1        1        1
         1        1        #_mult_by_agecomp_N
```

1 1 1 1 1 1 1 1 1 1 1
1 1 #_mult_by_size-at-age_N

30 # DF For discard T-distribution
30 # DF For meanbodywt T-distribution
1 #_maxlambdaphase
0 #_sd_offset
4 # N changes to default Lambdas = 1.0

#####################################
#Example of changes to default lambda
#3 # number of changes to make to default Lambdas (default value is 1.0)
Like_comp codes: 1=surv; 2=disc; 3=mnwt; 4=length; 5=age; 6=SizeFreq; 7=sizeage; 8=catch;
9=init_equ_catch; 10=recrdev; 11=parm_prior; 12=parm_dev; 13=CrashPen; 14=Morphcomp; 15=Tag-comp; 16=Tag-negbin
#like_comp fleet/survey phase value sizefreq_method
1 8 1 0 1 #_CPUE/survey:_1 CPFV Logbook 1960-1999
1 9 1 0 1 #_CPUE/survey:_2 CPFV Logbook 2000-2008
1 10 1 0 1 #_CPUE/survey:_3 CPFV Logbook 1960-2008
1 11 1 0 1 #_CPUE/survey:_4 CalCOFI
1 12 1 0 1 #_CPUE/survey:_5 Edison Impingement
1 13 1 0 1 #_CPUE/survey:_6 PISCO Adult
4 1 1 0 1 #_lencomp:_FLEET 1
4 2 1 0 1 #_lencomp:_FLEET 2
4 3 1 0 1 #_lencomp:_FLEET 3
4 4 1 0 1 #_lencomp:_FLEET 4
4 5 1 0 1 #_lencomp:_FLEET 5
4 6 1 0 1 #_lencomp:_FLEET 6
5 7 1 0 1 #_Cond_age:_Females, Males, & Unsexed
1 1 1 0 1 #_init_equ_catch
1 1 1 0 1 #_recruitments
1 1 1 0 1 #_parameter-priors
1 1 1 0 1 #_parameter-dev-vectors
1 1 1 0 1 #_crashPenLambda
#####################################

0 # (0/1) read specs for more stddev reporting
1 1 -1 5 1 5 # selex type, len/age, year, N selex bins, Growth pattern, N growth ages
3 9 15 21 27 # vector with selex std bin picks (-1 in first bin to self-generate)
1 2 14 26 40 # vector with growth std bin picks (-1 in first bin to self-generate)

999 # end of control file

Appendix E-1. Data file for CAS.

CAS cabezon data file 2009, SS v3.03a, May 2009
1916 #_styr
2008 #_endyr
1 #N_seasons_per_year
12 #vector_with_N_months_in_each_season
1 #spawning_season_-_spawning_will_occur_at_beginning_of_this_season
7 #N_fishing_fleets
9 #N_surveys;_data_type_numbers_below_must_be_sequential_with_the_N_fisheries
1 #Number of areas

fleet1%fleet2%fleet3%fleet4%fleet5%fleet6%fleet7%survey1%survey2%survey3%survey4%survey5%survey6%survey7%survey8%survey9
0.5 0.5 0.5 0.5 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 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 #_area_assignments_for_each_fishery_and_survey
1 1 1 1 1 1 1 # Units for catch by fishing fleet: 1=Biomass(mt),2=Numbers(1000s)
0.01 0.01 0.01 0.01 0.01 0.01 0.01 # SE of log(catch) by fleet for equilibrium and continuous options

2 #number_of_genders(1 / 2)
35 #accumulator_age;_model_always_starts_with_age_0

#Catch	(mt)							
#Fleet1	Fleet2	Fleet3	Fleet4	Fleet5	Fleet6 Fleet7			
#CommNL		CommL	MM	Shore	PBR	CPFV	age_samples	Year	Season
0	0	0	0	0	0	0	#initial_equilibrium	
93 # Number of lines catch data - FINAL CATCHES w/discards								
0.03	0.00	0.35	0.73	0.00	0.00	0	1916	1
0.15	0.00	0.35	0.73	0.00	0.00	0	1917	1
0.08	0.00	0.35	0.73	0.00	0.00	0	1918	1
0.00	0.00	0.35	0.73	0.00	0.00	0	1919	1
0.00	0.00	0.35	0.73	0.00	0.00	0	1920	1
0.00	0.00	0.35	0.73	0.00	0.00	0	1921	1
0.00	0.00	0.35	0.73	0.00	0.00	0	1922	1
0.00	0.00	0.35	0.73	0.00	0.00	0	1923	1
0.00	0.00	0.35	0.73	0.00	0.00	0	1924	1
1.52	0.00	0.35	0.73	0.00	0.00	0	1925	1
0.00	0.00	0.35	0.73	0.00	0.00	0	1926	1
0.34	0.00	0.35	0.73	0.00	0.00	0	1927	1
1.19	0.00	0.35	0.73	0.02	0.04	0	1928	1
0.54	0.00	0.38	0.75	0.52	1.06	0	1929	1
0.47	0.00	0.56	1.12	0.78	1.58	0	1930	1
0.51	0.00	0.75	1.49	1.04	2.11	0	1931	1
2.12	0.00	0.94	1.86	1.30	2.64	0	1932	1
1.93	0.00	1.12	2.24	1.56	3.16	0	1933	1
2.37	0.00	1.31	2.61	1.82	3.69	0	1934	1
4.78	0.00	1.50	2.98	2.08	4.22	0	1935	1
8.34	0.00	2.10	4.19	2.92	5.93	0	1936	1
3.71	0.00	1.76	3.57	2.49	5.03	0	1937	1
2.46	0.00	3.53	6.97	4.86	9.88	0	1938	1
1.82	0.00	1.91	3.88	2.70	5.46	0	1939	1
1.54	0.00	2.70	5.58	3.88	7.82	0	1940	1
6.05	0.00	2.28	5.48	0.25	6.34	0	1941	1
1.04	0.00	2.28	5.48	0.25	6.34	0	1942	1
3.41	0.00	2.28	5.48	0.25	6.34	0	1943	1
1.77	0.00	2.28	5.48	0.25	6.34	0	1944	1
1.95	0.00	2.28	5.48	0.25	6.34	0	1945	1
3.54	0.00	2.28	5.48	0.25	6.34	0	1946	1
2.05	0.00	8.74	21.48	12.11	24.60	0	1947	1
3.72	0.00	11.48	28.56	16.06	32.55	0	1948	1
7.28	0.00	10.98	26.56	15.03	30.61	0	1949	1
9.83	0.00	12.02	29.98	16.85	34.14	0	1950	1
10.82	0.00	13.90	35.21	19.73	39.86	0	1951	1
15.65	0.00	8.19	19.20	10.94	22.41	0	1952	1
6.04	0.00	6.97	14.60	8.53	17.85	0	1953	1
2.82	0.00	8.73	14.03	8.79	19.38	0	1954	1
3.15	0.00	8.15	12.83	12.68	17.91	0	1955	1
5.62	0.00	12.52	23.31	28.19	30.02	0	1956	1
5.99	0.00	10.25	20.01	23.89	25.23	0	1957	1

8.85	0.00	7.00	14.01	16.37	17.28	0	1958	1
4.30	0.00	4.05	15.62	10.89	11.12	0	1959	1
1.39	0.00	1.91	11.79	12.72	5.53	0	1960	1
2.25	0.00	1.94	11.85	10.50	4.71	0	1961	1
1.12	0.00	3.65	20.08	17.32	8.44	0	1962	1
1.28	0.00	7.83	44.17	37.95	18.22	0	1963	1
2.40	0.00	5.00	18.66	22.19	11.28	0	1964	1
3.37	0.00	6.10	24.53	33.24	14.09	0	1965	1
5.72	0.00	8.14	30.82	43.14	18.45	0	1966	1
6.48	0.00	4.23	17.02	22.47	9.61	0	1967	1
9.12	0.00	3.40	14.28	18.48	7.84	0	1968	1
11.72	0.00	3.47	14.92	19.13	8.09	0	1969	1
4.85	0.00	5.19	23.33	29.34	12.30	0	1970	1
2.05	0.00	3.72	14.79	24.73	8.40	0	1971	1
2.66	0.00	9.26	34.26	61.92	20.39	0	1972	1
2.07	0.00	6.52	29.60	43.05	15.52	0	1973	1
6.76	0.00	6.00	26.52	39.68	14.12	0	1974	1
3.33	0.00	5.14	18.08	34.45	11.11	0	1975	1
8.69	0.00	5.48	20.20	36.33	12.80	0	1976	1
5.51	0.00	7.89	19.54	32.42	11.88	0	1977	1
12.89	0.00	12.62	31.43	51.42	18.97	0	1978	1
22.83	0.00	7.46	18.28	31.26	11.29	0	1979	1
27.23	0.00	13.90	58.01	71.41	14.65	0	1980	1
29.21	0.00	7.50	24.00	96.13	13.82	0	1981	1
28.94	0.00	3.82	33.96	86.49	13.38	0	1982	1
10.97	0.00	8.83	41.38	45.96	11.52	0	1983	1
8.68	0.00	12.24	20.69	73.81	4.89	0	1984	1
12.07	0.00	6.41	17.72	49.62	3.54	0	1985	1
7.55	0.00	7.30	51.31	89.04	9.66	0	1986	1
4.11	0.00	6.77	22.33	89.31	11.16	0	1987	1
5.93	0.00	10.16	30.58	53.22	9.07	0	1988	1
11.63	0.00	6.82	33.50	58.77	7.07	0	1989	1
12.07	0.00	5.74	21.72	60.77	10.65	0	1990	1
7.57	0.00	5.74	21.92	59.81	10.53	0	1991	1
17.09	0.00	8.95	36.71	80.14	14.79	0	1992	1
19.59	0.40	2.19	25.98	50.88	6.82	0	1993	1
10.04	32.14	1.69	13.36	40.02	4.35	0	1994	1
12.41	80.50	1.31	21.78	47.03	6.24	0	1995	1
8.56	107.80	3.04	29.94	44.33	8.17	0	1996	1
22.32	113.65	3.26	40.50	13.49	7.20	0	1997	1
15.02	165.98	1.49	48.81	26.28	10.15	0	1998	1
9.10	119.07	1.26	7.62	32.16	7.95	0	1999	1
6.35	113.03	0.49	10.21	19.75	7.23	0	2000	1
3.91	70.54	6.56	5.42	31.10	10.92	0	2001	1
5.44	46.14	0.61	15.23	24.79	5.49	0	2002	1
4.55	42.34	1.84	15.72	72.59	13.39	0	2003	1
3.41	51.09	3.62	11.77	23.31	8.62	0	2004	1
4.28	31.47	2.50	9.57	26.13	11.41	0	2005	1
4.24	28.94	0.66	3.33	16.20	7.03	0	2006	1
3.44	26.21	1.99	3.04	14.88	6.85	0	2007	1
2.19	21.55	1.41	8.11	9.40	6.93	0	2008	1

#Abundance_Indices
216 #_N_observations

#Year	Season	Type	Value	CV	
1960	1	8	0.003569573	0.1264597	#CPFV 1960-1999
1961	1	8	0.004188287	0.11550688	
1962	1	8	0.006246827	0.11716954	
1963	1	8	0.010074766	0.10957163	
1964	1	8	0.009629989	0.10614817	
1965	1	8	0.009805879	0.09790296	
1966	1	8	0.011286564	0.09044949	
1967	1	8	0.00644204	0.0896925	
1968	1	8	0.003947586	0.10387586	
1969	1	8	0.003838455	0.11684276	
1970	1	8	0.005224122	0.09562956	
1971	1	8	0.004496888	0.10465009	
1972	1	8	0.008650627	0.08861907	
1973	1	8	0.00601308	0.08884906	
1974	1	8	0.006211383	0.09231888	

1975	1	8	0.005058109	0.08820247	
1976	1	8	0.004568031	0.09062617	
1977	1	8	0.003940812	0.09395383	
1978	1	8	0.00656997	0.08647531	
1980	1	8	0.005250099	0.08683573	
1981	1	8	0.003767996	0.08944441	
1982	1	8	0.002732926	0.10409536	
1983	1	8	0.002990655	0.10712495	
1984	1	8	0.001142674	0.11529581	
1985	1	8	0.001346136	0.11562747	
1986	1	8	0.003282127	0.11705519	
1987	1	8	0.005006518	0.09172441	
1988	1	8	0.005382393	0.09315619	
1989	1	8	0.005303112	0.09976812	
1990	1	8	0.005128299	0.08385973	
1991	1	8	0.003764223	0.0887545	
1992	1	8	0.003091355	0.0898675	
1993	1	8	0.0020728	0.10790711	
1994	1	8	0.001233568	0.14491168	
1995	1	8	0.001421875	0.11158891	
1996	1	8	0.002831094	0.08992817	
1997	1	8	0.002703445	0.08719669	
1998	1	8	0.001853618	0.10983901	
1999	1	8	0.001970287	0.12568128	
2000	1	9	0.00135106	0.1314358	#CPFV 2000-2008
2001	1	9	0.002170723	0.1356551	
2002	1	9	0.000900426	0.1818937	
2003	1	9	0.002465609	0.1238841	
2004	1	9	0.002262145	0.1307548	
2005	1	9	0.002156659	0.1291184	
2006	1	9	0.001596934	0.1322206	
2007	1	9	0.00160575	0.1400739	
2008	1	9	0.001703499	0.1388095	
1960	1	10	0.003603473	0.12529667	#CPFV 1960-2008
1961	1	10	0.00422777	0.11340875	
1962	1	10	0.006342528	0.1128821	
1963	1	10	0.010160662	0.10873295	
1964	1	10	0.009884469	0.09495078	
1965	1	10	0.010039024	0.09397481	
1966	1	10	0.011782677	0.09180671	
1967	1	10	0.006726405	0.08505302	
1968	1	10	0.004090315	0.09266688	
1969	1	10	0.003963075	0.10857903	
1970	1	10	0.005402911	0.09194584	
1971	1	10	0.004605732	0.10029151	
1972	1	10	0.008963003	0.08726804	
1973	1	10	0.006188497	0.08181022	
1974	1	10	0.006404248	0.08721701	
1975	1	10	0.005225801	0.08884661	
1976	1	10	0.00467619	0.08276395	
1977	1	10	0.004064863	0.09296821	
1978	1	10	0.006758306	0.08645533	
1980	1	10	0.005425769	0.08625227	
1981	1	10	0.003866641	0.09578397	
1982	1	10	0.00278264	0.09791423	
1983	1	10	0.003021278	0.10255609	
1984	1	10	0.001134578	0.1136517	
1985	1	10	0.0013361	0.11820532	
1986	1	10	0.003317589	0.11604652	
1987	1	10	0.005121936	0.09287003	
1988	1	10	0.005473009	0.09321711	
1989	1	10	0.005376785	0.08362734	
1990	1	10	0.005171739	0.08607796	
1991	1	10	0.003827265	0.09261628	
1992	1	10	0.00315013	0.09085644	
1993	1	10	0.002074089	0.10840646	
1994	1	10	0.001238437	0.1477387	
1995	1	10	0.001434396	0.11303097	
1996	1	10	0.002936946	0.09233882	
1997	1	10	0.002756911	0.08213361	

1998	1	10	0.001856165	0.10009348	
1999	1	10	0.001956529	0.12013276	
2000	1	10	0.001805899	0.12296804	
2001	1	10	0.002824685	0.11623809	
2002	1	10	0.001249648	0.15946963	
2003	1	10	0.003801144	0.11878178	
2004	1	10	0.003101041	0.11312068	
2005	1	10	0.002980493	0.1173888	
2006	1	10	0.002150293	0.11092879	
2007	1	10	0.002202424	0.11301302	
2008	1	10	0.002243224	0.11618095	
1977	1	11	0.6282	0.3117	#TENERA adult
1978	1	11	0.9299	0.6584	
1979	1	11	0.8947	0.1842	
1980	1	11	0.7827	0.4417	
1981	1	11	0.5391	0.5321	
1982	1	11	0.7835	0.5442	
1983	1	11	0.5204	0.5568	
1984	1	11	0.252	0.7899	
1985	1	11	0.5272	0.4939	
1986	1	11	1.6052	0.5201	
1987	1	11	0.7935	0.6916	
1988	1	11	0.9752	0.4046	
1989	1	11	0.9113	0.3631	
1990	1	11	0.8514	0.3892	
1991	1	11	1.1086	0.2669	
1992	1	11	0.6737	0.4345	
1993	1	11	0.36	1.0358	
1994	1	11	0.3001	0.183	
1995	1	11	0.3806	0.5293	
1996	1	11	0.3287	1.0193	
1997	1	11	0.5408	0.3845	
1999	1	11	0	1.8341	
2000	1	11	0.2644	0.3253	
2001	1	11	0.2667	0.44	
2002	1	11	0.2339	0.2249	
2003	1	11	0.3397	0.2538	
2004	1	11	0.5032	0.2911	
2005	1	11	0.324	0.1774	
2006	1	11	0.4918	0.3489	
2007	1	11	0.1668	0.447	
2008	1	11	0.3515	0.2369	
1999	1	12	0.0739	0.2585712	#PISCO adults
2000	1	12	0.0640	0.2642103	
2001	1	12	0.0772	0.2531238	
2002	1	12	0.0441	0.2185799	
2003	1	12	0.0979	0.1092816	
2004	1	12	0.0537	0.1671391	
2005	1	12	0.0409	0.177508	
2006	1	12	0.0453	0.1653677	
2007	1	12	0.0459	0.1272527	
2008	1	12	0.0539	0.1151816	
1999	1	13	0.0193	0.3426557	#PISCO SMURFS
2000	1	13	0.0331	0.201354	
2001	1	13	0.1739	0.2195138	
2002	1	13	0.0253	0.2085032	
2003	1	13	0.0599	0.2264606	
2004	1	13	0.0210	0.2269958	
2005	1	13	0.0066	0.296077	
2006	1	13	0.0202	0.2296618	
2007	1	13	0.0159	0.2409526	
2008	1	13	0.0203	0.2531415	
2006	1	14	0.2755	0.4435	#SLO SMURFS
2007	1	14	0.2769	0.5095	
2008	1	14	1.1772	0.2981	
1978	1	15	0.016469	0.716219	#CalCOFI: manta tows
1980	1	15	0.003682	1.525368	
1981	1	15	0.001965	0.353765	
1983	1	15	0.000745	0.862236	
1984	1	15	0.001515	0.385216	

1985	1	15	0.004325	0.427435	
1986	1	15	0.001908	0.449719	
1987	1	15	0.001061	0.611327	
1988	1	15	0.002251	0.550732	
1989	1	15	0.004629	0.474342	
1990	1	15	0.000755	0.600677	
1991	1	15	0.002051	0.597394	
1992	1	15	0.000855	0.788863	
1993	1	15	0.000471	0.513378	
1994	1	15	0.000133	0.866171	
1995	1	15	0.002915	0.522748	
1996	1	15	0.002699	0.454805	
1997	1	15	0.002193	0.408187	
1998	1	15	0.000189	0.50679	
1999	1	15	0.002981	0.40929	
2000	1	15	0.002236	0.532012	
2001	1	15	0.001094	0.486084	
2002	1	15	0.003644	0.400154	
2003	1	15	0.007146	0.461904	
2004	1	15	0.002537	0.527275	
2005	1	15	0.001678	0.397993	
2006	1	15	0.006018	0.362456	
2007	1	15	0.001973	0.45983	
2008	1	15	0.004615	0.592653	
1972	1	16	9.91E-04	0.3375879	#Edison Impingement
1973	1	16	1.92E-03	0.278647	
1974	1	16	1.13E-03	0.2066957	
1975	1	16	2.27E-03	0.1251556	
1976	1	16	1.68E-03	0.1312414	
1977	1	16	9.64E-04	0.2322483	
1978	1	16	7.53E-04	0.1857204	
1979	1	16	4.89E-04	0.2186301	
1980	1	16	6.75E-04	0.1667745	
1981	1	16	6.36E-04	0.2232059	
1982	1	16	5.22E-04	0.273381	
1983	1	16	4.54E-04	0.2476573	
1984	1	16	7.14E-04	0.2283976	
1985	1	16	5.54E-04	0.1997272	
1986	1	16	3.08E-04	0.2069409	
1987	1	16	5.98E-04	0.2040686	
1988	1	16	1.44E-04	0.3873733	
1989	1	16	5.16E-04	0.2642365	
1990	1	16	3.37E-04	0.2750285	
1991	1	16	4.64E-04	0.2425585	
1992	1	16	2.82E-04	0.2307056	
1993	1	16	1.10E-04	0.3610428	
1994	1	16	1.43E-04	0.3517632	
1995	1	16	1.10E-04	0.4753732	
1996	1	16	6.73E-05	0.4754682	
1997	1	16	1.52E-04	0.3397869	
1998	1	16	6.24E-05	0.4211199	
1999	1	16	8.50E-04	0.1974443	
2000	1	16	3.07E-04	0.3912762	
2001	1	16	1.95E-04	0.5737525	
2002	1	16	6.06E-04	0.4017963	
2003	1	16	8.96E-04	0.4861232	
2004	1	16	3.48E-04	0.6324122	
2005	1	16	5.65E-05	0.6582139	
2006	1	16	4.90E-04	0.782376	
2007	1	16	3.19E-04	0.5970551	
2008	1	16	7.40E-04	0.5104997	

#_Discard_Biomass
1 #_(1=biomass;_2=fraction)
0 #_N_observations

#_Mean_BodyWt
109

#Year	Seas	Type	Mkt	Value	CV
1980	1	3	2	0.772	1.436

1981	1	3	2	0.693	0.806
1982	1	3	2	0.692	0.822
1983	1	3	2	0.722	0.807
1984	1	3	2	0.961	0.925
1985	1	3	2	0.539	0.979
1986	1	3	2	0.890	0.838
1987	1	3	2	0.789	0.778
1988	1	3	2	1.250	0.921
1989	1	3	2	0.785	0.884
1993	1	3	2	0.535	0.986
1994	1	3	2	0.936	0.672
1995	1	3	2	0.290	0.415
1996	1	3	2	0.525	0.684
1997	1	3	2	0.736	0.890
1998	1	3	2	0.686	0.618
1999	1	3	2	0.288	0.699
2000	1	3	2	0.146	1.403
2001	1	3	2	1.111	0.573
2002	1	3	2	0.348	0.706
2003	1	3	2	1.040	0.686
2004	1	3	2	1.050	0.923
2005	1	3	2	1.116	0.757
2006	1	3	2	0.724	0.592
2007	1	3	2	1.421	1.059
2008	1	3	2	0.701	0.927
1980	1	4	2	1.172	0.775
1981	1	4	2	0.803	0.524
1982	1	4	2	1.074	0.766
1983	1	4	2	0.963	0.552
1984	1	4	2	0.997	0.584
1985	1	4	2	0.746	0.601
1986	1	4	2	1.011	0.648
1987	1	4	2	0.792	0.743
1988	1	4	2	0.871	0.662
1989	1	4	2	1.210	0.848
1993	1	4	2	1.053	0.678
1994	1	4	2	0.996	0.782
1995	1	4	2	0.986	0.726
1996	1	4	2	0.951	0.472
1997	1	4	2	1.120	0.516
1998	1	4	2	1.125	0.441
1999	1	4	2	0.841	0.473
2000	1	4	2	0.908	0.686
2001	1	4	2	0.961	0.436
2002	1	4	2	1.244	0.580
2003	1	4	2	1.507	0.517
2004	1	4	2	1.948	0.452
2005	1	4	2	1.355	0.665
2006	1	4	2	1.888	0.627
2007	1	4	2	1.400	0.214
2008	1	4	2	1.374	0.249
1980	1	5	2	1.499	0.540
1981	1	5	2	1.932	0.955
1982	1	5	2	1.405	0.567
1983	1	5	2	1.351	0.647
1984	1	5	2	1.367	0.482
1985	1	5	2	1.514	0.590
1986	1	5	2	1.281	0.584
1987	1	5	2	1.429	0.537
1988	1	5	2	1.380	0.578
1989	1	5	2	1.370	0.612
1993	1	5	2	1.296	0.554
1994	1	5	2	1.346	0.639
1995	1	5	2	1.471	0.706
1996	1	5	2	1.400	0.652
1997	1	5	2	1.090	0.518
1998	1	5	2	1.349	0.569
1999	1	5	2	1.272	0.500
2000	1	5	2	1.524	0.463
2001	1	5	2	1.636	0.451

2002	1	5	2	1.480	0.742
2003	1	5	2	1.622	0.476
2004	1	5	2	2.175	0.544
2005	1	5	2	2.273	0.448
2006	1	5	2	1.938	0.491
2007	1	5	2	2.108	0.462
2008	1	5	2	2.005	0.507
1947	1	6	2	2.268	0.500
1948	1	6	2	2.268	0.500
1949	1	6	2	2.268	0.500
1950	1	6	2	2.268	0.500
1951	1	6	2	2.268	0.500
1980	1	6	2	1.288	0.580
1981	1	6	2	1.256	0.526
1982	1	6	2	1.040	1.029
1983	1	6	2	1.143	0.903
1984	1	6	2	1.100	0.519
1985	1	6	2	1.317	0.640
1986	1	6	2	1.571	1.085
1987	1	6	2	1.262	0.450
1988	1	6	2	1.359	0.897
1989	1	6	2	0.813	0.623
1993	1	6	2	0.850	0.898
1994	1	6	2	1.417	0.440
1995	1	6	2	2.309	0.525
1996	1	6	2	1.527	0.800
1997	1	6	2	0.677	0.406
1998	1	6	2	1.246	0.575
1999	1	6	2	1.298	0.702
2000	1	6	2	1.519	0.707
2001	1	6	2	1.144	0.348
2002	1	6	2	1.391	0.973
2003	1	6	2	2.316	0.560
2004	1	6	2	2.103	0.408
2005	1	6	2	2.278	0.397
2006	1	6	2	1.745	0.538
2007	1	6	2	2.362	0.461
2008	1	6	2	2.289	0.464

Population size structure
1 # Length bin method: 1=Use data bins
Lower edge of bins

#6	8	10	12	14	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	90	92	

0.0001 # Minimum proportion for compressing tails of observed compositional data
0.0001 # Constant added to expected frequencies
0 # Combine males and females at and below this bin number
44 #_N_length_bins
#_lower_edge_of_length_bins

6	8	10	12	14	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	90	92	

148 #N_observations - do we need to put a cap on some of these sample sizes per Method recommendation - 300?

#Year	Seas	Fleet	sexes	Mkt	Nsamp	begin	data:	females	then	males	

#Fleet 1 Not live fish fishery

1995	1	1	0	0	71	0	0	0	0	0	0
	0	0	0	0	255	211	378	410	330	438	294
	301	165	505	64	41	109	73	35	2	22	3
	0	0	3	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1996	1	1	0	0	231	0	0	0	0	0	0
	0	2	2	28	86	243	509	597	506	442	309
	204	170	150	156	134	77	50	32	21	19	0

	2	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1997	1	1	0	0	102	0	0	0	0	0	0
	0	0	0	4	23	85	450	706	594	706	527
	490	608	150	359	182	184	103	89	147	141	141
	0	77	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1998	1	1	0	0	26	0	0	0	0	0	0
	0	0	0	0	28	28	257	406	753	601	548
	875	214	66	100	182	0	26	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1999	1	1	0	0	8	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	134	542	456
	412	414	230	75	0	80	0	55	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2000	1	1	0	0	8	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	338	518
	253	253	308	196	237	55	140	140	0	55	0
	0	0	70	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						

#Fleet 2 Live fish fishery

1997	1	2	0	0	16	0	0	0	0	0	0
	0	0	0	0	0	0	0	96	1440	1632	2496
	1632	2112	864	960	576	576	288	192	96	192	0
	96	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1998	1	2	0	0	111	0	0	0	0	0	0
	0	0	0	0	476	2443	7430	10842	20456	23249	18562
	12723	11932	4637	3847	2460	1442	666	954	815	312	133
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1999	1	2	0	0	174	0	0	0	0	0	0
	0	0	0	48	0	65	26	281	2590	16100	15080
	10976	8326	5929	3277	2809	1864	1327	1173	458	535	207
	68	6	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						

2000	1	2	0	0	323	0	0	0	0	0	0
	0	0	0	0	16	42	87	128	5872	13902	12400
	10458	6570	5997	4051	2499	1541	1602	648	363	255	114
	121	21	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2001	1	2	0	0	156	0	0	0	0	0	0
	0	0	0	0	0	0	0	12	878	3910	9455
	8455	6143	4749	2930	1664	845	833	285	246	160	48
	0	12	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	2	0	0	37	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1934	5189
	3128	2639	2383	2704	1483	1406	1132	637	508	360	202
	0	64	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	2	0	0	11	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	567
	926	435	545	247	265	635	610	1830	117	610	727
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	2	0	0	36	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	192	1375
	2183	916	208	101	6	274	245	306	378	123	70
	115	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	2	0	0	29	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	59	1667
	1041	1081	717	479	39	153	370	177	114	67	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2006	1	2	0	0	34	0	0	0	0	0	0
	0	0	0	0	0	64	215	64	128	466	3281
	2940	1796	1845	1519	766	388	572	194	486	325	0
	0	0	0	32	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2007	1	2	0	0	50	0	0	0	0	0	0
	0	0	0	0	0	0	0	6	0	97	663
	756	393	239	285	130	120	173	108	210	101	67
	45	0	31	10	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2008	1	2	0	0	38	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	44	66	930
	801	960	844	663	801	523	68	108	69	23	23
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
#Fleet 3 Manmade mode											
1980	1	3	0	0	40	0	0	0	0	0	1
	2	4	3	4	8	4	4	5	4	2	2
	1	2	1	1	1	1	1	0	1	1	0
	0	0	0	0	0	0	0	0	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1981	1	3	0	0	29	0	0	0	0	0	0
	0	2	1	3	9	4	8	5	4	2	1
	1	0	2	1	2	0	0	0	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1982	1	3	0	0	24	0	0	0	0	0	2
	1	1	0	2	0	5	2	5	1	1	2
	1	0	1	0	0	0	1	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1983	1	3	0	0	29	0	0	0	0	0	1
	1	2	0	6	6	3	2	3	4	3	1
	2	3	1	1	0	0	1	0	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1984	1	3	0	0	33	0	0	1	0	1	3
	0	0	3	1	0	5	3	6	1	4	0
	1	1	0	2	2	1	1	1	0	1	0
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1985	1	3	0	0	31	0	0	1	1	1	2
	2	2	4	8	4	2	7	2	2	0	1
	0	2	1	0	2	0	0	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1986	1	3	0	0	29	0	0	0	0	1	0
	0	1	0	3	4	4	5	3	1	2	1
	2	0	1	1	2	1	1	1	0	0	1
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1987	1	3	0	0	33	0	0	0	0	1	2
	3	1	1	1	4	3	6	3	1	4	6
	2	0	3	0	3	1	0	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1988	1	3	0	0	25	0	1	0	2	0	2
	1	1	1	0	3	5	3	5	1	2	0
	1	1	3	2	2	1	4	0	1	0	0
	3	0	2	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1989	1	3	0	0	16	0	1	0	0	0	2
	0	0	2	1	0	3	1	3	1	2	1
	2	0	0	1	0	1	0	0	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1993	1	3	0	0	21	0	0	0	1	0	2
	0	5	2	2	5	2	2	4	0	2	1
	0	0	1	0	0	1	0	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1994	1	3	0	0	5	0	0	0	0	0	0
	0	0	1	0	0	1	0	0	1	0	1
	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	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1996	1	3	0	0	15	0	0	1	1	1	1
	0	3	0	2	1	1	2	2	1	0	3
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1997	1	3	0	0	4	0	0	0	0	0	0
	0	2	0	1	1	0	0	0	0	0	1
	0	1	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1998	1	3	0	0	3	0	0	0	0	0	0
	0	0	1	1	0	0	0	0	1	2	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1999	1	3	0	0	9	0	0	1	0	1	0
	0	4	2	2	0	2	0	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2000	1	3	0	0	4	0	0	2	4	3	0
	0	0	0	0	1	1	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2001	1	3	0	0	7	0	0	0	0	0	1
	2	2	1	2	2	1	4	1	0	0	0
	1	1	2	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	3	0	0	6	0	0	0	1	0	0
	1	0	1	0	1	2	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	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	3	0	0	5	0	0	0	0	0	0
	0	0	0	0	0	1	1	0	0	2	0
	0	0	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	3	0	0	16	0	0	0	0	0	1
	0	2	1	3	0	3	2	1	2	0	1
	0	1	0	1	0	0	2	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	3	0	0	25	0	0	0	0	0	0
	1	0	3	1	2	3	4	2	1	1	2
	5	1	0	1	1	3	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						

2006	1	3	0	0	12	0	0	0	0	0	0
	0	1	0	1	3	2	0	0	3	1	2
	0	0	1	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2007	1	3	0	0	13	0	0	0	0	0	0
	1	1	1	1	2	0	1	2	0	0	0
	0	0	1	2	0	0	0	0	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2008	1	3	0	0	21	0	0	0	0	0	0
	0	1	1	2	3	3	5	2	0	0	2
	0	0	2	1	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
#Fleet 4 Beach/bank mode											
1980	1	4	0	0	35	0	0	0	0	1	1
	0	0	1	1	3	4	3	6	2	5	1
	3	7	4	4	2	3	0	1	2	0	0
	0	0	0	0	1	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1981	1	4	0	0	36	0	0	0	0	0	0
	0	0	2	4	0	7	5	8	9	9	4
	2	3	3	2	0	1	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1982	1	4	0	0	50	0	0	0	0	1	0
	0	1	3	3	5	3	6	6	7	5	5
	3	6	5	4	3	2	2	0	0	0	2
	1	0	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1983	1	4	0	0	60	0	0	0	0	0	0
	1	2	2	2	7	5	3	11	9	22	10
	16	7	7	3	3	2	0	2	1	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1984	1	4	0	0	30	0	0	0	0	0	0
	1	0	1	2	1	1	3	2	4	5	3
	2	4	1	1	2	0	3	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1985	1	4	0	0	36	0	0	2	0	2	0
	0	3	1	3	2	6	4	7	9	8	4
	4	6	1	0	0	1	1	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1986	1	4	0	0	42	0	0	0	0	0	0
	1	0	3	3	4	1	8	9	8	8	5
	8	6	9	2	3	1	0	0	3	0	0
	0	0	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1987	1	4	0	0	22	0	0	1	1	1	0
	2	2	1	0	1	0	3	2	2	4	4
	1	0	0	1	1	1	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1988	1	4	0	0	7	0	0	0	0	0	0
	1	0	0	0	0	1	0	1	1	0	0
	0	1	1	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1989	1	4	0	0	11	0	0	0	0	0	2
	0	5	1	0	0	1	0	2	1	0	1
	3	2	6	1	0	0	2	1	0	1	1
	0	0	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1993	1	4	0	0	42	0	0	0	0	1	0
	1	0	2	0	2	1	3	8	9	10	6
	9	4	4	2	3	1	0	1	2	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1994	1	4	0	0	15	0	0	0	0	0	1
	1	0	0	1	0	1	1	1	2	6	1
	0	3	1	0	2	1	0	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1996	1	4	0	0	38	0	0	0	0	0	0
	0	0	0	1	1	4	7	5	16	10	9
	6	4	3	2	0	2	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1997	1	4	0	0	27	0	0	0	0	0	0
	0	0	2	1	3	2	2	7	6	7	9
	7	6	5	2	2	1	1	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1998	1	4	0	0	34	0	0	0	0	0	0
	0	0	0	1	2	2	6	7	9	8	11
	6	11	5	1	0	3	3	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1999	1	4	0	0	23	0	0	0	0	0	0
	0	0	0	2	1	5	6	12	5	6	3
	5	1	0	2	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2000	1	4	0	0	15	0	0	0	0	0	0
	1	0	1	0	2	2	0	1	6	2	2
	4	0	0	1	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2001	1	4	0	0	11	0	0	0	0	0	0
	0	0	0	2	0	1	1	1	0	3	1
	2	3	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	4	0	0	11	0	0	0	0	0	0
	0	1	0	1	0	0	0	1	3	0	4
	3	1	1	1	1	1	1	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	4	0	0	6	0	0	0	0	0	0
	0	0	0	0	0	0	1	3	1	1	0
	2	0	3	0	2	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	4	0	0	17	0	0	0	0	0	0
	0	0	0	0	1	0	2	1	3	0	3

	4	1	2	2	0	2	4	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	4	0	0	12	0	0	0	0	0	0
	0	0	0	0	0	1	1	1	2	2	3
	3	2	0	2	0	0	1	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2006	1	4	0	0	4	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	1
	2	1	0	1	0	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2007	1	4	0	0	4	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	1
	0	1	2	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2008	1	4	0	0	8	0	0	0	0	0	0
	0	0	0	1	0	0	2	0	0	2	1
	2	0	1	0	1	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
#Fleet 5 PBR											
1980	1	5	0	0	106	0	0	0	0	0	0
	0	0	0	2	6	10	10	10	21	20	13
	14	16	27	18	12	16	14	9	8	13	3
	3	1	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1981	1	5	0	0	52	0	0	0	0	0	1
	0	0	0	0	1	1	4	6	4	6	8
	7	6	7	8	5	6	7	7	2	4	4
	2	0	1	1	0	0	0	0	0	0	0
	0	0	0	2	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1982	1	5	0	0	50	0	0	0	0	0	0
	0	0	0	1	3	5	3	4	7	4	4
	6	6	9	3	7	4	4	4	3	3	2
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1983	1	5	0	0	57	0	0	0	0	0	0
	0	0	1	2	0	4	11	4	7	9	6
	5	4	8	3	3	2	6	4	2	3	3
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1984	1	5	0	0	77	0	0	0	0	0	0
	0	0	3	0	0	2	3	6	9	17	16
	14	12	6	10	13	9	7	6	2	3	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1985	1	5	0	0	44	0	0	0	0	0	0
	0	0	0	1	4	3	1	0	2	4	6
	9	5	7	5	4	2	5	4	4	3	1
	0	0	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1986	1	5	0	0	71	0	0	0	0	0	0
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1987	1	5	0	0	47	0	0	0	0	0	0
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1988	1	5	0	0	34	0	0	0	0	0	0
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1989	1	5	0	0	43	0	0	0	1	0	0
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1993	1	5	0	0	95	0	0	0	0	0	0
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1994	1	5	0	0	53	0	0	0	0	0	0
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1996	1	5	0	0	67	0	0	0	0	0	0
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1997	1	5	0	0	25	0	0	0	0	0	0
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1998	1	5	0	0	47	0	0	0	0	0	0
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1999	1	5	0	0	69	0	0	0	0	0	0
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2000	1	5	0	0	39	0	0	0	0	0	0
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	4	8	7	5	7	5	1	1	3	0	0
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	0	0	0	0	0						
2001	1	5	0	0	28	0	0	0	0	0	0
	0	0	0	1	1	0	2	1	6	1	4
	3	3	5	10	2	7	3	1	0	1	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	5	0	0	34	0	0	0	0	0	0
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	0	0	0	0	0						
2003	1	5	0	0	82	1	0	0	1	0	0
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	0	0	0	0	0						
2004	1	5	0	0	313	1	0	0	0	0	0
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	67	56	64	67	68	58	34	31	25	13	9
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	5	0	0	494	0	0	0	0	0	0
	0	0	0	1	2	6	4	15	10	28	40
	59	92	95	101	107	110	91	62	41	34	19
	11	4	7	1	0	0	0	0	1	1	0
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	0	0	0	0	0						
2006	1	5	0	0	487	0	0	0	0	0	0
	1	0	0	0	2	4	4	14	23	25	65
	76	79	82	75	72	64	69	49	51	27	8
	8	2	2	1	0	0	0	0	1	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2007	1	5	0	0	363	0	0	0	0	0	1
	0	0	0	0	2	7	5	4	12	28	40
	59	56	56	63	72	50	51	34	27	20	11
	8	2	3	2	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2008	1	5	0	0	302	0	0	0	0	1	0
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	57	57	66	62	49	40	32	36	14	12	8
	7	4	2	1	0	1	0	1	1	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
#Fleet 6 CPFV											
1975	1	6	0	0	32	0	0	0	0	0	0
	1	0	1	2	7	6	11	13	7	10	3
	6	4	2	2	2	0	1	0	0	1	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						

1976	1	6	0	0	63	0	0	0	1	0	0
	0	1	1	5	6	11	18	9	6	8	5
	8	3	4	2	2	4	0	1	1	0	0
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	0	0	0	0	0						
1977	1	6	0	0	44	0	0	0	0	1	0
	0	0	0	5	9	10	11	5	7	7	4
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	0	0	0	0	0						
1978	1	6	0	0	51	0	0	0	1	0	0
	2	1	0	5	5	7	12	8	11	8	5
	9	8	3	3	4	0	4	4	0	1	0
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	0	0	0	0	0						
1986	1	6	0	0	60	0	0	0	0	0	0
	1	1	6	15	13	16	14	4	3	3	3
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	0	0	0	0	0						
1987	1	6	0	0	64	0	0	0	0	0	0
	0	0	2	1	13	12	25	13	12	9	10
	3	1	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0						
1988	1	6	0	0	40	0	0	0	0	0	0
	0	0	1	4	3	5	8	10	8	6	8
	10	1	1	0	0	1	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1989	1	6	0	0	63	0	0	0	0	0	1
	0	2	6	15	15	8	9	8	6	8	3
	1	3	1	1	4	2	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1980	1	6	0	0	18	0	0	0	0	0	0
	0	0	0	0	2	0	5	0	1	0	3
	1	2	1	2	0	2	2	1	1	0	0
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	0	0	0	0	0	0	0	0	0	0	0
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1981	1	6	0	0	16	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1982	1	6	0	0	10	0	0	0	0	0	0
	0	0	0	0	1	4	1	1	0	0	0
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	0	0	0	0	0						
1983	1	6	0	0	22	0	0	0	0	0	0
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	0	0	0	0	0						
1984	1	6	0	0	8	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1985	1	6	0	0	15	0	0	0	0	0	0
	0	1	0	1	2	1	0	0	3	1	1
	3	0	2	0	2	1	2	2	2	0	0
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	0	0	0	0	0						
1986	1	6	0	0	22	0	0	0	0	0	0
	0	1	1	1	4	0	5	1	5	2	5
	3	1	3	2	2	1	3	2	1	1	0
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	0	0	0	0	1	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1987	1	6	0	0	10	0	0	0	0	0	0
	0	0	0	0	0	0	1	1	1	0	1
	2	2	2	1	0	1	0	1	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1988	1	6	0	0	11	0	0	0	0	0	0
	1	0	1	1	1	1	2	1	2	0	0
	2	0	1	0	3	3	0	0	0	2	0
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	0	0	0	0	0						
1989	1	6	0	0	14	0	0	0	1	0	0
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	0	0	0	0	0						
1993	1	6	0	0	2	0	0	0	0	0	0
	0	0	0	1	0	0	0	0	0	0	0
	0	0	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0						
1994	1	6	0	0	8	0	0	0	0	0	0
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	2	0	0	1	0	3	1	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1996	1	6	0	0	27	0	0	0	0	0	0
	0	1	2	0	1	1	3	6	4	2	5
	1	4	3	4	3	2	1	1	3	0	1
	0	0	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1997	1	6	0	0	32	0	0	0	0	0	0
	0	0	0	1	0	1	2	2	5	16	6
	8	5	1	9	1	0	2	0	1	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1998	1	6	0	0	37	0	0	0	0	0	0
	0	0	0	0	1	0	1	3	5	11	7
	10	2	6	6	2	1	2	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1999	1	6	0	0	14	0	0	0	0	0	0
	0	0	0	0	2	0	1	0	1	0	0
	1	1	0	3	2	1	0	0	0	1	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2000	1	6	0	0	15	0	0	0	0	0	0
	0	0	0	0	0	0	1	1	1	2	1
	3	1	0	2	2	3	1	1	1	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2001	1	6	0	0	25	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	2	9
	8	11	4	12	11	7	3	5	2	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	6	0	0	12	0	0	0	0	0	0
	0	0	1	0	0	0	0	1	0	1	1
	6	3	1	2	1	0	0	0	0	1	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	6	0	0	41	0	0	0	0	0	0
	0	0	0	0	0	0	1	0	2	2	10
	11	12	14	17	6	13	5	3	3	2	1
	1	0	0	0	0	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	6	0	0	37	0	0	0	0	0	0
	0	0	0	0	1	1	0	2	3	1	3
	6	7	5	8	6	6	2	2	1	1	0
	0	0	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	6	0	0	45	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	5
	7	6	10	6	8	11	5	1	3	3	0
	1	3	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2006	1	6	0	0	49	0	0	0	0	0	0
	0	0	0	0	0	1	0	0	0	1	9
	6	10	8	8	11	6	6	5	1	3	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2007	1	6	0	0	59	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	4
	8	6	11	3	12	9	6	7	5	4	5
	0	2	0	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						

2008	1	6	0	0	55	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	8
	8	10	7	5	8	5	7	3	1	1	2
	1	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	6	0	0	4	0	0	0	0	0	0
	0	0	0	0	0	1	0	0	1	1	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	6	0	0	48	0	0	0	0	0	0
	0	0	2	1	6	2	5	9	10	23	21
	25	14	15	4	6	4	3	0	1	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	6	0	0	19	0	0	0	0	0	0
	1	0	0	0	2	2	1	3	5	2	7
	7	4	6	8	4	6	5	3	1	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	6	0	0	39	0	0	0	0	0	0
	1	1	1	4	1	8	12	9	8	8	4
	4	2	4	7	2	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1987	1	6	0	0	4	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	0
	3	2	3	2	5	3	3	2	2	5	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1988	1	6	0	0	21	0	0	0	0	0	0
	0	0	0	0	1	2	2	0	1	3	4
	6	6	8	16	4	5	10	2	2	4	0
	1	2	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1989	1	6	0	0	21	0	0	0	0	0	0
	0	0	0	0	0	1	1	2	3	8	2
	8	8	3	8	7	8	4	4	4	1	1
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1990	1	6	0	0	6	0	0	0	0	0	0
	0	0	0	0	0	0	0	1	0	0	0
	3	1	1	1	1	1	0	0	1	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1991	1	6	0	0	13	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	2
	3	2	1	2	1	0	1	1	3	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1992	1	6	0	0	16	0	0	0	0	0	0
	0	0	0	0	0	0	0	1	3	6	1
	5	4	2	2	2	2	0	1	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1993	1	6	0	0	12	0	0	0	0	0	0
	0	0	0	0	0	0	0	2	3	2	4
	6	3	3	1	3	2	2	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1994	1	6	0	0	16	0	0	0	0	0	0
	0	0	0	0	0	0	2	0	6	7	2
	4	5	4	4	1	0	2	2	0	0	1
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1995	1	6	0	0	18	0	0	0	0	0	0
	0	0	0	0	0	1	1	1	1	6	3
	7	3	6	1	2	3	0	1	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1996	1	6	0	0	31	0	0	0	0	0	0
	0	0	1	0	0	1	6	14	10	11	13
	10	8	7	7	7	6	3	0	1	0	1
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1997	1	6	0	0	30	0	0	0	0	0	0
	0	0	0	1	0	0	0	1	5	16	6
	9	6	1	9	1	0	2	0	1	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1998	1	6	0	0	23	0	0	0	0	0	0
	0	0	0	0	1	0	1	1	3	7	6
	8	2	5	4	2	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	6	0	0	11	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	3	2	1
	2	0	1	2	1	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	6	0	0	18	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	2	3	0
	3	1	3	0	5	2	2	3	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	6	0	0	5	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	2	1	2	0	0	0	1
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2006	1	6	0	0	3	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	2	0	0	3	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2007	1	6	0	0	3	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	0
	0	2	0	1	1	1	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2008	1	6	0	0	3	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	1
	1	1	0	0	0	0	2	0	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						

20	#_N_age_bins										
1	2	3	4	5	6	7	8	9	10	11	12
	13	14	15	16	17	18	19	20			
2	#_N_ageerror_definitions										
#Female											
-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1									
0.479363	0.479363	0.547477	0.604513	0.652275	0.69227	0.725762	0.753807	0.777291	0.796957	0.813425	0.827214
	0.838762	0.848431	0.856529	0.863309	0.868987	0.873741	0.877723	0.881057	0.883849	0.886186	0.888144
	0.889783	0.891156	0.892306	0.893268	0.894074	0.894749	0.895314	0.895788	0.896184	0.896516	0.896794
	0.897027	0.897221									
#Male											
-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1									
0.571868	0.571868	0.297421	0.206562	0.161637	0.135119	0.117833	0.105851	0.0972099	0.0908204	0.0860316	0.0824308
	0.0797446	0.0777855	0.0764214	0.0755572	0.0751234	0.0750688	0.0753554	0.0759549	0.0768471	0.0780175	0.0794561
	0.0811573	0.0831183	0.0853394	0.0878231	0.0905741	0.0935993	0.0969071	0.100508	0.104414	0.108639	0.113197
	0.118107	0.123388									
149	#_N_Agecomp_obs										
2	#_Lbin_method:		1=poplenbins		2=datalenbins		3=lengths				
0	#_combinemales		into	females	at	or	below	this	bin	number	
#Conditional_Age-at_Length			1	2	3	4	5	6	7	8	9
	10	11	12	13	14	15	16	17	18	19	20
	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20		
#Joanna's data											
#Yr	Seas	Flt/Survey	Gender	Part	Ageerr	Lbin_lo	Lbin_hi	Nsamp	1	2	3
	4	5	6	7	8	9	10	11	12	13	14
	15	16	17	18	19	20	1	2	3	4	5
	6	7	8	9	10	11	12	13	14	15	16
	17	18	19	20							
#Females											
1996	1	7	1	0	1	12	12	1	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	1	0	1	13	13	5	0	0	2
	3	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	1	0	1	14	14	8	0	1	5
	0	0	2	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	1	0	1	15	15	7	0	0	3
	0	2	2	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	1	0	1	16	16	3	0	0	0
	1	2	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	1	0	1	17	17	4	0	0	1
	1	1	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	1	0	1	18	18	1	0	0	0
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	1	0	1	19	19	1	0	0	0
	0	0	0	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	1	0	1	21	21	1	0	0	0
	0	0	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	1	0	1	22	22	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	0	0	0							
1996	1	7	1	0	1	23	23	2	0	0	0
	0	0	1	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	1	0	1	12	12	1	0	0	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	1	0	1	13	13	7	0	0	5
	1	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	1	0	1	14	14	4	0	0	2
	1	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	1	0	1	15	15	12	0	0	1
	3	3	4	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	1	0	1	16	16	6	0	0	0
	2	3	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	1	0	1	17	17	7	0	0	0
	3	3	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							
1997	1	7	1	0	1	18	18	5	0	0	0
	1	2	1	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	1	0	1	19	19	4	0	0	0
	1	2	0	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	1	0	1	20	20	2	0	0	0
	0	0	1	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	1	0	1	21	21	1	0	0	0
	0	0	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	1	0	1	12	12	1	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	1	0	1	13	13	1	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	1	0	1	14	14	5	0	0	1
	1	2	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	1	0	1	15	15	7	0	0	1
	3	2	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	1	0	1	16	16	5	0	0	0
	2	3	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	1	0	1	17	17	4	0	0	0
	0	4	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	1	0	1	18	18	1	0	0	0
	0	0	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	1	0	1	19	19	3	0	0	0
	1	0	0	2	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1999	1	7	1	0	1	17	17	1	0	0	0
	0	0	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1999	1	7	1	0	1	18	18	4	0	0	0
	0	0	3	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	3	3	2	2	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	4	4	5	5	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	5	5	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	6	6	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	11	11	1	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	13	13	1	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	15	15	6	0	0	1
	2	2	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	16	16	5	0	0	0
	2	2	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	17	17	8	0	0	0
	2	1	3	2	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	18	18	11	0	0	2
	1	2	4	2	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	19	19	11	0	0	1
	2	3	2	3	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	20	20	7	0	0	0
	0	3	1	2	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	21	21	11	0	0	0
	1	3	5	1	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	22	22	7	0	0	0
	0	1	1	3	1	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	23	23	9	0	0	0
	0	1	0	3	1	3	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							
2000	1	7	1	0	1	24	24	11	0	0	0
	0	0	3	4	3	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	25	25	8	0	0	0
	0	1	0	1	1	4	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							
2000	1	7	1	0	1	26	26	1	0	0	0
	0	0	0	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	27	27	3	0	0	0
	0	0	0	0	1	1	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	28	28	1	0	0	0
	0	0	0	0	0	0	0	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	29	29	2	0	0	0
	0	0	0	0	0	0	1	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							
2000	1	7	1	0	1	31	31	1	0	0	0
	0	0	0	0	0	0	0	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	1	0	1	32	32	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	4	4	3	3	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	5	5	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	6	6	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	7	7	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	9	9	1	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	17	17	1	0	0	0
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	18	18	2	0	0	0
	0	2	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	19	19	2	0	0	0
	0	0	1	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	20	20	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	0	0	0							
2001	1	7	1	0	1	21	21	2	0	0	0
	0	0	0	2	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0							
2001	1	7	1	0	1	22	22	2	0	0	0
	0	0	1	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	23	23	3	0	0	0
	0	0	0	1	1	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	1	0	1	25	25	2	0	0	0
	0	0	1	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							
2001	1	7	1	0	1	30	30	1	0	0	0
	0	0	0	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	6	6	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	16	16	1	0	0	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	17	17	8	0	0	3
	3	2	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	18	18	3	0	0	0
	3	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	19	19	7	0	0	0
	4	2	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	20	20	8	0	0	0
	4	2	1	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	21	21	4	0	0	0
	0	3	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	22	22	5	0	0	0
	0	1	0	3	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	23	23	15	0	0	0
	0	4	3	1	5	1	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	24	24	7	0	0	0
	0	1	2	0	1	0	1	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	25	25	11	0	0	0
	0	1	0	4	2	2	0	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	26	26	5	0	0	0
	0	0	0	0	2	2	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	27	27	5	0	0	0
	0	0	0	0	0	2	0	0	0	2	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	1	0	1	28	28	4	0	0	0
	0	0	0	0	0	2	1	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							
2000	1	7	1	0	1	19	19	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	0	0	0							
#Males											
1996	1	7	2	0	2	12	12	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	2	0	2	13	13	5	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	1	1	1	0
	2	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	2	0	2	14	14	4	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	2	1	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	2	0	2	15	15	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	2	0	2	19	19	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	1	0	0	0	0	0	0	0
	0	0	0	0							
1996	1	7	2	0	2	21	21	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	2	0	2	12	12	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	2	0	2	13	13	4	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	1	1	1
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	2	0	2	14	14	18	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	7	6	3
	2	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	2	0	2	15	15	16	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	2	9	2
	2	1	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	2	0	2	16	16	7	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	2	2	0
	1	2	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	2	0	2	17	17	7	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	2	1
	3	0	0	0	1	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	2	0	2	18	18	9	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	1
	1	2	1	3	0	0	0	0	0	0	0
	0	0	0	0							
1997	1	7	2	0	2	19	19	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	1	0	0	1	0	0	0	0	0
	0	0	0	0							
1998	1	7	2	0	2	12	12	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	2	0	2	13	13	7	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	3	2	2
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	2	0	2	14	14	6	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	3	2
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	2	0	2	15	15	4	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	1	2
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	2	0	2	16	16	7	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	5
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1998	1	7	2	0	2	17	17	7	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	2
	2	0	2	0	0	0	0	0	0	0	0
	0	0	0	0							
1999	1	7	2	0	2	15	15	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	1
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1999	1	7	2	0	2	16	16	3	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	1
	0	2	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1999	1	7	2	0	2	17	17	3	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	1
	1	1	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1999	1	7	2	0	2	18	18	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	1	0	1	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	4	4	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	5	5	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	9	9	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	10	10	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	12	12	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	13	13	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	14	14	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	2	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	15	15	3	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	1
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	16	16	10	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	2	2	1
	4	1	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	17	17	13	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	2	1
	4	6	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	18	18	10	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	5	2
	1	1	1	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	19	19	8	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	1	1
	2	3	0	1	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	20	20	10	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	3	3	1	1	1	0	1	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	21	21	4	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	1	2	1	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	22	22	6	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	1	1	1	0	2	0	0	0	1	0	0
	0	0	0	0							
2000	1	7	2	0	2	23	23	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	1	1	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	2	0	2	24	24	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	1	0	0	0	0	0
	0	0	0	0							
2001	1	7	2	0	2	3	3	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	2	0	2	6	6	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	2	0	2	16	16	3	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	2	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	2	0	2	17	17	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	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	2	0	2	18	18	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	0	0
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	2	0	2	19	19	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	1
	0	0	1	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	2	0	2	20	20	4	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	0
	1	2	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	2	0	2	21	21	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
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	2	0	2	23	23	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
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	2	0	2	16	16	4	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	2	2	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	2	0	2	17	17	3	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	2
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	2	0	2	18	18	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
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2002	1	7	2	0	2	19	19	4	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	0
	0	1	1	0	0	1	0	0	0	0	0
	0	0	0	0							
2002	1	7	2	0	2	21	21	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	1	0	0	0	0	0
	0	0	0	0							
#Unsexed											
1991	1	7	0	0	1	2	2	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
1993	1	7	0	0	1	3	3	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	0	0	1	3	3	5	5	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2000	1	7	0	0	1	4	4	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	0	0	1	1	1	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	0	0	1	2	2	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	0	0	1	3	3	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	0	0	1	6	6	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							

2001	1	7	0	0	1	21	21	2	0	0	0
	0	0	0	0	1	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	0	0	1	24	24	2	0	0	0
	0	0	0	0	1	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2001	1	7	0	0	1	25	25	1	0	0	0
	0	0	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							

0 #_N_MeanSize-at-Age_obs
#Yr Seas Flt Svy Gender Part Ageerr Ignore datavector(female-male)
samplesize(female-male)
0 #_N_environ_variables
0 #_N_environ_obs
0 # N sizefreq methods to read
#Sizefreq N bins per method
#Sizetfreq units(bio num) per method
#Sizefreq scale(kg lbs cm inches) per method
#Sizefreq mincomp per method
#Sizefreq N obs per method
#_Sizefreq bins
#_Year season Fleet Partition Gender SampleSize <data>
0 # no tag data
0 # no morphcomp data

999

ENDDATA

Appendix E-2. Control file for CAS.

```
# CAS cabezon control file, SS v3.03a, May 2009
# Morph setup
1             # Number of growth patterns
1             # N sub morphs within growth patterns
2             #_Nblock_Patterns
1 2                        # Blocks_per_pattern
1999 2008                  # Accounts for change in commerical regs (size limits)
2000 2004 2005 2008    # Accounts for change in recreational regs (size & bag limits)

# Mortality and growth specifications
0.5           # Fraction female at birth
0             # M setup: 0=single Par,1=N_breakpoints,2=Lorenzen,3=agespecific;_4=agespec_withseasinterpolate
#2            # Number of M breakpoints
#0 0          # Ages at M breakpoints
1             # Growth model: 1=VB with L1 and L2, 2=VB with A0 and Linf, 3=Richards, 4=Read vector of L@A
0             # Age for growth Lmin
999           # Age for growth Lmax or 999 = Linf
0             # SD constant added to LAA (0.1 mimics SS2 v1.x for compatibility only)
0             # Variability about growth: 0=CV~f(LAA) [mimic v1.xx], 1=CV~f(A), 2=SD~f(LAA), 3=SD~f(A)
1             # Maturity option: 1=length logistic, 2=age logistic, 3=read age-maturity matrix by growth_pattern
1             # First age allowed to mature
1   #_fecundity option:(1)eggs=Wt*(a+b*Wt);(2)eggs=a*L^b;(3)eggs=a*Wt^b
0   #_hermaphroditism option:  0=none; 1=age-specific fxn
1   #_parameter_offset_approach (1=none, 2= M, G, CV_G as offset from female-GP1, 3=like SS2 V1.x)
1   #_env/block/dev_adjust_method (1=standard; 2=with logistic trans to keep within base parm bounds)

#_LO      HI        INIT              PRIOR     PR_type SD          PHASE env-var use_dev dev_minyr dev_maxyr
dev_stddev Block Block_Fxn
0.02      0.5       0.25      0.25      0         0.08      -4        0         0         0         0         0.5
0         0         #         NatM_p_2_Fem_GP:1 old
1         40        13.97     14        0         1         3         0         0         0         0         0.5
0         0         #         L_at_Amin_Fem_GP_1
20        90        59.0      58        0         100   2   0         0         0         0         0.5       0
0         #         L_at_Amax_Fem_GP_1
0.05      0.3       0.17      0.185     0         0.8       3         0         0         0         0         0.5
0         0         #         VonBert_K_Fem_GP_1
0.01      0.5       0.14      0.139     0         0.8       3         0         0         0         0         0.5
0         0         #         CV_young_Fem_GP_1
0.01      0.5       0.1   0.1           0         0.8       3         0         0         0         0         0.5
0         0         #         CV_old_Fem_GP_1

0.02      0.5       0.3       0.3       0         0.08      -4        0         0         0         0         0.5
0         0         #         NatM_p_1_Mal_GP:1 old
1         40        12.57     13  0     1         3         0         0         0         0         0.5       0
0         #         L_at_Amin_Mal_GP_1
20        90        41.8      41.8  0   100   2   0         0         0         0         0.5       0         0
          #         L_at_Amax_Mal_GP_1
0.05      0.6       0.45      0.45      0         0.8       3         0         0         0         0         0.5
0         0         #         VonBert_K_Mal_GP_1
0.01      0.5       0.17      0.17      0         0.8       3         0         0         0         0         0.5
0         0         #         CV_young_Mal_GP_1
0.01      0.5       0.14      0.1       0         0.8       3         0         0         0         0         0.5
0         0         #         CV_old_Mal_GP_1

# Add 2+2*gender lines to read the wt-Len and mat-Len parameters
-3        3         0.000009184   0.000009184   0         0.8       -3        0         0         0         0
          0.5       0         0         #Female wt-len-1
-3        4         3.188     3.188  0            3         -3        0         0         0         0         0.5
          0         0         #Female wt-len-2
-3        40        34.6      35    0             10        -3        0         0         0         0         0.5
          0         0         #Female mat-len-1
-3        3         -0.7      -0.7  0             0.8       -3        0         0         0         0         0.5
          0         0         #Female mat-len-2
-3        3         1         1     0             0.8       -3        0         0         0         0         0.5
          0         0         #Female eggs/gm intercept
-3        3         0         0     0             0.8       -3        0         0         0         0         0.5
          0         0         #Female eggs/gm slope
```

```
-3	3	0.00001163	0.00001163	0	0.8	-3	0	0	0	0
	0.5	0	0	#Male wt-len-1
-3	4	3.118	3.190852	0	3	-3	0	0	0	0
	0.5	0	0	#Male wt-len-2

-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 0 0 -1 99 -3 0 0 0 0 0.5 0 0 #_recrdistribution_by_season 1
 0 2 1 1 -1 99 -3 0 0 0 0 0.5 0 0 #_cohort_growth_deviation
# Seasonal effects on biology parameters (0=none)
 0 0 0 0 0 0 0 0 0 0

#_Spawner-Recruitment
3 #_SR_function
#_LO   HI    INIT PRIOR PR_type SD PHASE
  3   30    10   12  -1    10   2  # SR_R0
0.2    1   0.7  0.71   0   0.8   -3  # SR_steep
  0    1   0.5    1   0    1   -1     # SR_sigmaR
  0    5     0    0   0    1   -3     # SR_envlink
  0    5     0    0   0    1   -3     # SR_R1_offset
  0    2     0    1   0   50  -50    # Autocorrelation placeholder (Future implementation)
0 #_SR_env_link
0 #_SR_env_target_1=devs;_2=R0;_3=steepness
1 #do_recr_dev:  0=none; 1=devvector; 2=simple deviations
# Recruitment residuals
1970	# Start year recruitment residuals
2006	# End year recruitment residuals
1	# Phase
1	# Read 13 advanced recruitment options: 0=no, 1=yes
0	# first year for early rec devs
-4	# phase for early rec devs
5	# Phase for forecast recruit deviations
100	# Lambda for forecast recr devs before endyr+1
1979	#_last_yr_nobias_adj_in_MPD
1980	# first year of full bias correction (linear ramp up from this year minus the plus-age to this year)
2004	# last year for full bias correction in_MPD
2005	#_first_recent_yr_nobias_adj_in_MPD
1	#_max_bias_adj_in_MPD (1.0 to mimic pre-2009 models)
0	#_placeholder
-15	# Lower bound rec devs
15	# Upper bound rec devs
0	# read intitial values for rec devs

# Fishing mortality setup
0.1	# F ballpark for tuning early phases
2008	# F ballpark year
1	# F method:  1=Pope's; 2=Instan. F; 3=Hybrid (recommended)
0.9	# max F or harvest rate, depends on F_Method
#init_F_setup,	for	each	fleet
#LO	HI	INIT	PRIOR	P_TYPE SD	PHASE
 0	1	0	0.0001	0	99	-1  #1  InitF_FISHERY1_Comm_Non-Live
 0	1	0	0.0001	0	99	-1  #2  InitF_FISHERY2_Comm_Live
 0	1	0	0.0001	0	99	-1  #3  InitF_FISHERY3_Rec_MM
 0	1	0	0.0001	0	99	-1  #4  InitF_FISHERY4_Rec_BB
 0	1	0	0.0001	0	99	-1  #5  InitF_FISHERY5_Rec_PBR
 0	1	0	0.0001	0	99	-1  #6  InitF_FISHERY6_Rec_CPFV
 0	1	0	0.0001	0	99	-1  #7  InitF_FISHERY7_Ghost

#_Q_setup
#_add_parm_row_for_each_positive_entry_below(row_then_column)
# 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 #1  InitF_FISHERY1_Comm_Non-Live
 0	0	0	0	1	0	#2  InitF_FISHERY2_Comm_Live
 0	0	0	0	1	0	#3  InitF_FISHERY3_Rec_MM
 0	0	0	0	1	0	#4  InitF_FISHERY4_Rec_BB
 0	0	0	0	1	0	#5  InitF_FISHERY5_Rec_PBR
 0	0	0	0	1	0	#6  InitF_FISHERY6_Rec_CPFV
 0	0	0	0	1	0	#7  InitF_FISHERY7_Ghost
```

```
 0   0   0   0   0   0   #8  InitF_SURVEY1_CPFV 1960-1999
 0   0   0   0   0   0   #9  InitF_SURVEY2_CPFV 2000-2008
 0   0   0   0   0   0   #10 InitF_SURVEY3_CPFV 1960-2008
 0   0   0   0   0   0   #11 InitF_SURVEY4_TENERA_adult
 0   0   0   0   0   0   #12 InitF_SURVEY5_PISCO_adult
 0   0   0   0   0   0   #13 InitF_SURVEY6_PISCO_MONTEREY_SMURFs
 0   0   0   0   0   0   #14 InitF_SURVEY7_SLO_SMURFs
 0   0   0   0   0   0   #15 InitF_SURVEY8_CalCOFI
 0   0   0   0   0   0   #16 InitF_SURVEY9_Edison_Impingement

#_size_selex_types
#_Pattern Discard Male Special
 24 0 0 0 #1  Comm_Non-Live
 24 0 0 0 #2  Comm_Live
 24 0 0 0 #3  Rec_MM
 24 0 0 0 #4  Rec_BB
 24 0 0 0 #5  Rec_PBR
 24 0 0 0 #6  Rec_CPFV
 0 0 0 0  #7  CA_age_samples
 5 0 0 6  #8  CPFV 1960-1999
 5 0 0 6  #9  CPFV 2000-2008
 5 0 0 6  #10 CPFV 1960-2008
 30 0 0 0 #11 TENERA adult
 30 0 0 0 #12 PISCO Adults
 33 0 0 0 #13 PISCO SMURFS (Monterey)
 33 0 0 0 #14 SMURFS (SLO)
 33 0 0 0 #15 CalCOFI
 33 0 0 0 #16 Edison impingement

#_age_selex_types
#_Pattern Discard Male Special
 10 0 0 0 #1  Comm_Non-Live
 10 0 0 0 #2  Comm_Live
 10 0 0 0 #3  Rec_MM
 10 0 0 0 #4  Rec_BB
 10 0 0 0 #5  Rec_PBR
 10 0 0 0 #6  Rec_CPFV
 10 0 0 0 #7  CA_age_samples
 10 0 0 0 #8  CPFV_CPUE
 10 0 0 0 #9  CPFV 2000-2008
 10 0 0 0 #10 CPFV 1960-2008
 10 0 0 0 #11 TENERA adult
 10 0 0 0 #12 PISCO Adults
 10 0 0 0 #13 PISCO SMURFS (Monterey)
 10 0 0 0 #14 SMURFS (SLO)
 10 0 0 0 #15 CalCOFI
 10 0 0 0 #16 Edison Impingement

#_LO   HI   INIT   PRIOR   PR_type  SD PHASE env-var use_dev dev_minyr dev_maxyr
dev_stddev Block Block_Fxn
#FLEET 1 NOT THE LIVE FISH FISHERY
  10    91    31    31    1    0.05    2    0    0    0    0    0.5
        0     0  # PEAK
 -5.0   3.0   -2.8   -2.8   1    0.05    3    0    0    0    0    0.5
        0     0  # TOP:_width of plateau
 -4.0   12.0   4.1   4.1  1   0.05   3   0   0   0   0   0.5   0
0  # Asc_width
 -10    6.0    4    -1.0   1    0.05   -3    0    0    0    0    0.5
        0     0  # Desc_width
-15.0   15.0   -10   -5.0   1    0.05   -2    0    0    0    0    0.5
        0     0  # INIT:_selectivity_at_fist_bin
 -5.0   15.0   10   -0.3   1    0.05   -2    0    0    0    0    0.5
        0     0  # FINAL:_selectivity_at_last_bin
#FLEET 2 LIVE FISH FISHERY
  10   91   38.2   38.2  1   0.05   2    0    0    0    0    0.5    1    2  # PEAK
 -5.0   3.0   -0.3   -0.3   1    0.05    3    0    0    0    0    0.5
        1     2  # TOP:_width of plateau
 -4.0   12.0   2.3   2.3  1   0.05   3   0   0   0   0   0.5   1
2  # Asc_width
```

```
 -10   6.0   3   3.0  1   0.05   3   0   0   0   0   0.5   1
2  # Desc_width
-15.0   5.0   -5   -5.0   1   0.05   -2   0   0   0   0   0.5
   0   0  # INIT:_selectivity_at_fist_bin
 -5.0   15.0   -3.5   -3.5   1   0.05   2   0   0   0   0   0.5
   1   2  # FINAL:_selectivity_at_last_bin
#FLEET 3 Man Made
  10   91   10.8   10.8   1   0.05   2   0   0   0   0   0.5
   0   0  # PEAK
 -5.0   3.0   -0.5   -0.5   1   0.05   3   0   0   0   0   0.5
   0   0  # TOP:_width of plateau
 -4.0   12.0   -0.6   -0.6   1   0.05   3   0   0   0   0   0.5
   0   0  # Asc_width
 -10   6.0   -2   -2.0   1   0.05   3   0   0   0   0   0.5
   0   0  # Desc_width
-15.0   15.0   -10   -5.0   1   0.05   -2   0   0   0   0   0.5
   0   0  # INIT:_selectivity_at_fist_bin
 -5.0   15.0   -0.5   -0.5   1   0.05   2   0   0   0   0   0.5
   0   0  # FINAL:_selectivity_at_last_bin
#FLEET 4 Shore
  10   91   33.7   33.7   1   0.05   2   0   0   0   0   0.5
   0   0  # PEAK
 -5.0   3.0   -2.8   -2.8   1   0.05   3   0   0   0   0   0.5
   0   0  # TOP:_width of plateau
 -4.0   12.0   4.1   4.1  1   0.05   3   0   0   0   0   0.5   0
0  # Asc_width
 -10   6.0   -1   -1.0   1   0.05   3   0   0   0   0   0.5
   0   0  # Desc_width
-15.0   15.0   -10   -5.0   1   0.05   -2   0   0   0   0   0.5
   0   0  # INIT:_selectivity_at_fist_bin
 -5.0   15.0   -0.3   -0.3   1   0.05   2   0   0   0   0   0.5
   0   0  # FINAL:_selectivity_at_last_bin
#FLEET 5 PBR
  10   91   45   45   1   0.05   2   0   0   0   0   0.5
   2   2  # PEAK
 -5.0   3.0   -2.8   -2.8   1   0.05   3   0   0   0   0   0.5
   2   2  # TOP:_width of plateau
 -4.0   12.0   4.1   4.1  1   0.05   3   0   0   0   0   0.5   2
2  # Asc_width
 -10   6.0   4   -1.0   1   0.05   -3   0   0   0   0   0.5
   0   0  # Desc_width
-15.0   15.0   -10   -5.0   1   0.05   -2   0   0   0   0   0.5
   0   0  # INIT:_selectivity_at_fist_bin
 -5.0   15.0   10   -0.3   1   0.05   -2   0   0   0   0   0.5
   0   0  # FINAL:_selectivity_at_last_bin
#FLEET 6 CPFV
  10   91   45   45   1   0.05   2   0   0   0   0   0.5
   2   2  # PEAK
 -5.0   3.0   -2.8   -2.8   1   0.05   3   0   0   0   0   0.5
   2   2  # TOP:_width of plateau
 -4.0   12.0   4.1   4.1  1   0.05   3   0   0   0   0   0.5   2
2  # Asc_width
 -10   6.0   4   -1.0   1   0.05   -3   0   0   0   0   0.5
   0   0  # Desc_width
-15.0   15.0   -10   -5.0   1   0.05   -2   0   0   0   0   0.5
   0   0  # INIT:_selectivity_at_fist_bin
 -5.0   15.0   10   -0.3   1   0.05   -2   0   0   0   0   0.5
   0   0  # FINAL:_selectivity_at_last_bin
#FLEET 7 CA_age_samples

#Survey 1: CPFV CPUE 1960-1999
  1   44   1   1   0   10   -3   0   0   0   0   0.5   0   0
   #min Len bin - fixed
  1   100   44   50   0   10   -4   0   0   0   0   0.5   0
0   #max Len bin fixed
#Survey 2: CPFV CPUE 2000-2008
  1   44   1   1   0   10   -3   0   0   0   0   0.5
   0   0   #min Len bin - fixed
  1   100   44   50   0   10   -4   0   0   0   0   0.5
   0   0   #max Len bin fixed
```

```
#Survey 3: CPFV CPUE 1960-2008
   1          44         1          1          0          10         -3         0          0          0          0          0.5
           0          0          #min Len bin - fixed
   1          100        44         50         0          10         -4         0          0          0          0          0.5
           0          0          #max Len bin fixed
#Survey 4: TENERA adult
#Survey 5: PISCO adult
#Survey 6: PISCO SMURFS
#Survey 7: SMURFS (SLO)
#Survey 8: CalCOFI
#Survey 9: Edison Impingement

1          #_Custom_block_setup SELECTIVITY BLOCK: 1999-2008
#FLEET 1 NOT THE LIVE FISH FISHERY
#   10        91         31         31         1          0.05       2          # PEAK
# -5.0      3.0        -2.8       -2.8       1          0.05       3          # TOP:_width of plateau
# -4.0      12.0       4.1        4.1        1          0.05       3          # Asc_width
#  -10      6.0        4          -1.0       1          0.05       -3         # Desc_width
# -5.0      15.0       10         -0.3       1          0.05       -2         # FINAL:_selectivity_at_last_bin
#FLEET 2 LIVE FISH FISHERY
   10    91   38.2   38.2   1    0.05    3   # PEAK
 -5.0       3.0        -0.3       -0.3       1          0.05       4          # TOP:_width of plateau
 -4.0       12.0       2.3        2.3        1          0.05       4          # Asc_width
  -10       6.0        3          3.0        1          0.05       4          # Desc_width
 -5.0       15.0       -3.5       -3.5       1          0.05       3          # FINAL:_selectivity_at_last_bin
#FLEET 5 PBR
   10       91         45         45         1          0.05       3          # PEAK
   10       91         45         45         1          0.05       3          # PEAK
 -5.0       3.0        -2.8       -2.8       1          0.05       4          # TOP:_width of plateau
 -5.0       3.0        -2.8       -2.8       1          0.05       4          # TOP:_width of plateau
 -4.0       12.0       4.1        4.1        1          0.05       4          # Asc_width
 -4.0       12.0       4.1        4.1        1          0.05       4          # Asc_width
#  -10      6.0        4          -1.0       1          0.05       -3         # Desc_width
# -5.0      15.0       10         -0.3       1          0.05       -2         # FINAL:_selectivity_at_last_bin
#FLEET 6 CPFV
   10       91         45         45         1          0.05       3          # PEAK
   10       91         45         45         1          0.05       3          # PEAK
 -5.0       3.0        -2.8       -2.8       1          0.05       4          # TOP:_width of plateau
 -5.0       3.0        -2.8       -2.8       1          0.05       4          # TOP:_width of plateau
 -4.0       12.0       4.1        4.1        1          0.05       4          # Asc_width
 -4.0       12.0       4.1        4.1        1          0.05       4          # Asc_width
#  -10      6.0        4          -1.0       1          0.05       -3         # Desc_width
# -5.0      15.0       10         -0.3       1          0.05       -2         # FINAL:_selectivity_at_last_bin

2          #separt_adj_method

# Tag loss and Tag reporting parameters go next
0  # TG_custom:  0=no read; 1=read if tags exist
#_Cond -6 6 1 1 2 0.01 -4 0 0 0 0 0 0 0  #_placeholder if no parameters
### Likelihood related quantities ###
1          # Do variance adjustments
#1  Comm: Non-live Fishery
#2  Comm: Live Fishery
#3  Rec: Man-made
#4  Rec: Beach/bank
#5  Rec: PBR
#6  Rec: CPFV
#7  CA age samples
#8  CPFV CPUE survey 1960-1999
#9  CPFV CPUE survey 2000-2008
#10 CPFV CPUE survey 1960-2008
#11 TENERA adult survey
#12 PISCO adult survey
#13 PISCO SMURFS
#14 SLO SMURFS
#15 CalCOFI
#16 Edison Impingement
#          1          2          3          4          5          6          7          8          9          10         11
           12         13         14    15 16
```

```
#       0       0       0       0       0       0       0       0       0       0       0
        0       0       0               #_add_to_survey_CV
        0       0       0       0       0       0       0       0.20 0.27   0.20 0.75   0.34 0.47   0.79 0.51
0.28    #_add_to_survey_CV
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0 0     #_add_to_discard_stddev
        0       0       0       0       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       1       1       1 1     #_mult_by_lencomp_N
        1       0.68    1.1     1.7     1.3     0.9     1       1       1       1       1
        1       1       1       1 1     #_mult_by_lencomp_N
        1       1       1       1       1       1       4       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       1       1       1 1     #_mult_by_size-at-age_N

30      #  DF For discard T-distribution
30      #  DF For meanbodywt T-distribution
1       #_maxlambdaphase
0       #_sd_offset
8       # N changes to default Lambdas = 1.0

######################################
#Example of changes to default lambda
#3 # number of changes to make to default Lambdas (default value is 1.0)
# Like_comp codes:  1=surv; 2=disc; 3=mnwt; 4=length; 5=age; 6=SizeFreq; 7=sizeage; 8=catch;
# 9=init_equ_catch; 10=recrdev; 11=parm_prior; 12=parm_dev; 13=CrashPen; 14=Morphcomp; 15=Tag-comp; 16=Tag-negbin
#like_comp fleet/survey  phase  value  sizefreq_method
#  1  8 1 0 1 #_CPUE/survey:_1 CPFV Logbook 1960-1999
  1  9 1 0 1 #_CPUE/survey:_2 CPFV Logbook 2000-2008
  1 10 1 0 1 #_CPUE/survey:_3 CPFV Logbook 1960-2008
  1 11 1 0 1 #_CPUE/survey:_4 TENREA Adult
  1 12 1 0 1 #_CPUE/survey:_5 PISCO Adult
  1 13 1 0 1 #_CPUE/survey:_6 PISCO SMURF
  1 14 1 0 1 #_CPUE/survey:_7 SLO SMURF
  1 15 1 0 1 #_CPUE/survey:_8 CalCOFI
  1 16 1 0 1 #_CPUE/survey:_9 Edison Impingement
#  4 1 1 0 1 #_lencomp:_FLEET 1
#  4 2 1 0 1 #_lencomp:_FLEET 2
#  4 3 1 0 1 #_lencomp:_FLEET 3
#  4 4 1 0 1 #_lencomp:_FLEET 4
#  4 5 1 0 1 #_lencomp:_FLEET 5
#  4 6 1 0 1 #_lencomp:_FLEET 6
#  5 7 1 0 1 #_Cond_age:_Females, Males, & Unsexed
#  1 1 1 0 1 #_init_equ_catch
#  1 1 1 0 1 #_recruitments
#  1 1 1 0 1 #_parameter-priors
#  1 1 1 0 1 #_parameter-dev-vectors
#  1 1 1 0 1 #_crashPenLambda
######################################

0 # (0/1) read specs for more stddev reporting
# 1 1 -1 5 1 5 # selex type, len/age, year, N selex bins, Growth pattern, N growth ages
# 3 9 15 21 27 # vector with selex std bin picks (-1 in first bin to self-generate)
# 1 2 14 26 40 # vector with growth std bin picks (-1 in first bin to self-generate)

999 # end of control file
```

Appendix F-1. Data file for ORS.

```
# Oregon Cabezon 2009, SS v3.03a, May 2009
1973 #_styr
2008 #_endyr
1	#N_seasons_per_year
12	#vector_with_N_months_in_each_season
1	#spawning_season_-_spawning_will_occur_at_beginning_of_this_season
5	#N_fishing_fleets
1	#N_surveys;_data_type_numbers_below_must_be_sequential_with_the_N_fisheries
1	# Number of areas
fleet1%fleet2%fleet3%fleet4%fleet5%survey1
0.5 0.5	0.5 0.5	0.5 0.5	#_surveytiming_in_season
1 1 1 1 1 1 #_area_assignments_for_each_fishery_and_survey
1 1 1 1 1	# Units for catch by fishing fleet: 1=Biomass(mt),2=Numbers(1000s)
0.01 0.01 0.01 0.01 0.01	# SE of log(catch) by fleet for equilibrium and continuous options

2	#number_of_genders(1 / 2)
35	#accumulator_age;_model_always_starts_with_age_0

### Catch section ###
# Initial equilibrium catch (landings + discard) by fishing fleet
# comm nonlive - comm live - shore-based (man-made, beach/bank) - boat-based(PBR,CPFV)-ghost Josie
0 0	3	3 0	#	initial_equilibrium
36 # Number of lines catch data - FINAL CATCHES w/discards
0.00	0.00	3.29	3.10	0.00	1973	1
0.00	0.00	3.29	4.20	0.00	1974	1
0.00	0.00	3.29	4.60	0.00	1975	1
0.00	0.00	3.29	10.80	0.00	1976	1
0.00	0.00	3.29	8.80	0.00	1977	1
0.00	0.00	3.29	20.80	0.00	1978	1
0.00	0.00	3.29	10.40	0.00	1979	1
0.00	0.00	3.29	5.90	0.00	1980	1
0.08	0.06	3.66	22.70	0.00	1981	1
0.03	0.03	1.57	13.30	0.00	1982	1
0.28	0.04	1.78	11.00	0.00	1983	1
1.09	0.05	1.12	14.10	0.00	1984	1
2.54	0.03	3.47	7.80	0.00	1985	1
4.92	0.05	5.91	15.50	0.00	1986	1
6.37	0.00	4.41	5.90	0.00	1987	1
11.33	0.00	1.39	12.30	0.00	1988	1
6.70	0.00	3.17	15.80	0.00	1989	1
5.16	0.00	4.11	18.70	0.00	1990	1
8.32	0.00	4.11	12.70	0.00	1991	1
7.23	0.00	4.11	16.30	0.00	1992	1
1.43	0.03	5.05	17.60	0.00	1993	1
6.99	0.04	2.03	18.70	0.00	1994	1
5.72	0.03	1.71	13.60	0.00	1995	1
5.65	0.06	1.48	14.40	0.00	1996	1
10.08	10.87	1.85	20.00	0.00	1997	1
3.70	23.19	0.56	16.50	0.00	1998	1
3.00	23.46	0.90	17.90	0.00	1999	1
3.39	27.80	0.87	16.20	0.00	2000	1
2.38	43.94	3.17	12.10	0.00	2001	1
1.54	44.50	1.77	15.10	0.00	2002	1
1.49	25.55	1.59	16.00	0.00	2003	1
1.54	32.17	0.98	17.20	0.00	2004	1
1.51	28.41	2.11	17.60	0.00	2005	1
0.75	24.87	1.56	16.10	0.00	2006	1
0.76	22.48	1.56	16.30	0.00	2007	1
1.56	23.50	1.56	16.60	0.00	2008	1

#Abundance_Indices
8
#_N_observations
#Year	Season	Type	Value	CV
2001	1	6	0.0643624 0.14954056
2002	1	6	0.1118209 0.11422067
2003	1	6	0.104658	0.10200015
```

```
2004	1	6	0.1338716 0.11435232
2005	1	6	0.1321419 0.07760565
2006	1	6	0.1055009 0.08183698
2007	1	6	0.1175127 0.09619694
2008	1	6	0.1172195 0.09070033
#_Discard_Biomass
1	#_(1=biomass;_2=fraction)
0	#_N_observations
#Year	Season	Type	Value	CV

#_Mean_BodyWt
#	2009	from	sample	data	to	calc	CV	-	at	least	2
	fish
49
#Year	Seas	Type	Part	Mean Wt	CV
1980	1	3	2	0.814285714	0.970463018
1981	1	3	2	0.71025641	0.752533617
1982	1	3	2	0.508333333	0.730598086
1983	1	3	2	0.748387097	0.666204197
1984	1	3	2	0.7	0.747289474
1985	1	3	2	0.727272727	0.794497861
1986	1	3	2	0.828181818	0.682160738
1987	1	3	2	0.55	1.191415914
1988	1	3	2	0.476666667	0.671788184
1989	1	3	2	0.775	0.888923879
1993	1	3	2	0.72952381	1.048709233
1994	1	3	2	0.535	0.694708094
1995	1	3	2	0.641428571	0.588770803
1996	1	3	2	0.794230769	0.51677122
1997	1	3	2	0.577878788	0.675419209
1998	1	3	2	0.535555556	0.647841302
1999	1	3	2	0.637777778	0.440197226
2000	1	3	2	0.533076923	0.443416053
2001	1	3	2	0.748333333	0.817815652
2002	1	3	2	0.701333333	0.372787567
2003	1	3	2	1.298571429	0.808659434
2004	1	3	2	0.803076923	0.652704746
2005	1	3	2	1.726666667	0.512147281
1980	1	4	2	2.825925926	0.598248467
1981	1	4	2	2.452941176	0.498613661
1982	1	4	2	2.313461538	0.649932671
1983	1	4	2	2.010714286	0.582563165
1984	1	4	2	1.863492063	0.451892613
1985	1	4	2	2.017045455	0.432939218
1986	1	4	2	2.136428571	0.368500822
1987	1	4	2	2.027102804	0.458061681
1988	1	4	2	1.947096774	0.527351162
1989	1	4	2	1.947297297	0.45395525
1993	1	4	2	2.554174757	0.600461742
1994	1	4	2	2.324607843	0.534473908
1995	1	4	2	2.159622642	0.494231194
1996	1	4	2	2.130454545	0.511176505
1997	1	4	2	2.277575758	0.537967412
1998	1	4	2	2.120108696	0.490665528
1999	1	4	2	2.311046512	0.475578793
2000	1	4	2	2.118968254	0.476218242
2001	1	4	2	1.961354167	0.570703128
2002	1	4	2	2.207352941	0.492217198
2003	1	4	2	1.831666667	0.373385062
2004	1	4	2	2.58370664	0.377365756
2005	1	4	2	2.786372348	0.371878338
2006	1	4	2	2.765892405	0.37197854
2007	1	4	2	2.797415902	0.400341519
2008	1	4	2	2.563985083	0.418941384

## Population size structure
1  # Length bin method: 1=Use data bins
  # 2=generate from min/max/width read below
  # 3=Read count and vector below
#44 # Count of population bins
```

# Lower edge of bins											
#6	8	10	12	14	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	90	92	
0.0001	# Minimum proportion for compressing tails of observed compositional data										
0.0001	# Constant added to expected frequencies										
0	# Combine males and females at and below this bin number										
44	#_N_length_bins										
#_lower_edge_of_length_bins											
6	8	10	12	14	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	90	92	
83	#N_observations		(counts	-	samples	are	trips)				
#Year	Seas	Fleet	sexes	Partition	Nsamp	6	8	10	12	14	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	90	92	6	8	10	12	14	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	90	92						
#Not-live											
2001	1	1	1	0	2	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	413	0	0	140	25	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	1	1	0	3	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	26	11	4	0	0	0	0	17	0
	0	0	3	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	1	1	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2001	1	1	2	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	400	671	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	1	2	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	69
	0	54	86	0	0	0	0	22	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						

2007	1	1	2	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2008	1	1	2	0	2	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	4	0	4	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2000	1	1	0	0	4	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	117	31
	0	164	3	87	0	0	14	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2001	1	1	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	101
	0	0	0	0	0	0	40	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	1	0	0	2	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	16	0	16	11	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	1	0	0	5	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	399	176	149	271	61	225	141	0	5	0	0
	5	23	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	1	0	0	4	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	184	0	0	0	0	3	0	0	0
	0	14	0	0	7	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	1	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	8	7	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2006	1	1	0	0	8	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	39
	46	26	43	77	56	15	42	11	15	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2008	1	1	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	4	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
#Live											
1999	1	2	1	0	4	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	34	67	55	77	60	32	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2000	1	2	1	0	26	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	21	362	206
	307	263	110	119	185	104	259	192	76	48	69
	29	32	47	0	15	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2001	1	2	1	0	3	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	68	62	105
	0	0	0	51	51	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	2	1	0	6	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	182	0
	361	0	190	83	37	45	0	84	6	0	0
	4	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2008	1	2	1	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	48	23	21
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1999	1	2	2	0	5	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	284
	206	0	99	42	36	65	52	7	0	0	14
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2000	1	2	2	0	32	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1081	850
	368	547	527	670	319	555	333	552	64	152	34
	0	20	32	15	0	0	0	0	0	0	0
	0	0	0	0	0						
2001	1	2	2	0	2	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	75	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	2	2	0	7	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	620	811
	513	196	148	140	96	0	63	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2008	1	2	2	0	3	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	72	63	0	0	0	0	0	0
	0	0	23	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1998	1	2	0	0	5	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	506	1394	329	498	700	1048	151	291	166	163	0
	61	0	0	0	39	0	36	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1999	1	2	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	94	77	37	62	56	0	23	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2000	1	2	0	0	75	0	0	0	0	0	0
	0	0	0	0	0	0	0	192	1337	4462	4181
	5534	7773	6290	5183	4614	2000	2018	1706	627	365	359
	227	206	36	16	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2001	1	2	0	0	129	0	0	0	0	0	0
	0	0	0	0	0	0	0	201	3460	11115	9058

	13514	10543	11516	10382	7338	7737	6340	6824	4410	3323	1649
	1780	461	425	327	403	0	0	0	36	0	31
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	2	0	0	164	0	0	0	0	0	0
	0	0	0	0	0	0	45	75	640	16057	16778
	18841	13315	9726	5949	5002	4824	2145	2152	1144	948	448
	385	96	47	42	19	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	2	0	0	105	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	92	0	917
	7581	9380	9367	5463	3867	3334	1811	1178	832	774	338
	314	101	54	24	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	2	0	0	142	0	0	0	0	0	0
	0	0	0	0	0	0	0	98	327	68	1745
	7490	6624	5519	4789	4237	2927	2286	2267	1533	1356	908
	537	354	105	12	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	2	0	0	87	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	77	178
	8243	8254	6986	3796	2887	2295	1827	1046	992	640	426
	346	204	137	69	18	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2006	1	2	0	0	128	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	66	731
	3121	2472	2707	2079	2224	2703	2637	2356	2211	1129	1015
	738	381	166	193	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2007	1	2	0	0	127	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	86	70	1315
	3547	5577	3350	5404	4294	5166	6011	3670	5568	3649	3214
	1881	1012	902	360	37	41	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2008	1	2	0	0	91	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	90	84
	1389	1811	2176	1992	1832	1234	802	967	1148	701	417
	394	211	224	76	6	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						

#Shore	modes										
1980	1	3	0	0	44	1	0	0	0	1	2
	0	1	3	2	8	7	7	3	8	7	4
	1	1	1	3	1	2	0	0	2	0	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1981	1	3	0	0	28	0	0	0	0	0	0
	1	2	0	2	4	0	6	5	9	4	0
	1	1	2	0	0	1	0	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1982	1	3	0	0	27	0	0	0	0	0	1
	0	3	2	2	4	4	6	4	4	2	1
	1	0	1	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1983	1	3	0	0	23	0	0	0	0	0	0
	0	1	0	2	1	4	4	6	3	2	1
	1	3	0	1	0	1	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1984	1	3	0	0	18	0	0	0	0	1	2
	0	2	1	0	1	2	1	2	1	2	1
	4	1	0	1	0	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1985	1	3	0	0	48	0	0	0	0	2	1
	5	5	6	1	2	1	3	6	6	3	5
	4	0	2	3	3	1	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1986	1	3	0	0	55	0	0	0	0	0	0
	0	3	5	3	5	4	5	4	6	4	6
	9	1	6	2	1	0	0	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1987	1	3	0	0	28	0	0	0	0	0	0
	2	7	3	3	2	6	3	3	3	1	3
	2	2	0	0	1	0	0	0	0	0	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1988	1	3	0	0	21	0	0	0	0	0	0
	1	3	2	4	2	2	4	4	4	2	2
	0	0	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1989	1	3	0	0	16	0	0	0	0	0	1
	0	0	0	1	2	1	7	4	0	0	0
	0	2	0	0	1	0	1	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1993	1	3	0	0	42	0	0	0	0	0	2
	2	3	4	3	6	3	5	9	9	6	2
	1	0	1	1	3	1	0	1	0	0	0
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1994	1	3	0	0	49	0	0	0	1	0	1
	5	1	2	5	8	3	1	10	8	1	1
	0	2	1	1	0	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1996	1	3	0	0	23	0	0	0	0	0	0
	0	1	2	1	0	0	4	3	4	1	3
	4	1	3	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1997	1	3	0	0	30	0	0	0	0	0	0
	1	2	3	3	2	4	4	8	3	2	0
	1	2	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1998	1	3	0	0	6	0	0	0	0	0	0
	0	0	1	2	1	1	2	0	0	1	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1999	1	3	0	0	8	0	0	0	0	0	0
	1	0	0	0	1	0	1	1	4	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2000	1	3	0	0	13	0	0	0	0	0	0
	0	0	0	1	2	2	4	0	2	2	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2001	1	3	0	0	9	0	0	1	0	0	0
	0	0	1	0	1	2	1	2	0	1	1
	0	1	0	0	0	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	3	0	0	15	0	0	0	0	0	0
	1	0	1	0	0	2	2	1	4	1	2
	1	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	3	0	0	7	0	0	0	0	0	0
	0	0	0	0	1	0	2	1	0	1	2
	0	0	1	0	0	0	0	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	3	0	0	12	0	0	0	0	0	0
	1	0	0	0	1	2	1	2	1	2	0
	0	1	2	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	3	0	0	4	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	2	0
	1	1	0	1	0	1	0	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
#Boat	modes										
1980	1	4	0	0	24	0	0	0	0	0	0
	0	0	0	0	0	2	0	1	1	0	1
	0	2	1	1	2	2	1	3	3	5	1
	0	0	0	1	1	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						

1981	1	4	0	0	24	0	0	0	0	0	0
	0	0	0	0	0	1	0	0	3	1	0
	0	0	4	4	4	2	2	1	5	4	0
	2	2	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1982	1	4	0	0	36	0	0	0	0	0	1
	0	0	1	0	0	0	0	1	1	1	1
	4	7	10	1	3	4	5	2	4	2	3
	0	2	1	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1983	1	4	0	0	19	0	0	0	0	0	0
	0	0	0	0	1	0	0	1	1	0	2
	1	3	2	0	3	6	1	1	0	3	1
	0	0	1	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1984	1	4	0	0	35	0	0	0	0	0	0
	0	0	0	0	0	0	0	2	3	1	0
	8	5	5	7	8	5	3	6	2	2	4
	1	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1985	1	4	0	0	48	0	0	0	0	0	0
	0	0	0	1	1	0	0	0	1	2	5
	8	3	9	5	5	10	8	8	9	5	6
	1	0	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1986	1	4	0	0	35	0	0	0	0	0	0
	0	0	0	0	0	0	1	2	1	1	5
	1	2	0	4	8	13	10	9	6	2	3
	1	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1987	1	4	0	0	47	0	0	0	0	0	0
	0	0	3	1	0	0	2	1	0	3	4
	2	7	6	10	6	18	14	6	9	6	3
	3	2	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1988	1	4	0	0	91	0	0	0	0	0	0
	0	0	0	2	3	3	2	3	4	5	6
	7	8	9	19	14	10	13	11	19	4	5
	3	0	2	1	1	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1989	1	4	0	0	36	0	0	0	0	0	0
	0	0	0	0	0	0	0	1	3	1	2
	10	3	4	10	9	4	7	5	9	1	0
	3	1	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1993	1	4	0	0	69	0	0	0	0	0	0
	0	1	0	0	0	0	0	1	2	3	5
	7	6	15	11	5	13	3	8	6	4	3
	2	0	2	1	2	2	0	3	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1994	1	4	0	0	85	0	0	0	0	0	0
	0	0	0	1	0	0	1	2	6	3	1
	2	7	6	12	7	6	11	8	3	4	3
	1	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1996	1	4	0	0	47	0	0	0	0	0	0
	0	0	1	0	0	0	0	1	0	3	7
	5	2	8	7	5	3	7	2	7	1	1
	2	1	2	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1997	1	4	0	0	79	0	0	0	0	0	0
	0	0	0	0	0	0	1	2	8	9	4
	10	13	5	14	20	17	15	14	7	3	2
	0	4	0	0	0	0	1	0	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1998	1	4	0	0	115	0	0	0	0	0	0
	0	0	0	0	0	1	0	3	12	5	13
	11	16	21	23	14	15	21	14	10	5	4
	1	1	2	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
1999	1	4	0	0	122	0	0	0	0	0	0
	0	0	0	0	0	0	2	2	8	6	5
	13	17	11	17	27	18	16	13	6	5	7
	9	3	1	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	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2000	1	4	0	0	79	0	0	0	0	0	0
	0	0	0	0	0	0	2	4	5	7	6
	8	12	12	12	11	12	18	17	5	4	3
	3	0	2	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2001	1	4	0	0	61	0	0	0	0	0	0
	0	0	0	0	1	0	4	2	3	9	7
	8	13	10	8	8	5	5	7	3	3	1
	4	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2002	1	4	0	0	73	0	0	0	0	0	0
	0	0	0	0	0	0	1	0	2	8	11
	13	11	10	14	19	10	7	10	7	9	3
	0	1	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2003	1	4	0	0	10	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	1	4	1	2	1	0	4	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2004	1	4	0	0	481	0	0	0	0	0	0
	0	0	0	0	0	0	0	1	0	0	2
	39	69	106	95	128	125	118	111	76	58	34
	17	15	11	3	1	0	0	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2005	1	4	0	0	696	0	0	0	0	0	0
	0	0	0	0	0	0	0	1	1	3	6
	28	57	87	137	141	211	223	172	132	98	46
	55	28	19	11	1	1	2	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2006	1	4	0	0	779	0	0	0	0	0	0
	0	0	0	0	0	0	0	2	1	1	4
	40	58	125	132	152	175	215	189	166	116	72
	57	32	22	13	5	1	2	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2007	1	4	0	0	534	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	5
	37	82	88	116	116	143	150	140	116	89	94
	56	34	20	16	4	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
2008	1	4	0	0	711	0	0	0	0	0	0
	0	0	0	0	0	0	0	1	1	4	19
	96	127	165	187	202	186	210	186	145	116	88

	55	34	32	14	6	2	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0						
20	#_N_age_bins										
1	2	3	4	5	6	7	8	9	10	11	12
	13	14	15	16	17	18	19	20			
1	#_N_ageerror_definitions										
#Female											
-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1									
0.457687	0.457687	0.46745	0.478098	0.48971	0.502373	0.516184	0.531244	0.547669	0.565581	0.585115	0.606417
	0.629649	0.654984	0.682614	0.712746	0.745606	0.781441	0.820522	0.863142	0.909621	0.960309	1.01559
	1.07587	1.14161	1.21331	1.2915	1.37676	1.46975	1.57116	1.68175	1.80236	1.93389	2.07733
	2.23376	2.40435									
114	#_N_Agecomp_obs										
2	#_Lbin_method:		1=poplenbins		2=datalenbins		3=lengths				
0	#_combinemales		into	females	at	or	below	this	bin	number	
#Conditional_Age-at_Length			1	2	3	4	5	6	7	8	9
	10	11	12	13	14	15	16	17	18	19	20
	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20		
#Recreational (ORBS) data Josie ages											
#Females											
#Year	Seas	Flt/Svy	Gender	Part	Ageerr	Lbin_lo	Lbin_hi	Nsamp	1	2	3
	4	5	6	7	8	9	10	11	12	13	14
	15	16	17	18	19	20	1	2	3	4	5
	6	7	8	9	10	11	12	13	14	15	16
	17	18	19	20							
2005	1	5	1	0	1	19	19	3	0	0	0
	3	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2005	1	5	1	0	1	20	20	2	0	0	0
	1	0	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2005	1	5	1	0	1	21	21	1	0	0	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2005	1	5	1	0	1	22	22	3	0	0	0
	0	3	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2005	1	5	1	0	1	23	23	5	0	0	0
	1	3	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2005	1	5	1	0	1	24	24	4	0	0	0
	0	1	1	1	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2005	1	5	1	0	1	25	25	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	0	0	0							

2005	1	5	1	0	1	26	26	3	0	0	0
	0	0	1	0	1	0	0	0	0	0	0
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2005	1	5	1	0	1	27	27	1	0	0	0
	0	0	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2005	1	5	1	0	1	28	28	3	0	0	0
	0	0	0	0	2	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	1	0	1	17	17	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	0	0	0							
2006	1	5	1	0	1	18	18	4	0	0	1
	3	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	1	0	1	19	19	1	0	0	0
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	1	0	1	20	20	9	0	0	1
	1	5	2	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	1	0	1	21	21	9	0	0	0
	0	6	1	1	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	1	0	1	22	22	6	0	0	0
	0	2	4	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	1	0	1	23	23	6	0	0	0
	0	4	0	2	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	1	0	1	24	24	7	0	0	0
	0	1	4	1	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	1	0	1	25	25	9	0	0	0
	0	2	1	4	1	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	1	0	1	26	26	18	0	0	0
	0	0	2	7	5	3	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							
2006	1	5	1	0	1	27	27	13	0	0	0
	0	0	1	3	4	2	1	1	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							

2006	1	5	1	0	1	28	28	15	0	0	0
	0	0	0	0	6	4	3	1	0	0	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	1	0	1	29	29	4	0	0	0
	0	0	0	0	0	3	0	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	1	0	1	30	30	7	0	0	0
	0	0	0	0	0	2	2	3	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	1	0	1	31	31	5	0	0	0
	0	0	0	0	0	0	1	2	0	0	1
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	1	0	1	32	32	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	1	0	1	33	33	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	1	0	1	34	34	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2007	1	5	1	0	1	19	19	1	0	0	0
	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2007	1	5	1	0	1	20	20	4	0	0	0
	1	2	0	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2007	1	5	1	0	1	21	21	4	0	0	0
	1	2	0	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2007	1	5	1	0	1	22	22	2	0	0	0
	0	0	2	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2007	1	5	1	0	1	23	23	4	0	0	0
	0	0	2	2	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2007	1	5	1	0	1	24	24	4	0	0	0
	0	0	3	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2007	1	5	1	0	1	25	25	9	0	0	0
	0	0	1	4	3	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							

2007	1	5	1	0	1	26	26	9	0	0	0
	0	0	0	6	2	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							
2007	1	5	1	0	1	27	27	12	0	0	0
	0	0	2	3	3	1	0	1	1	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							
2007	1	5	1	0	1	28	28	7	0	0	0
	0	0	1	1	3	1	0	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2007	1	5	1	0	1	29	29	3	0	0	0
	0	0	0	0	2	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2007	1	5	1	0	1	30	30	2	0	0	0
	0	0	0	0	0	0	1	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2007	1	5	1	0	1	31	31	1	0	0	0
	0	0	0	0	0	0	0	0	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2007	1	5	1	0	1	33	33	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2008	1	5	1	0	1	15	15	1	0	0	0
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2008	1	5	1	0	1	18	18	4	0	0	2
	3	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2008	1	5	1	0	1	19	19	10	0	0	1
	9	2	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2008	1	5	1	0	1	20	20	8	0	0	0
	3	7	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2008	1	5	1	0	1	21	21	13	0	0	0
	3	11	3	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2008	1	5	1	0	1	22	22	15	0	0	0
	5	9	3	0	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2008	1	5	1	0	1	23	23	10	0	0	0
	1	4	7	2	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							

2008	1	5	1	0	1	24	24	10	0	0	0
	0	6	5	2	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2008	1	5	1	0	1	25	25	18	0	0	0
	0	2	6	6	2	3	0	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2008	1	5	1	0	1	26	26	8	0	0	0
	0	0	2	4	3	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							
2008	1	5	1	0	1	27	27	7	0	0	0
	0	0	0	4	2	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							
2008	1	5	1	0	1	28	28	11	0	0	0
	0	0	0	2	5	4	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							
2008	1	5	1	0	1	29	29	5	0	0	0
	0	0	0	1	2	2	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2008	1	5	1	0	1	30	30	6	0	0	0
	0	0	0	1	2	2	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2008	1	5	1	0	1	31	31	2	0	0	0
	0	0	0	0	0	0	0	0	1	2	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2008	1	5	1	0	1	32	32	2	0	0	0
	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							
#Males											
2005	1	5	2	0	1	18	18	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	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2005	1	5	2	0	1	19	19	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	2	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2005	1	5	2	0	1	20	20	3	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	0	2
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2005	1	5	2	0	1	21	21	7	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	3
	2	1	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2005	1	5	2	0	1	22	22	8	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	4

	4	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2005	1	5	2	0	1	23	23	7	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	3
	0	2	0	2	0	0	0	0	0	0	0
	0	0	0	0							
2005	1	5	2	0	1	24	24	6	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	1	2	1	2	0	0	0	0	0	0	0
	0	0	0	0							
2005	1	5	2	0	1	25	25	3	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	2	0	1	0	0	0	0	0	0	0
	0	0	0	0							
2005	1	5	2	0	1	26	26	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	1	0	0	0
	0	0	1	0							
2005	1	5	2	0	1	27	27	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	1	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	2	0	1	16	16	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	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	2	0	1	17	17	3	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	2	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	2	0	1	18	18	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	2
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	2	0	1	19	19	12	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	3	6
	3	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	2	0	1	20	20	10	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	2	3
	4	1	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	2	0	1	21	21	17	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	2	7
	7	0	1	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	2	0	1	22	22	25	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	10
	9	4	1	0	0	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	2	0	1	23	23	28	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	4
	9	8	5	1	1	0	0	0	0	0	0
	0	0	0	0							
2006	1	5	2	0	1	24	24	42	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	1

	9	11	8	6	6	0	1	0	0	0	0
	0	0	0	0							
2006	1	5	2	0	1	25	25	28	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	8	8	7	4	0	0	0	1	0	0
	0	0	0	0							
2006	1	5	2	0	1	26	26	16	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	3	3	4	2	3	0	0	0	1	0	0
	0	0	0	0							
2006	1	5	2	0	1	27	27	9	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	2	0	1	2	1	1	0	1	1
	0	0	0	0							
2006	1	5	2	0	1	28	28	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	1	0	0	0	0
	0	0	0	0							
2006	1	5	2	0	1	29	29	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	1	0	0	0	0	0
	0	0	0	0							
2007	1	5	2	0	1	17	17	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	1
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2007	1	5	2	0	1	18	18	3	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	1
	1	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2007	1	5	2	0	1	19	19	10	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	2	6
	2	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2007	1	5	2	0	1	20	20	10	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	6
	3	1	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2007	1	5	2	0	1	21	21	12	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	5
	5	0	1	0	0	0	0	0	0	0	0
	0	0	0	0							
2007	1	5	2	0	1	22	22	14	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	2
	3	8	0	0	0	0	1	0	0	0	0
	0	0	0	0							
2007	1	5	2	0	1	23	23	19	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	1
	3	9	1	3	1	1	0	0	0	0	0
	0	0	0	0							
2007	1	5	2	0	1	24	24	12	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	3	1	4	3	0	1	0	0	0	0	0
	0	0	0	0							
2007	1	5	2	0	1	25	25	16	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0

	1	2	4	5	1	2	0	0	0	0	1
	0	0	0	0							
2007	1	5	2	0	1	26	26	8	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	1	0	1	3	1	0	2	0	0	0	0
	0	0	0	0							
2007	1	5	2	0	1	27	27	3	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	1	0	0	0	0	0	0	1	1	0
	0	0	0	0							
2007	1	5	2	0	1	28	28	2	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	2	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2007	1	5	2	0	1	29	29	3	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	1	0	0	0	0	0	0	1	0	1
	0	0	0	0							
2007	1	5	2	0	1	32	32	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	1
	0	0	0	0							
2008	1	5	2	0	1	16	16	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2008	1	5	2	0	1	17	17	1	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2008	1	5	2	0	1	18	18	11	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	2	9	2
	2	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2008	1	5	2	0	1	19	19	10	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	11	2
	3	0	0	0	0	0	0	0	0	0	0
	0	0	0	0							
2008	1	5	2	0	1	20	20	25	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	6	9
	10	2	1	0	0	0	0	0	0	0	0
	0	0	0	0							
2008	1	5	2	0	1	21	21	13	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	7
	6	1	1	0	0	0	0	0	0	0	0
	0	0	0	0							
2008	1	5	2	0	1	22	22	9	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	2
	7	1	1	0	0	0	0	0	0	0	0
	0	0	0	0							
2008	1	5	2	0	1	23	23	14	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	9
	4	2	2	1	1	0	0	0	0	0	0
	0	0	0	0							
2008	1	5	2	0	1	24	24	26	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	2

```
        6       11      10      0       0       0       0       0       0       0       0
        0       0       0       0
2008    1       5       2       0       1       25      25      13      0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        1       6       3       4       1       1       2       0       0       0       0
        0       0       0       0
2008    1       5       2       0       1       26      26      8       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        1       4       4       0       0       0       0       0       0       0       0
        0       0       0       0
2008    1       5       2       0       1       27      27      3       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       2       3       0       1       0       0       0       0       0       0
        0       0       0       0
2008    1       5       2       0       1       29      29      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       1       0       0       0       0       0       0       0       0       0
        0       0       0       0
#Unidentified
2005    1       5       0       0       1       20      20      1       0       0       0
        1       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2005    1       5       0       0       1       21      21      1       0       0       0
        0       1       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2006    1       5       0       0       1       19      19      1       0       0       0
        1       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2008    1       5       0       0       1       19      19      1       0       0       0
        0       1       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0
2008    1       5       0       0       1       27      27      1       0       0       0
        0       0       0       0       1       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0

0       #_N_MeanSize-at-Age_obs
#Yr     Seas    Flt     Svy     Gender  Part    Ageerr  Ignore  datavector(female-male)
#       samplesize(female-male)
0       #_N_environ_variables
0       #_N_environ_obs
0       #       N       sizefreq        methods to      read
#Sizefreq N     bins    per     method
#Sizetfreq units(bio    num)    per     method
#Sizefreq scale(kg      lbs     cm      inches) per     method
#Sizefreq mincomp       per     method
#Sizefreq N     obs     per     method
#_Sizefreq bins
#_Year  season  Fleet   Partition       Gender  SampleSize      <data>
0       #       no      tag     data
0       #       no      morphcomp       data

999

ENDDATA
```

Appendix F-2. Control file for ORS.

```
# OREGON cabezon control file                 for SS v3.03a-May09

# Morph setup
1             # Number of growth patterns
1             # N sub morphs within growth patterns

2 #_Nblock_Patterns
2 1           #_Blocks_per_pattern
2000 2003 2004        2008    #Accounts for change in size limits (commercial)
2003          2008            #Accounts for change in size limits (recreational)

# Mortality and growth specifications
0.5           # Fraction female at birth
0             # M setup: 0=single Par,1=N_breakpoints,2=Lorenzen,3=agespecific;_4=agespec_withseasinterpolate
#2            # Number of M breakpoints
#0 0          # Ages at M breakpoints
1             # Growth model: 1=VB with L1 and L2, 2=VB with A0 and Linf, 3=Richards, 4=Read vector of L@A
0              # Age for growth Lmin
999           # Age for growth Lmax or 999 = Linf
0              # SD constant added to LAA (0.1 mimics SS2 v1.x for compatibility only)
0             # Variability about growth: 0=CV~f(LAA) [mimic v1.xx], 1=CV~f(A), 2=SD~f(LAA), 3=SD~f(A)
1              # Maturity option: 1=length logistic, 2=age logistic, 3=read age-maturity matrix by growth_pattern
1              # First age allowed to mature
1   #_fecundity option:(1)eggs=Wt*(a+b*Wt);(2)eggs=a*L^b;(3)eggs=a*Wt^b
0   #_hermaphroditism option:  0=none; 1=age-specific fxn
1   #_parameter_offset_approach (1=none, 2= M, G, CV_G as offset from female-GP1, 3=like SS2 V1.x)
1   #_env/block/dev_adjust_method (1=standard; 2=with logistic trans to keep within base parm bounds)

#_LO    HI    INIT          PRIOR    PR_type SD       PHASE env-var use_dev dev_minyr dev_maxyr
dev_stddev Block Block_Fxn
0.02    0.5     0.25     0.25     0       0.08    -4      0       0       0       0       0.5
0       0       #        NatM_p_2_Fem_GP:1 old
1         40    13.97    14       0       1        3      0       0       0       0       0.5
0       0       #        L_at_Amin_Fem_GP_1
20       90     59.0      58      0       100     2       0       0       0       0       0.5
0       0       #        L_at_Amax_Fem_GP_1
0.05    0.3     0.17     0.185    0       0.8     3       0       0       0       0       0.5
0       0       #        VonBert_K_Fem_GP_1
0.01    0.5     0.14     0.139    0       0.8     3       0       0       0       0       0.5
0       0       #        CV_young_Fem_GP_1
0.01    0.5      0.1    0.1       0       0.8     3       0       0       0       0       0.5
0       0       #        CV_old_Fem_GP_1

0.02    0.5      0.3      0.3     0       0.08    -4      0       0       0       0       0.5
0       0       #        NatM_p_1_Mal_GP:1 old
1         40    12.57    13   0        1          3       0       0       0       0.5     0
0       #       L_at_Amin_Mal_GP_1
20       90     41.8     41.8     0       100     2       0       0       0       0       0.5
0       0       #        L_at_Amax_Mal_GP_1
0.05    0.6     0.45     0.45     0       0.8     3       0       0       0       0       0.5
0       0       #        VonBert_K_Mal_GP_1
0.01    0.5     0.17     0.17     0       0.8     3       0       0       0       0       0.5
0       0       #        CV_young_Mal_GP_1
0.01    0.5     0.14     0.1      0       0.8     3       0       0       0       0       0.5
0       0       #        CV_old_Mal_GP_1

# Add 2+2*gender lines to read the wt-Len and mat-Len parameters
-3      3       0.000009184      0.000009184    0       0.8     -3      0       0       0
        0       0.5      0       0          #Female wt-len-1
-3      4          3.188    3.188  0          3       -3      0       0       0       0       0.5
        0       0        #Female wt-len-2
-3 50   43.7       43.7  0        10      -3      0       0       0       0       0.5     0
        0       #Female mat-len-1
-3      3          -0.37     -0.37  0        0.8     -3      0       0       0       0       0.5
        0       0        #Female mat-len-2
```

```
-3	3	1	1	0	0.8	-3	0	0	0	0	0.5
	0	0	#Female eggs/gm intercept
-3	3	0	0	0	0.8	-3	0	0	0	0	0.5
	0	0	#Female eggs/gm slope
-3	3	0.00001163	0.00001163	0	0.8	-3	0	0	0	0
	0.5	0	0	#Male wt-len-1
-3	4	3.118	3.118	0	3	-3	0	0	0	0	0.5
	0	0	#Male wt-len-2

-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 0 0 -1 99 -3 0 0 0 0 0.5 0 0 #_recrdistribution_by_season 1
 0 2 1 1 -1 99 -3 0 0 0 0 0.5 0 0 #_cohort_growth_deviation
# Seasonal effects on biology parameters (0=none)
 0 0 0 0 0 0 0 0 0 0

#_Spawner-Recruitment
3 #_SR_function
#_LO   HI    INIT PRIOR PR_type SD PHASE
  3    30    6.6    12  -1    10    2  # SR_R0
0.2     1    0.701  0.71   0   0.8   -3  # SR_steep
  0     1      0.5   1.1   0     1   -1  # SR_sigmaR
  0     5      0     0   0     1   -3  # SR_envlink
  0     5      0     0   0     1   -3  # SR_R1_offset
  0     2     0      1     0     50  -50  # Autocorrelation placeholder (Future implementation)
0 #_SR_env_link
0 #_SR_env_target_1=devs;_2=R0;_3=steepness
1 #do_recr_dev:  0=none; 1=devvector; 2=simple deviations

# Recruitment residuals
1980	# Start year recruitment residuals
2007	# End year recruitment residuals
1	# Phase

1 # Read 13 advanced recruitment options: 0=no, 1=yes
0	# first year for early rec devs
-4	# phase for early rec devs
5	# Phase for forecast recruit deviations
100	# Lambda for forecast recr devs before endyr+1
1979	#_last_yr_nobias_adj_in_MPD
1980	# first year of full bias correction (linear ramp up from this year minus the plus-age to this year)
2004	# last year for full bias correction in_MPD
2005	#_first_recent_yr_nobias_adj_in_MPD
 1 #_max_bias_adj_in_MPD (1.0 to mimic pre-2009 models)
 0 #_placeholder
-15	# Lower bound rec devs
15	# Upper bound rec devs
0 # read intitial values for rec devs

# Fishing mortality setup
0.1	# F ballpark for tuning early phases
2003	# F ballpark year
1	# F method:  1=Pope's; 2=Instan. F; 3=Hybrid (recommended)
0.9	# max F or harvest rate, depends on F_Method

#init_F_setup,	for	each	fleet
#LO	HI	INIT	PRIOR	PRIOR TYPE	SD	PHASE
0	1	0.0	0.0001	0	99	-1
0	1	0.0	0.0001	0	99	-1
0	1	0.0001	0.0001	0	99	1
0	1	0.0001	0.0001	0	99	1
0	1	0.0	0.0001	0	99	-1

#_Qsetup
#_add_parm_row_for_each_positive_entry_below(Loop rows within columns Then columns
#1 Do-power(0/1)
#2 env-Var
#3 extra SD
#4 devtype(<0=mirror, 0/1=none, 2=cons, 3=rand, 4=randwalk)
#5 Num/Bio(0/1)
```

```
#6 err_type(0=lognormal, >0=Student's T)

#_Q_setup
#_add_parm_row_for_each_positive_entry_below(row_then_column)
# 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 #1  InitF_FISHERY1_Comm_Non-Live
 0         0          0          0          1          0          #2  InitF_FISHERY2_Comm_Live
 0         0          0          0          1          0          #4  InitF_FISHERY3_Rec_Shore
 0         0          0          0          1          0          #6  InitF_FISHERY4_Rec_Boat
 0         0          0          0          1          0          #6  InitF_FISHERY5_OR_age_samples
 0         0          0          0          0          0 #8  InitF_SURVEY1_ORBS

#_size_selex_types
#_Pattern Discard Male Special
 24 0 0 0 #1  Comm_Non-Live
 24 0 0 0 #2  Comm_Live
 24 0 0 0 #3  Rec_Shore
 24 0 0 0 #4  Rec_PBR
  0 0 0 0 #5  OR_age_samples
  5 0 0 4 #8  ORBS

#_age_selex_types
#_Pattern Discard Male Special
 10 0 0 0 #1  Comm_Non-Live
 10 0 0 0 #2  Comm_Live
 10 0 0 0 #3  Rec_Shore
 10 0 0 0 #4  Rec_Boat
 10 0 0 0 #5  OR_age_samples
 10 0 0 0 #6  ORBS

#_LO              HI          INIT                   PRIOR      PR_type  SD PHASE env-var use_dev dev_minyr dev_maxyr
dev_stddev Block Block_Fxn
#FLEET 1 NOT THE LIVE FISH FISHERY
  10          91          31          31        1            0.05        2          0          0          0          0            0.5
            0            0  # PEAK
-5.0          3.0         -2.8        -2.8       1            0.05        3          0          0          0          0            0.5
            0            0  # TOP:_width of plateau
-4.0         12.0         4.1         4.1   1      0.05        3          0          0          0          0            0.5        0
0  # Asc_width
 -10          6.0          4          -1.0       1            0.05       -3          0          0          0          0            0.5
            0            0  # Desc_width
-15.0        15.0        -10         -5.0       1            0.05       -2          0          0          0          0            0.5
            0            0  # INIT:_selectivity_at_fist_bin
-5.0         15.0         10         -0.3       1            0.05       -2          0          0          0          0            0.5
            0            0  # FINAL:_selectivity_at_last_bin

#FLEET 2 LIVE FISH FISHERY
  10    91   38.2   38.2   1   0.05    2   0   0  0  0  0.5  1  2  # PEAK
-5.0          3.0        -0.3        -0.3       1            0.05        3          0  0       0          0            0.5  1  2  #
TOP:_width of plateau
-4.0         12.0         2.3         2.3   1      0.05        3   0   0     0          0  0.5  1     2  # Asc_width
 -10          6.0          3          3.0   1      0.05        3          0          0          0          0            0.5  1      2  #
Desc_width
-15.0         5.0         -5          -5.0       1            0.05       -2   0      0          0          0            0.5        0
0  # INIT:_selectivity_at_fist_bin
-5.0         15.0        -3.5        -3.5       1            0.05        2   0      0          0          0            0.5        1
2  # FINAL:_selectivity_at_last_bin

#FLEET 3 Shore
  10          91         33.7        33.7       1            0.05        2          0          0          0          0            0.5
            0            0  # PEAK
-5.0          3.0        -2.8        -2.8       1            0.05        3          0          0          0          0            0.5  0
0  # TOP:_width of plateau
-4.0         12.0         4.1         4.1   1      0.05        3          0          0          0          0            0.5        0
0  # Asc_width
 -10          6.0         -1         -1.0       1            0.05        3          0          0          0          0            0.5
            0            0  # Desc_width
```

-15.0 15.0 -10 -5.0 1 0.05 -2 0 0 0 0 0.5
0 0 # INIT:_selectivity_at_fist_bin
-5.0 15.0 -0.3 -0.3 1 0.05 2 0 0 0 0 0.5
0 0 # FINAL:_selectivity_at_last_bin

#FLEET 4 Boat
10 91 45 45 1 0.05 2 0 0 0 0 0.5
2 2 # PEAK
-5.0 3.0 -2.8 -2.8 1 0.05 3 0 0 0 0 0.5
2 2 # TOP:_width of plateau
-4.0 12.0 4.1 4.1 1 0.05 3 0 0 0 0 0.5 2
2 # Asc_width
-10 6.0 4 -1.0 1 0.05 -3 0 0 0 0 0.5
0 0 # Desc_width
-15.0 15.0 -10 -5.0 1 0.05 -2 0 0 0 0 0.5
0 0 # INIT:_selectivity_at_fist_bin
-5.0 15.0 10 -0.3 1 0.05 -2 0 0 0 0 0.5
0 0 # FINAL:_selectivity_at_last_bin

#FLEET 7 CA_age_samples

#Survey 1: CPFV CPUE 1960-1999
1 44 1 1 0 10 -3 0 0 0 0 0.5 0 0
#min Len bin - fixed
1 100 44 50 0 10 -4 0 0 0 0 0.5 0
0 #max Len bin fixed

1 #_Custom_block_setup SELECTIVITY BLOCK: 1999-2008
#FLEET 2 LIVE FISH FISHERY
10 91 38.2 38.2 1 0.05 3 # PEAK
10 91 38.2 38.2 1 0.05 3 # PEAK
-5.0 3.0 -0.3 -0.3 1 0.05 4 # TOP:_width of plateau
-5.0 3.0 -0.3 -0.3 1 0.05 4 # TOP:_width of plateau
-4.0 12.0 2.3 2.3 1 0.05 4 # Asc_width
-4.0 12.0 2.3 2.3 1 0.05 4 # Asc_width
-10 6.0 3 3.0 1 0.05 4 # Desc_width
-10 6.0 3 3.0 1 0.05 4 # Desc_width
-5.0 15.0 -3.5 -3.5 1 0.05 3 # FINAL:_selectivity_at_last_bin
-5.0 15.0 -3.5 -3.5 1 0.05 3 # FINAL:_selectivity_at_last_bin
#FLEET 4 Boat
10 91 45 45 1 0.05 3 # PEAK
-5.0 3.0 -2.8 -2.8 1 0.05 4 # TOP:_width of plateau
-4.0 12.0 4.1 4.1 1 0.05 4 # Asc_width

2 #separt_adj_method
Tag loss and Tag reporting parameters go next
0 # TG_custom: 0=no read; 1=read if tags exist
#_Cond -6 6 1 1 2 0.01 -4 0 0 0 0 0 0 0 #_placeholder if no parameters

Likelihood related quantities
1 # Do variance adjustments
#1 Comm: Non-live Fishery
#2 Comm: Live Fishery
#3 Rec: Shore
#4 Rec: Boat
#5 CA age samples
#6 ORBS survey
1 2 3 4 5 6
0 0 0 0 0 0 #_add_to_survey_CV (no additions)
0 0 0 0 0 0.1 #_add_to_survey_CV
0 0 0 0 0 0 #_add_to_discard_stddev
0 0 0 0 0 0 #_add_to_bodywt_CV
1 1 1 1 1 1 #_mult_by_lencomp_N
3.5 1.4 1.1 0.75 1.4 1 #_mult_by_lencomp_N
1 1 1 1 1 1 #_mult_by_agecomp_N
1 1 1 1 1 1 #_mult_by_size-at-age_N

30 # DF For discard T-distribution
30 # DF For meanbodywt T-distribution
1 #_maxlambdaphase

```
0		#_sd_offset
0		# N changes to default Lambdas = 1.0
######################################
#Example of changes to default lambda
#3 # number of changes to make to default Lambdas (default value is 1.0)
# Like_comp codes:  1=surv; 2=disc; 3=mnwt; 4=length; 5=age; 6=SizeFreq; 7=sizeage; 8=catch;
# 9=init_equ_catch; 10=recrdev; 11=parm_prior; 12=parm_dev; 13=CrashPen; 14=Morphcomp; 15=Tag-comp; 16=Tag-negbin
#like_comp fleet/survey  phase  value  sizefreq_method
#  1 8 1 0 1 #_CPUE/survey:_1 ORBS
#  4 1 1 0 1 #_lencomp:_FLEET 1
#  4 2 1 0 1 #_lencomp:_FLEET 2
#  4 3 1 0 1 #_lencomp:_FLEET 3
#  4 4 1 0 1 #_lencomp:_FLEET 4
#  5 7 1 0 1 #_Cond_age:_Females, Males, & Unsexed
#  1 1 1 0 1 #_init_equ_catch
#  1 1 1 0 1 #_recruitments
#  1 1 1 0 1 #_parameter-priors
#  1 1 1 0 1 #_parameter-dev-vectors
#  1 1 1 0 1 #_crashPenLambda
######################################

0 # (0/1) read specs for more stddev reporting
# 1 1 -1 5 1 5 # selex type, len/age, year, N selex bins, Growth pattern, N growth ages
# 3 9 15 21 27 # vector with selex std bin picks (-1 in first bin to self-generate)
# 1 2 14 26 40 # vector with growth std bin picks (-1 in first bin to self-generate)

999 # end of control file
```

Appendix G. Numbers at age for A) females and B) males for the NCS sub-stock. Decadal numbers are given up to 1980.

A) NCS Females

	Age class																									
Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25+
1914	438	341	266	207	161	125	98	76	59	46	36	28	22	17	13	10	8	6	5	4	3	2	2	1	1	4
1920	438	341	266	207	161	125	98	76	59	46	36	28	22	17	13	10	8	6	5	4	3	2	2	1	1	4
1930	438	341	265	207	161	125	97	76	59	46	36	28	22	17	13	10	8	6	5	4	3	2	2	1	1	4
1940	435	339	264	205	160	124	96	74	57	44	34	26	20	16	12	9	7	6	4	3	3	2	2	1	1	3
1950	428	335	261	202	155	118	89	67	51	38	29	22	17	13	10	8	6	5	3	3	2	2	1	1	1	3
1960	423	329	256	198	153	117	88	66	50	37	28	21	15	11	8	6	4	3	2	2	1	1	1	1	0	1
1970	755	329	255	198	153	117	88	67	50	37	27	20	14	11	8	6	4	3	2	2	1	1	1	1	0	1
1980	253	234	365	201	105	82	75	70	64	55	46	19	14	10	7	5	4	3	2	2	1	1	1	0	0	1
1981	366	197	181	280	152	78	60	54	49	45	38	32	13	9	7	5	4	3	2	1	1	1	1	0	0	1
1982	237	285	152	140	213	113	57	42	37	34	31	26	21	9	6	5	3	2	2	1	1	1	1	0	0	1
1983	318	185	221	117	106	158	83	41	30	26	24	21	18	15	6	4	3	2	2	1	1	1	0	0	0	1
1984	258	248	143	170	89	79	116	59	29	21	18	17	15	12	10	4	3	2	2	1	1	1	0	0	0	1
1985	168	201	191	110	129	67	58	84	43	21	15	13	12	10	9	7	3	2	2	1	1	1	0	0	0	1
1986	506	131	156	148	84	98	50	43	62	31	15	11	9	9	8	6	5	2	2	1	1	1	0	0	0	1
1987	521	394	101	120	112	62	71	35	30	42	21	10	7	6	6	5	4	3	1	1	1	1	0	0	0	1
1988	244	406	305	78	91	84	46	51	25	21	29	14	7	5	4	4	3	3	2	1	1	0	0	0	0	1
1989	306	190	313	234	59	68	61	32	35	17	14	20	10	5	3	3	2	2	2	2	1	0	0	0	0	0
1990	507	238	147	240	177	44	49	43	22	24	11	9	13	6	3	2	2	2	1	1	1	0	0	0	0	0
1991	386	395	185	113	183	133	32	35	31	16	17	8	7	9	4	2	1	1	1	1	1	1	0	0	0	0
1992	342	300	306	143	87	138	99	23	25	22	11	12	6	5	6	3	1	1	1	1	1	1	0	0	0	0
1993	667	266	232	234	107	63	97	67	15	16	14	7	7	3	3	4	2	1	1	1	0	0	0	0	0	0
1994	421	519	207	179	177	79	45	67	45	10	11	9	5	5	2	2	3	1	1	0	0	0	0	0	0	0
1995	314	328	403	160	136	131	57	32	47	31	7	7	6	3	3	2	1	2	1	0	0	0	0	0	0	0
1996	320	245	255	311	119	96	89	37	20	29	19	4	5	4	2	2	1	1	1	0	0	0	0	0	0	0
1997	615	249	190	196	230	83	63	56	23	12	18	11	3	3	2	1	1	1	0	1	0	0	0	0	0	0
1998	524	479	193	145	143	157	53	39	34	14	7	10	7	2	2	1	1	1	0	0	0	0	0	0	0	0
1999	254	408	371	147	104	93	93	30	21	18	7	4	5	3	1	1	1	0	0	0	0	0	0	0	0	0
2000	245	197	317	287	112	74	61	57	18	12	10	4	2	3	2	0	0	0	0	0	0	0	0	0	0	0
2001	211	191	153	246	220	81	50	39	35	11	7	6	2	1	2	1	0	0	0	0	0	0	0	0	0	0
2002	292	164	148	119	188	162	57	33	25	22	6	4	4	1	1	1	1	0	0	0	0	0	0	0	0	0
2003	366	227	128	115	91	141	117	40	23	17	15	4	3	2	1	0	1	0	0	0	0	0	0	0	0	0
2004	276	285	176	99	88	68	99	78	25	14	10	8	2	2	1	0	0	0	0	0	0	0	0	0	0	0
2005	443	215	221	137	76	66	49	69	53	17	9	6	5	2	1	1	0	0	0	0	0	0	0	0	0	0
2006	369	345	167	172	105	57	48	35	48	36	11	6	4	4	1	1	1	0	0	0	0	0	0	0	0	0
2007	375	287	269	130	133	80	43	35	25	34	26	8	4	3	2	1	0	0	0	0	0	0	0	0	0	0
2008	382	292	223	209	100	101	60	32	26	18	25	18	6	3	2	2	1	0	0	0	0	0	0	0	0	0
2009	388	298	227	173	161	77	76	45	23	19	13	18	13	4	2	2	1	0	0	0	0	0	0	0	0	0

B) NCS Males

	Age class																									
Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25+
1914	438	324	240	178	132	98	72	54	40	29	22	16	12	9	7	5	4	3	2	1	1	1	1	0	0	1
1920	438	324	240	178	132	98	72	54	40	29	22	16	12	9	7	5	4	3	2	1	1	1	1	0	0	1
1930	438	324	240	178	132	98	72	53	40	29	22	16	12	9	7	5	4	3	2	1	1	1	1	0	0	1
1940	435	322	239	177	131	96	71	52	38	28	21	15	11	8	6	5	3	2	2	1	1	1	1	0	0	1
1950	428	319	236	173	126	92	67	49	35	26	19	14	10	7	5	4	3	2	2	1	1	1	0	0	0	0
1960	423	313	231	170	125	91	66	48	34	25	18	13	9	6	5	3	2	2	1	1	1	0	0	0	0	0
1970	755	313	231	170	125	91	66	48	34	24	17	12	9	6	5	3	2	2	1	1	1	0	0	0	0	0
1980	253	223	330	172	86	64	56	51	45	37	30	12	9	6	4	3	2	2	1	1	1	0	0	0	0	0
1981	366	187	164	240	124	61	45	39	35	31	25	21	8	6	4	3	2	1	1	1	1	0	0	0	0	0
1982	237	271	138	120	173	88	43	31	27	24	21	17	14	5	4	3	2	1	1	1	0	0	0	0	0	0
1983	318	176	200	101	86	124	62	30	22	19	16	14	12	9	4	3	2	1	1	1	0	0	0	0	0	0
1984	258	236	129	145	73	62	87	44	21	15	13	11	10	8	6	3	2	1	1	1	0	0	0	0	0	0
1985	168	191	173	94	105	52	44	62	31	15	10	9	8	7	6	4	2	1	1	1	0	0	0	0	0	0
1986	506	124	141	127	69	76	38	31	44	22	10	7	6	6	5	4	3	1	1	1	0	0	0	0	0	0
1987	521	375	91	102	91	49	53	26	22	30	15	7	5	4	4	3	3	2	1	1	0	0	0	0	0	0
1988	244	386	276	67	74	65	35	38	18	15	21	10	5	3	3	2	2	2	1	1	0	0	0	0	0	0
1989	306	181	282	201	48	53	46	24	26	12	10	14	7	3	2	2	2	1	1	1	0	0	0	0	0	0
1990	507	227	133	206	144	34	37	32	16	18	8	7	9	5	2	2	1	1	1	1	1	0	0	0	0	0
1991	386	375	167	97	149	104	24	26	22	11	12	6	5	6	3	1	1	1	1	1	1	0	0	0	0	0
1992	342	286	277	122	71	108	74	17	18	16	8	8	4	3	4	2	1	1	1	1	0	0	0	0	0	0
1993	667	253	209	200	87	49	74	50	11	12	10	5	5	3	2	3	1	1	0	0	0	0	0	0	0	0
1994	421	494	187	153	144	62	34	51	34	8	8	7	3	4	2	1	2	1	0	0	0	0	0	0	0	0
1995	314	312	365	137	110	103	43	24	35	23	5	5	5	2	2	1	1	1	1	0	0	0	0	0	0	0
1996	320	233	230	266	97	76	68	28	15	22	14	3	3	3	1	1	1	1	1	0	0	0	0	0	0	0
1997	615	237	171	167	186	66	49	43	17	9	13	9	2	2	2	1	1	0	0	0	0	0	0	0	0	0
1998	524	456	174	124	116	124	42	31	26	10	5	8	5	1	1	1	0	0	0	0	0	0	0	0	0	0
1999	254	388	335	125	84	74	75	24	17	14	5	3	4	3	1	1	0	0	0	0	0	0	0	0	0	0
2000	245	188	287	246	90	58	49	48	15	10	8	3	2	2	1	0	0	0	0	0	0	0	0	0	0	0
2001	211	182	139	211	178	63	40	32	30	9	6	5	2	1	1	1	0	0	0	0	0	0	0	0	0	0
2002	292	156	134	102	153	127	44	27	21	20	6	4	3	1	1	1	1	0	0	0	0	0	0	0	0	0
2003	366	216	115	98	74	110	90	30	18	15	13	4	3	2	1	0	1	0	0	0	0	0	0	0	0	0
2004	276	271	160	85	72	53	77	61	20	12	9	9	3	2	1	0	0	0	0	0	0	0	0	0	0	0
2005	443	204	200	117	62	51	37	53	42	14	8	6	6	2	1	1	0	0	0	0	0	0	0	0	0	0
2006	369	328	151	148	86	45	37	26	37	29	9	6	4	4	1	1	1	0	0	0	0	0	0	0	0	0
2007	375	273	243	112	108	63	32	26	19	26	20	7	4	3	3	1	1	0	0	0	0	0	0	0	0	0
2008	382	278	202	179	82	79	45	23	19	13	18	14	5	3	2	2	1	0	0	0	0	0	0	0	0	0
2009	388	283	205	149	132	60	57	33	17	13	9	13	10	3	2	1	1	0	0	0	0	0	0	0	0	0

Appendix H. Numbers at age for A) females and B) males for the SCS sub-stock. Decadal numbers are given up to 1980.
A) SCS Females

	Age class																									
Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25+
1914	103	80	62	49	38	30	23	18	14	11	8	7	5	4	3	2	2	1	1	1	1	1	0	0	0	1
1920	103	80	62	49	38	30	23	18	14	11	8	7	5	4	3	2	2	1	1	1	1	1	0	0	0	1
1930	103	80	62	49	38	29	23	18	14	11	8	7	5	4	3	2	2	1	1	1	1	1	0	0	0	1
1940	103	80	62	48	38	29	23	18	14	11	8	6	5	4	3	2	2	1	1	1	1	1	0	0	0	1
1950	102	80	62	48	37	28	22	17	13	10	8	6	5	4	3	2	2	1	1	1	1	1	0	0	0	1
1960	100	77	60	46	35	26	19	14	10	8	6	5	4	3	2	2	1	1	1	1	0	0	0	0	0	1
1970	291	78	60	46	35	27	20	15	11	8	6	5	4	3	2	2	1	1	1	0	0	0	0	0	0	0
1980	142	60	44	33	20	21	20	19	14	13	17	4	3	2	2	1	1	1	1	0	0	0	0	0	0	0
1981	45	110	46	32	23	13	14	13	13	9	8	11	3	2	1	1	1	1	0	0	0	0	0	0	0	0
1982	43	35	84	34	23	16	9	9	9	8	6	6	7	2	1	1	1	1	0	0	0	0	0	0	0	0
1983	62	34	27	61	23	15	10	5	5	5	5	4	3	4	1	1	1	0	0	0	0	0	0	0	0	0
1984	237	48	26	20	45	17	10	7	4	4	4	3	3	2	3	1	1	0	0	0	0	0	0	0	0	0
1985	43	185	37	19	14	30	11	7	4	2	2	2	2	2	1	2	0	0	0	0	0	0	0	0	0	0
1986	22	33	141	27	13	9	19	7	4	3	2	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0
1987	68	17	25	100	18	8	5	11	4	2	2	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
1988	99	53	13	18	66	11	5	3	7	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
1989	37	77	40	10	13	46	8	3	2	4	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	37	29	58	29	7	9	31	5	2	1	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	38	29	21	40	19	4	5	17	3	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	30	30	21	15	25	11	2	3	9	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	32	23	22	15	10	16	6	1	2	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	210	25	18	17	11	7	11	5	1	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	74	164	19	13	12	7	5	7	3	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	53	57	126	14	10	8	5	3	5	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	82	41	44	93	10	6	5	3	2	3	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1998	189	64	32	33	67	7	4	3	2	1	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
1999	251	147	49	24	23	44	4	3	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	44	196	113	37	17	16	28	3	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	64	34	152	87	27	12	10	17	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002	113	50	26	117	65	20	8	7	11	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	76	88	39	20	88	48	14	6	5	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	39	59	69	30	15	66	35	10	4	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	46	31	46	53	23	12	49	26	8	3	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	61	36	24	35	40	17	9	37	19	6	2	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0
2007	96	47	28	18	27	31	13	7	27	15	4	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0
2008	97	75	37	21	14	21	23	10	5	20	11	3	1	1	2	0	0	0	0	0	0	0	0	0	0	0
2009	96	75	58	28	16	11	16	17	7	4	15	8	2	1	1	1	0	0	0	0	0	0	0	0	0	0

B) SCS Males

Year	Age class																								
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25+
1914	103	76	57	42	31	23	17	13	9	7	5	4	3	2	2	1	1	1	0	0	0	0	0	0	0	0
1920	103	76	57	42	31	23	17	13	9	7	5	4	3	2	2	1	1	1	0	0	0	0	0	0	0	0
1930	103	76	57	42	31	23	17	13	9	7	5	4	3	2	2	1	1	1	0	0	0	0	0	0	0	0
1940	103	76	56	42	31	23	17	12	9	7	5	4	3	2	2	1	1	1	0	0	0	0	0	0	0	0
1950	102	76	56	41	30	22	16	12	9	7	5	4	3	2	1	1	1	1	0	0	0	0	0	0	0	0
1960	100	74	54	40	29	20	14	10	7	5	4	3	2	1	1	1	1	0	0	0	0	0	0	0	0	0
1970	291	74	54	40	29	21	15	11	8	5	4	3	2	2	1	1	1	0	0	0	0	0	0	0	0	0
1980	142	58	40	29	16	16	15	14	10	8	10	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0
1981	45	105	41	28	19	11	10	10	9	6	5	6	2	1	1	1	0	0	0	0	0	0	0	0	0	0
1982	43	33	76	29	19	13	7	7	6	6	4	3	4	1	1	0	0	0	0	0	0	0	0	0	0	0
1983	62	32	24	53	19	12	8	4	4	3	3	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0
1984	237	46	23	17	37	13	8	5	3	3	2	2	1	1	2	0	0	0	0	0	0	0	0	0	0	0
1985	43	176	33	16	12	24	8	5	3	2	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
1986	22	32	127	23	11	8	15	5	3	2	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0
1987	68	16	22	86	15	7	4	9	3	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	99	50	11	15	55	9	4	3	5	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	37	73	36	8	11	38	6	3	2	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	37	27	52	25	6	7	24	4	2	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	38	27	19	35	16	3	4	13	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	30	28	19	13	21	9	2	2	7	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	32	22	20	13	8	13	5	1	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	210	24	16	14	9	6	9	4	1	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	74	156	17	11	10	6	4	6	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	53	55	114	12	8	7	4	2	4	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	82	39	39	80	8	5	4	2	1	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1998	189	61	29	28	55	5	3	3	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	251	140	44	20	19	36	3	2	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	44	186	102	32	14	13	23	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	64	32	137	74	23	10	9	15	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002	113	47	24	100	53	16	7	6	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	76	84	35	17	72	38	11	5	4	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	39	56	62	26	13	52	27	8	3	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	46	29	41	45	19	9	37	19	6	2	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	61	34	21	30	33	14	7	27	14	4	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0
2007	96	45	25	16	22	24	10	5	19	10	3	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0
2008	97	71	33	18	12	16	17	7	3	14	7	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0
2009	96	72	52	24	13	8	12	13	5	2	10	5	1	1	0	1	0	0	0	0	0	0	0	0	0	0

Appendix I. Numbers at age for A) females and B) males for the CAS sub-stock. Decadal numbers are given up to 1980.

A) CAS Females

	Age class																									
Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25+
1914	458	357	278	217	169	131	102	80	62	48	38	29	23	18	14	11	8	7	5	4	3	2	2	1	1	4
1920	458	357	278	216	169	131	102	80	62	48	38	29	23	18	14	11	8	7	5	4	3	2	2	1	1	4
1930	458	357	278	216	168	131	102	79	62	48	37	29	23	18	14	11	8	6	5	4	3	2	2	1	1	4
1940	456	355	276	215	167	129	100	77	59	46	35	27	21	16	13	10	8	6	5	4	3	2	2	1	1	4
1950	449	351	272	210	160	121	92	69	53	40	31	24	18	14	11	8	6	5	4	3	2	2	1	1	1	3
1960	440	342	265	205	157	119	89	66	49	36	27	20	15	11	8	6	4	3	2	2	1	1	1	1	0	2
1970	436	342	265	204	157	119	89	67	49	36	26	19	14	11	8	6	4	3	2	2	1	1	1	0	0	1
1980	381	305	370	182	106	103	108	101	58	36	24	17	12	9	6	5	3	2	2	1	1	1	1	0	0	1
1981	368	296	234	280	135	76	72	74	68	39	24	16	11	8	6	4	3	2	2	1	1	1	0	0	0	1
1982	224	287	229	179	209	97	54	50	50	45	26	15	10	7	5	4	3	2	1	1	1	1	0	0	0	1
1983	400	175	222	175	133	151	68	37	33	33	30	17	10	7	5	3	2	2	1	1	1	0	0	0	0	1
1984	839	312	135	169	131	97	108	48	26	23	23	20	11	7	4	3	2	2	1	1	1	0	0	0	0	0
1985	230	654	240	103	127	96	70	76	33	18	16	15	14	8	5	3	2	2	1	1	1	0	0	0	0	0
1986	358	179	505	184	78	94	70	50	54	23	12	11	11	9	5	3	2	1	1	1	1	0	0	0	0	0
1987	529	279	138	383	136	55	65	47	33	35	15	8	7	7	6	3	2	1	1	1	0	0	0	0	0	0
1988	406	412	215	105	287	99	39	44	31	22	23	10	5	4	4	4	2	1	1	1	0	0	0	0	0	0
1989	324	316	317	164	79	210	71	27	31	22	15	15	6	3	3	3	3	1	1	1	0	0	0	0	0	0
1990	482	253	244	242	123	57	149	49	19	21	14	10	10	4	2	2	2	2	1	1	0	0	0	0	0	0
1991	374	375	195	186	182	90	41	105	34	13	14	10	7	7	3	1	1	1	1	1	0	0	0	0	0	0
1992	340	291	290	149	140	134	65	29	73	23	9	10	7	4	5	2	1	1	1	1	0	0	0	0	0	0
1993	648	265	224	220	110	100	92	43	19	47	15	6	6	4	3	3	1	1	1	1	0	0	0	0	0	0
1994	388	505	205	172	165	81	72	65	30	13	32	10	4	4	3	2	2	1	0	0	0	0	0	0	0	0
1995	297	303	392	158	129	121	58	50	45	21	9	22	7	3	3	2	1	1	1	0	0	0	0	0	0	0
1996	218	231	234	300	116	91	81	38	32	29	13	6	14	4	2	2	1	1	1	0	0	0	0	0	0	0
1997	406	170	179	178	217	79	59	51	23	19	17	8	3	8	2	1	1	1	0	0	0	0	0	0	0	0
1998	589	316	131	136	128	146	50	36	31	14	11	10	5	2	5	1	1	1	0	0	0	0	0	0	0	0
1999	389	458	244	99	94	80	83	27	19	16	7	6	5	2	1	2	1	0	0	0	0	0	0	0	0	0
2000	234	303	355	187	73	64	49	48	15	10	8	4	3	3	1	1	1	0	0	0	0	0	0	0	0	0
2001	170	182	235	274	139	50	40	29	26	8	5	4	2	2	1	1	0	1	0	0	0	0	0	0	0	0
2002	272	133	141	181	205	98	33	25	17	15	4	3	2	1	1	1	0	0	0	0	0	0	0	0	0	0
2003	366	211	103	108	137	149	68	22	16	10	9	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0
2004	212	285	164	79	82	98	99	42	13	9	5	4	1	1	1	0	0	0	0	0	0	0	0	0	0	0
2005	282	165	221	126	60	59	68	66	27	8	5	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0
2006	280	220	128	170	96	44	42	46	44	18	5	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0
2007	366	218	171	99	131	72	32	30	32	30	12	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0
2008	375	285	169	132	76	98	53	23	21	23	21	8	2	1	1	1	0	0	0	0	0	0	0	0	0	0
2009	380	292	221	131	102	58	73	38	17	15	16	15	6	2	1	1	1	0	0	0	0	0	0	0	0	0

B) CAS Males

Year	Age class																									
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25+
1914	458	340	252	186	138	102	76	56	42	31	23	17	13	9	7	5	4	3	2	2	1	1	1	0	0	1
1920	458	340	252	186	138	102	76	56	42	31	23	17	12	9	7	5	4	3	2	2	1	1	1	0	0	1
1930	458	339	251	186	138	102	76	56	41	31	23	17	12	9	7	5	4	3	2	2	1	1	1	0	0	1
1940	456	338	250	185	136	100	74	54	40	29	22	16	12	9	6	5	3	3	2	1	1	1	1	0	0	1
1950	449	334	246	180	131	95	69	50	36	27	19	14	10	8	6	4	3	2	2	1	1	1	0	0	0	1
1960	440	325	240	176	129	93	67	48	34	24	17	12	9	6	4	3	2	2	1	1	1	0	0	0	0	0
1970	436	325	239	176	129	93	67	48	34	24	17	12	9	6	4	3	2	2	1	1	1	0	0	0	0	0
1980	381	290	334	156	87	81	82	74	41	24	16	11	8	5	4	3	2	1	1	1	0	0	0	0	0	0
1981	368	282	211	240	110	61	55	55	49	27	16	10	7	5	4	3	2	1	1	1	0	0	0	0	0	0
1982	224	273	207	153	171	77	42	38	37	33	18	11	7	5	3	2	2	1	1	1	0	0	0	0	0	0
1983	400	166	200	150	109	120	53	28	25	25	22	12	7	4	3	2	1	1	1	1	0	0	0	0	0	0
1984	839	297	121	145	107	77	83	37	19	17	17	15	8	5	3	2	1	1	1	0	0	0	0	0	0	0
1985	230	622	217	88	104	76	54	58	25	13	12	11	10	5	3	2	1	1	1	0	0	0	0	0	0	0
1986	358	170	457	158	63	74	53	38	40	17	9	8	8	7	4	2	1	1	1	0	0	0	0	0	0	0
1987	529	265	124	329	112	44	50	36	25	26	11	6	5	5	4	2	1	1	1	0	0	0	0	0	0	0
1988	406	392	194	90	235	78	30	34	24	17	17	7	4	3	3	3	1	1	1	0	0	0	0	0	0	0
1989	324	300	286	140	64	166	55	21	24	16	11	12	5	3	2	2	2	1	1	0	0	0	0	0	0	0
1990	482	240	220	207	100	45	115	38	14	16	11	7	8	3	2	1	1	1	1	0	0	0	0	0	0	0
1991	374	357	176	160	149	71	32	79	26	10	11	7	5	5	2	1	1	1	1	0	0	0	0	0	0	0
1992	340	277	262	128	115	106	50	22	55	18	7	7	5	3	3	1	1	1	1	1	0	0	0	0	0	0
1993	648	252	202	188	90	79	72	33	14	36	11	4	5	3	2	2	1	0	0	0	0	0	0	0	0	0
1994	388	480	185	147	135	64	55	49	23	10	24	8	3	3	2	1	1	1	0	0	0	0	0	0	0	0
1995	297	288	354	135	106	96	45	38	34	15	7	16	5	2	2	1	1	1	0	0	0	0	0	0	0	0
1996	218	220	212	256	96	73	64	29	25	21	10	4	10	3	1	1	1	1	1	0	0	0	0	0	0	0
1997	406	162	161	152	179	64	47	40	18	15	13	6	2	6	2	1	1	0	0	0	0	0	0	0	0	0
1998	589	301	118	115	105	118	41	29	24	11	9	7	3	1	3	1	0	0	0	0	0	0	0	0	0	0
1999	389	436	219	84	78	66	70	23	16	13	6	4	4	2	1	2	1	0	0	0	0	0	0	0	0	0
2000	234	288	321	159	59	53	43	44	14	9	7	3	2	2	1	0	1	0	0	0	0	0	0	0	0	0
2001	170	173	213	234	114	41	35	27	26	8	5	4	2	1	1	0	0	0	0	0	0	0	0	0	0	0
2002	272	126	127	155	168	79	27	23	17	16	5	3	2	1	1	1	0	0	0	0	0	0	0	0	0	0
2003	366	201	93	93	112	119	55	19	15	11	10	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0
2004	212	271	148	68	67	79	81	36	12	9	7	6	2	1	1	0	0	0	0	0	0	0	0	0	0	0
2005	282	157	200	108	49	47	54	55	24	8	6	4	4	1	1	1	0	0	0	0	0	0	0	0	0	0
2006	280	209	116	146	79	35	33	38	38	16	5	4	3	3	1	0	0	0	0	0	0	0	0	0	0	0
2007	366	207	155	85	107	57	25	24	26	26	11	4	3	2	2	1	0	0	0	0	0	0	0	0	0	0
2008	375	271	153	114	62	78	41	18	17	18	18	8	2	2	1	1	0	0	0	0	0	0	0	0	0	0
2009	380	278	200	113	83	45	56	29	13	12	13	12	5	2	1	1	1	0	0	0	0	0	0	0	0	0

Appendix J. Numbers at age for A) females and B) males for the ORS sub-stock. All years are provided.

A) ORS Females

	Age class																									
Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25+
1971	97	76	59	46	36	28	22	17	13	10	8	6	5	4	3	2	2	1	1	1	1	1	0	0	0	1
1972	97	76	58	45	35	27	21	16	12	10	7	6	4	3	3	2	2	1	1	1	1	0	0	0	0	1
1973	97	76	58	45	35	27	21	16	12	10	7	6	4	3	3	2	2	1	1	1	1	0	0	0	0	1
1974	97	75	58	45	35	27	21	16	12	10	7	6	4	3	3	2	2	1	1	1	1	0	0	0	0	1
1975	97	75	58	45	35	27	21	16	12	10	7	6	4	3	3	2	2	1	1	1	1	0	0	0	0	1
1976	97	75	58	45	35	27	21	16	12	10	7	6	4	3	3	2	2	1	1	1	1	0	0	0	0	1
1977	97	75	58	44	34	26	20	16	12	9	7	6	4	3	3	2	2	1	1	1	1	0	0	0	0	1
1978	96	75	58	44	34	26	20	16	12	9	7	6	4	3	3	2	2	1	1	1	1	0	0	0	0	1
1979	96	75	58	44	34	26	20	15	12	9	7	5	4	3	3	2	1	1	1	1	1	0	0	0	0	1
1980	77	75	58	44	34	26	20	15	12	9	7	5	4	3	2	2	1	1	1	1	1	0	0	0	0	1
1981	126	60	58	44	34	26	20	15	12	9	7	5	4	3	2	2	1	1	1	1	1	0	0	0	0	1
1982	52	98	46	44	34	26	20	15	11	9	7	5	4	3	2	2	1	1	1	1	1	0	0	0	0	1
1983	69	41	76	35	34	26	20	15	11	9	7	5	4	3	2	2	1	1	1	1	0	0	0	0	0	1
1984	65	53	31	58	27	26	20	15	11	9	7	5	4	3	2	2	1	1	1	1	0	0	0	0	0	1
1985	45	50	41	24	45	21	20	15	11	9	7	5	4	3	2	2	1	1	1	1	0	0	0	0	0	1
1986	106	35	39	32	18	34	16	15	11	9	7	5	4	3	2	2	1	1	1	1	0	0	0	0	0	1
1987	97	83	27	29	24	14	25	12	11	8	6	5	4	3	2	2	1	1	1	1	0	0	0	0	0	1
1988	52	75	63	20	22	18	10	19	9	8	6	5	4	3	2	2	1	1	1	1	0	0	0	0	0	1
1989	83	41	58	48	15	16	13	8	14	7	6	5	4	3	2	2	1	1	1	1	0	0	0	0	0	1
1990	71	64	31	44	36	11	12	10	6	11	5	5	3	3	2	2	1	1	1	1	0	0	0	0	0	0
1991	91	55	49	24	33	27	8	9	7	4	8	4	3	3	2	1	1	1	1	1	0	0	0	0	0	0
1992	99	71	42	37	18	25	20	6	7	5	3	6	3	2	2	1	1	1	1	0	0	0	0	0	0	0
1993	110	77	54	32	28	13	18	15	5	5	4	2	4	2	2	1	1	1	1	0	0	0	0	0	0	0
1994	89	85	59	41	24	21	10	13	11	3	4	3	2	3	1	1	1	1	1	0	0	0	0	0	0	0
1995	88	69	66	45	31	18	15	7	10	8	2	3	2	1	2	1	1	1	1	0	0	0	0	0	0	0
1996	101	68	54	50	34	23	13	11	5	7	6	2	2	2	1	2	1	1	1	0	0	0	0	0	0	0
1997	100	78	53	41	38	26	17	10	8	4	5	4	1	1	1	1	1	1	1	0	0	0	0	0	0	0
1998	118	78	61	40	30	27	18	12	7	6	3	4	3	1	1	1	0	1	0	0	0	0	0	0	0	0
1999	178	92	60	46	30	21	19	13	8	5	4	2	3	2	1	1	1	0	1	0	0	0	0	0	0	0
2000	105	139	71	46	34	21	15	13	9	6	3	3	1	2	2	0	1	0	0	0	0	0	0	0	0	0
2001	94	82	108	54	33	24	14	10	9	6	4	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0
2002	74	73	63	81	37	22	16	10	7	6	4	3	2	2	1	1	1	0	0	0	0	0	0	0	0	0
2003	66	58	57	48	56	25	15	11	7	5	4	3	2	1	1	1	1	1	0	0	0	0	0	0	0	0
2004	93	51	45	43	35	40	18	11	8	5	3	3	2	1	1	1	0	1	0	0	0	0	0	0	0	0
2005	68	73	40	35	32	25	28	12	7	5	3	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0
2006	44	53	56	31	26	23	17	19	9	5	4	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0
2007	71	34	41	43	23	19	16	12	14	6	4	3	2	1	1	1	1	0	0	0	0	0	0	0	0	0
2008	90	55	27	32	32	16	13	11	9	9	4	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0
2009	89	70	42	20	24	23	12	9	8	6	7	3	2	1	1	1	1	0	0	0	0	0	0	0	0	0

B) ORS Males

	Age class																									
Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25+
1971	97	72	53	40	29	22	16	12	9	7	5	4	3	2	1	1	1	1	0	0	0	0	0	0	0	0
1972	97	72	53	39	28	21	15	11	8	6	4	3	2	2	1	1	1	1	0	0	0	0	0	0	0	0
1973	97	72	53	39	28	21	15	11	8	6	4	3	2	2	1	1	1	1	0	0	0	0	0	0	0	0
1974	97	72	53	39	28	21	15	11	8	6	4	3	2	2	1	1	1	1	0	0	0	0	0	0	0	0
1975	97	72	52	39	28	21	15	11	8	6	4	3	2	2	1	1	1	1	0	0	0	0	0	0	0	0
1976	97	72	52	38	28	21	15	11	8	6	4	3	2	2	1	1	1	1	0	0	0	0	0	0	0	0
1977	97	72	52	38	28	21	15	11	8	6	4	3	2	2	1	1	1	1	0	0	0	0	0	0	0	0
1978	96	71	52	38	28	20	15	11	8	6	4	3	2	2	1	1	1	1	0	0	0	0	0	0	0	0
1979	96	71	52	38	28	20	15	11	8	6	4	3	2	2	1	1	1	0	0	0	0	0	0	0	0	0
1980	77	71	52	38	28	20	15	11	8	6	4	3	2	2	1	1	1	0	0	0	0	0	0	0	0	0
1981	126	57	52	38	28	20	15	11	8	6	4	3	2	2	1	1	1	0	0	0	0	0	0	0	0	0
1982	52	93	42	38	28	20	15	11	8	6	4	3	2	2	1	1	1	0	0	0	0	0	0	0	0	0
1983	69	39	68	31	28	20	15	11	8	6	4	3	2	2	1	1	1	0	0	0	0	0	0	0	0	0
1984	65	51	28	50	22	20	15	11	8	6	4	3	2	2	1	1	1	0	0	0	0	0	0	0	0	0
1985	45	48	37	21	37	16	15	11	8	6	4	3	2	2	1	1	1	0	0	0	0	0	0	0	0	0
1986	106	33	35	27	15	27	12	11	8	6	4	3	2	2	1	1	1	0	0	0	0	0	0	0	0	0
1987	97	79	24	25	20	11	19	8	8	5	4	3	2	1	1	1	1	0	0	0	0	0	0	0	0	0
1988	52	72	57	17	18	14	8	14	6	5	4	3	2	1	1	1	1	0	0	0	0	0	0	0	0	0
1989	83	39	53	42	13	13	10	6	10	4	4	3	2	1	1	1	1	0	0	0	0	0	0	0	0	0
1990	71	61	28	38	30	9	9	7	4	7	3	3	2	1	1	1	1	0	0	0	0	0	0	0	0	0
1991	91	53	44	20	28	22	6	6	5	3	5	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0
1992	99	67	38	32	15	20	15	5	5	3	2	3	1	1	1	1	0	0	0	0	0	0	0	0	0	0
1993	110	74	49	28	23	10	14	11	3	3	2	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0
1994	89	81	53	35	20	16	7	10	8	2	2	2	1	2	1	1	0	0	0	0	0	0	0	0	0	0
1995	88	66	60	39	25	14	12	5	7	5	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0
1996	101	65	48	44	28	18	10	8	4	5	4	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0
1997	100	75	48	36	32	20	13	7	6	3	3	3	1	1	1	0	1	0	0	0	0	0	0	0	0	0
1998	118	74	55	35	26	22	14	9	5	4	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0
1999	178	88	55	40	25	18	15	9	6	3	3	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0
2000	105	132	65	40	29	18	12	10	6	4	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0
2001	94	78	97	47	29	20	12	8	7	4	3	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
2002	74	70	57	71	33	19	13	8	5	4	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0
2003	66	55	51	42	50	22	12	8	5	3	3	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0
2004	93	49	40	38	30	35	15	8	6	3	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0
2005	68	69	36	30	27	21	24	10	5	4	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0
2006	44	51	51	26	22	19	15	16	7	4	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0
2007	71	33	37	37	19	15	13	10	11	4	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0
2008	90	52	24	27	27	14	11	9	7	7	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0
2009	89	66	38	18	20	19	9	7	6	4	5	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0