

Appendix N. Gulf of Maine-Georges Bank Acadian redfish

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The input (*.dat) and output (*.rep) files for the base ASAP model used for assessment of Gulf of Main-Georges Bank Acadian Redfish.

```
# ASAP VERSION 2.0
# c:\work\redfish\garm3\asap_2_0\garm3_final_model_1913_2007\discards_revised_mat_waa\red_1913_2007.dat
#
# ASAP GUI - 15 JAN 2008
#
# Number of Years
95
# First Year
1913
# Number of Ages
26
# Number of Fleets
1
# Number of Selectivity Blocks (sum over all fleets)
1
# Number of Available Indices
2
# Fleet Names
# $strawl
# Index Names
# $fall
# $spring
#
# Natural Mortality Rate Matrix
0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05
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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

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```

# Index Units
1 1
# Index Month
10.5 4.5
# Index Selectivity Choice
-1 -1
# Index Selectivity Option for each Index 1=by age, 2=logistic, 3=double logistic
1 1
# Index Start Age
1 1
# Index End Age
26 26
# Use Index? 1=yes
1 1
# Index Selectivity initial guess, phase, lambda, and CV
# (have to enter values for nages + 6 parameters for each block)
# Index-1
1 4 1 0.5
1 4 1 0.5
1 4 1 0.5
1 4 1 0.5
1 4 1 0.5
1 4 1 0.5
1 4 1 0.5
1 4 1 0.5
1 4 1 0.5
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
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
3 -1 0 1
1 -1 0 1
3 -1 0 1
1 -1 0 1
8 -1 0 1
1 -1 0 1
# Index-2
1 4 1 0.5
1 4 1 0.5
1 4 1 0.5
1 4 1 0.5
1 4 1 0.5
1 4 1 0.5
1 4 1 0.5
1 4 1 0.5
1 4 1 0.5
1 4 1 0.5
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
1 -1 1 1
1 -1 1 1

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1972	44988.7839427438	0.186808667406035	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1973	31117.446960034	0.179111628330722	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1974	44137.5879464286	0.302663031640376	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1975	72978.806459042	0.285549050194399	0.0000	0.0001	0.0085	0.2724	0.0023	0.0025	0.0025	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0135	0.0173	0.0996	0.0382	0.0829	0.0436	0.0461	0.0298	0.0176	0.0216	0.0000	0.0000
0.0120	0.0529	0.0195	0.0231	0.0271	0.0181	0.1514	100						
1976	27933.7897321429	0.38676100913081	0.0000	0.0000	0.0020	0.0168	0.3159	0.0048	0.0048	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0311	0.0049	0.0880	0.0449	0.0415	0.0576	0.0358	0.0341	0.0285	0.0000	0.0000
0.0206	0.0029	0.0586	0.0000	0.0106	0.0155	0.1859	100						
1977	31515.4773629149	0.154789125889299	0.0000	0.0020	0.0007	0.0006	0.0319	0.5005	0.0014	0.0014	0.0127	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0201	0.0259	0.0774	0.0366	0.0301	0.0146	0.0147	0.0127	0.0000	0.0000
0.0151	0.0166	0.0083	0.0314	0.0087	0.1509	0.0000	100						
1978	37883.3319733169	0.157740389262214	0.0003	0.0001	0.0041	0.0020	0.0069	0.0732	0.5333	0.0237	0.0000	0.0000	0.0000
0.0032	0.0000	0.0015	0.0023	0.0126	0.0616	0.0434	0.0318	0.0269	0.0207	0.0100	0.0237	0.0000	0.0000
0.0160	0.0113	0.0114	0.0227	0.0088	0.0131	0.0589	100						
1979	29189.315702255	0.211500272707986	0.0033	0.0000	0.0022	0.0069	0.0022	0.0095	0.0387	0.0387	0.0223	0.0000	0.0000
0.5368	0.0012	0.0013	0.0012	0.0062	0.0123	0.0222	0.0453	0.0614	0.0238	0.0323	0.0223	0.0000	0.0000
0.0155	0.0290	0.0187	0.0128	0.0050	0.0039	0.0860	100						
1980	23073.9150191327	0.308889115123398	0.0014	0.0403	0.0019	0.0049	0.0208	0.0145	0.0078	0.0078	0.0382	0.0000	0.0000
0.0222	0.4781	0.0026	0.0000	0.0000	0.0026	0.0020	0.0142	0.0691	0.0365	0.0258	0.0382	0.0000	0.0000
0.0184	0.0115	0.0303	0.0137	0.0153	0.0213	0.1066	100						
1981	22352.3353528912	0.31898624119992	0.0000	0.0062	0.0431	0.0123	0.0015	0.0124	0.0042	0.0042	0.0123	0.0000	0.0000
0.0074	0.0416	0.2958	0.0084	0.0183	0.0231	0.0239	0.0187	0.0468	0.0282	0.1701	0.0123	0.0000	0.0000
0.0339	0.0252	0.0198	0.0166	0.0153	0.0208	0.0940	100						
1982	6349.98487811791	0.271856209535326	0.0000	0.0033	0.0064	0.4456	0.0451	0.0000	0.0000	0.0000	0.0331	0.0000	0.0000
0.0020	0.0133	0.0183	0.2467	0.0105	0.0089	0.0039	0.0066	0.0166	0.0378	0.0188	0.0331	0.0000	0.0000
0.0038	0.0077	0.0096	0.0077	0.0096	0.0052	0.0394	100						
1983	7535.29475623583	0.231020715463835	0.0015	0.0250	0.0308	0.0343	0.4121	0.0163	0.0052	0.0177	0.0000	0.0000	0.0000
0.0076	0.0120	0.0238	0.0250	0.2443	0.0058	0.0055	0.0073	0.0121	0.0141	0.0120	0.0177	0.0000	0.0000
0.0031	0.0056	0.0142	0.0121	0.0095	0.0072	0.0360	100						
1984	7188.51019345238	0.377813593850363	0.0052	0.0509	0.0330	0.0274	0.0035	0.3223	0.0043	0.0043	0.0023	0.0000	0.0000
0.0070	0.0027	0.0035	0.0039	0.0000	0.4073	0.0000	0.0039	0.0000	0.0099	0.0041	0.0023	0.0000	0.0000
0.0000	0.0897	0.0000	0.0017	0.0023	0.0017	0.0137	100						
1985	10396.7651254252	0.309738389127771	0.0000	0.0140	0.1024	0.1178	0.0277	0.0242	0.2419	0.0022	0.0000	0.0000	0.0000
0.0139	0.0000	0.0303	0.0000	0.0541	0.0033	0.2339	0.0015	0.0109	0.0000	0.0111	0.0022	0.0000	0.0000
0.0049	0.0043	0.0830	0.0000	0.0106	0.0000	0.0080	100						
1986	14629.1905718537	0.336070857570531	0.0000	0.0000	0.0108	0.2161	0.3510	0.0197	0.0000	0.0000	0.0010	0.0000	0.0000
0.1921	0.0034	0.0004	0.0057	0.0025	0.0057	0.0047	0.1472	0.0000	0.0008	0.0000	0.0010	0.0000	0.0000
0.0027	0.0000	0.0000	0.0268	0.0000	0.0007	0.0087	100						
1987	9968.57141794218	0.323399316864771	0.0000	0.0119	0.0461	0.0502	0.2591	0.1388	0.0057	0.0057	0.0000	0.0000	0.0000
0.0061	0.1637	0.0000	0.0027	0.0066	0.0037	0.0037	0.0023	0.2074	0.0036	0.0037	0.0000	0.0000	0.0000
0.0021	0.0016	0.0055	0.0030	0.0634	0.0000	0.0092	100						
1988	11559.7036139456	0.569417368265127	0.0299	0.0904	0.0334	0.0595	0.0198	0.1900	0.1144	0.0000	0.0000	0.0000	0.0000
0.0063	0.0000	0.1856	0.0000	0.0000	0.0051	0.0102	0.0041	0.0092	0.1856	0.0000	0.0000	0.0000	0.0000
0.0012	0.0000	0.0000	0.0000	0.0000	0.0392	0.0160	100						
1989	12447.9070684524	0.300597549345325	0.0031	0.0450	0.1682	0.1314	0.0440	0.0274	0.2423	0.0000	0.0000	0.0000	0.0000
0.0503	0.0000	0.0063	0.1317	0.0000	0.0000	0.0018	0.0092	0.0027	0.0028	0.0630	0.0000	0.0000	0.0000
0.0018	0.0076	0.0110	0.0064	0.0000	0.0015	0.0423	100						
1990	22206.2899447279	0.331332133463519	0.0063	0.0070	0.0253	0.1055	0.3132	0.1092	0.0454	0.0454	0.0587	0.0000	0.0000
0.0759	0.0695	0.0223	0.0014	0.0819	0.0000	0.0000	0.0090	0.0048	0.0070	0.0015	0.0587	0.0000	0.0000
0.0000	0.0073	0.0010	0.0035	0.0000	0.0034	0.0409	100						
1991	15275.9560161565	0.446909525624668	0.0106	0.0059	0.0184	0.0558	0.2403	0.1495	0.0614	0.0614	0.0037	0.0000	0.0000
0.0379	0.0965	0.0432	0.0240	0.0000	0.1097	0.0051	0.0059	0.0000	0.0121	0.0101	0.0037	0.0000	0.0000
0.0666	0.0000	0.0051	0.0000	0.0089	0.0000	0.0294	100						
1992	14786.4635629252	0.291798723284711	0.0089	0.0100	0.0256	0.0881	0.1258	0.1779	0.1768	0.1768	0.0099	0.0000	0.0000
0.0519	0.0335	0.0557	0.0392	0.0143	0.0168	0.0861	0.0000	0.0112	0.0027	0.0081	0.0099	0.0000	0.0000
0.0000	0.0317	0.0000	0.0041	0.0025	0.0000	0.0190	100						
1993	20458.0521896259	0.325839928890841	0.0101	0.0294	0.0531	0.1174	0.1520	0.1935	0.1263	0.1263	0.0030	0.0000	0.0000
0.1162	0.0252	0.0255	0.0345	0.0156	0.0177	0.0000	0.0407	0.0018	0.0000	0.0019	0.0030	0.0000	0.0000
0.0014	0.0000	0.0175	0.0000	0.0000	0.0000	0.0173	100						
1994	10850.3763818027	0.433564933414897	0.0184	0.0466	0.0949	0.1340	0.1052	0.1212	0.1074	0.1074	0.0009	0.0000	0.0000
0.1308	0.0725	0.0306	0.0198	0.0374	0.0106	0.0016	0.0000	0.0427	0.0000	0.0000	0.0009	0.0000	0.0000
0.0008	0.0015	0.0000	0.0176	0.0000	0.0000	0.0056	100						
1995	8499.75251204649	0.239522466024601	0.0061	0.0299	0.1631	0.5279	0.0875	0.0570	0.0280	0.0280	0.0000	0.0000	0.0000
0.0221	0.0298	0.0073	0.0074	0.0026	0.0027	0.0086	0.0000	0.0120	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0028	0.0000	0.0051	100						
1996	55962.3741390306	0.33232357778657	0.0003	0.0006	0.0114	0.3269	0.4075	0.0770	0.0695	0.0695	0.0000	0.0000	0.0000
0.0504	0.0048	0.0110	0.0189	0.0027	0.0028	0.0029	0.0038	0.0000	0.0052	0.0000	0.0000	0.0000	0.0000
0.0003	0.0007	0.0000	0.0000	0.0000	0.0015	0.0017	100						
1997	34605.1963329082	0.392660463626439	0.0051	0.0015	0.0216	0.0725	0.2734	0.2226	0.0642	0.0642	0.0185	0.0000	0.0000
0.0540	0.0576	0.0373	0.0276	0.0760	0.0047	0.0177	0.0111	0.0091	0.0050	0.0021	0.0185	0.0000	0.0000
0.0009	0.0000	0.0025	0.0001	0.0024	0.0000	0.0126	100						
1998	57948.1060171228	0.446158535880193	0.0022	0.0007	0.0079	0.0274	0.1177	0.3412	0.2411	0.2411	0.0000	0.0000	0.0000
0.0717	0.0602	0.0458	0.0337	0.0074	0.0215	0.0000	0.0029	0.0069	0.0015	0.0000	0.0000	0.0000	0.0000
0.0078	0.0000	0.0004	0.0006	0.0000	0.0000	0.0014	100						
1999	41769.3885770975	0.235											


```
# Do Projections? (1=yes, 0=no), still need to enter values even if not doing projections
1
# Fleet Directed Flag
1
# Final Year of Projections
2008
# Year Projected Recruits, What Projected, Target, non- directed F mult
2008    -1    3    -99    0
# MCMC info
# doMCMC (1=yes)
1
# MCMCyear option (0=use final year values of NAA, 1=use final year + 1 values of NAA)
1
# MCMCnboot
100
# MCMCnthin
200
# MCMCseed
1415963
# R in agepro.bsn file (enter 0 to use NAA, 1 to use stock-recruit relationship, 2 to used geometric mean of previous years)
1
# Starting year for calculation of R
1990
# Starting year for calculation of R
2007
# Test Value
-23456
#####
# ---- FINIS ----
```

#c:\work\redfish\garm3\asap_2_0\garm3_final_model_1913_2007\discards_revised_mat_waa\red_1913_2007.rep

Age Structured Assessment Program (ASAP) Version 2.0
Start time for run: Thu Jul 10 09:21:29 2008

obj_fun = 5847.54

Component	Lambda	obj_fun
__Catch_Fleet_1	1	433.777
Catch_Fleet_Total	1	433.777
Discard_Fleet_Total	0	0
__Index_Fit_1	1	513.52
__Index_Fit_2	1	471.303
Index_Fit_Total	2	984.823
Catch_Age_Comps	see_below	893.235
Discard_Age_Comps	see_below	0
Survey_Age_Comps	see_below	2034.91
__Sel_Param_1	1	28.1528
__Sel_Param_2	1	28.3867
__Sel_Param_3	1	26.755
__Sel_Param_4	1	19.9076
__Sel_Param_5	1	4.88645
__Sel_Param_6	1	1.05695
__Sel_Param_7	1	0.646849
__Sel_Param_8	1	0.235195
__Sel_Param_9	1	0.168969
Sel_Params_Total	9	110.197
__Index_Sel_Param_1	1	0.168969
__Index_Sel_Param_2	1	0.281511
__Index_Sel_Param_3	1	0.223825
__Index_Sel_Param_4	1	0.168969
__Index_Sel_Param_5	1	0.168969
__Index_Sel_Param_6	1	0.168969
__Index_Sel_Param_7	1	0.168969
__Index_Sel_Param_8	1	0.192309
__Index_Sel_Param_9	1	0.235404
__Index_Sel_Param_27	1	0.441013
__Index_Sel_Param_28	1	0.650305
__Index_Sel_Param_29	1	0.356215
__Index_Sel_Param_30	1	0.412965
__Index_Sel_Param_31	1	1.11904
__Index_Sel_Param_32	1	0.463146
__Index_Sel_Param_33	1	0.205532
__Index_Sel_Param_34	1	0.333029
__Index_Sel_Param_35	1	0.399088
Index_Sel_Params_Total	18	6.15823
q_year1_Total	0	0
q_devs_Total	0	0
__Fmult_year1_fleet_1	0	0
Fmult_year1_fleet_Total	0	0
Fmult_devs_fleet_Total	0	0
N_year_1	1	265.035
Recruit_devs	1	1104.2
SRR_steepness	0	-0
SRR_unexpl_stock	1	14.7494
Fmult_Max_penalty	1000	0.451968
F_penalty	0	0

Input and Estimated effective sample sizes for fleet 1

1913	0	5.16987
1914	0	5.17033
1915	0	5.1708
1916	0	5.17132
1917	0	5.1721
1918	0	5.17473
1919	0	5.17967
1920	0	5.18516
1921	0	5.19172
1922	0	5.19889
1923	0	5.20598
1924	0	5.21298
1925	0	5.21991
1926	0	5.22675
1927	0	5.2335
1928	0	5.24018
1929	0	5.24677
1930	0	5.25327
1931	0	5.2597
1932	0	5.26605
1933	0	5.27227
1934	0	5.27857
1935	0	5.28787
1936	0	5.30976
1937	0	5.34636
1938	0	5.39161
1939	0	5.44671
1940	0	5.52318
1941	0	5.63576
1942	0	5.81102
1943	0	6.0475
1944	0	6.34934
1945	0	6.72165
1946	0	7.15714
1947	0	7.68057
1948	0	8.29468

1949	0	8.97539
1950	0	9.67956
1951	0	10.425
1952	0	11.1183
1953	0	11.7171
1954	0	12.2133
1955	0	12.6508
1956	0	13.0698
1957	0	13.6111
1958	0	14.0295
1959	0	14.4208
1960	0	14.5098
1961	0	14.61
1962	0	14.7363
1963	0	14.7342
1964	0	15.0675
1965	0	14.97
1966	0	15.1908
1967	0	14.9297
1968	0	15.1156
1969	200	39.1796
1970	200	60.0522
1971	200	58.5578
1972	200	99.4896
1973	200	74.8004
1974	200	91.3737
1975	200	67.9365
1976	200	205.273
1977	200	135.924
1978	200	214.267
1979	200	469.428
1980	200	488.111
1981	200	186.531
1982	200	37.4877
1983	200	55.3494
1984	200	30.3489
1985	200	45.8613
1986	0	3.0473
1987	0	4.10773
1988	0	4.86413
1989	0	5.81336
1990	0	6.54031
1991	0	6.50771
1992	0	6.74486
1993	0	7.625
1994	0	8.51066
1995	0	9.87511
1996	0	7.61265
1997	0	4.77622
1998	0	4.21546
1999	0	4.77621
2000	0	5.23416
2001	0	5.87283
2002	0	7.37043
2003	0	8.78809
2004	0	9.80004
2005	0	8.45614
2006	0	8.87488
2007	0	7.96235
Total	3400	2973.83

Input and Estimated effective Discard sample sizes for fleet 1

1913	0	1e+15
1914	0	1e+15
1915	0	1e+15
1916	0	1e+15
1917	0	1e+15
1918	0	1e+15
1919	0	1e+15
1920	0	1e+15
1921	0	1e+15
1922	0	1e+15
1923	0	1e+15
1924	0	1e+15
1925	0	1e+15
1926	0	1e+15
1927	0	1e+15
1928	0	1e+15
1929	0	1e+15
1930	0	1e+15
1931	0	1e+15
1932	0	1e+15
1933	0	1e+15
1934	0	1e+15
1935	0	1e+15
1936	0	1e+15
1937	0	1e+15
1938	0	1e+15
1939	0	1e+15
1940	0	1e+15
1941	0	1e+15
1942	0	1e+15
1943	0	1e+15
1944	0	1e+15
1945	0	1e+15

```

1946 0 1e+15
1947 0 1e+15
1948 0 1e+15
1949 0 1e+15
1950 0 1e+15
1951 0 1e+15
1952 0 1e+15
1953 0 1e+15
1954 0 1e+15
1955 0 1e+15
1956 0 1e+15
1957 0 1e+15
1958 0 1e+15
1959 0 1e+15
1960 0 1e+15
1961 0 1e+15
1962 0 1e+15
1963 0 1e+15
1964 0 1e+15
1965 0 1e+15
1966 0 1e+15
1967 0 1e+15
1968 0 1e+15
1969 0 1e+15
1970 0 1e+15
1971 0 1e+15
1972 0 1e+15
1973 0 1e+15
1974 0 1e+15
1975 0 1e+15
1976 0 1e+15
1977 0 1e+15
1978 0 1e+15
1979 0 1e+15
1980 0 1e+15
1981 0 1e+15
1982 0 1e+15
1983 0 1e+15
1984 0 1e+15
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1990 0 1e+15
1991 0 1e+15
1992 0 1e+15
1993 0 1e+15
1994 0 1e+15
1995 0 1e+15
1996 0 1e+15
1997 0 1e+15
1998 0 1e+15
1999 0 1e+15
2000 0 1e+15
2001 0 1e+15
2002 0 1e+15
2003 0 1e+15
2004 0 1e+15
2005 0 1e+15
2006 0 1e+15
2007 0 1e+15
Total 0 9.5e+16

```

Observed and predicted total fleet catch by year and standardized residual
fleet 1 total catches

```

1913 7.24 7.24 -1.1839e-05
1914 29.8 29.8 4.14824e-06
1915 40.23 40.23 5.92513e-06
1916 53.17 53.17 8.26824e-06
1917 82.48 82.48 1.35392e-05
1918 72.98 72.98 1.26364e-05
1919 24.8 24.8 4.52402e-06
1920 30.67 30.67 5.90157e-06
1921 12.54 12.54 2.54283e-06
1922 8.6 8.6 1.8331e-06
1923 6.92 6.92 1.55075e-06
1924 39.74 39.74 9.37301e-06
1925 24.77 24.77 6.13474e-06
1926 29.76 29.76 7.72995e-06
1927 30.06 30.06 8.19543e-06
1928 57.07 57.07 1.63163e-05
1929 33.85 33.85 1.01334e-05
1930 53.8 53.8 1.68515e-05
1931 107.62 107.62 3.52387e-05
1932 59.94 59.94 2.04888e-05
1933 119.89 119.89 4.27482e-05
1934 519 518.999 0.000192816
1935 7549 7548.78 0.00291776
1936 23162 23159.8 0.0093026
1937 14823 14822.1 0.00618519
1938 20640 20638.2 0.00893661
1939 25406 25403.1 0.0114044
1940 26762 26758.7 0.0124459
1941 50796 50783.6 0.0244457

```

1942	55892	55876.4	0.0278543
1943	48348	48335.9	0.0249823
1944	50439	50425.4	0.0270644
1945	37912	37903.9	0.0213414
1946	42423	42412.5	0.0247457
1947	40160	40150.6	0.0235276
1948	43631	43619.7	0.0259189
1949	30743	30737.3	0.018589
1950	34307	34300	0.0203559
1951	30077	30071.4	0.0186122
1952	21377	21374.9	0.00993788
1953	16791	16790.3	0.00416061
1954	12988	12988.2	-0.00135078
1955	13914	13914.5	-0.00335346
1956	14388	14388.7	-0.005191
1957	18490	18491.8	-0.0096077
1958	16047	16047.3	-0.00212329
1959	15521	15521	8.37354e-05
1960	11375	11374.1	0.00760518
1961	14101	14099.6	0.0100519
1962	14134	14131.2	0.0197551
1963	10046	10044.8	0.0118109
1964	8313	8312.04	0.0115344
1965	8057	8055.48	0.0189059
1966	8569	8566.3	0.0314785
1967	10864	10858.3	0.0525444
1968	6777	6774.14	0.0422041
1969	12455	12443.1	0.0956155
1970	16741	16718	0.137425
1971	20034	20000.8	0.165962
1972	19095	19064.1	0.162041
1973	17360	17335	0.144051
1974	10471	10461.5	0.0908746
1975	10572	10561.9	0.0952384
1976	10696	10685.4	0.098931
1977	13223	13206.4	0.125608
1978	14083	14061.9	0.149969
1979	14755	14740.9	0.0959291
1980	10183	10184.1	-0.0107329
1981	7915	7918.53	-0.044607
1982	6903	6906.57	-0.0517195
1983	5328	5326.69	0.0245985
1984	4793	4790.3	0.0563814
1985	4282	4282.15	-0.00348379
1986	2929	2931.14	-0.0728875
1987	1894	1895.29	-0.0681718
1988	1177	1177.48	-0.0407916
1989	669.427	670.178	-0.0374051
1990	638.655	639.339	-0.0368992
1991	2039.12	7903.43	-2.62692
1992	977.965	985.496	-0.191864
1993	1045.67	1141.74	-0.700271
1994	545.862	8123.59	-5.66537
1995	630.859	680.507	-0.536163
1996	688.715	741.812	-0.378725
1997	431.629	444.577	-0.163729
1998	586.094	731.752	-0.52762
1999	382.944	383.294	-0.0228475
2000	487.886	495.95	-0.098839
2001	727.67	741.883	-0.115268
2002	493.573	495.301	-0.0368743
2003	564.253	565.146	-0.0229354
2004	522.55	522.782	-0.0105585
2005	664.651	664.73	-0.00513963
2006	647.908	648.123	-0.0060345
2007	1160.39	1161.13	-0.00591422

Observed and predicted total fleet Discards by year and standardized residual

Year	Observed	Predicted	Standardized Residual
1913	0	0	0
1914	0	0	0
1915	0	0	0
1916	0	0	0
1917	0	0	0
1918	0	0	0
1919	0	0	0
1920	0	0	0
1921	0	0	0
1922	0	0	0
1923	0	0	0
1924	0	0	0
1925	0	0	0
1926	0	0	0
1927	0	0	0
1928	0	0	0
1929	0	0	0
1930	0	0	0
1931	0	0	0
1932	0	0	0
1933	0	0	0
1934	0	0	0
1935	0	0	0
1936	0	0	0
1937	0	0	0
1938	0	0	0
1939	0	0	0


```

1940 0 0 0
1941 0 0 0
1942 0 0 0
1943 0 0 0
1944 0 0 0
1945 0 0 0
1946 0 0 0
1947 0 0 0
1948 0 0 0
1949 0 0 0
1950 0 0 0
1951 0 0 0
1952 0 0 0
1953 0 0 0
1954 0 0 0
1955 0 0 0
1956 0 0 0
1957 0 0 0
1958 0 0 0
1959 0 0 0
1960 0 0 0
1961 0 0 0
1962 0 0 0
1963 0 0 0
1964 0 0 0
1965 0 0 0
1966 0 0 0
1967 0 0 0
1968 0 0 0
1969 0 0 0
1970 0 0 0
1971 0 0 0
1972 0 0 0
1973 0 0 0
1974 0 0 0
1975 0 0 0
1976 0 0 0
1977 0 0 0
1978 0 0 0
1979 0 0 0
1980 0 0 0
1981 0 0 0
1982 0 0 0
1983 0 0 0
1984 0 0 0
1985 0 0 0
1986 0 0 0
1987 0 0 0
1988 0 0 0
1989 0 0 0
1990 0 0 0
1991 0 0 0
1992 0 0 0
1993 0 0 0
1994 0 0 0
1995 0 0 0
1996 0 0 0
1997 0 0 0
1998 0 0 0
1999 0 0 0
2000 0 0 0
2001 0 0 0
2002 0 0 0
2003 0 0 0
2004 0 0 0
2005 0 0 0
2006 0 0 0
2007 0 0 0

```

```

Index data
index number 1
units = 1
month = 10.5
starting and ending ages for selectivity = 1 26
selectivity choice = -1
year, obs index, pred index, standardized residual
1963 44046 69771.8 -1.56696
1964 97988.4 71148.1 0.479684
1965 24120.4 72847.8 -3.09824
1966 53479.2 74453.4 -0.774278
1967 44522.2 74995.4 -1.46608
1968 73869.4 76642.1 -0.0888415
1969 43404.5 75589 -2.17307
1970 60207 70816.9 -0.875408
1971 42779.2 63113.6 -1.75497
1972 44988.8 54529.7 -1.03846
1973 31117.4 47237.3 -2.34899
1974 44137.6 43684.1 0.0348819
1975 72978.8 41759.9 1.99389
1976 27933.8 39192.1 -0.906995
1977 31515.5 35180.3 -0.714916
1978 37883.3 29851.9 1.5198
1979 29189.3 22429.7 1.25922
1980 23073.9 17166.8 0.979617
1981 22352.3 14931.8 1.29601

```

```

1982 6349.98 12059.1 -2.4019
1983 7535.29 9874.63 -1.18571
1984 7188.51 8098.38 -0.326267
1985 10396.8 6638.59 1.48211
1986 14629.2 5750.24 2.85453
1987 9968.57 5619.57 1.81737
1988 11559.7 6410.91 1.11244
1989 12447.9 7488.63 1.72775
1990 22206.3 8784.34 2.87351
1991 15276 7003.77 1.82748
1992 14786.5 7791.21 2.24138
1993 20458.1 9402.61 2.44727
1994 10850.4 8502.97 0.587384
1995 8499.75 11549.6 -1.29818
1996 55962.4 16540.9 3.76582
1997 34605.2 22484 1.13872
1998 57948.1 29231.9 1.60605
1999 41769.4 36252.2 0.610829
2000 47793.5 43629.9 0.323636
2001 51463 53724.1 -0.176349
2002 76505 67283.5 0.395051
2003 119647 82830.1 0.795561
2004 66915.6 100522 -1.38624
2005 85779 120127 -1.47084
2006 91753.2 140006 -1.42132
2007 92058.2 159541 -2.25613
index number 2
units = 1
month = 4.5
starting and ending ages for selectivity = 1 26
selectivity choice = -1
year, obs index, pred index, standardized residual
1968 31214.9 68719.3 -2.40556
1969 35969.3 69575.2 -2.35079
1970 34585.9 67271.9 -1.33833
1971 130737 62005.4 2.53648
1972 81045.3 54303.7 0.850713
1973 46216.4 47658.1 -0.0982659
1974 34412.1 42837 -0.365445
1975 32173.4 39917 -0.626359
1976 47852.9 34977.3 0.620384
1977 21170 32725 -1.68173
1978 22226.8 29953.8 -1.49113
1979 58848.5 22926.9 2.94102
1980 37165.8 17223.5 2.31782
1981 33443.9 15848.1 1.20233
1982 17186 12648.8 0.861693
1983 11086.5 9665.73 0.350157
1984 4895.68 8035.46 -1.56131
1985 12068.1 6806.6 1.48638
1986 5876.66 5286.55 0.339266
1987 23615 4748.11 2.18573
1988 5967.39 5559.1 0.157343
1989 5448.57 6264.59 -0.402926
1990 12449.1 6940.98 1.43049
1991 7786.54 7052.14 0.269869
1992 19495 6281.7 2.89115
1993 31966.8 7592.94 3.04775
1994 7161.56 8325.64 -0.259348
1995 3501.44 8913.52 -2.41499
1996 21716.4 11869.2 1.03385
1997 62182.3 15752.4 2.16164
1998 14319.2 21987.5 -1.32265
1999 34744.6 28242.2 0.722226
2000 102320 34457.5 2.0152
2001 69361.9 44016.4 0.901045
2002 111817 56334.9 1.1839
2003 60899.5 68382.8 -0.284381
2004 101702 81526.4 0.540344
2005 84513.7 98469.6 -0.309463
2006 18873.7 115875 -5.47366
2007 64115.4 133541 -2.13675

Input and Estimated effective sample sizes for index 1
1963 0 0
1964 0 0
1965 0 0
1966 0 0
1967 0 0
1968 0 0
1969 0 0
1970 0 0
1971 0 0
1972 0 0
1973 0 0
1974 0 0
1975 100 43.5838
1976 100 47.0108
1977 100 13.4821
1978 100 29.4016
1979 100 57.7553
1980 100 159.191
1981 100 13.9383
1982 100 4.56135
1983 100 8.86103

```


Year 1969 Pred = 5.2426e-05 0.000419464 0.00147589 0.012231 0.0325943 0.0656919 0.0431952 0.0673151 0.0455636 0.0729755
0.0585716 0.067062 0.0591889 0.051928 0.0550177 0.0445849 0.0427679 0.0318401 0.030059 0.0269495 0.0242961 0.0223128 0.0190005
0.0158324 0.0135409 0.0955334
Year 1970 Obs = 0
Year 1970 Pred = 6.81598e-05 0.000211464 0.0011566 0.0032747 0.0191266 0.0439751 0.080741 0.0442193 0.0667738 0.0556008
0.0731135 0.0575212 0.0648025 0.0564443 0.0489816 0.0514279 0.0413617 0.0394248 0.0291945 0.027437 0.0245045 0.0220199 0.0201663
0.017132 0.0142465 0.0970754
Year 1971 Obs = 0
Year 1971 Pred = 8.12806e-05 0.000288665 0.000612149 0.00269242 0.00533952 0.0266031 0.0554066 0.084074 0.0443079 0.0822022
0.0561972 0.0724355 0.0560733 0.0623412 0.0537101 0.0461895 0.0481308 0.0384648 0.0364679 0.026883 0.0251679 0.0224047 0.0200771
0.0183435 0.015552 0.0995537
Year 1972 Obs = 0
Year 1972 Pred = 0.00594218 0.000354884 0.000861461 0.00146871 0.00451518 0.00760206 0.034186 0.0586607 0.0853536 0.0551892
0.0840645 0.0563332 0.0714457 0.0545802 0.0600227 0.0512462 0.0478334 0.0452881 0.0359998 0.0339768 0.0249507 0.0232828 0.0206691
0.0184779 0.0168483 0.104942
Year 1973 Obs = 0
Year 1973 Pred = 0.000255068 0.0258675 0.00105591 0.0020603 0.00245098 0.00637643 0.00967333 0.035761 0.0587223 0.104785
0.0556272 0.0830551 0.0547637 0.0685424 0.0517941 0.0564451 0.0478283 0.0405628 0.0417758 0.033058 0.0310808 0.0227497 0.02117
0.018749 0.0167275 0.109063
Year 1974 Obs = 0
Year 1974 Pred = 0.000128805 0.00104152 0.0722046 0.00237142 0.00325798 0.00332739 0.00783199 0.00986858 0.0351698 0.0707979
0.103722 0.0539736 0.0792931 0.051596 0.063877 0.0478334 0.0517356 0.0435603 0.0367459 0.0376739 0.0296979 0.0278307 0.0203143
0.0188589 0.0166684 0.110619
Year 1975 Obs = 0 9.999e-05 0.00849915 0.272373 0.00229977 0.00249975 0 0 0 0.0134987 0.0172983 0.09959 0.0381962 0.0828917
0.0435956 0.0460954 0.029797 0.0175982 0.0215978 0.0119988 0.0528947 0.0194981 0.0230977 0.0270973 0.0180982 0.151385
Year 1975 Pred = 8.34017e-05 0.000508739 0.00281191 0.156798 0.00361524 0.00425193 0.00393754 0.0076792 0.00932782 0.0408364
0.0674925 0.0969232 0.0496263 0.0719482 0.0463087 0.0568141 0.0422237 0.0453792 0.0380043 0.0319144 0.032595 0.0256106 0.0239338
0.0174285 0.0161471 0.1078
Year 1976 Obs = 0 0 0.002 0.0168 0.3159 0.0048 0 0 0 0.0311 0.0049 0.088 0.0449 0.0415 0.0576 0.0358 0.0341 0.0285 0.0206
0.0029 0.0586 0.0106 0.0155 0.1859
Year 1976 Pred = 8.65153e-05 0.000335324 0.00139809 0.00621351 0.242472 0.0047581 0.00505897 0.00386626 0.00724256 0.0107992
0.0388165 0.0628847 0.0888571 0.0448984 0.0643874 0.0410685 0.0500052 0.0369281 0.039476 0.0329113 0.0275316 0.0280272 0.0219604
0.020474 0.0148789 0.104665
Year 1977 Obs = 0 0.0019996 0.00069986 0.00059988 0.0318936 0.5004 0.00139972 0 0 0 0.020096 0.0258948 0.0773845 0.0365927
0.030094 0.0145971 0.0146971 0.0126975 0.015097 0.0165967 0.00829834 0.0313937 0.00869826 0.15087 0
Year 1977 Pred = 6.04625e-05 0.000363155 0.00096195 0.00322198 0.0099362 0.0325248 0.0057366 0.00498262 0.00362777 0.00833633
0.0102055 0.0359565 0.0573165 0.0799248 0.0399468 0.0567698 0.0359362 0.0434797 0.0319377 0.0339872 0.0282267 0.0235359 0.0238931
0.0186769 0.0173775 0.100354
Year 1978 Obs = 0.00030006 0.00010002 0.00410082 0.0020004 0.00690138 0.0732146 0.533407 0.00320064 0 0.0015003 0.00230046
0.0126025 0.0616123 0.0434087 0.0318064 0.0269054 0.0207041 0.010002 0.0237047 0.0160032 0.0113023 0.0114023 0.0227045 0.00880176
0.0131026 0.0589118
Year 1978 Pred = 8.97719e-05 0.000268038 0.0011001 0.00233881 0.00538991 0.0137262 0.400629 0.00571086 0.00468011 0.00417198
0.00787109 0.00944523 0.032744 0.0515097 0.0710482 0.0351899 0.0496326 0.0312198 0.0375711 0.027473 0.029124 0.024109 0.0200467
0.0203027 0.0158382 0.0987704
Year 1979 Obs = 0.0033 0.0022 0.0069 0.0022 0.0095 0.0387 0.5368 0.0012 0.0013 0.0012 0.0062 0.0123 0.0222 0.0453 0.0614
0.0238 0.0323 0.0223 0.0155 0.029 0.0187 0.0128 0.005 0.0039 0.086
Year 1979 Pred = 0.000303573 0.000448659 0.000915244 0.00301195 0.00436581 0.00817113 0.0184017 0.429137 0.00571324 0.00572175
0.00418767 0.00774436 0.00914403 0.0312833 0.0486778 0.0665365 0.0327069 0.0458384 0.0286793 0.0343579 0.0250272 0.0264448
0.0218304 0.018109 0.0183032 0.102207
Year 1980 Obs = 0.0014 0.0403 0.0019 0.0049 0.0208 0.0145 0.0078 0.0222 0.4781 0.0026 0 0 0.0026 0.002 0.0142 0.0691 0.0365
0.0258 0.0382 0.0184 0.0115 0.0303 0.0137 0.0153 0.0213 0.1066
Year 1980 Pred = 0.000149799 0.0149103 0.00150583 0.00246533 0.00558087 0.00665291 0.0110227 0.0200203 0.438314 0.00711683
0.00585181 0.00419811 0.0076391 0.0089012 0.0301221 0.0464482 0.0630103 0.0307774 0.042904 0.0267221 0.0318907 0.0231543 0.024398
0.020093 0.0166341 0.109516
Year 1981 Obs = 0 0.00620062 0.0431043 0.0123012 0.00150015 0.0124012 0.00420042 0.00740074 0.0416042 0.29583 0.00840084
0.0183018 0.0231023 0.0239024 0.0187019 0.0468047 0.0282028 0.170117 0.0123012 0.0339034 0.0252025 0.019802 0.0166017 0.0153015
0.0208021 0.0940094
Year 1981 Pred = 0.000324118 0.000647679 0.0440526 0.00357085 0.00402368 0.00751255 0.00796027 0.0106539 0.0182215 0.487546
0.00649941 0.00523839 0.00369774 0.00664016 0.00765327 0.0256654 0.0392777 0.0529456 0.0257233 0.0356966 0.0221479 0.0263457
0.0190753 0.0200523 0.0164807 0.102348
Year 1982 Obs = 0 0.00330033 0.00640064 0.445645 0.0451045 0 0 0.0020002 0.0133013 0.0183018 0.246725 0.0105011 0.00890089
0.00390039 0.00660066 0.0166017 0.0378038 0.0188019 0.0331033 0.00380038 0.00770077 0.00960096 0.00770077 0.00960096 0.00520052
0.0394039
Year 1982 Pred = 0.00199911 0.0015078 0.00205867 0.112309 0.00622566 0.00572618 0.0094718 0.00804764 0.0100874 0.0210861
0.463219 0.00605291 0.00480024 0.00334392 0.00593964 0.00678413 0.0225792 0.0343359 0.0460371 0.0222658 0.0307803 0.0190354
0.0225804 0.0163104 0.017111 0.100305
Year 1983 Obs = 0.00149985 0.0249975 0.0307969 0.0342966 0.412059 0.0162984 0.00519948 0.00759924 0.0119988 0.0237976 0.0249975
0.244276 0.00579942 0.00549945 0.00729927 0.0120988 0.0140986 0.0119988 0.0176982 0.00309969 0.00559944 0.0141986 0.0120988
0.00949905 0.00719928 0.0359964
Year 1983 Pred = 0.00321639 0.00916928 0.00472529 0.00517442 0.192952 0.0087116 0.00707807 0.00937636 0.0074445 0.0113882
0.0195449 0.420865 0.00541122 0.00423496 0.00291812 0.00513657 0.00582264 0.0192565 0.0291267 0.0388764 0.0187305 0.0258088
0.0159166 0.0188361 0.0135782 0.0967011
Year 1984 Obs = 0.00519844 0.0508847 0.0329901 0.0273918 0.00349895 0.322203 0.00429871 0.0069979 0.00269919 0.00349895
0.00389883 0.407178 0.00389883 0 0.00989703 0.00409877 0.00229931 0 0.00896731 0 0.00169949 0.00229931 0.00169949 0.0136959
Year 1984 Pred = 0.00110824 0.0147172 0.0286642 0.0118406 0.00881553 0.265401 0.0105536 0.00682449 0.00840844 0.00814702
0.0102324 0.0172137 0.364719 0.0046277 0.00358246 0.00244625 0.0042735 0.00481363 0.0158345 0.0238426 0.0317016 0.015224 0.020919
0.0128705 0.0152004 0.088019
Year 1985 Obs = 0 0.014 0.1024 0.1178 0.0277 0.0242 0.2419 0.0139 0 0.0303 0 0.0541 0.0033 0.2339 0.0015 0.0109 0 0.0111 0.0022
0.0049 0.0043 0.083 0 0.0106 0 0.008
Year 1985 Pred = 0.00213384 0.00506471 0.0459434 0.0716529 0.019933 0.011783 0.31017 0.00970305 0.00577937 0.00867925 0.00690434
0.00850003 0.0140699 0.294192 0.00369233 0.00283257 0.00191962 0.00333226 0.00373339 0.0122256 0.018338 0.0243032 0.0116387
0.0159546 0.00979628 0.0777246
Year 1986 Obs = 0 0 0.0108 0.2161 0.351 0.0197 0 0.1921 0.0034 0.0004 0.0057 0.0025 0.0057 0.0047 0.1472 0 0.0008 0 0.001
0.0027 0 0.0268 0 0.0007 0.0087
Year 1986 Pred = 0.00804011 0.00924286 0.0149889 0.109013 0.115862 0.0260379 0.0134906 0.28295 0.00821532 0.00595152 0.00733814
0.00572198 0.00693138 0.0113226 0.234178 0.0029126 0.00221756 0.00149331 0.0025784 0.00287574 0.00938101 0.0140254 0.0185362
0.00885589 0.0121153 0.0657243
Year 1987 Obs = 0 0.0118988 0.0460954 0.050195 0.259074 0.138786 0.00569943 0.00609939 0.163684 0 0.00269973 0.00659934
0.00369963 0.00369963 0.00229977 0.207379 0.00359964 0.00369963 0 0.00209979 0.00159984 0.00549945 0.0029997 0.0633937 0
0.00919908
Year 1987 Pred = 0.00748202 0.0309667 0.0243296 0.0316927 0.159861 0.141617 0.028298 0.0119374 0.236731 0.00838296 0.00498606
0.0060261 0.0046235 0.00552712 0.00893073 0.183043 0.00225944 0.00170937 0.00114495 0.00196799 0.00218653 0.00710948 0.01010598
0.0139757 0.00666354 0.0579485
Year 1988 Obs = 0.029903 0.090409 0.0334033 0.059506 0.019802 0.190019 0.114411 0.00630063 0 0.185619 0 0 0.00510051 0.010201
0.00410041 0.00920092 0.185619 0 0 0.00120012 0 0 0 0.0392039 0.0160016

Year 1988 Pred = 0.00418344 0.0247584 0.070048 0.0442769 0.0405849 0.175366 0.140196 0.023238 0.00943079 0.228991 0.00665757
0.00388147 0.00461583 0.00349494 0.00413265 0.00661732 0.134605 0.00165102 0.0012424 0.000828415 0.00141846 0.00157084 0.00509342
0.00757599 0.00996861 0.0455724
Year 1989 Obs = 0.00310062 0.045009 0.168234 0.131426 0.0440088 0.0274055 0.242348 0.0503101 0 0.00630126 0.131726 0 0
0.00180036 0.00920184 0.00270054 0.00280056 0.0630126 0 0.00180036 0.00760152 0.0110022 0.00640128 0 0.0015003 0.0423085
Year 1989 Pred = 0.00416507 0.0135501 0.0548281 0.124948 0.0561825 0.045042 0.177685 0.119506 0.0193121 0.00962688 0.191916
0.00546929 0.00313752 0.00368209 0.00275769 0.00323147 0.00513531 0.103798 0.00126635 0.000948635 0.000630112 0.0010754
0.00118762 0.00384173 0.00570265 0.0413743
Year 1990 Obs = 0.0063 0.007 0.0253 0.1055 0.3132 0.1092 0.0454 0.0759 0.0695 0.0223 0.0014 0.0819 0 0 0.009 0.0048 0.007
0.0015 0.0587 0 0.0073 0.001 0.0035 0 0.0034 0.0409
Year 1990 Pred = 0.00322051 0.0134449 0.0299065 0.097501 0.15848 0.0627391 0.0461855 0.153924 0.10146 0.0201872 0.00826206
0.161449 0.00452718 0.00256294 0.00297514 0.00220813 0.00256799 0.0040551 0.0815263 0.000990143 0.000738885 0.000489192
0.000832577 0.000917285 0.00296123 0.0358892
Year 1991 Obs = 0.0105989 0.00589941 0.0183982 0.0557944 0.240276 0.149485 0.0613939 0.0378962 0.0964904 0.0431957 0.0239976 0
0.109689 0.00509949 0.00589941 0 0.0120988 0.010099 0.00369963 0.0665933 0 0.00509949 0 0.00889911 0 0.0293971
Year 1991 Pred = 0.00467856 0.0150371 0.042842 0.0758989 0.158319 0.189854 0.0652023 0.0357644 0.106425 0.0864184 0.0141171
0.00566342 0.108893 0.00301334 0.00168741 0.00194113 0.00142983 0.00165232 0.00259525 0.0519409 0.00062841 0.000467419
0.000308604 0.000523983 0.000576126 0.0241219
Year 1992 Obs = 0.00890178 0.010002 0.0256051 0.0881176 0.125825 0.177936 0.176835 0.0519104 0.0335067 0.0557111 0.0392078
0.0143029 0.0168034 0.0861172 0 0.0112022 0.00270054 0.00810162 0.00990198 0 0.0317063 0 0.00410082 0.0025005 0 0.0190038
Year 1992 Pred = 0.0174115 0.0158346 0.034795 0.0797688 0.0997101 0.175802 0.184168 0.05217 0.0269673 0.0964447 0.0642978
0.0102957 0.00406409 0.0771151 0.00211081 0.00117135 0.00133732 0.000978828 0.0011251 0.00175918 0.0350732 0.000422953
0.000313724 0.00020664 0.000350147 0.001363062
Year 1993 Obs = 0.010099 0.0293971 0.0530947 0.117388 0.151985 0.193481 0.126287 0.116188 0.0251975 0.0254975 0.0344966
0.0155984 0.0176982 0 0.0406959 0.00179982 0 0.00189981 0.0029997 0.00139986 0 0.0174983 0 0 0 0.0172983
Year 1993 Pred = 0.0208432 0.0545592 0.0339217 0.0600126 0.0974447 0.105897 0.170418 0.149521 0.0411969 0.0261867 0.0768916
0.0502478 0.00791683 0.00308399 0.0578831 0.0015701 0.000864722 0.000980995 0.000714191 0.000817211 0.00127288 0.025295
0.00030419 0.000225098 0.000147965 0.0117834
Year 1994 Obs = 0.0183982 0.0465953 0.0948905 0.133987 0.105189 0.121188 0.107389 0.130787 0.0724928 0.0305969 0.019798
0.0373963 0.0105989 0.00159984 0 0.0426957 0 0 0.00089991 0.00079992 0.00149985 0 0.0175982 0 0 0.00559944
Year 1994 Pred = 0.0116784 0.0857629 0.153203 0.0758517 0.0857395 0.102326 0.0961259 0.114994 0.0898047 0.0304341 0.0158831
0.0457144 0.0293945 0.0045704 0.00176108 0.0327553 0.000881799 0.000482572 0.000544537 0.000394648 0.000449845 0.000698391
0.0138401 0.000166043 0.000122622 0.00642088
Year 1995 Obs = 0.00610061 0.029903 0.163116 0.527953 0.0875088 0.0570057 0.0280028 0.0221022 0.029803 0.00730073 0.00740074
0.00260026 0.00270027 0.00860086 0 0 0.0120012 0 0 0 0.00280028 0 0.00510051
Year 1995 Pred = 0.00966505 0.0323987 0.162684 0.233985 0.0822107 0.079268 0.0828561 0.0646219 0.0731908 0.0686767 0.0191085
0.00977512 0.0276831 0.0175664 0.00270167 0.00103163 0.0190431 0.000509411 0.000277291 0.000311485 0.000224881 0.000255499
0.000395565 0.00782043 9.36335e-05 0.0036455
Year 1996 Obs = 0.00030003 0.00060006 0.0114011 0.326933 0.407541 0.0770077 0.069507 0.050405 0.00480048 0.0110011 0.0189019
0.00270027 0.00280028 0.00290029 0.00380038 0 0.00520052 0.00070007 0 0 0.00150015 0.00170017
Year 1996 Pred = 0.00544386 0.0255552 0.058572 0.236975 0.243162 0.0752561 0.0666464 0.0588728 0.0450145 0.062777 0.0483627
0.0131901 0.00663924 0.0185552 0.0116465 0.00177505 0.000672688 0.0123388 0.000328305 0.000177902 0.000199074 0.000143256
0.000162309 0.000250693 0.00494623 0.00233658
Year 1997 Obs = 0.00509949 0.00149985 0.0215978 0.0724928 0.273373 0.222578 0.0641936 0.0539946 0.0575942 0.0372963 0.0275972
0.0759924 0.00469953 0.0176982 0.0110989 0.00909909 0.0049995 0.00209979 0.0184982 0.00089991 0 0.00249975 9.999e-05 0.00239976 0
0.0125987
Year 1997 Pred = 0.00394318 0.0151793 0.0487249 0.090033 0.261238 0.238264 0.0679813 0.0512006 0.0445693 0.0419828 0.0480704
0.0363001 0.00974138 0.00483888 0.0133768 0.00832048 0.00125857 0.000473938 0.0086468 0.000229032 0.000123632 0.000137895
9.89559e-05 0.000111852 0.00017241 0.00498307
Year 1998 Obs = 0.0022 0.0007 0.0079 0.0274 0.1177 0.3412 0.2411 0.0717 0.0602 0.0458 0.0337 0.0074 0.0215 0 0.009 0.0029 0.0069
0.0015 0 0.0078 0 0.0004 0.0006 0 0.0014
Year 1998 Pred = 0.00428699 0.0114973 0.0302639 0.0783176 0.103767 0.267849 0.225679 0.0547809 0.0407104 0.0437904 0.0338039
0.0379396 0.0281902 0.00746562 0.00366819 0.0100491 0.00620345 0.000932405 0.00034924 0.000634297 0.000167366 9.00505e-05
0.000100161 7.17067e-05 8.08873e-05 0.00368394
Year 1999 Obs = 0.0218978 0.009999 0.00619938 0.0216978 0.0969903 0.155284 0.228177 0.187781 0.0821918 0.0520948 0.0617938
0.0144986 0.00339966 0.0419958 0.00139986 0.00039996 0.00209979 0.00029997 0 0.00149985 0 0 0.00039996 0.00079992 0.00909909
Year 1999 Pred = 0.00496756 0.0131086 0.0240402 0.0510275 0.0948964 0.112251 0.267951 0.192559 0.0462046 0.0423486 0.0373306
0.0282995 0.031252 0.0229159 0.00600299 0.00292293 0.00794705 0.00487479 0.00072879 0.000271742 0.00491653 0.000129305 6.93791e-
05 7.69857e-05 5.50038e-05 0.00285317
Year 2000 Obs = 0.00290058 0.0157031 0.0375075 0.0557111 0.0773155 0.137227 0.171034 0.267654 0.111522 0.0160032 0.00970194
0.0469094 0.00590118 0.00640128 0.030206 0.00080016 0.00080016 0.00260052 0.00090018 0 0.00090018 0 0 0.00230046
Year 2000 Pred = 0.0108908 0.0156537 0.0282468 0.0417733 0.0637292 0.105885 0.115942 0.236152 0.167884 0.0497082 0.0374058
0.032321 0.0241086 0.0262741 0.0190568 0.00494702 0.00239061 0.00645859 0.0039406 0.000586468 0.000217837 0.00392842 0.000103031
5.51507e-05 6.10735e-05 0.0022793
Year 2001 Obs = 0.0161 0.0084 0.014 0.0255 0.0288 0.0539 0.0905 0.0997 0.2999 0.1934 0.0119 0.0329 0.0436 0.0054 0.001 0.0528 0
0.0022 0.0054 0 0.0107 0 0.0039
Year 2001 Pred = 0.00366303 0.0335419 0.0329673 0.0479701 0.0509777 0.0694588 0.106821 0.0997797 0.201016 0.176341 0.0428675
0.0316198 0.0268832 0.0197889 0.0213324 0.015333 0.00395034 0.00189688 0.00509736 0.00309603 0.000459008 0.000169938 0.00305612
7.99634e-05 4.27164e-05 0.00179101
Year 2002 Obs = 0.0014 0.0105 0.0736 0.0758 0.0928 0.0793 0.0974 0.1269 0.1034 0.1788 0.1101 0.0109 0.0089 0.0077 0.0019 0
0.0167 0 0.0006 0 0 0.0029 0.0004
Year 2002 Pred = 0.00685174 0.0110931 0.0694613 0.055056 0.0576036 0.0547268 0.0690379 0.0906376 0.0837811 0.208266 0.150002
0.0357432 0.0259417 0.0217658 0.0158481 0.0169301 0.012077 0.00309179 0.0014767 0.00395031 0.00239015 0.000353202 0.000130403
0.00233958 6.10912e-05 0.00138414
Year 2003 Obs = 0.00119988 0.0039996 0.0187981 0.0942906 0.10469 0.0936906 0.0567943 0.0947905 0.108589 0.0918908 0.148985
0.110389 0.0127987 0.00679932 0.00589941 0.00539946 0.00079992 0.0292971 0 0.00079992 0.00409959 0 0 0.00379962 0.00219978
Year 2003 Pred = 0.00165161 0.02111 0.0233713 0.118016 0.067264 0.0629313 0.0553715 0.0596378 0.0774983 0.0884051 0.180429
0.127381 0.0298659 0.0213912 0.0177531 0.0128098 0.0135812 0.00962675 0.00245135 0.00116553 0.00310595 0.00187315 0.000276035
0.000101671 0.0018204 0.00111126
Year 2004 Obs = 0.0299 0.0025 0.01 0.0632 0.1557 0.0915 0.0578 0.0662 0.0786 0.1096 0.0875 0.1012 0.0762 0.0117 0.0068 0.0094
0.0041 0.0011 0.028 0 0.0004 0.0001 0 0.0085
Year 2004 Pred = 0.00319716 0.00516194 0.0451168 0.040282 0.146294 0.0745823 0.0646302 0.0485617 0.0517786 0.083037 0.0777703
0.155583 0.108078 0.025007 0.0177167 0.0145709 0.0104344 0.0109927 0.00775039 0.00196464 0.000930537 0.00247167 0.00148648
0.000218536 8.033e-05 0.00230305
Year 2005 Obs = 0.00739852 0.00589882 0.0141972 0.09978 0.0717856 0.220156 0.074785 0.0729854 0.0716857 0.0627874 0.0940812
0.0606879 0.0891822 0.0166967 0.00889822 0.00389922 0.00709858 0.00339932 0 0.0133973 0.0004999 0 0.00029994 0.00039992
Year 2005 Pred = 0.00210083 0.0101477 0.0112036 0.0789696 0.0507086 0.164728 0.0777895 0.057565 0.0428205 0.0563477 0.0741916
0.0681109 0.134073 0.0919112 0.0210357 0.0147687 0.0120548 0.00857796 0.00898869 0.00630882 0.0015931 0.0007521 0.00199217
0.00119527 0.000175367 0.00188984
Year 2006 Obs = 0.00040004 0.0156016 0.0352035 0.0325033 0.157916 0.0568057 0.228323 0.0622062 0.0561056 0.0405041 0.0394039
0.0746075 0.0340034 0.10371 0.00690069 0.0080008 0.0149015 0.00720072 0.00590059 0.00410041 0.0136014 0 0.00050005 0 0.00160016
Year 2006 Pred = 0.00103005 0.0068371 0.0225836 0.0201079 0.101945 0.0585651 0.176234 0.0710785 0.0520776 0.0478091 0.0516525
0.0666638 0.0602181 0.116978 0.0793223 0.0179907 0.0125357 0.0101673 0.00719625 0.00750678 0.00524855 0.00132104 0.000621932
0.00164348 0.000984066 0.00168099

1939	0.0349455	0.0329864	0.0428661
1940	0.0384159	0.0359578	0.0470569
1941	0.0780443	0.0723934	0.0954481
1942	0.0950736	0.0864205	0.115894
1943	0.091595	0.0811806	0.111161
1944	0.106785	0.0924552	0.128992
1945	0.08922	0.0751955	0.10716
1946	0.110625	0.0915793	0.132225
1947	0.117472	0.0948678	0.139573
1948	0.14528	0.114217	0.171505
1949	0.115676	0.0879968	0.135388
1950	0.144565	0.107966	0.168084
1951	0.143285	0.104152	0.165132
1952	0.111925	0.079871	0.127926
1953	0.0929843	0.0651638	0.105791
1954	0.0739407	0.0516471	0.0839571
1955	0.0804999	0.0560018	0.0914636
1956	0.0850458	0.059382	0.0965576
1957	0.113775	0.079194	0.12889
1958	0.103594	0.0708276	0.116835
1959	0.104253	0.0713283	0.117081
1960	0.0779225	0.052473	0.087313
1961	0.0979845	0.0671098	0.109856
1962	0.100781	0.0673683	0.112946
1963	0.0723519	0.0489497	0.0809657
1964	0.0590352	0.0385052	0.0660223
1965	0.0557622	0.0370885	0.0625012
1966	0.0579463	0.0406762	0.0649767
1967	0.0724272	0.0557842	0.0815773
1968	0.0443288	0.03742	0.0502376
1969	0.0799132	0.0758973	0.09255
1970	0.110734	0.114469	0.130983
1971	0.143385	0.157934	0.17345
1972	0.1539	0.105693	0.189441
1973	0.162882	0.105684	0.198863
1974	0.113719	0.0682444	0.132917
1975	0.131084	0.0756941	0.143132
1976	0.14763	0.0982708	0.154107
1977	0.193134	0.166087	0.207808
1978	0.237718	0.219527	0.256467
1979	0.285837	0.24586	0.332691
1980	0.236363	0.209563	0.29284
1981	0.234829	0.189315	0.283541
1982	0.269518	0.17499	0.309309
1983	0.271176	0.146269	0.293337
1984	0.300022	0.169248	0.316951
1985	0.350788	0.173785	0.346254
1986	0.285191	0.111097	0.273081
1987	0.19203	0.0674766	0.180797
1988	0.116256	0.0398134	0.103416
1989	0.0594966	0.0200318	0.0505836
1990	0.0467726	0.0180281	0.0406013
1991	0.635184	0.282745	0.576265
1992	0.0891748	0.0234869	0.0718463
1993	0.0837972	0.017728	0.0675594
1994	0.641668	0.14019	0.500605
1995	0.0578256	0.00945504	0.0328209
1996	0.0454278	0.00964791	0.0255391
1997	0.0174578	0.00541777	0.0112839
1998	0.0191471	0.0074619	0.0143252
1999	0.00710022	0.00301252	0.00596864
2000	0.00666187	0.00247185	0.00624213
2001	0.00783888	0.00308157	0.00760385
2002	0.00433936	0.00154431	0.00414417
2003	0.00415699	0.00164653	0.00387799
2004	0.00319856	0.0013763	0.00297459
2005	0.0033312	0.00163813	0.00318082
2006	0.00270267	0.00153714	0.00265
2007	0.00397234	0.00231012	0.00412204

Population Numbers at the Start of the Year

51250.4 48745.5 46368 44106.4 41955.2 39908.8 37962.1 36110.3 34348.7 32673.1 31079.1 29563 28120.8 26749 25444.1 24202.9
23022.2 21899.1 20830.8 19814.7 18848.1 17928.6 17054 16222.1 15430.7 300951
52112.5 48750.9 46368.1 44106.6 41955.3 39908.9 37962.2 36110.4 34348.8 32673.1 31079.2 29563.1 28120.9 26749.1 25444.2 24202.9
23022.2 21899.2 20830.9 19814.7 18848.1 17928.6 17054 16222.1 15430.8 300948
52128 49570.9 46373.2 44106.6 41955.4 39908.7 37961.6 36109.7 34347.9 32672.1 31078.2 29562.1 28119.9 26748.2 25443.3 24202.1
23021.5 21898.4 20830.1 19814 18847.4 17928 17053.4 16221.5 15430.2 300935
52143.7 49585.6 47153.2 44111.5 41955.4 39908.6 37961.1 36108.7 34346.8 32670.7 31076.7 29560.6 28118.6 26746.8 25442 24200.9
23020.3 21897.3 20829.1 19813 18846.5 17927.1 17052.6 16220.7 15429.4 300917
52159.7 49600.5 47167.1 44853.4 41960 39908.4 37960.5 36107.8 34345.3 32668.9 31074.7 29558.6 28116.6 26745 25440.3 24199.2
23018.7 21895.8 20827.6 19811.6 18845.1 17925.8 17051.4 16219.6 15428.3 300893
52175.7 49615.6 47181.3 44866.6 42665.6 39912.3 37959.5 36106.3 34343.1 32666 31071.7 29555.4 28113.4 26741.9 25437.3 24196.4
23016 21893.2 20825.2 19809.3 18843 17923.7 17049.4 16217.7 15426.5 300856
52192 49630.9 47195.7 44880.1 42678.2 40583.7 37963.5 36105.6 34342 32664.4 31069.4 29552.9 28110.7 26739.2 25434.8 24194
23013.7 21891 20823.1 19807.3 18841 17921.9 17047.6 16216 15425 300822
52208.8 49646.5 47210.3 44893.9 42691.2 40596.4 38603.6 36111.1 34343.6 32665.9 31070.1 29552.9 28110.5 26738.7 25434.2 24193.4
23013.1 21890.5 20822.6 19806.8 18840.6 17921.5 17047.2 16215.6 15424.6 300812
52226.1 49662.4 47225.1 44907.8 42704.3 40608.6 38615.5 36719.7 34348.5 32667 31071.3 29553.4 28110.3 26738.3 25433.4 24192.6
23012.3 21889.7 20821.9 19806.1 18839.9 17920.8 17046.6 16215 15424 300799
52243.6 49679 47240.4 44921.9 42717.6 40621.4 38627.7 36731.7 34928.3 32672.7 31073.2 29555.3 28111.5 26738.8 25433.7 24192.6
23012.2 21889.6 20821.7 19806 18839.8 17920.7 17046.5 16214.9 15423.9 300795
52260.8 49695.6 47256.1 44936.4 42731 40634.1 38640 36743.5 34939.9 33224.4 31078.8 29557.4 28113.5 26740.1 25434.4 24193
23012.4 21889.6 20821.7 19806 18839.8 17920.7 17046.5 16214.9 15423.9 300793
52277.5 49712 47271.9 44951.4 42744.8 40646.9 38652.1 36755.2 34951.2 33235.5 31603.7 29562.8 28115.5 26742.1 25435.7 24193.7
23012.8 21889.8 20821.8 19806 18839.8 17920.8 17046.5 16214.9 15423.9 300791

52293.2 49727.8 47287.4 44966.3 42758.9 40659.5 38663.2 36765.6 34960.8 33244.5 31612.6 30060.5 28119.2 26742.7 25436.3 24193.7 23012.3 21889.1 20820.9 19805.1 18838.9 17919.9 17045.7 16214.1 15423.2 300775 52307.4 49742.8 47302.5 44981.2 42773.2 40673.2 38675.7 36776.7 34971.4 33254.5 31622 30069.7 28593.3 26746.8 25437.4 24194.8 23012.9 21889.1 20820.8 19804.7 18838.5 17919.4 17045.3 16213.7 15422.8 300765 52320 49756.3 47316.7 44995.5 42787.3 40686.7 38688.6 36788.4 34981.7 33264.3 31631.2 30078.4 28601.8 27197.5 25441.2 24195.7 23013.8 21889.5 20820.6 19804.4 18838 17918.9 17044.7 16213.2 15422.3 300753 52330.4 49768.3 47329.5 45009 42800.9 40700.1 38701.4 36800.6 34992.8 33274.1 31640.5 30087.1 28610.1 27205.6 25869.9 24199.3 23014.6 21890.3 20821 19804.3 18837.6 17918.4 17044.2 16212.7 15421.8 300741 52339.4 49778.1 47340.9 45021.1 42813.7 40712.7 38713.3 36811.9 35003.2 33283.3 31648.5 30094.7 28617.2 27212.3 25876.5 24606 23017 21890.2 20820.9 19803.8 18836.7 17917.3 17043 16211.5 15420.6 300717 52346.3 49786.7 47350.3 45032 42825.3 40725.1 38726 36824 35015 33294.3 31658.4 30103.4 28625.4 27220.1 25883.8 24613.2 23404.7 21893.3 20821.5 19804.4 18836.9 17917.1 17042.6 16210.9 15420 300703 52351.7 49793.2 47358.4 45040.9 42835.6 40735.9 38737.2 36835.4 35025.6 33304.5 31667.9 30111.8 28632.8 27227.1 25890.4 24619.4 23410.8 22261.4 20823.8 19804.4 18836.9 17916.7 17041.9 16210.1 15419 300681 52357.2 49798.3 47364.6 45048.5 42843.9 40744.9 38745.7 36844.1 35033.9 33311.8 31674.9 30118.4 28638.5 27231.8 25894.8 24623.6 23414.8 22265.4 21172.2 19804.9 18835.4 17915.3 17040.1 16208 15416.9 300633 52360.2 49803.6 47369.4 45054.4 42851.3 40753.4 38755.8 36853.9 35044.4 33322.2 31684.2 30127.3 28646.6 27239.2 25901.3 24629.6 23420.5 22270.7 21177.5 20137.7 18837.2 17915.1 17039.9 16207.5 15416.1 300608 52361.4 49806.3 47374.4 45058.9 42856.7 40759.6 38762 36861.3 35051 33329.1 31691.2 30133.3 28652.6 27244.6 25905.9 24633.5 23424.1 22274.1 21180.6 20140.9 19152 17915.2 17038.2 16205.9 15414.2 300555 52360.5 49806.5 47376.1 45062.8 42859.6 40758.9 38755.1 36852.9 35039.8 33314.7 31678.1 30121.3 28640.6 27233.3 25895 24622.6 23413.2 22263.7 21170.7 20131.4 19143.2 18203.3 17027.7 16194.2 15403.1 300317 52326.9 49789.7 47361.4 45048.6 42839.1 40656.8 38528.2 36592.1 34709.2 32940.2 31318.5 29779.9 28316.4 26924.5 25601.4 24343.4 23147.2 22010.3 20929.7 19902.2 18925.1 17996.1 17112.5 16007.4 15223.8 296802 52182.4 49721.2 47311 44998.3 42770.1 40397.8 37918.5 35804.1 33739.1 31816.5 30194.9 28708.3 27298 25956.4 24680.5 23467.8 22314.6 21218.1 20175.9 19185.3 18243.5 17347.9 16496.3 15686.3 14673.3 286021 51969.8 49602.1 47263.1 44968.6 42750.1 40452.2 37931.3 35519 33365.4 31320.2 29535.4 28030.1 26650.1 25340.9 24095.5 22911.1 21785.2 20714.7 19696.9 18729.4 17809.9 16935.5 16104.1 15313.6 14561.7 279136 51774.2 49384.9 47135.6 44907.9 42698.8 40333.8 37770.1 35296.2 32807.9 30649.2 28770.5 27131 25748.2 24480.6 23277.9 22133.9 21045.9 20011.8 19028.8 18093.4 17204.7 16360 15556.8 14793.1 14066.9 269789 51499.7 49185.1 46916.2 44773 42620 40194.2 37466 34932.8 32337.8 29847.1 27883.3 26174.1 24682.5 23424.5 22271.3 21177.2 20136.4 19146.6 18205.8 17311.2 16460.5 15652 14883.6 14152.9 13458.1 258239 51158.3 48918 46720.4 44558.3 42482.3 40078.4 37248.4 34555 31885.8 29289.5 27033.6 25254.9 23706.8 22355.8 21216.4 20171.9 19180.9 18238.3 17341.8 16489.6 15679.3 14908.9 14176.6 13480.6 12818.8 246086 50626 48522 46399.2 44300.8 42168.8 39478.5 36154 33277.1 30226.4 27456.3 25220.7 23278.2 21746.6 20413.6 19250.3 18269.1 17369.7 16516.4 15704.7 14932.7 14199 13501.2 12837.8 12207.3 31607.9 222939 49751.4 47986.8 45994.8 43965.7 41878.3 38988.1 35202.9 31860.2 28581 25468.2 23134.1 21250.5 19613.8 18323.2 17200.1 16219.9 15393.2 14635.4 13916.4 13232.5 12582 11963.7 11375.9 10816.9 10285.6 197624 48724.2 47163.8 45493.3 43588.8 41571 38759.9 34848 31109 27466.5 24188.8 21554.4 19579 17984.8 16599.7 15507.4 14556.9 13727.3 13027.7 12386.3 11777.8 11199 10648.5 10125.2 9627.9 9154.6 175960 47528 46163.9 44688.2 43086.8 41173.6 38301.1 34288.1 30421.6 26384.7 22799.5 20078.8 17892 16252.3 14928.9 13779.1 12872.5 12083.4 11394.8 10814.1 10281.7 9776.57 9296.11 8839.15 8404.81 7991.8 153660 45777.9 45060.1 43769 42354.6 40746.3 38134.7 34289.2 30358.5 26293.2 23379.9 19354.4 17044.8 15188.4 13796.5 12673.1 11697 10927.4 10257.6 9673.02 9180.02 8728.06 8299.28 7891.42 7503.51 7134.8 137226 45641.2 43366.3 42688.8 41447.2 39997.7 37498.2 33647.1 29841.6 25642.2 21718.9 18501.3 15987.3 14079.5 12546.1 11396.3 10468.3 9662.07 9026.33 8473.04 7990.19 7582.96 7209.63 6855.45 6518.54 6198.11 119246 45424.5 43225.7 41073.9 40413.1 39123.3 36734 32931.9 29121.9 25020.9 20997 17784.4 15149.7 13091.1 11528.9 10273.3 9331.78 8571.95 7911.74 7391.16 6938.1 6542.72 6209.26 5903.57 5613.54 5337.67 102719 42589.2 42976 40899 38840.2 38077.6 35633.5 31656.6 27872.8 23698.9 19774.1 16594 14055.1 11972.9 10345.9 9111.35 8119.01 7374.95 6774.45 6252.68 5841.27 5483.21 5170.74 4907.21 4665.62 4436.41 85397.8 41044.3 40338 40706.9 38721.5 36666.8 34989.4 31332.4 27438.8 23415.3 19450.2 16229.1 13619.1 11535.4 9826.4 8491.15 7477.89 6663.46 6052.79 5559.95 5131.72 4794.06 4500.2 4243.75 4027.46 3829.18 73729 39736.7 38832.9 38167.7 38494.3 36485.5 33403.2 30167.8 26534.3 22346.3 18522.1 15385.6 12837.6 10773.1 9124.76 7772.93 6716.72 5915.2 5270.97 4787.91 4398.06 4059.32 3792.23 3559.77 3356.91 3185.82 61350.5 36567.6 37597.6 36745.3 36095 36274.5 33250.8 28825.3 25574.4 21639.9 17705.4 14675.4 12190.3 10171.5 8535.69 7229.72 6158.64 5321.78 4686.72 4176.28 3793.55 3484.66 3216.27 3004.65 2820.47 2659.74 51133.3 42706.9 34639.5 35617.4 34794.3 34083.6 33369.9 29312 25060.1 21571.2 17845.2 14600.9 12102.2 10052.9 8388.01 7039.03 5962.05 5078.78 4388.66 3864.95 3444.01 3128.39 2873.66 2652.33 2477.81 2325.93 44360.9 38985 40483.6 32837.9 33752.3 32896.2 31532.5 29798.2 25874.2 21571.9 18223.9 15076.1 12335.3 10224.3 8492.95 7086.43 5946.77 5036.91 4290.7 3707.66 3265.22 2909.6 2642.95 2427.75 2240.76 2093.33 39442.4 42419.1 36981.7 38404.9 31142.4 31950.8 30607.7 28524.3 26709.2 22733.1 18672.7 15774.7 13050 10677.5 8850.2 7351.53 6134.04 5147.55 4359.97 3714.04 3209.37 2826.39 2518.56 2287.75 2101.47 1939.61 35953.5 36063.3 40229.5 35074.3 36412.3 29467.6 29669.9 27564.5 25432.9 23301.9 19513.9 16028.5 13540.9 11202 9165.45 7596.94 6310.49 5265.41 4418.61 3742.56 3188.1 2754.89 2426.15 2161.91 1963.78 1803.88 32527.1 37748.1 34196 38148.2 33248.4 34443.8 27326.8 26637.5 24487.5 22080.3 19886.4 16653.7 13679.2 11556.2 9560.07 7822.04 6483.44 5385.55 4493.65 3770.97 3194 2720.81 2351.1 2070.54 1845.03 1675.95 29299 39862.9 35755.3 32392.7 36120 31391.8 31668.3 24059.4 23123.7 20613.5 18165.8 16360.9 13701.2 11254.1 9507.44 7865.22 6435.32 5334.02 4430.77 3696.99 3102.43 2627.76 2238.46 1934.29 1703.46 1517.94 25483.6 33386.2 37772.8 33882.4 30683.2 34125.8 28950.2 28075.5 21057.3 19679.5 17180.7 15140.6 13636.3 11419.6 9379.94 7924.16 6555.43 5363.64 4445.75 3692.92 3081.33 2585.78 2190.16 1865.69 1612.17 1419.79 22505 41037.2 31634.9 35793.4 32093.4 28987.9 31465.3 25654.2 24559.3 17908.2 16388.5 14307.6 12608.7 11355.9 9509.87 7811.33 6599 5459.16 4466.68 3702.29 3075.35 2566.04 2153.36 1823.9 1553.69 1342.57 19923.8 31020.4 38922.7 30006.1 33939.9 30372.6 26939.2 28386.6 22921.3 21485.6 15422.9 14114.1 12321.9 10858.8 9779.92 8190.07 6727.26 5683.18 4701.53 3846.79 3188.48 2648.55 2209.92 1854.52 1570.77 1338.06 18315 45024.2 29400 36891.6 28429 32077.8 28057.3 23974.2 24956.9 19625.1 18036.2 12946.8 11848.1 10343.7 9115.5 8209.81 6875.21 5647.24 4770.78 3946.73 3229.21 2676.59 2223.34 1855.13 1556.79 1318.6 16497.9 28797 42667.9 27863 34948.6 26864.4 29607.8 84921.8 21030.2 21303.9 16415.8 15086.7 10829.6 9910.58 8652.19 7624.82 6867.24 5750.88 4723.73 3990.6 3301.31 2701.13 2238.88 1859.75 1551.76 1302.2 14902.9 52268.9 27318.9 40479.4 26426.1 33086.8 25007.4 26812.1 22366.8 18508.7 18478.1 14238.4 13085.6 9393.16 8596.04 7504.57 6613.46 5956.37 4988.09 4097.18 3461.29 2863.42 2342.85 1941.91 1613.07 1345.93 14055.7 33641.7 49610.6 25930.3 38412.7 25040.1 30922.6 22852.1 24322.4 19968.6 16328.8 16301.8 12561.4 11544.4 8286.85 7583.61 6620.69 5834.54 5254.84 4400.6 3614.62 3053.62 2526.17 2066.91 1713.2 1423.09 13587.6 18664 31934.6 47094.6 24609.7 36406 23425.2 28320.3 20784.7 21791 17690.5 14465.8 14442 1128.3 10227.3 7341.42 6718.42 5865.35 5168.89 4655.32 3898.54 3202.23 2705.24 2237.97 1831.1 1517.74 13298.2 4693.57 17715.5 30312.6 44692.2 23320.7 34035.7 21422 25713 18577.8 19251.2 15628.6 12779.8 12758.7 9831.28 9035.32 6485.76 5935.37 5181.73 4566.44 4112.74 3444.16 2829.01 2389.94 1977.13 1617.68 13089.9 3450.28 4452.64 16806.7 28749.3 42311.1 21708.2 30820.4 19224.7 22628.2 16112.1 16696.1 13554.3 11083.6 11065.4 8526.44 7836.12 5624.95 5147.61 4494 3960.37 3566.88 2987.04 2453.53 2072.74 1714.72 12754.8 1633.2 3276.6 4228.6 15958.2 27267.8 39717.7 20036.5 28290.9 17436.7 20341.1 14483.7 15008.6 12184.4 9964.1 9946.97 7664.67 7044.12 5056.43 4627.34 4039.78 3560.09 3206.37 2685.14 2205.55 1863.25 13007.1 1991.1 1548.93 3107.67 4009.3 15100.6 25325.6 35783 17873.4 24697.4 14978.7 17473.7 12442 12892.9 10466.8 8558.91 8544.78 6584.21 6051.14 4343.65 3975.04 3470.31 3058.24 2754.38 2306.62 1894.64 12774.1 2118.14 1886.2 1467.41 2942.81 3786.17 13896.4 22343.7 31138.9 15095 20397.9 12371.1 14431.8 10276 10648.4 8644.67 7068.92 7057.25 5437.99 4997.72 3587.48 3283.04 2866.18 2525.84 2274.88 1905.07 12115.1

133832 2004.11 1784.79 1387.72 2773.09 3450.4 11991.1 18940.1 25391.9 11958.5 16159.6 9800.64 11433.1 8140.81 8435.87 6848.46
5600.12 5590.88 4308.07 3959.28 2842.06 2600.88 2270.64 2001.02 1802.2 11107.1
4977.78 12657.7 1895.64 1687.14 1306.78 2519.23 2956.11 10078.9 15271.19847.9 9347.52 12631.3 7660.78 8936.83 6363.36 6594
5353.18 4377.4 4370.18 3367.45 3094.82 2221.53 2033.01 1774.87 1564.12 10090.7
2321.25 4706.38 119686 1791.26 1587.81 1183.97 2145.2 2466.83 8048.4 11800.8 15337.6 7223.35 9760.92 5919.91 6905.98 4917.32
5095.55 4136.7 3382.66 3377.08 2602.22 2391.54 1716.7 1571.02 1371.54 9006.31
1437.55 2198.72 4458.2 113323 1691.24 1459.88 1042.45 1862.3 2076.69 6622.02 9709.38 12619.4 5943.19 8031.03 4870.75 5682.07
4045.85 4192.49 3403.57 2783.17 2778.57 2141.04 1967.7 1412.46 1292.59 8538.63
1400.21 1360.78 2081.45 4218.2 106874 1546.94 1270.3 892.434 1538.8 1671.21 5329.05 7813.6 10155.4 4782.76 6462.95 3919.73
4572.63 3255.89 3373.89 2739.01 2239.75 2236.05 1723 1583.5 1136.67 7911.65
879.565 1324.61 1287.42 1968.07 3973.82 97272.3 1330.99 1073.12 724.416 1212.48 1316.81 4198.97 6156.63 8001.83 3768.52 5092.41
3088.5 3602.95 2565.44 2658.42 2158.17 1764.78 1761.87 1357.61 1247.7 7129.52
1109.6 830.672 1251.11 1215.04 1848.52 3567.94 81144.2 1084.01 829.531 538.604 901.479 979.052 3121.94 4577.46 5949.36 2801.9
3786.21 2296.31 2678.8 1907.41 1976.54 1604.6 1312.12 1309.95 1009.39 6228.47
28232.9 1046.18 783.298 1178.63 1137.9 1637.74 2887.52 63760.3 798.759 582.657 378.312 633.192 687.68 2192.83 3215.18 4178.79
1968.04 2659.41 1612.91 1881.57 1339.75 1388.31 1127.06 921.622 920.101 5083.82
1064.72 26571.6 984.776 736.474 1100.33 993.755 1282.77 2182.82 44615.4 527.638 384.887 249.902 418.27 454.263 1448.52 2123.86
2760.4 1300.03 1756.73 1065.44 1242.91 885.002 917.079 744.508 608.799 3966.03
2003.7 1003.92 25057.5 927.776 689.78 975.26 804.981 1009.05 1610.77 31391.8 371.251 270.81 175.833 294.298 319.623 1019.19
1494.37 1942.24 914.713 1236.05 749.656 874.524 622.695 645.264 523.842 3218.89
9991.06 1889.38 946.761 23608.6 869.041 611.656 790.824 633.997 745.838 1135.57 22130.8 261.727 190.918 123.96 207.476 225.33
718.518 1053.51 1369.25 644.861 871.402 528.498 616.529 438.992 454.903 2638.58
13163.5 9408.89 1779.55 890.757 22063.7 762.664 484.425 605.719 451.477 503.045 765.908 14926.6 176.527 128.768 83.6074 139.936
151.978 484.618 710.559 923.52 434.939 587.734 356.455 415.83 296.086 2086.46
3722.92 12395.7 8861.4 1674.17 832.379 19353.4 603.34 370.543 430.572 303.864 338.571 515.49 10046.2 118.81 86.6666 56.2715
94.1835 102.288 326.169 478.238 621.57 292.733 395.571 239.91 279.872 1603.56
5884.9 3502.01 11662 8326.87 1561.5 723.859 15013.1 450.924 255.361 279.323 197.124 219.64 334.412 6517.25 77.0754 56.2229
36.5048 61.0993 66.357 211.595 310.245 403.228 189.904 256.617 155.636 1221.83
19169.4 5525.24 3288.61 10936 7740.64 1337.46 542.475 10771.8 294.264 155.271 169.841 119.86 133.551 203.337 3962.78 46.8653
34.186 22.1965 37.1511 40.348 128.659 188.643 245.181 115.47 156.035 837.561
17385.6 18041.9 5201.06 3092.11 10209.9 6761.37 1048.03 410.298 7542.64 194.543 102.652 112.285 79.2418 88.2929 134.43 2619.86
30.9835 22.601 14.6745 24.5612 26.6748 85.0587 124.715 162.093 76.3392 656.883
11065 16419.9 17041.5 4908.87 2904.5 9170.08 5644.55 854.314 317.539 5615.87 144.847 76.4297 83.6015 58.9994 65.7384 100.09
1950.62 23.0687 16.8275 10.9259 18.287 19.8607 63.3303 92.8566 120.686 545.92
12846.8 10479.9 15552.6 16133.8 4633.99 2668.47 8060.04 4890.21 717.243 260.419 4605.66 118.791 62.6812 68.5629 48.3864 53.9131
82.0851 1599.73 18.919 13.8005 8.9605 14.9975 16.288 51.9382 76.1532 546.694
11647.8 12193.2 9947.04 14758.3 15287.2 4330.28 2437.71 7308.88 4363.71 632.395 229.612 4060.82 104.738 55.2662 60.4521 42.6624
47.5353 72.3746 1410.49 16.6809 12.168 7.9005 13.2233 14.3612 45.794 549.166
13727.3 11060.4 11578.7 9443.91 13995.5 14339.7 3990.19 2233.26 6611.74 3910.45 566.709 205.762 3639.03 93.8593 49.5257 54.173
38.2311 42.5978 64.8571 1263.98 14.9483 10.9041 7.07988 11.8498 12.8695 533.162
55923.2 12752.6 10278.6 10732.8 8616.81 11010.5 8857.43 2277.83 1073.73 2796.95 1654.23 239.733 87.0432 1539.41 39.7051 20.9508
22.9167 16.1728 18.0201 27.4364 534.699 6.32355 4.61273 2.99499 5.01281 230.987
80778.6 53019.4 12091 9741.9 10149.8 7980.94 9857.47 7842.6 1968.82 911.534 2374.45 1404.35 203.52 73.8948 1306.87 33.7074
17.786 19.455 13.7298 15.298 23.2919 453.93 5.36834 3.91595 2.54258 200.35
41608.1 76599.6 50278.8 11462.2 9216 9415.92 7171.35 8765.88 6817.92 1682.92 779.168 2029.65 1200.42 173.967 63.1644 1117.1
28.8127 15.2033 16.6299 11.7361 13.0766 19.9097 388.014 4.58879 3.34731 173.43
45975.1 38644.4 71168.3 46593.2 10453.9 7236.32 5790.5 4072.55 4185.29 2860.41 706.058 326.895 851.528 503.629 72.9866 26.5002
468.672 12.0882 6.37844 6.97696 4.92379 5.48619 8.35297 162.789 1.9252 74.1659
37073 43638.8 36681.7 67538.1 44153.1 9773.6 6618.08 5257.91 3640.61 3698.05 2527.41 623.861 288.839 752.397 444.998 64.4898
23.4151 414.111 10.6809 5.63588 6.16473 4.35058 4.84751 7.38055 143.837 67.2329
36471.5 35205.3 41441.4 34828.3 64053.2 41433.2 9014.23 6069.56 4763.27 3268.07 3319.63 2268.78 560.021 259.282 675.404 399.461
57.8905 21.0191 371.735 9.58793 5.05916 5.53389 3.90538 4.35146 6.6253 189.471
51554.2 34670.2 33466.9 39392.2 33091.8 60612.1 38947.5 8455.11 5666.28 4431.16 3040.21 3088.18 2110.6 520.976 241.204 628.313
771.61 53.8543 19.5536 345.817 8.91945 4.70643 5.14806 3.6331 4.04807 182.424
34059 49004.9 32956.2 31809.8 37424 31298.2 56910.4 36482.2 7879.01 5259.87 4113.34 2822.16 2866.68 1959.22 483.609 223.904
583.248 344.957 49.9916 18.1511 321.013 8.27971 4.36886 4.77882 3 37251 173.098
195407 70428.4 46602.8 31339.8 30244.4 35523.3 29628.4 53826.8 34439.2 7427.17 4958.23 3877.45 2660.31 2702.29 1846.86 455.875
211.064 549.8 325.174 47.1247 17.1102 302.604 7.80488 4.11832 4.50476 166.35
80932 185830 66977.2 44317.9 29798.3 28712.1 33638.2 28032.9 50836.5 32482.4 7005.15 4676.5 3657.13 2509.15 2548.74 1741.92
429.972 199.071 518.56 306.698 44.4471 16.138 285.41 7.36141 3.88431 161.147
189572 76962.4 176717 63690.4 42134.8 28278.7 27166.6 31796.6 26442.1 47876 30590.7 6597.2 4404.16 3444.16 2363.03 2400.31
1640.48 404.933 187.478 488.362 288.837 41.8587 15.1982 268.789 6.93271 155.421
56254.6 180298 73197.3 168068 60566.9 40027.9 26820.3 25751.7 30105.2 25013.7 45289.7 28938.2 6240.81 4166.24 3258.1 2235.37
2270.64 1551.86 383.057 177.35 461.979 273.233 39.5974 14.3771 254.268 153.583
132153 53502.7 171478 69615.6 159828 57541.5 37968.3 25427.2 24386.7 28485.5 23667.9 42853 27381.3 5905.04 3942.09 3082.81
2115.11 2148.48 1468.37 362.448 167.808 437.124 258.533 37.467 13.6036 385.908
103773 125692 50887.4 163094 66206.5 151888 54616.3 36023.3 24104.1 23102.8 26985.9 22421.9 40597 25939.8 5594.18 3734.56
2920.51 2003.76 2035.37 1391.07 343.367 158.974 414.112 244.923 35.4946 378.48
59299.5 98699.3 119548 48399 155106 62914.9 144153 51813.7 34144.5 22831.3 21882.9 25560.9 21237.9 38453.3 24570.1 5298.78
3537.36 2766.3 1897.95 1927.9 1317.61 325.236 150.58 392.245 231.99 392.114
206252 56401.7 93876.4 113705 46030.4 147422 59736.7 136825 49143.8 32367.5 21643.1 20744 24230.6 20132.6 36452 23291.3 5023.01
3353.26 2622.33 1799.17 1827.56 1249.04 308.309 142.743 371.831 591.623

q by index
index 1 q over time
1963 0.594601
1964 0.594601
1965 0.594601
1966 0.594601
1967 0.594601
1968 0.594601
1969 0.594601
1970 0.594601
1971 0.594601
1972 0.594601
1973 0.594601
1974 0.594601
1975 0.594601
1976 0.594601
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1983 0.594601
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 2000 0.594601
 2001 0.594601
 2002 0.594601
 2003 0.594601
 2004 0.594601
 2005 0.594601
 2006 0.594601
 2007 0.594601

index 2 q over time
 1968 0.542274
 1969 0.542274
 1970 0.542274
 1971 0.542274
 1972 0.542274
 1973 0.542274
 1974 0.542274
 1975 0.542274
 1976 0.542274
 1977 0.542274
 1978 0.542274
 1979 0.542274
 1980 0.542274
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 1982 0.542274
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 1997 0.542274
 1998 0.542274
 1999 0.542274
 2000 0.542274
 2001 0.542274
 2002 0.542274
 2003 0.542274
 2004 0.542274
 2005 0.542274
 2006 0.542274
 2007 0.542274

Proportions of catch at age by fleet

fleet 1
 Year 1 Obs = 0
 Year 1 Pred = 0.00187876 0.00176079 0.00185873 0.00284748 0.0123476 0.0267068 0.0300425 0.0381871 0.0431379 0.0410335 0.0390317
 0.0371276 0.0353164 0.0335936 0.0319548 0.030396 0.0289132 0.0275027 0.0261611 0.0248849 0.0236709 0.0225162 0.0214178 0.020373
 0.0193792 0.377959
 Year 2 Obs = 0
 Year 2 Pred = 0.00191034 0.00176096 0.00185871 0.00284745 0.0123474 0.0267063 0.0300419 0.0381862 0.0431368 0.0410324 0.0390307
 0.0371266 0.0353154 0.0335926 0.0319539 0.0303951 0.0289123 0.0275019 0.0261603 0.0248842 0.0236703 0.0225156 0.0214172 0.0203724
 0.0193786 0.377944
 Year 3 Obs = 0
 Year 3 Pred = 0.00191093 0.0017906 0.00185894 0.00284749 0.0123476 0.0267064 0.0300416 0.0381857 0.0431358 0.0410312 0.0390295
 0.0371255 0.0353144 0.0335917 0.0319529 0.0303942 0.0289115 0.0275011 0.0261595 0.0248834 0.0236695 0.0225149 0.0214166 0.0203718
 0.0193778 0.377929
 Year 4 Obs = 0
 Year 4 Pred = 0.00191155 0.00179118 0.00189025 0.00284787 0.0123479 0.0267068 0.0300418 0.0381853 0.043135 0.0410301 0.0390282
 0.0371243 0.0353132 0.0335905 0.0319518 0.0303931 0.0289105 0.0275001 0.0261586 0.0248825 0.0236687 0.0225141 0.0214158 0.0203711
 0.0193773 0.377912
 Year 5 Obs = 0
 Year 5 Pred = 0.00191221 0.00179178 0.00189088 0.00289587 0.0123496 0.0267074 0.030042 0.0381849 0.0431337 0.0410284 0.0390263
 0.0371222 0.0353112 0.0335886 0.03195 0.0303914 0.0289088 0.0274986 0.0261571 0.0248811 0.0236673 0.0225128 0.0214146 0.0203699
 0.0193762 0.377887
 Year 6 Obs = 0
 Year 6 Pred = 0.00191257 0.00179212 0.00189123 0.00289639 0.0125558 0.026707 0.0300378 0.0381791 0.0431262 0.0410203 0.0390182
 0.0371141 0.0353034 0.0335811 0.0319429 0.0303846 0.0289023 0.0274924 0.0261512 0.0248755 0.0236662 0.0225077 0.0214097 0.0203653
 0.0193719 0.377799
 Year 7 Obs = 0

Year 7 Pred = 0.00191239 0.00179194 0.00189103 0.00289608 0.0125545 0.0271457 0.0300295 0.038164 0.043109 0.0410031 0.0390008
0.0370973 0.0352869 0.0335653 0.0319279 0.0303703 0.0288887 0.0274794 0.0261389 0.0248638 0.0236508 0.0224971 0.0213996 0.0203557
0.0193627 0.377617
Year 8 Obs = 0
Year 8 Pred = 0.00191204 0.0017916 0.00189066 0.0028955 0.012552 0.0271404 0.0305202 0.0381504 0.0430889 0.040984 0.0389819
0.0370784 0.0352686 0.0335475 0.0319108 0.030354 0.0288732 0.0274647 0.0261249 0.0248504 0.0236381 0.022485 0.0213881 0.0203448
0.0193523 0.377412
Year 9 Obs = 0
Year 9 Pred = 0.0019114 0.00179099 0.00189 0.00289448 0.0125475 0.0271308 0.0305097 0.0387681 0.0430671 0.0409588 0.038958
0.0370549 0.0352454 0.0335251 0.0318891 0.0303333 0.0288535 0.0274459 0.026107 0.0248334 0.023622 0.0224696 0.0213735 0.0203308
0.019339 0.37715
Year 10 Obs = 0
Year 10 Pred = 0.00191056 0.0017902 0.00188915 0.00289315 0.0125417 0.0271183 0.0304958 0.0387508 0.0437603 0.0409343 0.0389304
0.0370287 0.0352198 0.0335 0.0318649 0.0303099 0.0288311 0.0274246 0.0260867 0.0248141 0.0236036 0.0224521 0.0213569 0.020315
0.019324 0.376854
Year 11 Obs = 0
Year 11 Pred = 0.00190975 0.00178944 0.00188835 0.0028919 0.0125362 0.0271063 0.0304824 0.038734 0.0437417 0.0415941 0.038908
0.0370033 0.0351957 0.0334764 0.0318417 0.0302875 0.0288095 0.0274039 0.026067 0.0247954 0.0235858 0.0224352 0.0213407 0.0202997
0.0193094 0.376567
Year 12 Obs = 0
Year 12 Pred = 0.001909 0.00178876 0.00188763 0.0028908 0.0125312 0.0270952 0.0304698 0.038718 0.0437237 0.0415773 0.039536
0.0369828 0.0351723 0.0334542 0.0318199 0.0302661 0.0287888 0.027384 0.0260479 0.0247772 0.0235685 0.0224187 0.0213251 0.0202847
0.0192952 0.376287
Year 13 Obs = 0
Year 13 Pred = 0.00190827 0.00178811 0.00188697 0.0028898 0.0125269 0.0270853 0.0304581 0.038703 0.0437065 0.0415609 0.0395207
0.0375803 0.0351535 0.0334325 0.0317994 0.0302459 0.028769 0.0273648 0.0260294 0.0247595 0.0235516 0.0224027 0.0213098 0.0202702
0.0192814 0.376015
Year 14 Obs = 0
Year 14 Pred = 0.00190752 0.00178745 0.00188631 0.00288882 0.0125227 0.0270763 0.0304475 0.0386887 0.0436903 0.0415454 0.0395059
0.0375666 0.0351722 0.0334152 0.0317794 0.030227 0.0287504 0.0273465 0.0260117 0.0247424 0.0235352 0.0223871 0.0212949 0.0202561
0.0192679 0.375751
Year 15 Obs = 0
Year 15 Pred = 0.00190674 0.00178678 0.00188566 0.00288787 0.0125187 0.0270677 0.0304379 0.0386759 0.043675 0.0415307 0.0394918
0.0375531 0.0351096 0.0333956 0.0317635 0.0302085 0.0287329 0.0273292 0.0259947 0.0247259 0.0235193 0.0223718 0.0212805 0.0202423
0.0192548 0.375493
Year 16 Obs = 0
Year 16 Pred = 0.00190595 0.00178612 0.00188501 0.00288697 0.012515 0.0270598 0.030429 0.0386645 0.0436612 0.0415167 0.0394784
0.0375402 0.0356973 0.0333945 0.0322784 0.0301939 0.0287158 0.027313 0.0259787 0.0247102 0.0235041 0.0223571 0.0212663 0.0202289
0.019242 0.375241
Year 17 Obs = 0
Year 17 Pred = 0.00190515 0.00178541 0.00188435 0.00288603 0.0125113 0.0270524 0.0304206 0.0386539 0.043649 0.0415043 0.0394657
0.0375281 0.0356857 0.0333938 0.032268 0.0306837 0.0287022 0.0272971 0.0259637 0.0246953 0.0234894 0.0223429 0.0212526 0.0202157
0.0192295 0.374994
Year 18 Obs = 0
Year 18 Pred = 0.0019043 0.00178468 0.00188363 0.00288505 0.0125074 0.0270447 0.0304126 0.0386437 0.0436377 0.0414933 0.0394545
0.0375166 0.0356746 0.03339232 0.0322579 0.0306744 0.0291683 0.0272847 0.025949 0.0246814 0.0234757 0.0223293 0.0212395 0.020203
0.0192173 0.374754
Year 19 Obs = 0
Year 19 Pred = 0.00190352 0.001784 0.00188298 0.00288414 0.0125039 0.0270374 0.0304051 0.0386345 0.0436267 0.041483 0.0394445
0.0375063 0.0356641 0.03339131 0.0322482 0.0306651 0.0291598 0.0277281 0.0259375 0.0246677 0.0234627 0.0223165 0.0212268 0.0201907
0.0192054 0.374518
Year 20 Obs = 0
Year 20 Pred = 0.00190278 0.0017833 0.0018823 0.00288321 0.0125002 0.0270305 0.0303974 0.0386257 0.0436172 0.0414731 0.0394352
0.0374974 0.0356548 0.03339036 0.032239 0.0306563 0.0291513 0.0277203 0.0263593 0.0246571 0.02345 0.0223045 0.0212149 0.0201789
0.019194 0.374288
Year 21 Obs = 0
Year 21 Pred = 0.00190199 0.00178265 0.0018816 0.00288222 0.0124964 0.0270228 0.0303901 0.0386163 0.0436077 0.0414646 0.0394264
0.037489 0.0356468 0.0338953 0.0322304 0.030648 0.0291434 0.0277127 0.0263523 0.0250585 0.0234402 0.0222927 0.0212037 0.0201679
0.0191831 0.374063
Year 22 Obs = 0
Year 22 Pred = 0.00190179 0.00178252 0.00188156 0.00288212 0.0124956 0.0270193 0.0303855 0.0386095 0.0435973 0.0414555 0.0394182
0.0374806 0.0356388 0.0338875 0.0322224 0.0306397 0.0291354 0.027705 0.026345 0.0250517 0.0238217 0.0222834 0.0211925 0.0201572
0.0191725 0.373838
Year 23 Obs = 0
Year 23 Pred = 0.00191166 0.00179182 0.0018914 0.00289703 0.0125475 0.0270852 0.0304386 0.0386305 0.0435796 0.041434 0.0393985
0.0374623 0.0356208 0.0338705 0.0322061 0.0306236 0.0291194 0.0276898 0.0263303 0.0250378 0.0238087 0.0226397 0.0211777 0.0201409
0.0191571 0.37351
Year 24 Obs = 0
Year 24 Pred = 0.00195255 0.00183071 0.00193243 0.00295914 0.0127851 0.0274399 0.0306964 0.0388074 0.0435896 0.041368 0.0393314
0.0373992 0.0356512 0.0338132 0.0321516 0.0305717 0.0290695 0.0276417 0.0262846 0.0249942 0.0237672 0.0226005 0.0214908 0.020103
0.0191189 0.37274
Year 25 Obs = 0
Year 25 Pred = 0.00200132 0.00187904 0.00198411 0.00303849 0.0131365 0.0281118 0.0311678 0.0392263 0.0438142 0.0413174 0.0392116
0.0372811 0.0354496 0.0337075 0.0320506 0.0304756 0.0289781 0.0275542 0.0262008 0.0249144 0.0236913 0.0225282 0.0214223 0.0203705
0.0190551 0.371432
Year 26 Obs = 0
Year 26 Pred = 0.00204361 0.00192198 0.00203222 0.00311295 0.0134482 0.0287865 0.0318675 0.0397306 0.0442021 0.0414926 0.0391281
0.0371339 0.0353057 0.0335712 0.0319214 0.0303523 0.0288608 0.0274426 0.0260941 0.0248125 0.0235943 0.0224359 0.0213345 0.0202872
0.0192912 0.369796
Year 27 Obs = 0
Year 27 Pred = 0.00210471 0.00197823 0.0020952 0.00321346 0.0138723 0.0296008 0.0327104 0.0406577 0.044725 0.0417822 0.0392211
0.036986 0.035101 0.0333729 0.0317334 0.0301739 0.0286906 0.0272808 0.0259402 0.0246656 0.0234541 0.0223026 0.0212077 0.0201665
0.0191766 0.367787
Year 28 Obs = 0
Year 28 Pred = 0.00217521 0.00204708 0.00216678 0.00332862 0.0143804 0.0306153 0.0336685 0.0417347 0.045707 0.0421867 0.0394109
0.0369951 0.0348869 0.0331088 0.0314788 0.0299323 0.0284613 0.0270623 0.0257325 0.024468 0.0232657 0.022123 0.0210368 0.020004
0.019022 0.365001
Year 29 Obs = 0
Year 29 Pred = 0.00229703 0.00216435 0.00229363 0.00351956 0.0151598 0.0320476 0.0350557 0.0430106 0.0467724 0.042964 0.0396549
0.0370457 0.0347749 0.0327932 0.0311219 0.0295897 0.028136 0.0267533 0.0254382 0.0241882 0.0229996 0.0218695 0.0207953 0.0197743
0.0188035 0.360977
Year 30 Obs = 0
Year 30 Pred = 0.00249209 0.00235364 0.0024972 0.00383536 0.0164611 0.0344232 0.0370655 0.0450203 0.0481132 0.0437039 0.0401453
0.0370533 0.0346153 0.0324935 0.0306418 0.0290801 0.0276484 0.0262901 0.0249981 0.0237693 0.0226013 0.0214907 0.0204347 0.019431
0.018477 0.354864

Year 73 Pred = 0.00894126 0.00524345 0.019364 0.0221713 0.0182075 0.0179963 0.432381 0.0166 0.0108056 0.0118196 0.00834135
0.00929411 0.0141507 0.275779 0.00326146 0.00237908 0.00154471 0.00258542 0.0028079 0.00895366 0.0131281 0.0170627 0.0080358
0.0108588 0.00658576 0.0517019
Year 74 Obs = 0
Year 74 Pred = 0.0314864 0.00894329 0.00590387 0.0315078 0.0983944 0.0366771 0.0172971 0.442513 0.0139752 0.00737415 0.0080661
0.00569242 0.00634262 0.00965692 0.188201 0.00222573 0.00162357 0.00105416 0.00176438 0.00191621 0.00611028 0.00895905 0.0116442
0.00548391 0.00741041 0.0397775
Year 75 Obs = 0
Year 75 Pred = 0.0270162 0.0276273 0.008835 0.00843925 0.124255 0.180546 0.0327153 0.016693 0.357772 0.0092278 0.00486914
0.00532603 0.0037587 0.00418802 0.00637645 0.124269 0.00146965 0.00107204 0.00069606 0.00116502 0.00126527 0.00403461 0.00591565
0.00768861 0.00362101 0.0311581
Year 76 Obs = 0
Year 76 Pred = 0.0163578 0.0239198 0.0275435 0.0127594 0.0339576 0.238537 0.172418 0.0343421 0.0149879 0.26507 0.0068368
0.0036075 0.00394601 0.00278479 0.00310287 0.00472425 0.0920695 0.00108885 0.000794263 0.000515705 0.000863152 0.000937428
0.00298921 0.00432885 0.00569643 0.0257675
Year 77 Obs = 0
Year 77 Pred = 0.01744 0.0140189 0.0230852 0.0385399 0.0501167 0.0648921 0.230952 0.185772 0.0321686 0.0116799 0.206565
0.00532782 0.00281127 0.00307507 0.00217014 0.00241802 0.00368154 0.0717484 0.000848523 0.000618958 0.000401881 0.000672642
0.000730524 0.00232944 0.00341549 0.0245194
Year 78 Obs = 0
Year 78 Pred = 0.0128167 0.0132208 0.0119679 0.0285805 0.134231 0.0856995 0.0568899 0.226517 0.159867 0.0231681 0.00841194
0.14877 0.00383714 0.0020247 0.00221469 0.00156296 0.00174148 0.00265148 0.0516739 0.000611114 0.000445779 0.000289439
0.000484443 0.00052613 0.00167769 0.020119
Year 79 Obs = 0
Year 79 Pred = 0.0153049 0.0121532 0.0141011 0.0183792 0.115532 0.240235 0.0762577 0.0528241 0.175683 0.103906 0.0150582
0.00546737 0.0966938 0.00249397 0.00131596 0.00143945 0.00101585 0.00113188 0.00172334 0.0335856 0.000397196 0.000289736
0.000188122 0.000314866 0.00034196 0.0141668
Year 80 Obs = 0
Year 80 Pred = 0.0635434 0.0142786 0.0127694 0.0214502 0.0777025 0.222021 0.210073 0.0713456 0.0395914 0.103132 0.0609962
0.00883966 0.00320953 0.0567625 0.00146404 0.000772515 0.000845004 0.000596338 0.000664452 0.00101166 0.0197159 0.000233167
0.000170085 0.000110434 0.000184837 0.00851714
Year 81 Obs = 0
Year 81 Pred = 0.0732433 0.0473714 0.0119866 0.0155378 0.0730871 0.128639 0.186939 0.196553 0.0581182 0.0269079 0.0700924
0.0414555 0.0060078 0.00218133 0.0385781 0.000995022 0.000525033 0.000574299 0.000405295 0.000451589 0.000687564 0.0133997
0.00015847 0.000115596 7.50553e-05 0.00591422
Year 82 Obs = 0
Year 82 Pred = 0.0394459 0.071569 0.0520666 0.0189662 0.0646371 0.133878 0.116278 0.175789 0.153517 0.0378937 0.0175443 0.045701
0.0270295 0.00391715 0.00142225 0.0251534 0.000648765 0.000342327 0.000374449 0.000264257 0.000294441 0.000448299 0.00873677
0.000103324 7.53701e-05 0.00390507
Year 83 Obs = 0
Year 83 Pred = 0.044491 0.0368504 0.0753037 0.0793422 0.0806113 0.125509 0.118351 0.110379 0.133946 0.0915444 0.0225966
0.0104619 0.0272523 0.0161181 0.00233586 0.00084811 0.0149993 0.000386869 0.000204135 0.00022329 0.000157581 0.00017558
0.000267328 0.00520987 6.16139e-05 0.0023736
Year 84 Obs = 0
Year 84 Pred = 0.0250484 0.0290536 0.0270996 0.0803118 0.238095 0.11882 0.0948841 0.100126 0.0819634 0.0832566 0.0569013
0.0140454 0.00650281 0.0169392 0.0100185 0.0014519 0.00052716 0.00932314 0.000240466 0.000126884 0.00013879 9.79474e-05
0.000109135 0.000166163 0.0032383 0.00151366
Year 85 Obs = 0
Year 85 Pred = 0.0154631 0.014708 0.0192127 0.0259988 0.217532 0.318904 0.0819611 0.0735737 0.0684508 0.046964 0.0477049
0.0326037 0.00804782 0.00372603 0.00970593 0.00574048 0.000831919 0.000302056 0.00534203 0.000137784 0.27036e-05 7.95251e-05
5.61226e-05 6.25329e-05 9.52092e-05 0.00272281
Year 86 Obs = 0
Year 86 Pred = 0.015461 0.0102455 0.0109748 0.0207995 0.0794764 0.329813 0.250329 0.0724335 0.0575378 0.0449959 0.0308716
0.0313587 0.0214319 0.00529021 0.00244929 0.00638016 0.00377349 0.000546859 0.000198555 0.00351157 9.05719e-05 4.77911e-05
5.22756e-05 3.68928e-05 4.11058e-05 0.00185242
Year 87 Obs = 0
Year 87 Pred = 0.0172892 0.0112729 0.00841303 0.0130767 0.0700761 0.133081 0.286043 0.244797 0.0627413 0.0418848 0.0327549
0.0224731 0.0228277 0.0156014 0.00385102 0.00178297 0.00464446 0.00274692 0.000398088 0.000144539 0.00255626 6.5932e-05 3.47897e-
05 3.80541e-05 2.68556e-05 0.00137839
Year 88 Obs = 0
Year 88 Pred = 0.0355711 0.012633 0.0092766 0.0100461 0.0441621 0.117796 0.11614 0.281698 0.213901 0.0461299 0.0307954 0.0240827
0.0165231 0.0167838 0.0114708 0.00283143 0.00131091 0.00341479 0.00201965 0.00029269 0.000106271 0.00187946 4.84759e-05 2.55788e-
05 2.79789e-05 0.0010332
Year 89 Obs = 0
Year 89 Pred = 0.0127063 0.0287487 0.0114986 0.0122523 0.037521 0.0820847 0.113672 0.126454 0.272122 0.173875 0.0374978
0.0250328 0.0195762 0.0134312 0.0136431 0.00932433 0.0023016 0.00106561 0.0027758 0.00164172 0.000237921 8.63849e-05 0.00152777
3.94048e-05 2.07923e-05 0.000862603
Year 90 Obs = 0
Year 90 Pred = 0.0260204 0.0104092 0.0265239 0.0153947 0.0464044 0.0707586 0.0803661 0.125622 0.12401 0.224532 0.143466
0.0309399 0.0206549 0.0161526 0.0110823 0.0112571 0.00769362 0.00189908 0.000879245 0.00229035 0.0013546 0.000196311 7.12772e-05
0.00126058 3.25134e-05 0.0007289
Year 91 Obs = 0
Year 91 Pred = 0.00677841 0.0214072 0.00964463 0.0356627 0.0585591 0.0879304 0.0696565 0.0893228 0.12396 0.102995 0.186482
0.119154 0.0256968 0.0171547 0.0134154 0.00920426 0.00934949 0.00638985 0.00157726 0.000730248 0.00190222 0.00112505 0.000163044
5.91986e-05 0.00104696 0.000632384
Year 92 Obs = 0
Year 92 Pred = 0.0130956 0.00522427 0.0185815 0.0121485 0.1271 0.103985 0.0811254 0.0725684 0.0826278 0.0965157 0.0801924
0.145196 0.0927742 0.0200077 0.0133567 0.0104453 0.00716649 0.00727956 0.00497518 0.00122806 0.000568575 0.00148108 0.000875972
0.000126947 4.60923e-05 0.00130755
Year 93 Obs = 0
Year 93 Pred = 0.00842114 0.0100507 0.00451565 0.0233072 0.0431146 0.224766 0.0955596 0.0841876 0.0668756 0.0640977 0.0748711
0.0622085 0.112634 0.0719687 0.0155208 0.0103614 0.00810282 0.00555933 0.00564705 0.00385944 0.000952656 0.000441066 0.00114893
0.000679526 9.84779e-05 0.00105007
Year 94 Obs = 0
Year 94 Pred = 0.00410565 0.00673356 0.00905095 0.00590114 0.0861846 0.0794495 0.21524 0.103344 0.0808552 0.0540652 0.0518194
0.0605291 0.0502921 0.0910587 0.0581826 0.0125477 0.00837658 0.00655068 0.00449441 0.00456532 0.00312014 0.000770169 0.000356577
0.000928848 0.000549359 0.000928539
Year 95 Obs = 0
Year 95 Pred = 0.0119693 0.00322526 0.00595731 0.0116202 0.0214347 0.155979 0.074726 0.228595 0.0974674 0.0641947 0.0429249
0.0411418 0.0480568 0.0399292 0.0722957 0.0461939 0.00996218 0.00665055 0.00520089 0.00356832 0.00362462 0.00247723 0.000611473
0.000283103 0.000737456 0.00117337

Proportions of Discards at age by fleet
fleet 1
Year 1 Obs = 0

F Reference Points Using Final Year Selectivity and Freport options

refpt	F	slope to plot on SRR			
F0.1	0.0460683	0.213765			
Fmax	0.0938409	0.389873			
F30%SPR	0.0611839	0.265907			
F40%SPR	0.04171	0.199422			
Fmsy	0.0408952	0.196777	SSBmsy	203582	MSY 10490.6
Fcurrent	0.00397234	0.0896961			

Stock-Recruitment Relationship Parameters

alpha = 58868.2
 beta = 95580.4
 unexpl = 642383
 steepness = 0.658728

Spawning Stock, Obs Recruits(year+1), Pred Recruits(year+1), standardized residual

init	xxxx	51250.4	51242	0.00164143
1913	642256	52112.5	51242.3	0.168808
1914	642246	52128	51242.2	0.171807
1915	642221	52143.7	51242	0.174886
1916	642194	52159.7	51241.7	0.178007
1917	642167	52175.7	51241.4	0.181147
1918	642156	52192	51241.3	0.184289
1919	642209	52208.8	51241.8	0.187407
1920	642334	52226.1	51243.1	0.190488
1921	642510	52243.6	51244.9	0.193477
1922	642743	52260.8	51247.3	0.196319
1923	643017	52277.5	51250.2	0.198969
1924	643313	52293.2	51253.2	0.201379
1925	643621	52307.4	51256.4	0.203475
1926	643957	52320	51259.9	0.205221
1927	644307	52330.4	51263.5	0.206508
1928	644657	52339.4	51267.1	0.207525
1929	645008	52346.3	51270.7	0.208148
1930	645371	52351.7	51274.4	0.208457
1931	645703	52357.2	51277.8	0.208846
1932	646024	52360.2	51281.1	0.208769
1933	646348	52361.4	51284.4	0.208354
1934	646477	52360.5	51285.7	0.207921
1935	643595	52326.9	51256.1	0.207277
1936	630416	52182.4	51118	0.20661
1937	611730	51969.8	50913.2	0.205925
1938	595845	51774.2	50730.4	0.20417
1939	575019	51499.7	50477.7	0.200936
1940	551349	51158.3	50170.7	0.195408
1941	517571	50626	49691.6	0.186764
1942	468693	49751.4	48896.7	0.173711
1943	421056	48724.2	47977.3	0.154867
1944	377730	47528	46980.3	0.116183
1945	339493	45777.9	45935.6	-0.034456
1946	307277	45641.2	44901.4	0.163833
1947	274346	45424.5	43658	0.397639
1948	241919	42589.2	42196.6	0.0928445
1949	213686	41044.3	40674.7	0.0906922
1950	191539	39736.7	39271.3	0.118117
1951	169645	36567.6	37653.6	-0.293407
1952	153992	42706.9	36323	1.62312
1953	145259	38985	35505.5	0.937216
1954	140868	42419.1	35071.7	1.90677
1955	138484	36063.3	34829.3	0.349023
1956	135554	37748.1	34524.6	0.894849
1957	130763	39862.9	34009.3	1.59209
1958	124627	33386.2	33316.6	0.020913
1959	119992	41037.2	32767.2	2.25613
1960	117277	31020.4	32434.3	-0.446818
1961	115820	45024.2	32252.2	3.34446
1962	112806	28797	31867.1	-1.01554
1963	111311	52268.9	31672.1	5.02216
1964	112799	33641.7	31866.2	0.229116
1965	115510	18664	32213.1	-1.48607
1966	118339	4693.57	32565.5	-3.95952
1967	120076	3450.28	32777.4	-3.74391
1968	121974	1633.2	33005.1	-4.27403
1969	123597	1991.1	33196.5	-4.00053
1970	119361	2118.14	32690.6	-3.89075
1971	109776	133832	31468.8	2.05814
1972	96844.1	4977.78	29627.4	-2.53604
1973	83568.6	2321.25	27460.6	-3.5127
1974	73439.2	1437.55	25578.3	-4.09301
1975	67286.8	1400.21	24320.7	-4.05875
1976	61981	879.565	23157.4	-4.65012
1977	56638.7	1109.6	21904.1	-4.24069
1978	49717	28232.9	20143.2	0.480025
1979	41128.7	1064.72	17710.4	-3.99724
1980	32701.4	2003.7	15006.6	-2.86273
1981	26352.5	9991.06	12722.7	-0.343644
1982	20941.9	13163.5	10580	0.310626
1983	16583.5	3722.92	8703.68	-1.20742
1984	13386.5	5884.9	7231.92	-0.293049
1985	10736.9	19169.4	5945.06	1.66455
1986	8954.26	17385.6	5042.55	1.75978
1987	8350.72	11065	4729.98	1.20832
1988	8728.63	12846.8	4926.12	1.36284
1989	9957.03	11647.8	5553.97	1.05297
1990	11874.6	13727.3	6505.4	1.06172

1991	11208.9	55923.2	6178.94	3.13193
1992	9921.22	80778.6	5535.88	3.81101
1993	12066	41608.1	6598.51	2.61813
1994	12015.4	45975.1	6573.89	2.76534
1995	12366.3	37073	6743.88	2.42306
1996	17675.1	36471.5	9187.2	1.96023
1997	25225.4	51554.2	12292.2	2.03835
1998	35062	74059	15799.1	2.19651
1999	46798.9	195407	19349.5	3.28773
2000	60380.8	80932	22791	1.80174
2001	75578.1	189572	25994.3	2.82491
2002	92938.5	56254.6	29021.6	0.940998
2003	113478	132153	31954	2.01844
2004	137858	103773	34764.9	1.55484
2005	166468	59299.5	37396.4	0.655475
2006	199012	206252	39768.4	2.34028
2007	234609	xxxx	41827.5	

Root Mean Square Error computed from Standardized Residuals

Component	#resids	RMSE
_Catch_Fleet_1	95	0.652927
Catch_Fleet_Total	95	0.652927
_Discard_Fleet_1	0	0
Discard_Fleet_Total	0	0
_Index_1	45	1.6492
_Index_2	40	1.78355
Index_Total	85	1.71373
Nyear1	25	0.0049155
Fmult_Year1	0	0
_Fmult_devs_Fleet_1	0	0
Fmult_devs_Total	0	0
Recruit_devs	95	1.95332
Fleet_Sel_params	26	2.89131
Index_Sel_params	52	0.346232
q_year1	0	0
q_devs	0	0
SRR_steepness	0	0
SRR_unexpl_S	1	-2.10431

Projection into Future

Projected NAA

41827.5 196164 53643.2 89283.6 108131 43733.5 139854 56642.1 129598 46510.7 30633.3 20483.4 19632.6 22932.4 19053.9 34499
 22043.4 4753.88 3173.6 2481.83 1702.78 1729.64 1182.11 291.79 135.095 911.833

Projected Directed FAA

0.00152283 0.00150055 0.00166523 0.00268185 0.0122257 0.0277991 0.0328749 0.0439303 0.0521707 0.0521708 0.0521708 0.0521708
 0.0521708 0.0521708 0.0521708 0.0521708 0.0521708 0.0521708 0.0521708 0.0521708 0.0521708 0.0521708 0.0521708 0.0521708

Projected Discard FAA

0 0

Projected Nondirected FAA

0 0

Projected Catch at Age

62.0829 286.902 87.0598 233.247 1281.69 1169.66 4412.32 2375.02 6427.29 2306.66 1519.23 1015.86 973.66 1137.31 944.962 1710.95
 1093.22 235.764 157.392 123.084 84.4476 85.78 58.6259 14.4711 6.69991 45.2215

Projected Discards at Age (in numbers)

0 0

Projected Yield at Age

0.264197 6.0921 4.71162 23.7421 206.495 267.109 1323.71 885.921 2860.46 1186.48 880.859 650.793 678.14 849.859 749.377 1426.94
 951.643 212.854 146.588 117.725 82.6297 85.5856 59.4789 14.8937 6.98105 47.6205

Year, Total Yield (in weight), Total Discards (in weight), SSB, proj_what, SS/SSmsy

2008 13727 0 267529 3 1.31411

that's all