Description of the input and findings from potential base model runs for the northern and southern red drum stocks from the U.S. Atlantic coast.

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The age structured assessment model developed for red drum was fit to the input data using default weightings of one for most of the likelihoods except for down-weightings for the recreational released-alive (B2) fisheries age composition, as suggested during discussions at the assessment workshop (AW). The southern region's assessment input data (Table 1) was modified since the assessment workshop to include a new dataset for the South Carolina released-alive age composition and I assumed this also could be applied to the Georgia released-alive fishery. For the northern region, the input data (Table 2) is the same as that used at the end of the AW, though the commercial catch at age is currently being checked for accuracy.

Neither model came to a solution with a positive definite Hessian so there is some question about whether the solution is 'unique'. Many runs of each model generally gave either solutions similar to those presented below or unrealistic low F/high N solutions that are common in these nonlinear population dynamics models. These solutions also had the lowest objective function values of any of the alternative solutions I ran into.

Southern Region

The southern region analysis solved for 254 parameters using 1,397 data points (Table 3, a full deviance Table to be generated later). Even given the down-weighting of the proportion at age data for the released-alive fisheries (λ's = 0.001), these data contributed the most to the objective function.

The fits to the eight indices used in the southern region showed only a general trend agreement between the model and the young-of-the-year (age 1) indices, but better fits to the age-specific indices for ages 2 and 3 (Fig. 1). This was especially true for the longest-running, fishery-independent survey, the South Carolina trammel net survey index for age 2 red drum.

The southern region proportion caught-at-age fit the commercial and landed-fish (A+B1) recreational fisheries well (Fig. 2). The down-weighted likelihoods for the 'observed' age composition for the released-alive recreational fishery resulted in poor model fits with the model-predicted age composition from this fishery having a more significant single age-group contribution when compared to the smoother multi-age 'observed' data (Fig. 3). The fit to the total kill for both the landed fisheries and the released-alive fisheries was quite close (Fig. 3).

Estimates of average F and abundance show a relatively small population during the early to mid 1980's experiencing relatively high fishing mortalities that dropped to much lower levels by 1989 allowing for a rapid increase in population size between 1986 and 1991. Since then average fishing mortalities have trended upward slowly and the population size has stabilized (Fig. 4).

Northern Region

The northern region analysis solved for 176 parameters using 879 data points (Table 3). Even given the down-weighting of the proportion at age data for the released-alive fisheries (λ's = $1.0e^{-5}$), these data contributed the most to the objective function.

The fits to the four indices used in the northern region showed good agreement between the model all indices, especially the long-term young-of-the-year index (NC JAI_) and the MRFSS total catch index (Fig. 5). The tag-based annual absolute abundances for age 1-3 red drum were overestimated consistently by the model for age 1 but were similar in magnitude to the model estimates for most years during 1983-2004 (Fig. 6). Exceptions to this occurred in years that showed dramatic increases in abundance based on tag-return data.

As in the southern region, the northern regions observed proportion caught-at-age for the commercial and landed-fish (A+B1) recreational fisheries were fit well (Fig. 7). The age composition data for the released-alive recreational fishery were fit better in the northern region than in the southern region despite a much lower weighting in the likelihood (Fig. 8). The fit to the total kill for both the landed fisheries and the released-alive fisheries was quite close (Fig. 9).

Estimates of average F and abundance show a stable total population size at about 400,000 fish from the early 1980's through the mid 1990's. The total population size increased dramatically from 1994 through 1997, seemingly in response to sharp drops in fishing mortality during 1990-1992 and again during 1996 and 1997 (Fig. 10). Since the late 1990's fishing mortality has fluctuated with a gradual increase after 2003 while total abundance has continued to increase.

Table 1. Input data used in the southern region's age-structure model for red drum.


```
#Southern Region 1982-2007
#
# Defining 7 fleets with each state's (FL,GA,SC) having A+B1 rec, only FL com, and each states rec B2 fishery
# DECISION: add small com landings from GA SC to their A+B1 rec fisheries
#
#fleets
7
# global first and last years used in assessment
1982 2007
#
# first and last year for each fishing fleet
1982 1982 1982 1982 1982 1982 1982
1988 2007 2007 2007 2007 2007 2007
#
#firstage lastage (same for all fleets)
1 7
#
#last age selectivity estimated for
 3
#natural mortality (from nonparametric VBG curve)
#   1    2    3    4    5    6    7
 0.26 0.18 0.15 0.14 0.13 0.12 0.11
#
#selectivity block by fleet (each row is a fleet;1=FLcom,2=FLrec,3=Garec/com,4=SCrec/com,... then the B2 fleets FL,GA,SC)
#82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07
  1  1  1  1  1  1  1
  1  1  1  1  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2
  1  1  1  1  2  2  2  2  2  2  3  3  3  3  3  3  3  3  3  4  4  4  4  4  4  4
  1  1  1  1  1  1  1  1  2  2  2  2  3  3  3  3  3  3  3  4  4  4  4  4  4  4
  1  1  1  1  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2
  1  1  1  1  1  1  1  1  1  1  1  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2
  1  1  1  1  1  1  1  1  1  1  1  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2
#
# total kill by fleet in numbers (A+B1 for recs)
#1982  1983   1984   1985   1986   1987   1988   1989   1990   1991   1992   1993   1994   1995   1996   1997   1998   1999   2000   2001   2002   2003   2004   2005   2006   2007
33931  37248  38431  26050  22609  12793  73
204400 344514 549382 265186 113439 51224  9544   34747  44279  102727 104125 66685  120938 96928  146822 75094  108440 131219 194677 181079 120640 171365 164171 196236 149756 199159
30757  56853  258188 183840 104015 137310 137284 51235  76612  163133 85875  108189 139260 141673 63151  39361  27600  69011  94429  90395  93305  123443 133402 107970 82269  103385
160762 104803 129550 530108 194026 522044 288421 127826 113191 127421 114778 122141 119083 177072 125835 131834 47617  45826  37360  61046  41471  162695 132075 141023 72487  88220
0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0
#
# CV's for landings or releases depending on fishery (FL com assumed 0.01
#1982  1983   1984   1985   1986   1987   1988   1989   1990   1991   1992   1993   1994   1995   1996   1997   1998   1999   2000   2001   2002   2003   2004   2005   2006   2007
0.01   0.01   0.01   0.01   0.01   0.01   0.01
0.275  0.191  0.161  0.222  0.198  0.309  0.726  0.243  0.227  0.157  0.141  0.103  0.099  0.107  0.161  0.141  0.102  0.078  0.083  0.081  0.086  0.083  0.084  0.091  0.082  0.090
0.373  0.277  0.219  0.186  0.185  0.184  0.250  0.220  0.224  0.231  0.164  0.176  0.172  0.165  0.198  0.191  0.195  0.231  0.196  0.303  0.187  0.168  0.230  0.186  0.190  0.175
0.182  0.378  0.307  0.306  0.198  0.177  0.201  0.207  0.222  0.225  0.156  0.173  0.191  0.208  0.138  0.134  0.157  0.181  0.232  0.269  0.215  0.231  0.154  0.187  0.239  0.208
0.669  0.402  0.381  0.291  0.224  0.211  0.276  0.213  0.183  0.233  0.115  0.118  0.104  0.091  0.093  0.097  0.087  0.08   0.073  0.075  0.091  0.084  0.078  0.075  0.072  0.078
0.654  0.6    0.529  0.313  0.23   0.197  0.246  0.27   0.389  0.312  0.214  0.277  0.246  0.239  0.241  0.297  0.213  0.5    0.224  0.252  0.186  0.165  0.18   0.199  0.174  0.172
0.802  0.63   0.001  0.313  0.324  0.266  0.236  0.408  0.392  0.42   0.275  0.27   0.172  0.149  0.159  0.25   0.146  0.149  0.186  0.185  0.186  0.175  0.169  0.128  0.136  0.13
#
#input B2 selectivity for rec northern region by age (columns through last_sel_age) and year (rows)
1.000  0.221  0.000  0.012  0.012  0.012  0.012
1.000  0.221  0.000  0.012  0.012  0.012  0.012
1.000  0.221  0.000  0.012  0.012  0.012  0.012
1.000  0.221  0.000  0.012  0.012  0.012  0.012
1.000  0.221  0.000  0.012  0.012  0.012  0.012
1.000  0.221  0.000  0.012  0.012  0.012  0.012
1.000  0.221  0.000  0.012  0.012  0.012  0.012
1.000  0.221  0.000  0.012  0.012  0.012  0.012
1.000  0.221  0.000  0.012  0.012  0.012  0.012
1.000  0.467  0.031  0.023  0.023  0.023  0.023
1.000  0.467  0.031  0.023  0.023  0.023  0.023
1.000  0.467  0.031  0.023  0.023  0.023  0.023
1.000  0.467  0.031  0.023  0.023  0.023  0.023
1.000  0.467  0.031  0.023  0.023  0.023  0.023
1.000  0.467  0.031  0.023  0.023  0.023  0.023
```

1.000 0.467 0.031 0.023 0.023 0.023 0.023
0.684 1.000 0.207 0.089 0.089 0.089 0.089
0.684 1.000 0.207 0.089 0.089 0.089 0.089
0.684 1.000 0.207 0.089 0.089 0.089 0.089
total release by fleet (B2's -- SC 1984 zero is averaged across adjacent years)
#1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007
0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
10172 54724 47196 193398 100096 377959 233988 172303 68667 645772 284798 465657 691811 683706 500278 560345 482040 583157 712492 863580 670215 803039 1137540 1271042 893781 897091
3378 1416 4232 6314 58638 237297 180699 72179 156397 95585 130090 141946 147213 364295 72667 22796 34791 18706 130793 249863 169131 275931 156748 330581 148120 191737
2497 6751 11720 16689 23923 82084 269138 42824 100558 102492 46257 158015 321522 363163 203456 196519 83854 94686 99566 220395 156416 443976 389738 491526 607380 537007
#
#release mortality
0.08
#
#proportion catch at age (age columns, year rows) by fleet
#Age 1 2 3 4 5 6 7 8 9 10+
FL com
0.455195756 0.269394412 0.178108341 0.054664188 0.007836104 0.004973786 0.029827413
0.377903262 0.517437240 0.069786849 0.015055209 0.003489192 0.002556907 0.013771341
0.427703356 0.340860974 0.150362923 0.044194473 0.006137833 0.004630224 0.026110217
0.373011152 0.366915120 0.164652185 0.049181850 0.007344742 0.005913203 0.032981748
0.092929556 0.433623395 0.311434264 0.085425856 0.011940550 0.009047733 0.055598646
0.092847119 0.433969223 0.313433299 0.084656145 0.011871639 0.008835425 0.054387150
0.103300799 0.530091748 0.325477549 0.030186481 0.000089136 0.000089136 0.010765152
FLrec (AB1 prop at age)
0.71107724 0.26767949 0.00755203 0.00440195 0.00545397 0.00166147 0.00217385
0.76190172 0.19381681 0.03411402 0.00942713 0.00074032 0.00000000 0.00000000
0.75923306 0.16414074 0.04151962 0.01000544 0.00244582 0.00122553 0.02142980
0.87923618 0.10587690 0.01222052 0.00176256 0.00017998 0.00000000 0.00072385
0.33102352 0.43307189 0.19113340 0.01767540 0.00401991 0.00000000 0.02307588
0.43506039 0.38173178 0.09410451 0.06811678 0.01129155 0.00443222 0.00526277
0.36998279 0.50601563 0.07931079 0.03263370 0.00347685 0.00228851 0.00629173
0.31491021 0.48049246 0.12347638 0.06181182 0.00783740 0.00689753 0.00457420
0.24098580 0.47409672 0.15999462 0.08454883 0.01388023 0.01414645 0.01234736
0.16702276 0.29777916 0.26486572 0.22405532 0.03166977 0.00657599 0.00803128
0.30967310 0.31656060 0.19716913 0.14495885 0.01365739 0.00763239 0.01034854
0.10866745 0.36579754 0.29856153 0.17673439 0.02526153 0.01491402 0.01006354
0.17953596 0.31587891 0.30031710 0.17939555 0.01256366 0.00505562 0.00725322
0.11702704 0.30777011 0.33983358 0.18920826 0.02241453 0.00637073 0.01737576
0.22010868 0.33805670 0.26139372 0.15497726 0.01788476 0.00373733 0.00384154
0.18653179 0.29320276 0.24769939 0.20553831 0.02714874 0.02077304 0.01910598
0.10784524 0.36313031 0.35031347 0.14930099 0.01825740 0.00779767 0.00335492
0.03845467 0.53227078 0.35115582 0.05616096 0.02195777 0.00000000 0.00000000
0.02401761 0.51088664 0.36026963 0.07174471 0.03308141 0.00000000 0.00000000
0.02482402 0.47662003 0.36615689 0.08837673 0.04389968 0.00000000 0.00012265
0.01007436 0.47685025 0.37480700 0.09497156 0.04329683 0.00000000 0.00000000
0.01981715 0.52036051 0.36055582 0.06363114 0.03563539 0.00000000 0.00000000
0.01555853 0.44304880 0.34944481 0.18347572 0.00847214 0.00000000 0.00000000
0.02869365 0.43988907 0.36660982 0.15375091 0.01105655 0.00000000 0.00000000
0.01693788 0.37794664 0.44798483 0.14113257 0.01589195 0.00003032 0.00007581
0.02978489 0.39047265 0.42949546 0.13710285 0.01314415 0.00000000 0.00000000
#GArec/com (AB1 prop at age)
0.84097778 0.10531094 0.02074344 0.00417686 0.00032088 0.00162918 0.02684092
0.90476589 0.09030230 0.00449566 0.00043615 0.00000000 0.00000000 0.00000000
0.91892712 0.06095789 0.01806947 0.00113394 0.00000000 0.00030386 0.00060771
0.88634012 0.10487948 0.00835782 0.00041094 0.00000000 0.00000000 0.00001163
0.69644835 0.27507740 0.02466644 0.00355249 0.00012766 0.00000000 0.00012766
0.77397448 0.19071221 0.02769049 0.00434004 0.00000000 0.00000000 0.00328278
0.61913879 0.33341611 0.03496757 0.00642951 0.00017844 0.00000000 0.00586959
0.58807613 0.35680267 0.05231875 0.00275960 0.00002142 0.00000000 0.00002142
0.59379797 0.26131516 0.08816583 0.01466469 0.00034733 0.00372683 0.03798219
0.73753163 0.23628607 0.01865553 0.00752677 0.00000000 0.00000000 0.00000000
0.70990141 0.24566672 0.03121396 0.00398124 0.00101811 0.00110938 0.00710918
0.62853250 0.27307518 0.07494238 0.01852342 0.00236331 0.00040910 0.00215410
0.69157626 0.27337695 0.03307431 0.00197248 0.00000000 0.00000000 0.00000000
0.71064814 0.25169231 0.03613704 0.00149097 0.00001578 0.00000000 0.00001578
0.68907944 0.28339394 0.02392936 0.00348294 0.00006533 0.00001633 0.00003266
0.52709418 0.38161973 0.07491347 0.01349308 0.00287954 0.00000000 0.00000000

0.50857638 0.42506809 0.05537142 0.01098411 0.00000000 0.00000000 0.00000000
0.60780851 0.34030628 0.05188521 0.00000000 0.00000000 0.00000000 0.00000000
0.56457193 0.31181173 0.10821051 0.01540583 0.00000000 0.00000000 0.00000000
0.74783700 0.23056974 0.01778527 0.00379655 0.00000000 0.00000000 0.00001144
0.62638628 0.34851337 0.02221689 0.00288346 0.00000000 0.00000000 0.00000000
0.65512016 0.30180315 0.04307670 0.00000000 0.00000000 0.00000000 0.00000000
0.30019432 0.61402208 0.08271649 0.00306711 0.00000000 0.00000000 0.00000000
0.63523497 0.33689193 0.02780420 0.00006890 0.00000000 0.00000000 0.00000000
0.45014750 0.53095416 0.01629958 0.00254976 0.00000000 0.00000109 0.00004792
0.55402776 0.43192821 0.01220683 0.00183720 0.00000000 0.00000000 0.00000000
#SCrec/com (AB1 prop at age)
0.79210293 0.13314795 0.00577565 0.01467427 0.01331626 0.00092421 0.04005874
0.73645106 0.21415274 0.03993889 0.00934180 0.00011551 0.00000000 0.00000000
0.68596444 0.30218581 0.00839932 0.00333635 0.00008906 0.00000000 0.00002501
0.69752231 0.23537390 0.05818854 0.00891525 0.00000000 0.00000000 0.00000000
0.53466161 0.39789645 0.05871788 0.00805482 0.00032911 0.00000000 0.00034012
0.75062593 0.22023102 0.02596002 0.00308472 0.00008639 0.00000012 0.00001179
0.49534342 0.45054219 0.04957231 0.00394906 0.00013798 0.00000474 0.00045029
0.46673155 0.40522280 0.10678364 0.02026848 0.00073466 0.00001726 0.00024161
0.41886135 0.50722428 0.06177473 0.01162317 0.00047980 0.00000000 0.00003667
0.69379537 0.28492226 0.01899512 0.00093946 0.00038801 0.00009213 0.00086765
0.48001112 0.45784774 0.04723312 0.00424613 0.00406233 0.00000000 0.00659956
0.39646715 0.49961103 0.08372224 0.01840634 0.00140248 0.00000381 0.00038695
0.34777466 0.54623850 0.09285186 0.01274663 0.00036686 0.00002148 0.00000000
0.62140162 0.31418236 0.04777840 0.01450957 0.00207994 0.00000039 0.00004773
0.30077812 0.64126531 0.04650402 0.01041973 0.00100249 0.00003033 0.00000000
0.85118386 0.09215811 0.03184139 0.02319292 0.00115356 0.00040086 0.00006930
0.32008089 0.53968954 0.09455215 0.04164577 0.00396179 0.00006884 0.00000103
0.48523039 0.42423492 0.07823522 0.01156125 0.00073562 0.00000260 0.00000000
0.47343670 0.41549695 0.09345039 0.01632059 0.00129537 0.00000000 0.00000000
0.63593933 0.27528619 0.07257250 0.01561033 0.00057439 0.00000036 0.00001690
0.30850326 0.65687384 0.03138038 0.00313999 0.00009259 0.00000995 0.00000000
0.25146987 0.60923356 0.08854771 0.04609571 0.00460995 0.00004319 0.00000000
0.17700903 0.67717688 0.11284406 0.03082222 0.00208840 0.00005941 0.00000000
0.34798908 0.50528206 0.13161702 0.01469452 0.00041732 0.00000000 0.00000000
0.38985967 0.52441218 0.07179190 0.00805968 0.00052236 0.00013059 0.00522361
0.48428648 0.51009810 0.00555809 0.00005733 0.00000000 0.00000000 0.00000000
#
FLrec (B2 age comp -- replaced by NC selectivity estimated values during 1983-2001 in program)
1.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
1.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
1.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
1.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
0.59205159 0.34539690 0.05741776 0.00449389 0.00059283 0.00000000 0.00004702
0.47134593 0.35525769 0.12792634 0.03817904 0.00377693 0.00238202 0.00113206
0.47134593 0.35525769 0.12792634 0.03817904 0.00377693 0.00238202 0.00113206
0.31623679 0.34243839 0.14317900 0.12704478 0.02280008 0.02577455 0.02252641
0.31623679 0.34243839 0.14317900 0.12704478 0.02280008 0.02577455 0.02252641
0.31623679 0.34243839 0.14317900 0.12704478 0.02280008 0.02577455 0.02252641
0.31623679 0.34243839 0.14317900 0.12704478 0.02280008 0.02577455 0.02252641
0.31623679 0.34243839 0.14317900 0.12704478 0.02280008 0.02577455 0.02252641
0.31623679 0.34243839 0.14317900 0.12704478 0.02280008 0.02577455 0.02252641
0.31623679 0.34243839 0.14317900 0.12704478 0.02280008 0.02577455 0.02252641
0.31623679 0.34243839 0.14317900 0.12704478 0.02280008 0.02577455 0.02252641
0.31623679 0.34243839 0.14317900 0.12704478 0.02280008 0.02577455 0.02252641
0.26992646 0.43113878 0.12649562 0.09785207 0.04602145 0.00481723 0.02374839
0.26992646 0.43113878 0.12649562 0.09785207 0.04602145 0.00481723 0.02374839
0.26992646 0.43113878 0.12649562 0.09785207 0.04602145 0.00481723 0.02374839
0.26992646 0.43113878 0.12649562 0.09785207 0.04602145 0.00481723 0.02374839
0.26992646 0.43113878 0.12649562 0.09785207 0.04602145 0.00481723 0.02374839
0.24268827 0.41141422 0.13677444 0.15203865 0.04171714 0.00481723 0.01055004
0.24268827 0.41141422 0.13677444 0.15203865 0.04171714 0.00481723 0.01055004
0.28322352 0.33970155 0.18560556 0.13349648 0.04260561 0.00481723 0.01055004
0.28322352 0.33970155 0.18560556 0.13349648 0.04260561 0.00481723 0.01055004
#GArec/com (B2 age comp -- borrowed from SC information below)
0.62464534 0.22718863 0.07930730 0.05234593 0.01265279 0.00266534 0.00119475
0.59346239 0.34428104 0.03554991 0.01460788 0.00556802 0.00162806 0.00490203
0.63987600 0.27870333 0.05163667 0.02386176 0.00512095 0.00066038 0.00014052
0.61236622 0.28887847 0.04404601 0.02883430 0.00890192 0.00202205 0.01495096
0.56230662 0.28513755 0.07892290 0.04919662 0.01513699 0.00334501 0.00595445

0.73717134 0.19343874 0.04158366 0.02034346 0.00466113 0.00088499 0.00191557
0.65344851 0.24218586 0.04997405 0.03192058 0.01078013 0.00253803 0.00915161
0.57656953 0.28111028 0.08379944 0.03754222 0.00985708 0.00228353 0.00883757
0.71166677 0.20015928 0.04490851 0.02861340 0.00771494 0.00167849 0.00525781
0.78573592 0.17899055 0.02412844 0.00290153 0.00118827 0.00148533 0.00557000
0.61077378 0.32486203 0.05032028 0.00812315 0.00197644 0.00075131 0.00319309
0.38803167 0.34818939 0.19059958 0.05764308 0.00678737 0.00109361 0.00765529
0.17593282 0.32820075 0.26674962 0.17065048 0.02135410 0.00682225 0.03029063
0.28264395 0.29654444 0.16343297 0.18125057 0.03210796 0.00344994 0.04060000
0.10979195 0.45442694 0.17678472 0.16191921 0.06208160 0.00704642 0.02794915
0.17340378 0.24925145 0.27697305 0.22385249 0.04343180 0.01082930 0.02225922
0.15959003 0.30814581 0.13213125 0.20187088 0.09069977 0.01515136 0.09241188
0.16065846 0.29308053 0.22628033 0.16997654 0.09273685 0.01721775 0.04010745
0.08335014 0.28991161 0.26876571 0.21687327 0.08311522 0.00648803 0.05110862
0.16925367 0.15206610 0.24624962 0.22281958 0.07683213 0.01688954 0.11589008
0.06085357 0.34027738 0.18944133 0.15471936 0.10545862 0.01132624 0.13792460
0.02785600 0.28280930 0.29927904 0.21984056 0.08646740 0.02630834 0.05743969
0.01870044 0.27219603 0.31565140 0.26644652 0.06815821 0.02640779 0.03518406
0.03949210 0.19312508 0.35730393 0.26038392 0.08556977 0.01374777 0.04967044
0.03337321 0.23233154 0.31690157 0.27383913 0.07665807 0.02224871 0.04633637
0.12530176 0.30476423 0.27110751 0.15399790 0.07972887 0.00604072 0.05905853
#SCrec/com (B2 age comp - late entry from Steve Arnott)
0.62464534 0.22718863 0.07930730 0.05234593 0.01265279 0.00266534 0.00119475
0.59346239 0.34428104 0.03554991 0.01460788 0.00556802 0.00162806 0.00490203
0.63987600 0.27870333 0.05163667 0.02386176 0.00512095 0.00066038 0.00014052
0.61236622 0.28887847 0.04404601 0.02883430 0.00890192 0.00202205 0.01495096
0.56230662 0.28513755 0.07892290 0.04919662 0.01513699 0.00334501 0.00595445
0.73717134 0.19343874 0.04158366 0.02034346 0.00466113 0.00088499 0.00191557
0.65344851 0.24218586 0.04997405 0.03192058 0.01078013 0.00253803 0.00915161
0.57656953 0.28111028 0.08379944 0.03754222 0.00985708 0.00228353 0.00883757
0.71166677 0.20015928 0.04490851 0.02861340 0.00771494 0.00167849 0.00525781
0.78573592 0.17899055 0.02412844 0.00290153 0.00118827 0.00148533 0.00557000
0.61077378 0.32486203 0.05032028 0.00812315 0.00197644 0.00075131 0.00319309
0.38803167 0.34818939 0.19059958 0.05764308 0.00678737 0.00109361 0.00765529
0.17593282 0.32820075 0.26674962 0.17065048 0.02135410 0.00682225 0.03029063
0.28264395 0.29654444 0.16343297 0.18125057 0.03210796 0.00344994 0.04060000
0.10979195 0.45442694 0.17678472 0.16191921 0.06208160 0.00704642 0.02794915
0.17340378 0.24925145 0.27697305 0.22385249 0.04343180 0.01082930 0.02225922
0.15959003 0.30814581 0.13213125 0.20187088 0.09069977 0.01515136 0.09241188
0.16065846 0.29308053 0.22628033 0.16997654 0.09273685 0.01721775 0.04010745
0.08335014 0.28991161 0.26876571 0.21687327 0.08311522 0.00648803 0.05110862
0.16925367 0.15206610 0.24624962 0.22281958 0.07683213 0.01688954 0.11589008
0.06085357 0.34027738 0.18944133 0.15471936 0.10545862 0.01132624 0.13792460
0.02785600 0.28280930 0.29927904 0.21984056 0.08646740 0.02630834 0.05743969
0.01870044 0.27219603 0.31565140 0.26644652 0.06815821 0.02640779 0.03518406
0.03949210 0.19312508 0.35730393 0.26038392 0.08556977 0.01374777 0.04967044
0.03337321 0.23233154 0.31690157 0.27383913 0.07665807 0.02224871 0.04633637
0.12530176 0.30476423 0.27110751 0.15399790 0.07972887 0.00604072 0.05905853
assumed effective number of ages sampled by fleet and year
5 5 5 5 5 5 5
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 10 10 10 10 10 10 10 10
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 10 10 10 10 10 10 10 10
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 10 10 10 10 10 10 10 10
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 10 10 10 10 10 10 10 10
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 10 10 10 10 10 10 10 10
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 10 10 10 10 10 10 10 10

number of indices
YOY's: 1)FL 2)GA 3)SC; subadult: 4)FL hs 2 5)FL hs 3 6)SC tn 2 7) MRFSS 8) SC adults
 8
first year of surveys forllowed by last year of surveys
 1997 2003 2000 1997 1997 1991 1991 1994
 2006 2007 2007 2007 2007 2007 2007 2007
indices ages (indices in order by row showing begin, end ages)
1 1 1 2 3 2 1 7
1 1 1 2 3 2 3 7
#
#observed index values across years (columns)
YOY's: 1)FL 2)GA 3)SC; subadult: 4)FL hs 2 5)FL hs 3 6)SC tn 2 7) MRFSS 8)SC adult
#1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007
0.039 0.092 0.028 0.050 0.069 0.133 0.125 0.228 0.048 0.109

1.59 0.66 1.03 0.34 0.95
0.607 0.403 0.358 0.163 0.224 0.184 0.271 0.292
0.07 0.169 0.108 0.198 0.097 0.169 0.083 0.146 0.196 0.136 0.153
0.089 0.044 0.05 0.038 0.069 0.051 0.096 0.05 0.041 0.075 0.094
0.622 1.053 0.634 0.422 0.487 0.51 0.343 0.442 0.369 0.373 0.256 0.763 0.597 0.682 0.448 0.414 0.326
0.138 0.149 0.148 0.181 0.207 0.161 0.165 0.130 0.125 0.113 0.141 0.125 0.153 0.153 0.164 0.155 0.144
2.577 3.138 2.875 1.131 1.913 2.600 1.875 2.548 4.055 4.347 2.931 2.310 1.941 1.143

estimated CV's for the index values

#1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007
1.001 0.387 0.419 0.369 0.344 0.292 0.303 0.283 0.292 0.276
0.246 0.279 0.252 0.288 0.348
0.121 0.189 0.228 0.473 0.331 0.370 0.231 0.257
0.174 0.161 0.159 0.156 0.153 0.134 0.141 0.128 0.13 0.132 0.124
0.174 0.161 0.159 0.156 0.153 0.134 0.141 0.128 0.13 0.132 0.124
0.203 0.070 0.088 0.118 0.082 0.075 0.108 0.066 0.079 0.078 0.117 0.038 0.047 0.040 0.060 0.065 0.086
0.354 0.287 0.276 0.251 0.261 0.243 0.243 0.241 0.197 0.203 0.183 0.194 0.201 0.186 0.196 0.188 0.208
0.248 0.145 0.200 0.169 0.177 0.110 0.200 0.134 0.142 0.103 0.131 0.221 0.160 0.484

#weights

#total catch by fleet

1. 1. 1. 1. 1. 1. 1.

#catch at age by fleet and year

#1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007
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 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
0.001 0.001
0.001 0.001
0.001 0.001

index weight

1. 1. 1. 1. 1. 1. 1. 1.

#Fbrake level, eliminates low F/high N bias in early phases of solution

1000.

Table 2. Input data used in the northern region's age-structure model for red drum.


```
#Northern Region 1982-2007
#
# Defining two regional commercial fisheries - gillnet+beachseine and other gear less lines
# adding comm line gear to regional rec A+B1 fishery, and added a rec released-alive fishery
#
#fleets (1=VAMDNCcomGNBS, 2=VAMDNCcomSE, 3=NCVAMDrecAB1, 4=NCVAMDrecB2)
4
# global first and last years used in assessment
1982 2007
#
# first and last year for each fishing fleet
 1982 1982 1982 1982
 2007 2007 2007 2007
#
#firstage lastage (same for all fleets)
 1 7
#
#last age selectivity estimated for
 3
#natural mortality - Lorenzen scaled to Hoenig method -using nonparameteric growth
#  1    2    3    4    5    6    7
 0.20 0.13 0.10 0.09 0.08 0.08 0.07
#
#selectivity block
#82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07
  1  1  1  1  1  1  1  1  1  1  2  2  2  2  2  2  2  3  3  3  3  3  3  3  3  3
  1  1  1  1  1  1  1  1  1  1  2  2  2  2  2  2  2  3  3  3  3  3  3  3  3  3
  1  1  1  1  1  1  1  1  1  1  2  2  2  2  2  2  2  3  3  3  3  3  3  3  3  3
  1  1  1  1  1  1  1  1  1  1  2  2  2  2  2  2  2  3  3  3  3  3  3  3  3  3
#
# total kill by fleet in numbers, except only A+B1 for fleet3 (rec) (1=VAMDNCcomGNBS, 2=VAMDNCcomSE, 3=NCVAMDrecAB1, 4=NCVAMDrecB2)
#1982   1983   1984   1985   1986   1987   1988   1989   1990   1991   1992   1993   1994   1995   1996   1997   1998   1999   2000   2001   2002   2003   2004   2005   2006   2007
54939  54939  55860  29566  39038  71960  49074  60989  49914  35102  31823  37551  20723  34082  19195  9299   78437  78677  50383  27469  17665  19394  9205   27498  33187  48738
82150  82151  29922  20987  47045  65164  32277  16614  13961  18664  4105   5013   4212   11551  3115   2922   14220  3434   2480   1305   1939   1077   639    1675   1696   2886
16446  116882 110247 22075  58443  63286  146977 75381  34497  58678  36869  63923  30603  92921  37470  10714  132765 78764  84262  30400  100481 41360  35340  55892  74598  136178
0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0      0
# CV's for total kill by fleet in numbers (assumed for commercial fleets, from MRFSS AB1 north region for fleet 3 and B2 for fleet 4))
#1982   1983   1984   1985   1986   1987   1988   1989   1990   1991   1992   1993   1994   1995   1996   1997   1998   1999   2000   2001   2002   2003   2004   2005   2006   2007
0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01
0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01   0.01
0.3470 0.4110 0.6692 0.3270 0.2686 0.1932 0.1788 0.1448 0.2741 0.1552 0.1851 0.1446 0.1590 0.1200 0.1485 0.2387 0.1129 0.1367 0.1203 0.1519 0.1394 0.1708 0.1884 0.2009 0.1737 0.1109
1.0000 1.0000 1.0000 0.7340 0.6810 0.3670 0.5081 0.3003 0.3621 0.1488 0.1672 0.1841 0.1338 0.1109 0.1702 0.1298 0.1041 0.1605 0.1891 0.1265 0.0935 0.1704 0.0973 0.1300 0.1058 0.0982
#
#input B2 selectivity for rec northern region by age (columns through last_sel_age) and year (rows)
1.000  0.221  0.000  0.012  0.012  0.012  0.012
1.000  0.221  0.000  0.012  0.012  0.012  0.012
1.000  0.221  0.000  0.012  0.012  0.012  0.012
1.000  0.221  0.000  0.012  0.012  0.012  0.012
1.000  0.221  0.000  0.012  0.012  0.012  0.012
1.000  0.221  0.000  0.012  0.012  0.012  0.012
1.000  0.221  0.000  0.012  0.012  0.012  0.012
1.000  0.221  0.000  0.012  0.012  0.012  0.012
1.000  0.221  0.000  0.012  0.012  0.012  0.012
1.000  0.221  0.000  0.012  0.012  0.012  0.012
1.000  0.467  0.031  0.023  0.023  0.023  0.023
1.000  0.467  0.031  0.023  0.023  0.023  0.023
1.000  0.467  0.031  0.023  0.023  0.023  0.023
1.000  0.467  0.031  0.023  0.023  0.023  0.023
1.000  0.467  0.031  0.023  0.023  0.023  0.023
1.000  0.467  0.031  0.023  0.023  0.023  0.023
0.684  1.000  0.207  0.089  0.089  0.089  0.089
0.684  1.000  0.207  0.089  0.089  0.089  0.089
0.684  1.000  0.207  0.089  0.089  0.089  0.089
0.684  1.000  0.207  0.089  0.089  0.089  0.089
0.684  1.000  0.207  0.089  0.089  0.089  0.089
0.684  1.000  0.207  0.089  0.089  0.089  0.089
0.684  1.000  0.207  0.089  0.089  0.089  0.089
0.684  1.000  0.207  0.089  0.089  0.089  0.089
0.684  1.000  0.207  0.089  0.089  0.089  0.089
```

total release by fleet

#1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1866	2931	1115	7595	18500	28832	17522	13385	140347	75915	232761	118372	198152	38175	371869	298735	482682	402443	268973	1464952	137762	223283	350290	633277	610962

#release mortality

0.08

#

#proportion catch at age (age columns, year rows) by fleet

#Age	1	2	3	4	5	6	7+
# VAMDNCcomGNBS							
0.516943234	0.420558272	0.029611522	0.002300041	0.000614147	0.000469642	0.029503142	
0.550966619	0.398386207	0.023753661	0.001998584	0.000586106	0.000376782	0.023932041	
0.307631441	0.547899470	0.140006122	0.004461177	0.000000000	0.000000000	0.000001790	
0.516940124	0.420558819	0.029615199	0.002299947	0.000615574	0.000463372	0.029506965	
0.518797166	0.419352525	0.029297245	0.002282403	0.000612227	0.000458530	0.029199904	
0.628940362	0.347347986	0.023704704	0.000002779	0.000001390	0.000000000	0.000002779	
0.669270881	0.259785672	0.020083832	0.000222112	0.001516068	0.001516068	0.047605367	
0.511371779	0.463571121	0.005474785	0.000154127	0.000004919	0.000027874	0.019395395	
0.624005546	0.343035964	0.011219230	0.000480824	0.000148254	0.000000000	0.021110182	
0.642558623	0.344755382	0.007412746	0.004384403	0.000421632	0.000000000	0.000467214	
0.025802174	0.913964472	0.051198979	0.004477907	0.000006285	0.000009427	0.004540756	
0.005581742	0.631615669	0.360786663	0.000455381	0.000066576	0.000034620	0.001459349	
0.027607540	0.586055804	0.354897551	0.028712613	0.000019303	0.000028954	0.002678235	
0.003673450	0.823240147	0.171719128	0.001367275	0.000000000	0.000000000	0.000000000	
0.138570223	0.713857022	0.146457858	0.000531399	0.000088567	0.000026049	0.000468882	
0.193238273	0.629094350	0.171613222	0.005204637	0.000139794	0.000043014	0.000666710	
0.086422334	0.911981478	0.001360329	0.000006375	0.000001275	0.000010199	0.000218010	
0.077873218	0.762921885	0.156774695	0.001690465	0.000048299	0.000000000	0.000691438	
0.024909245	0.603833840	0.361418259	0.008330207	0.000349325	0.000099240	0.001059884	
0.027769385	0.397308248	0.570411845	0.003418386	0.000444135	0.000094652	0.000553349	
0.111430011	0.818589406	0.065072545	0.001919060	0.000333996	0.000147185	0.002507797	
0.017010679	0.832430119	0.149481533	0.001082826	0.000000000	0.000000000	0.000000000	
0.155715620	0.308997675	0.527833909	0.007376746	0.000000000	0.000000000	0.000076050	
0.065803829	0.906583656	0.026594275	0.001021878	0.000000000	0.000000000	0.000000000	
0.025501026	0.730203785	0.241745990	0.002543172	0.000000000	0.000000000	0.000006027	
0.024935318	0.780592596	0.193027631	0.001341866	0.000000000	0.000000000	0.000102589	
# VAMDNCcomSE							
0.537201763	0.407351401	0.026132163	0.002115084	0.000593014	0.000415110	0.026191465	
0.793273004	0.190003200	0.007646415	0.000770239	0.000265264	0.000124114	0.007917764	
0.400819433	0.569995782	0.028178066	0.000931403	0.000017574	0.000000000	0.000057742	
0.522085954	0.417204944	0.028730236	0.002252701	0.000607044	0.000445798	0.028673323	
0.531809699	0.410871201	0.027056843	0.002168118	0.000601547	0.000422996	0.027069596	
0.630243925	0.346502260	0.023186293	0.000019950	0.000012277	0.000000000	0.000035295	
0.675286733	0.269674757	0.015549580	0.000353188	0.001304318	0.001202079	0.036629345	
0.389168106	0.386796598	0.069201091	0.009203137	0.000337067	0.001685336	0.143608665	
0.539796771	0.383246511	0.018875812	0.000225095	0.001382726	0.000000000	0.056473085	
0.799307204	0.175509907	0.008294172	0.004956155	0.002436897	0.000140497	0.009355168	
0.080832744	0.836064169	0.055195014	0.020240314	0.000492621	0.000706805	0.006468333	
0.015307953	0.644149890	0.311620490	0.000259119	0.000318916	0.000438509	0.027905123	
0.015359168	0.479844045	0.376110586	0.063232514	0.005458412	0.002315690	0.057679585	
0.020733761	0.841405963	0.137201925	0.000632700	0.000000000	0.000000000	0.000025651	
0.028419586	0.792216209	0.161606014	0.008004148	0.001458246	0.000421271	0.007874526	
0.203472856	0.594202899	0.174622479	0.012702274	0.002229654	0.000709435	0.012060403	
0.121807259	0.872831395	0.002424200	0.000000000	0.000028107	0.000203773	0.002705266	
0.084252864	0.732343680	0.165277447	0.004366119	0.000079384	0.000000000	0.013680506	
0.035999839	0.543573466	0.355659127	0.037928402	0.008758889	0.002290168	0.015790109	
0.024204456	0.332170570	0.540542465	0.048408913	0.024418025	0.005268029	0.024987542	
0.123933791	0.718659228	0.098944165	0.020378994	0.005210014	0.001844253	0.031029555	
0.022450753	0.735370800	0.231822132	0.010428737	0.000000000	0.000000000	0.000000000	
0.183689381	0.332917511	0.474348979	0.007172930	0.000000000	0.000000000	0.001871199	
0.067745451	0.894315419	0.033663117	0.001467259	0.000000000	0.000000000	0.000000000	
0.094324987	0.671258804	0.222842781	0.011573428	0.000000000	0.000000000	0.000000000	
0.023912359	0.756714806	0.213231655	0.002204526	0.000000000	0.000000000	0.003936654	
#NCVAMDrec (just A+B1 proportions)							
0.696955000	0.194864000	0.055629000	0.016011000	0.000000000	0.000000000	0.036541000	
0.701794000	0.233011000	0.033712000	0.015301000	0.000000000	0.000000000	0.016182000	
0.722796000	0.186488000	0.047096000	0.017508000	0.000000000	0.000000000	0.026112000	
0.699669000	0.217771000	0.068575000	0.006530000	0.000000000	0.000000000	0.007455000	
0.809324000	0.135258000	0.000000000	0.000000000	0.000000000	0.000000000	0.055418000	

0.761174000 0.163919000 0.015389000 0.045813000 0.000000000 0.000000000 0.013705000
0.750577000 0.190330000 0.033340000 0.003419000 0.000000000 0.000000000 0.022334000
0.358876000 0.551751000 0.071952000 0.000000000 0.000000000 0.000000000 0.017421000
0.908423000 0.025114000 0.050877000 0.001991000 0.000000000 0.000000000 0.013595000
0.806628000 0.161583000 0.004921000 0.014918000 0.000000000 0.000000000 0.011950000
0.044449000 0.889033000 0.061028000 0.000343000 0.001716000 0.000000000 0.003431000
0.071285000 0.685741000 0.229765000 0.000627000 0.000574000 0.000000000 0.012008000
0.057572000 0.379518000 0.383244000 0.064008000 0.002770000 0.000000000 0.112888000
0.133864000 0.761833000 0.081905000 0.010695000 0.009466000 0.000000000 0.002237000
0.346870000 0.395779000 0.201431000 0.029463000 0.012091000 0.000000000 0.014366000
0.459152000 0.269600000 0.166783000 0.045867000 0.019456000 0.000000000 0.039142000
0.018456000 0.924506000 0.039808000 0.005366000 0.004096000 0.000997000 0.006771000
0.074608000 0.689224000 0.233853000 0.002012000 0.000000000 0.000000000 0.000303000
0.013461000 0.449898000 0.523974000 0.012666000 0.000000000 0.000000000 0.000001000
0.041071000 0.268319000 0.587449000 0.085487000 0.004154000 0.000470000 0.013050000
0.189933000 0.761250000 0.026655000 0.014030000 0.001532000 0.001879000 0.004721000
0.007417000 0.652730000 0.330581000 0.008831000 0.000440000 0.000000000 0.000000000
0.201126000 0.350817000 0.428649000 0.019408000 0.000000000 0.000000000 0.000000000
0.010577000 0.966242000 0.023181000 0.000000000 0.000000000 0.000000000 0.000000000
0.074168000 0.662770000 0.239804000 0.023258000 0.000000000 0.000000000 0.000000000
0.018908000 0.648792000 0.328451000 0.003848000 0.000000000 0.000000000 0.000001000
#NCVAMD B2 only -- calculated within program this is just initializing matrix
0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000
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0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000
#
rough estimates of effective number of ages that went into catch at age calcs by fleet and year
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5 5 5 5
5 5 5 5
5 5 5 5
5 5 5 5
5 5 5 5
5 5 5 5
5 5 5 5
5 5 5 5
5 5 5 5
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5 5 5 5
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5 5 5 5
5 5 5 5
5 5 5 5
5 5 5 5
10 10 10 10
10 10 10 10
10 10 10 10

```
10    10    10    10
10    10    10    10
10    10    10    10
10    10    10    10
10    10    10    10
# North region estimates of abundance (ages 1 to 3 for 1983-2004)
205257.08      68334.95       8119.77
146303.01      82802.59       23629.87
76590.63       36931.76       8047.89
179986.88      64695.46       6918.85
190323.74      69353.98       7908.10
227759.00      58054.52       12040.36
75433.15       81626.07       9658.49
89107.39       26588.56       4132.96
244137.10      51403.65       3170.03
19291.11       146730.88      24946.67
23681.80       125164.89      129526.94
23897.63       81681.68       181243.15
172096.35      440743.41      179409.13
260350.24      148256.91      158533.84
70691.86       31046.96       33232.14
79993.19       493011.50      35449.96
522727.41      357256.01      336446.13
82771.62       176700.23      538521.13
35816.67       31932.82       160203.57
345007.01      143692.16      17565.42
29189.87       137752.06      186035.81
622704.56      73388.32       362209.34
#
# number of indices
# 1)NCIGNS1 2)NCIGNS2 3)NC JAI 4) MRFSS
 4
# first year of surveys forllowed by last year of surveys
 2001 2001 1991 1991
 2007 2007 2007 2007
# indices ages (indices in order by row showing begin, end ages)
 1 2 1 1
 1 2 1 3
#
#observed index values across years (columns)
# 1)NCIGNS1 2)NCIGNS2 3)NC JAI 4) MRFSS
#1982  1983  1984  1985  1986  1987  1988  1989  1990  1991  1992  1993  1994  1995  1996  1997  1998  1999  2000  2001  2002  2003  2004  2005  2006  2007
                                                                  0.540 1.310 0.200 1.030 0.650 1.030 0.390
                                                                  0.360 0.400 0.590 0.060 0.860 0.770 0.760
                                      1.346 0.476 0.826 1.606 3.631 3.421 -999  1.486 5.523 1.342 4.040 2.714 2.039 1.149 3.156 3.595 0.776
                                      0.104 0.057 0.066 0.064 0.114 0.067 0.219 0.146 0.180 0.095 0.108 0.292 0.083 0.130 0.137 0.156 0.146
# estimated CV's for the index values
#1982  1983  1984  1985  1986  1987  1988  1989  1990  1991  1992  1993  1994  1995  1996  1997  1998  1999  2000  2001  2002  2003  2004  2005  2006  2007
                                                                  0.73  0.31  1.91  0.39  0.61  0.38  0.99
                                                                  1.07  0.97  0.67  6.26  0.46  0.51  0.52
                                      0.102 0.154 0.136 0.106 0.071 0.077 -999  0.114 0.072 0.107 0.079 0.093 0.087 0.120 0.088 0.071 0.149
                                      0.139 0.146 0.131 0.131 0.108 0.123 0.138 0.104 0.114 0.11  0.126 0.117 0.149 0.154 0.145 0.11  0.102
#weights
#total catch by fleet
 1.  1.  1.  1.
#catch at age by fleet and year
#1982 1983  1984  1985  1986  1987  1988  1989  1990  1991  1992  1993  1994  1995  1996  1997  1998  1999  2000  2001  2002  2003  2004  2005  2006  2007
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     1     1     1     1     1     1     1     1     1     1
0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001
# index weight
 1. 1. 1. 1.
# North Carolina abundance wt
 1.
#Fbrake level
 1.
```

Table 3. Summary of the number of parameters solved for in each regional model, the number of data points used in the objective function and the sums of the negative log likelihoods for the preliminary base runs.

	Southern		Northern	
Parameters	N		N	
Selectivities	51		36	
Fmults	163		104	
Initial N (age 2-7^{+})	6		6	
Recruitment (82-07)	26		26	
survey q's	8		4	
Total Parms	254		176	
Objective Function	N	value	N	value
Index	93	183.99	47	99.559
Prop at age	1,141	605.38	728	393.33
Total catch	163	35.308	104	15.146
Total	1,397	824.678	879	508.035

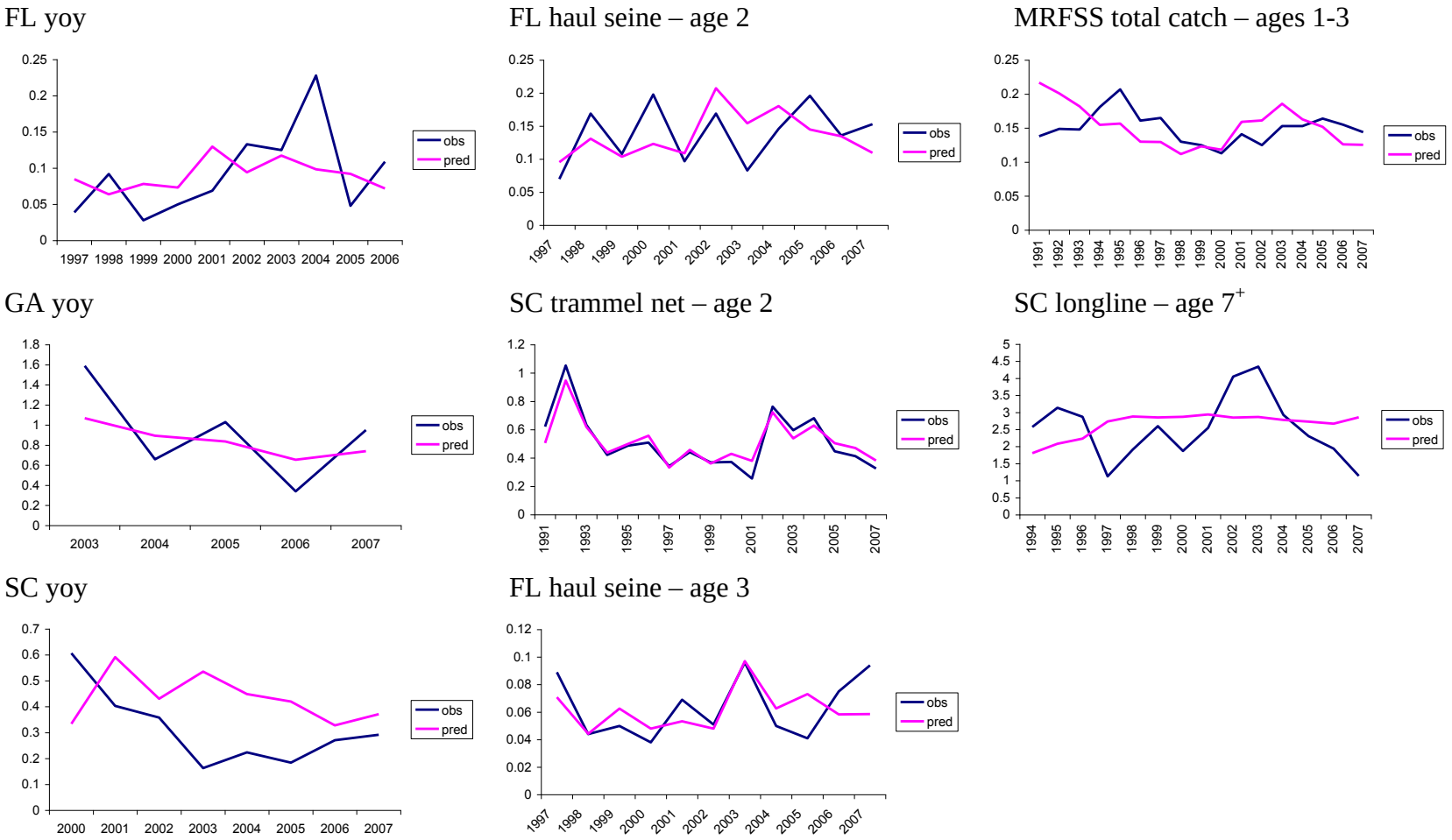


Figure 1. Observed (blue) and model predicted (pink) indices of red drum abundance in the southern region.

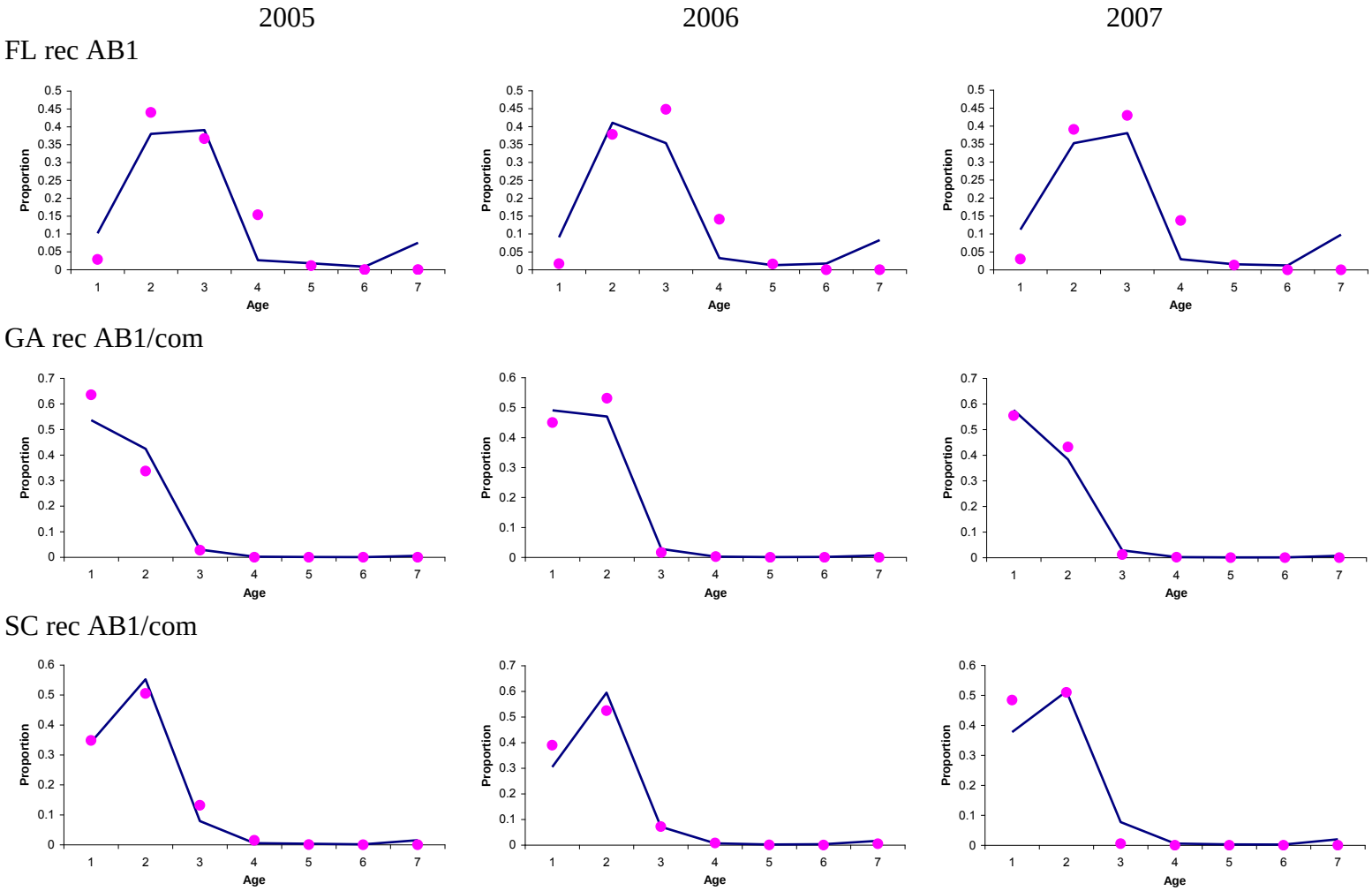


Figure 2. Observed (pink dots…sorry for change) and predicted (blue line) proportion at age in the Florida, Georgia, and South Carolina landed-fish fisheries during 2005-2007.

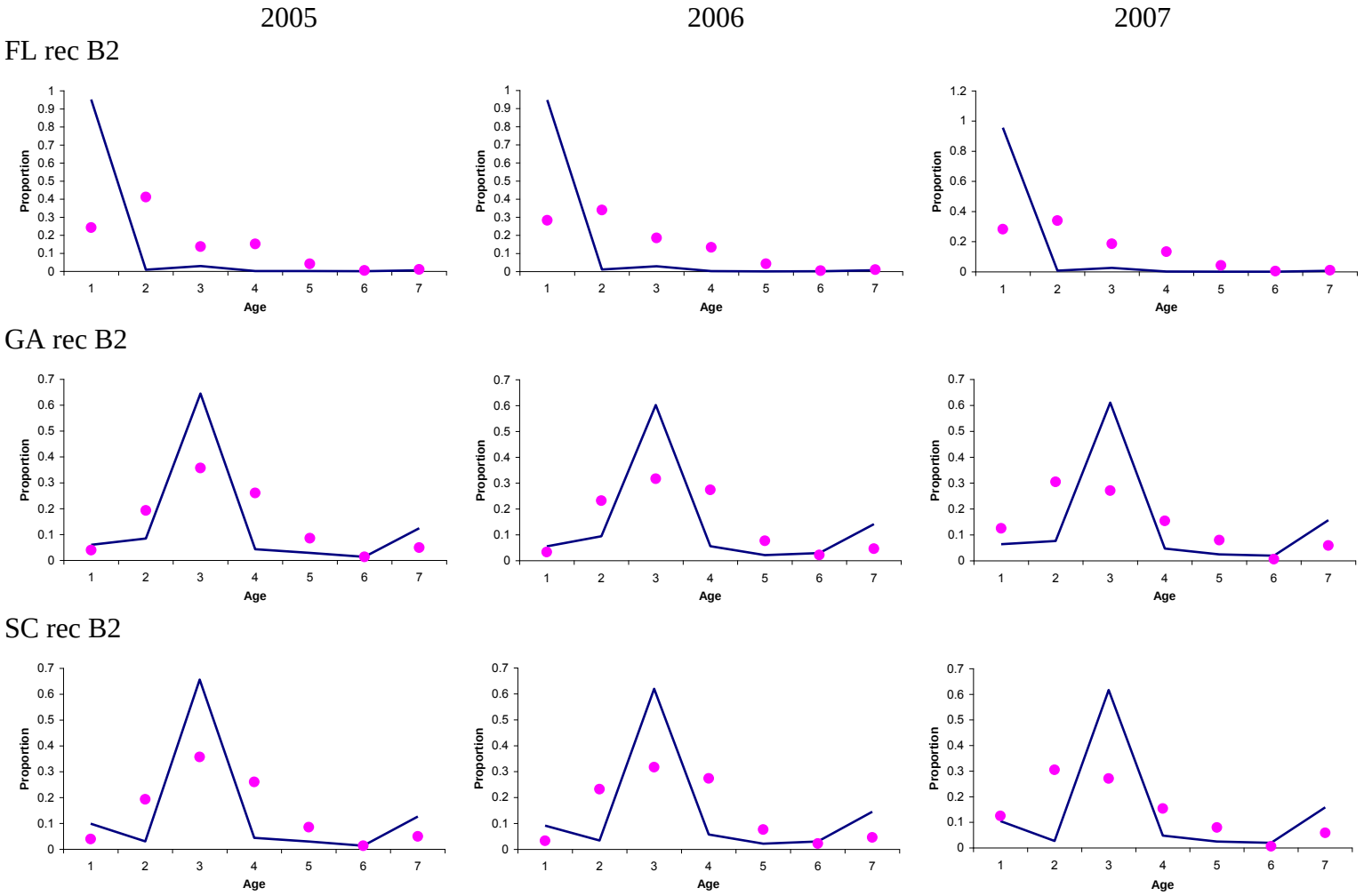
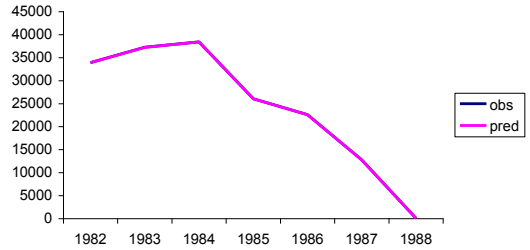
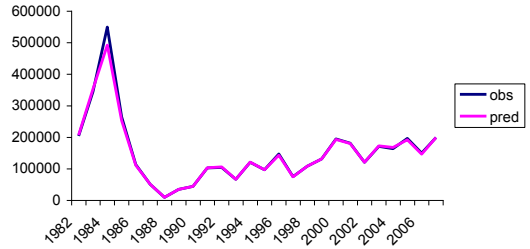


Figure 2. Observed (pink dots…sorry for change) and predicted (blue line) proportion at age in the Florida, Georgia, and South Carolina released-alive recreational fisheries during 2005-2007.

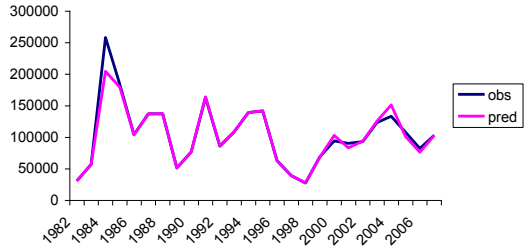
FL comm



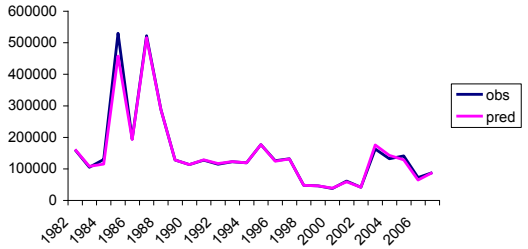
FL rec AB1



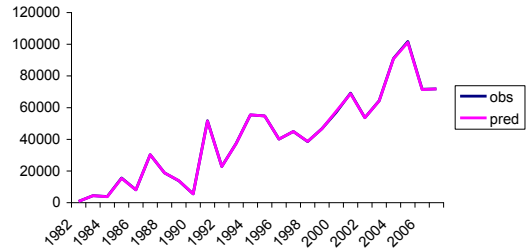
GA rec AB1/ comm



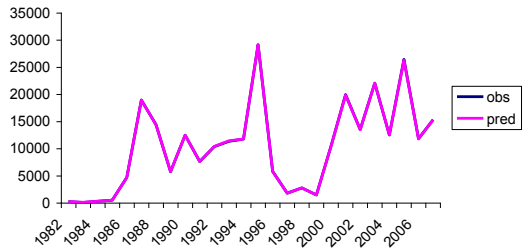
SC rec AB1 / comm



FL rec B2



GA rec B2



SC rec B2

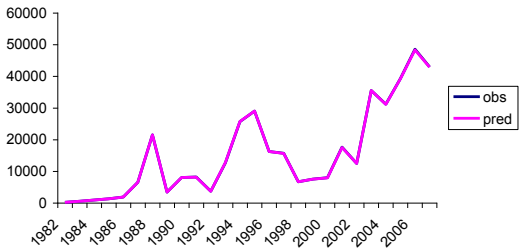


Figure 3. Observed (blue) and model predicted (pink) total kill of red drum in the eight fisheries modeled for the southern region.

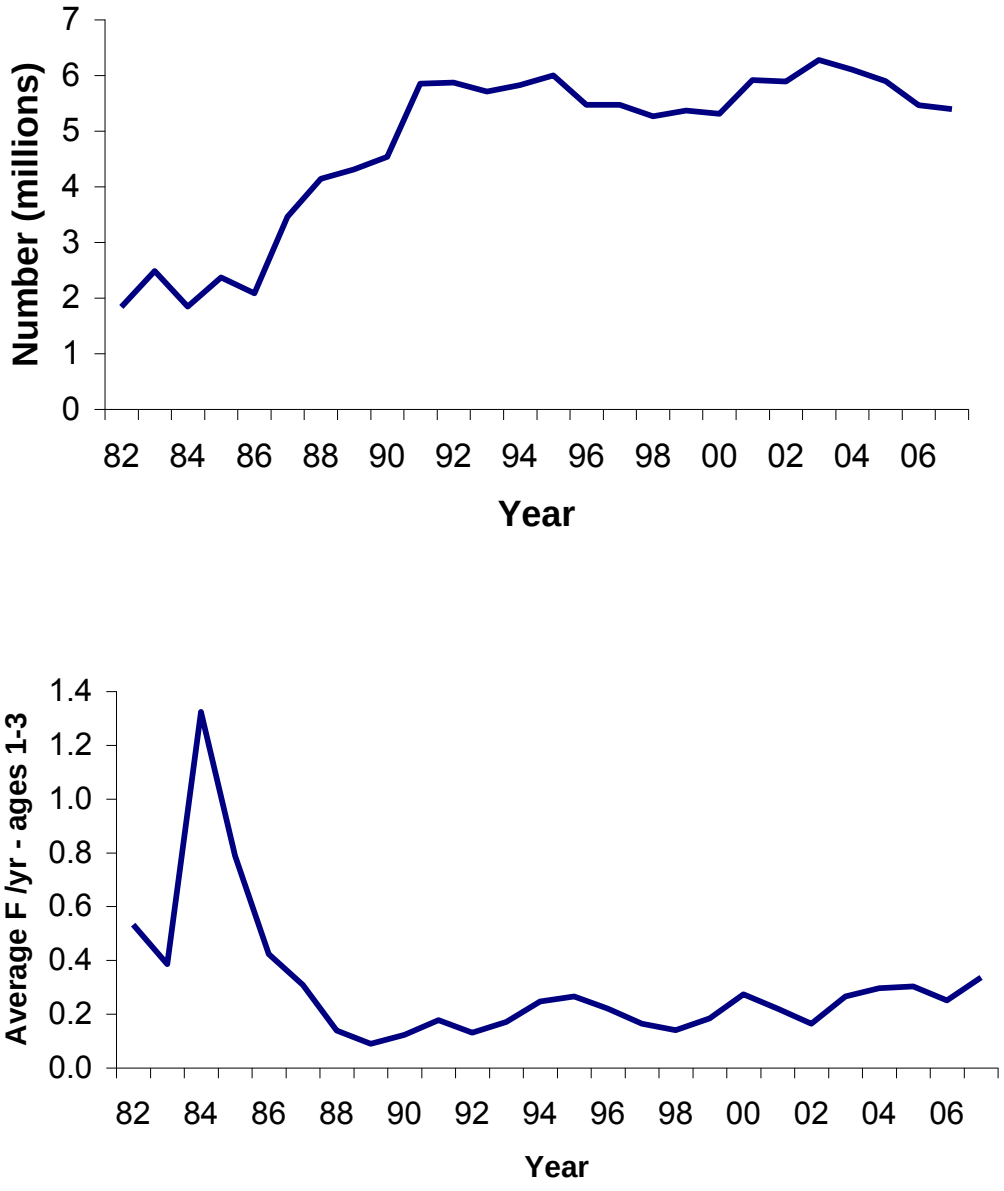
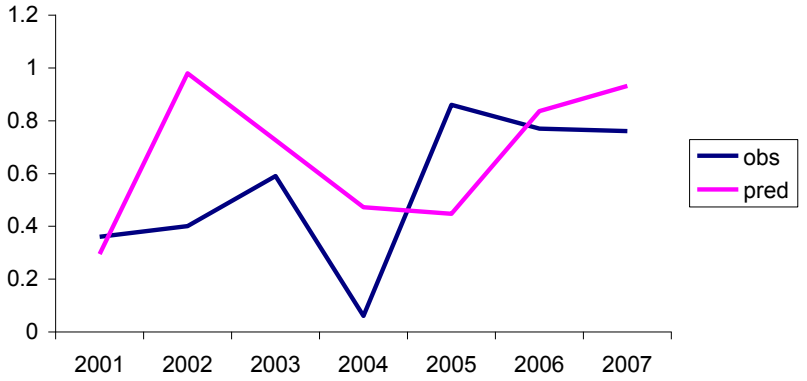


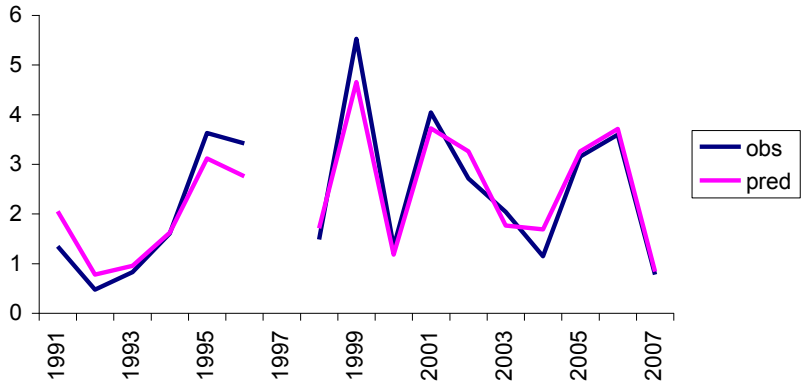
Figure 4. Estimated total population abundance and unweighted age 1-3 average F for red drum in the southern region.

NC Independent Gillnet Survey – young-of-the-year

NC Independent Gillnet Survey – age 2



NC juvenile abundance index – young-of-the-year



MRFSS total catch rate – ages 1-3

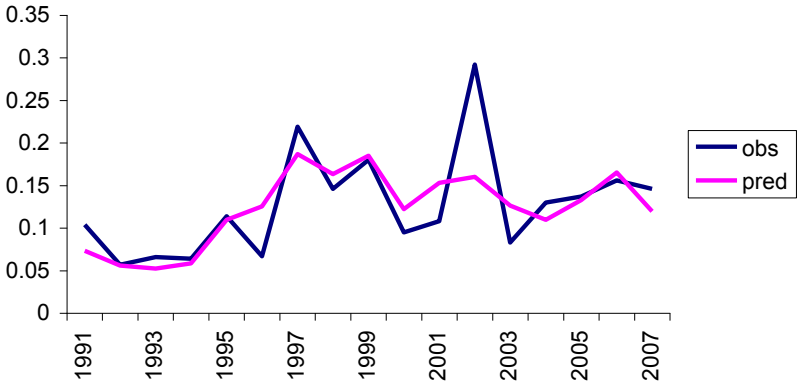
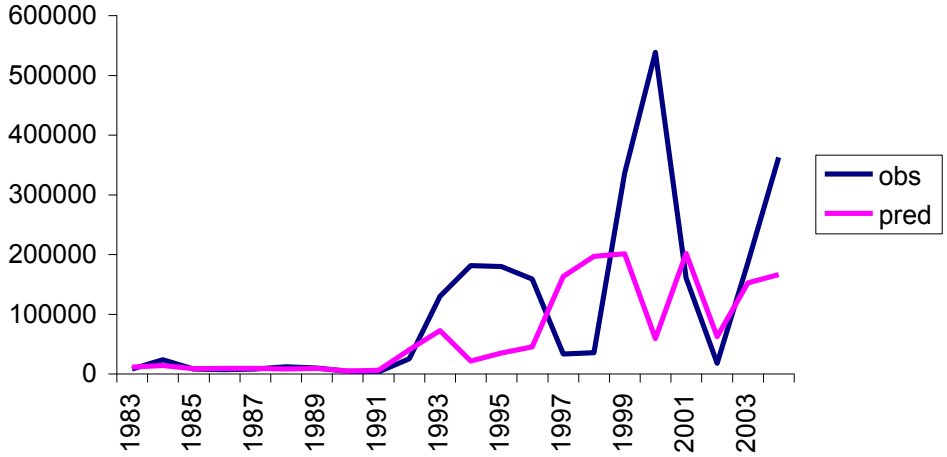
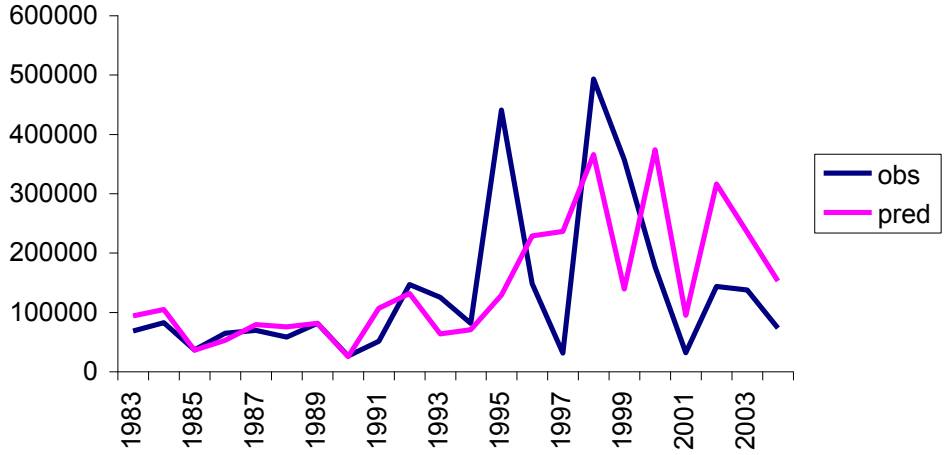


Figure 6. Observed (blue) and model predicted (pink) indices of red drum abundance in the northern region.

Age 1



Age 2



Age 3

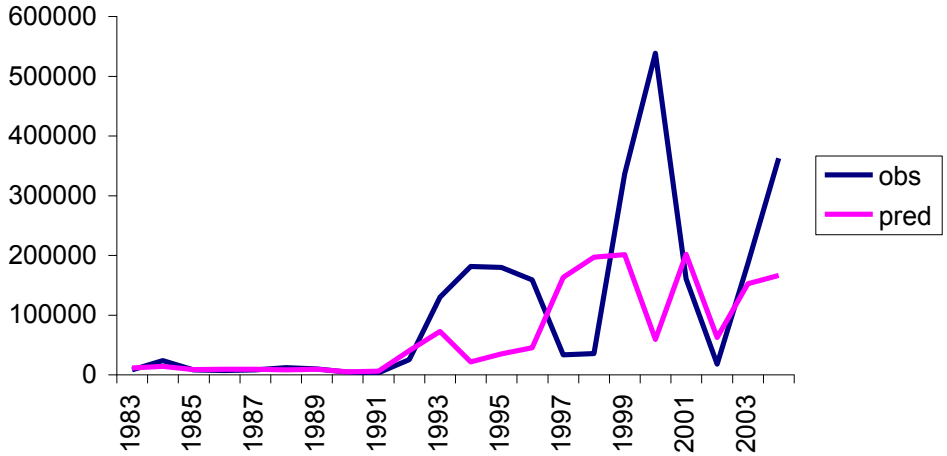


Figure 7. . Observed tag-analyses-based abundances (blue) and model predicted (pink) absolute abundances of red drum ages 1-3 in the northern region.

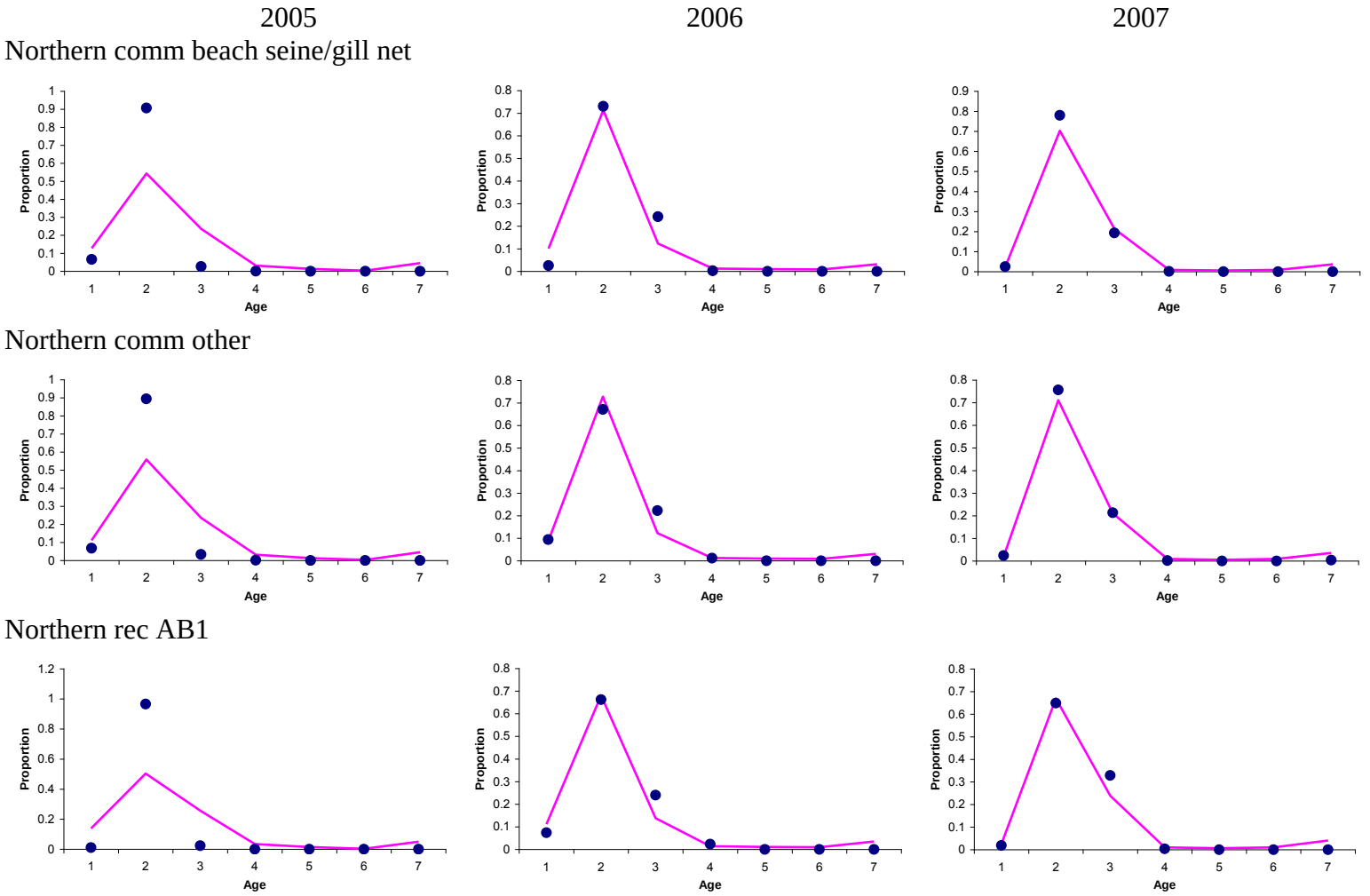
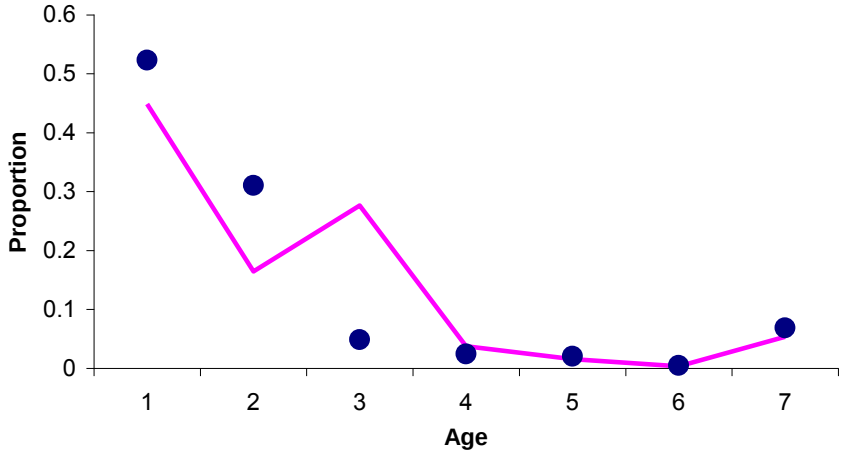
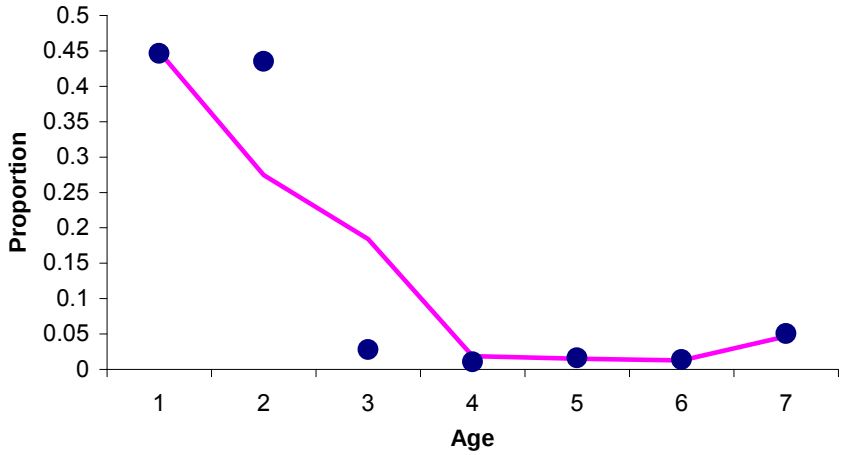


Figure 8. Observed (blue dots) and predicted (pink line) proportion at age in the northern region landed-fish fisheries during 2005-2007.

Northern rec B2 2005



2006



2007

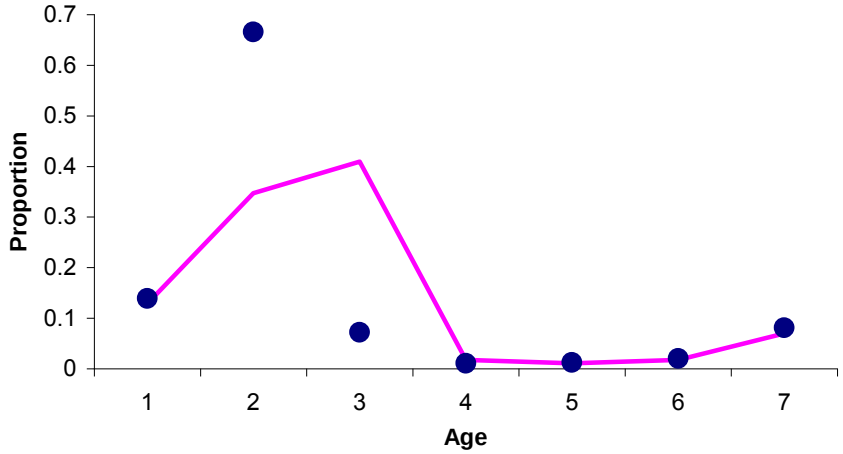
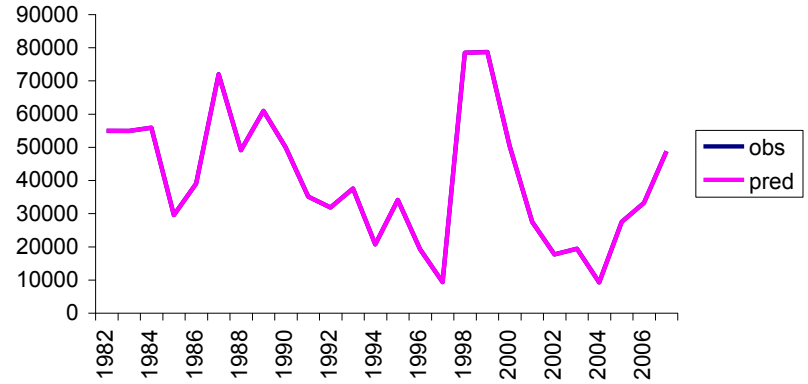
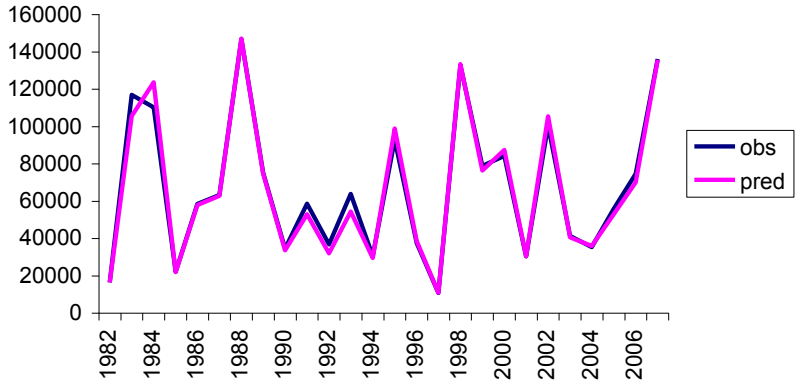


Figure 8. Observed (blue dots) and predicted (pink line) proportion at age in the northern region released-fish fisheries during 2005-2007.

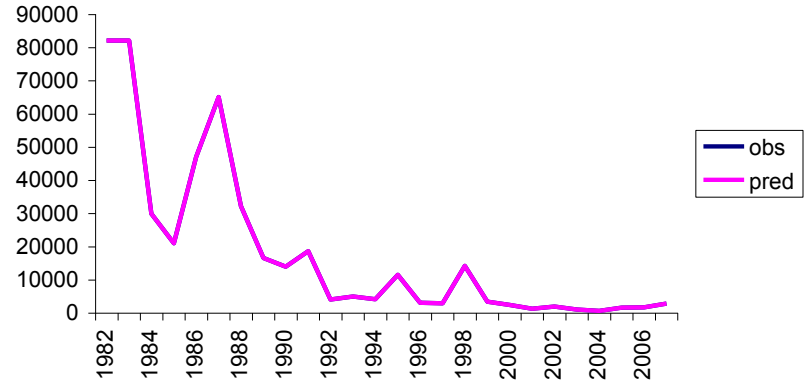
Northern comm, beach seine/gill net



Northern rec AB1



Northern comm, other comm



Northern rec B2

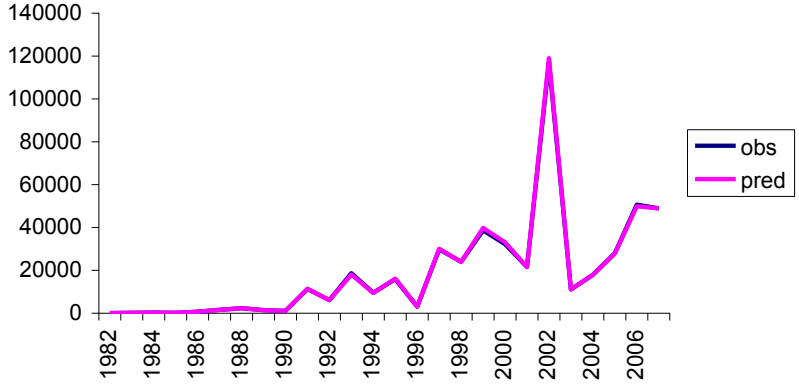


Figure 9. Observed (blue) and model predicted (pink) total kill of red drum in the four fisheries modeled for the northern region.

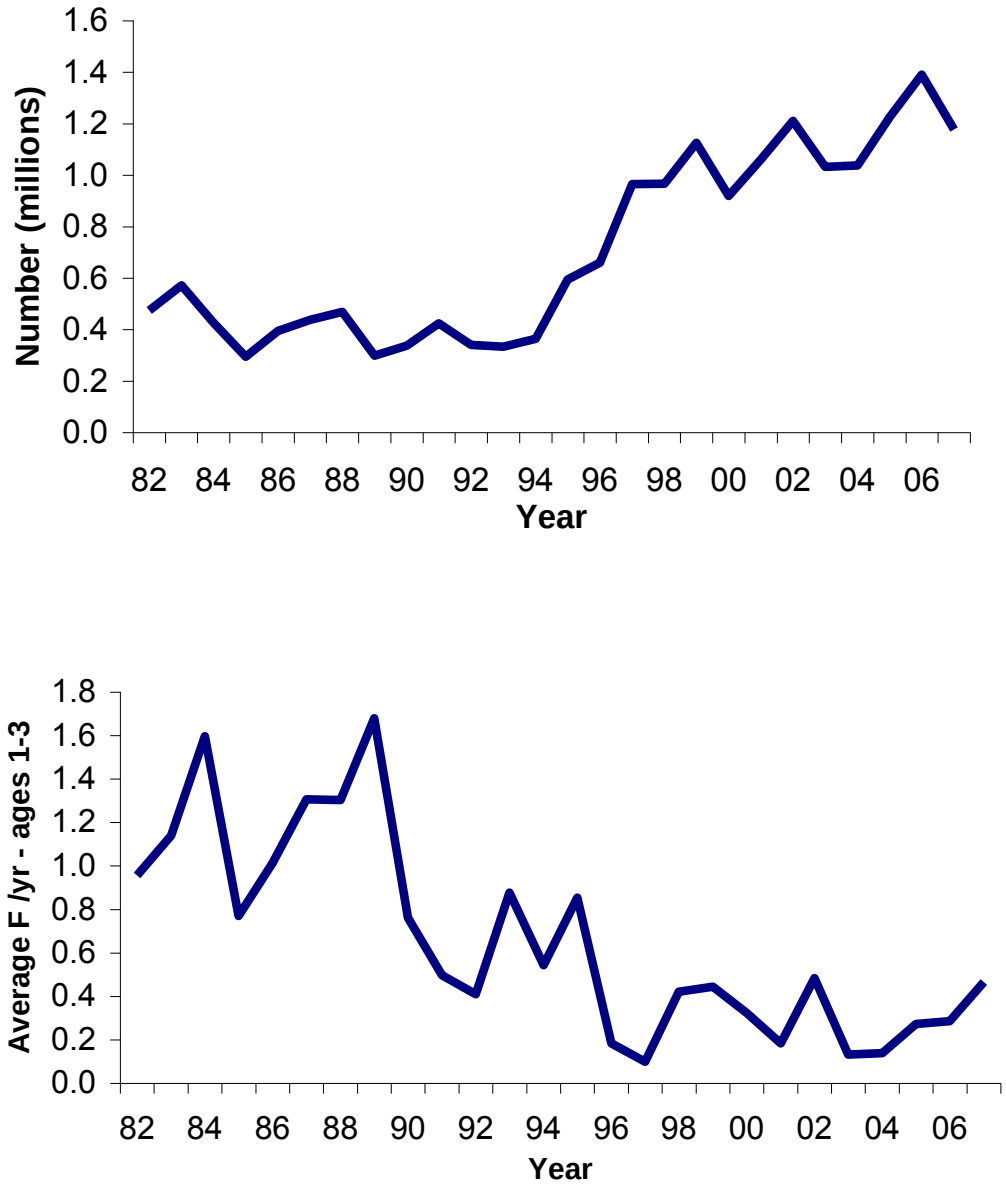


Figure 10. Estimated total population abundance and unweighted age 1-3 average F for red drum in the northern region