Appendix 3

Detailed stock assessment reports of wide ranging species

ICCAT Stocks (analyzed with CMSY_O_7m.R)

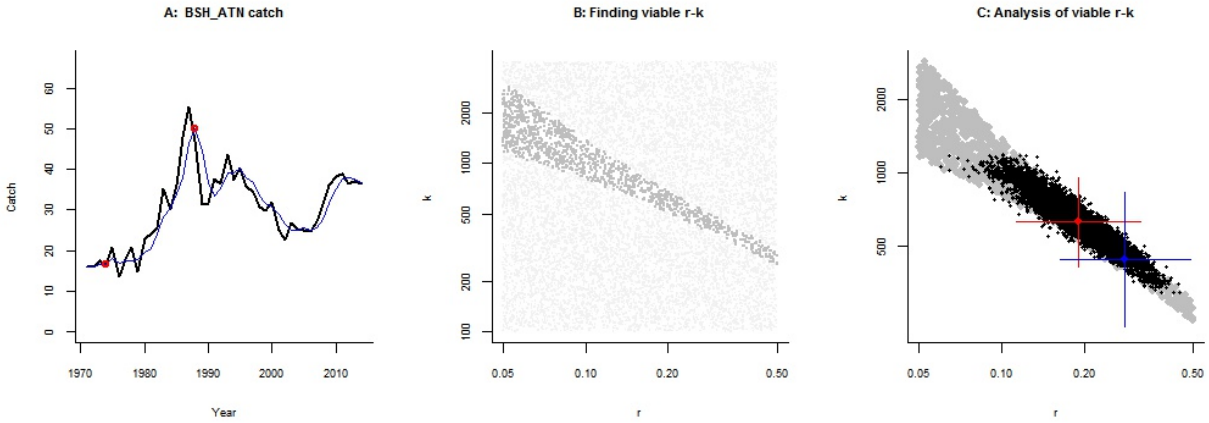
Species: Prionace glauca , stock: BSH_ATN
Blueshark - North Atlantic
Source: https://www.iccat.int/Documents/Meetings/Docs/2015_BSH%20ASSESS_REPORT_ENG.pdf
Region: North East Atlantic , Wide ranging
Catch data used from years 1971 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 1990 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.05 - 0.5 default , prior range for k = 100 - 4009
Prior range of q = 2.01e-06 - 1.27e-05

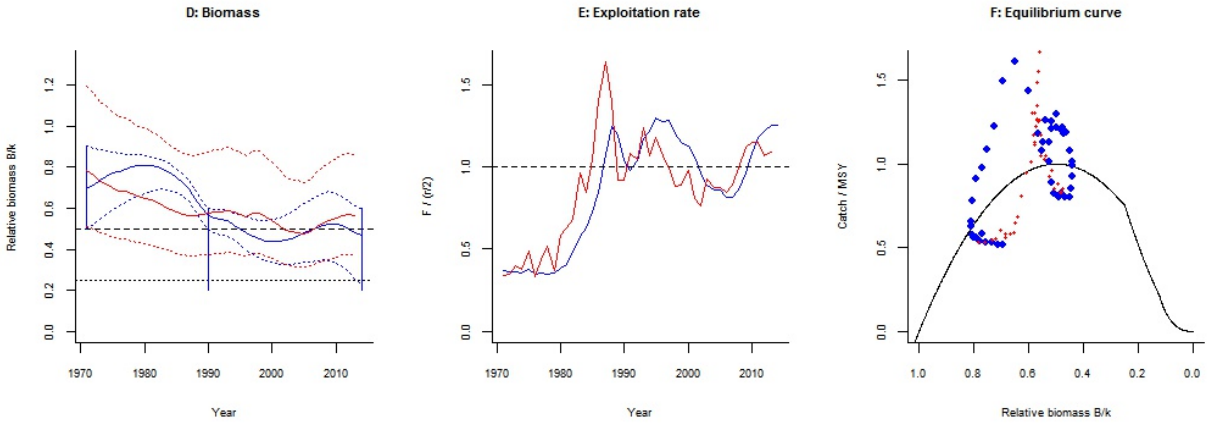
Results of CMSY analysis with altogether 5126 viable trajectories for 1118 r-k pairs
r = 0.282 , 95% CL = 0.163 - 0.487 , k = 441 , 95% CL = 234 - 832
MSY = 31.2 , 95% CL = 26.2 - 37
Relative biomass last year = 0.471 k, 2.5th = 0.223 , 97.5th = 0.595
Exploitation F/(r/2) in last year = 1.25

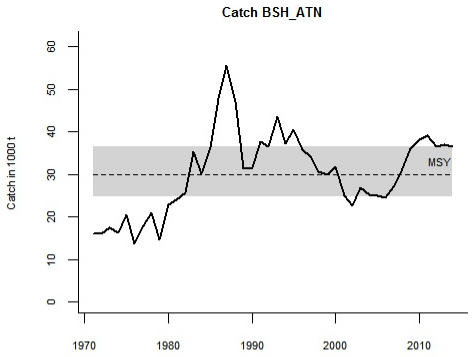
Results from Bayesian Schaefer model using catch & CPUE
r = 0.191 , 95% CL = 0.113 - 0.322 , k = 629 , 95% CL = 413 - 959
MSY = 30 , 95% CL = 24.7 - 36.6
Relative biomass in last year = 0.551 k, 2.5th perc = 0.435 , 97.5th perc = 0.654
Exploitation F/(r/2) in last year = 1.1
q = 2.41e-06 , lcl = 1.71e-06 , ucl = 3.4e-06

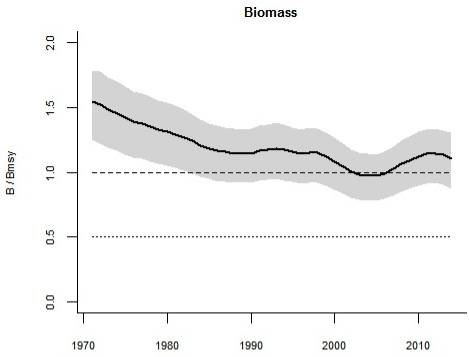
Results for Management (based on BSM analysis)
Fmsy = 0.0955 , 95% CL = 0.0566 - 0.161 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0955 , 95% CL = 0.0566 - 0.161 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 30 , 95% CL = 24.7 - 36.6
Bmsy = 315 , 95% CL = 206 - 480
Biomass in last year = 347 , 2.5th perc = 274 , 97.5 perc = 412
B/Bmsy in last year = 1.1 , 2.5th perc = 0.87 , 97.5 perc = 1.31
Fishing mortality in last year = 0.105 , 2.5th perc = 0.0887 , 97.5 perc = 0.133
F/Fmsy = 1.1 , 2.5th perc = 0.929 , 97.5 perc = 1.4

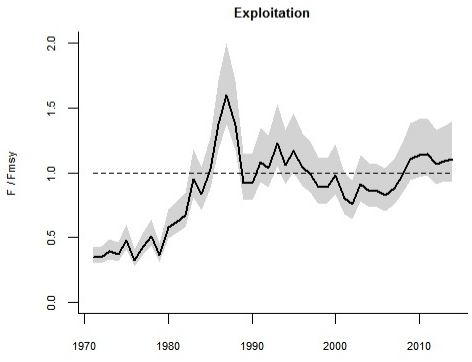
Stock status and exploitation in 2014
Biomass = 347 , B/Bmsy = 1.1 , fishing mortality F = 0.105 , F/Fmsy = 1.1
Comment: Reconstructed catch from BSH assessment (raw CPUE and Catch data from 2015 ICCAT assessment); Multiple CPUE series combined.

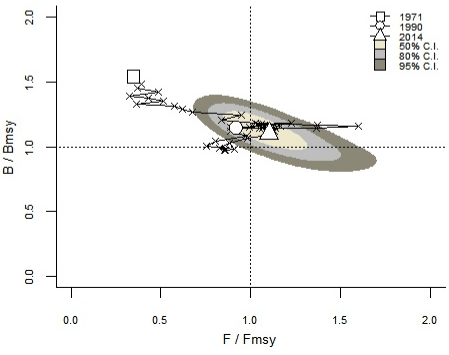

A: BSH_ATN catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r


D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k


Catch BSH_ATN
Catch in 1000 t
MSY


Biomass
B / Bmsy


Exploitation
F / Fmsy


B / Bmsy
F / Fmsy
1971
1990
2014
50% C.I.
80% C.I.
95% C.I.

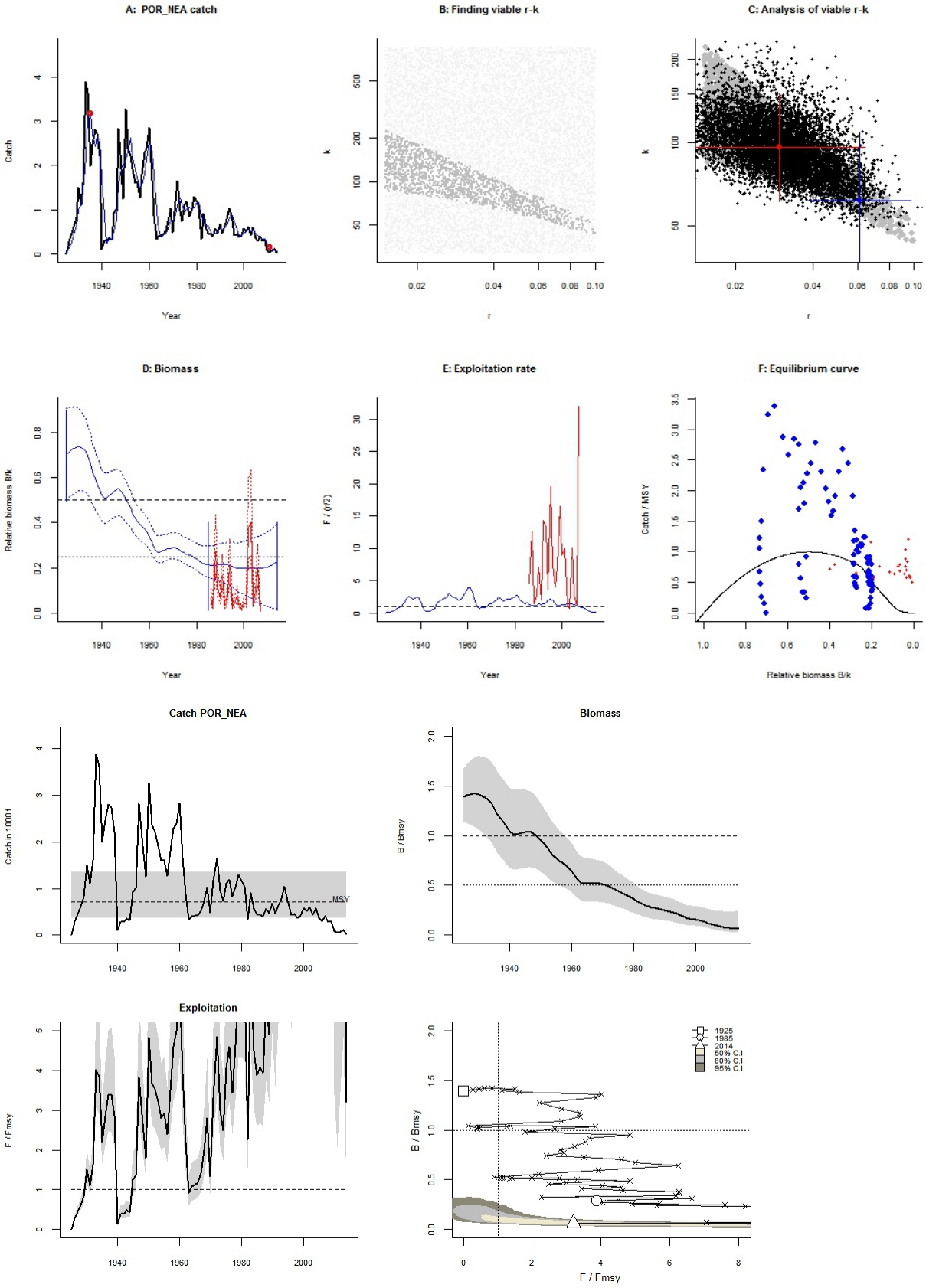
Species: Lamna nasus , stock: POR_NEA
Porbeagle - North East Atlantic
Source: https://www.iccat.int/Documents/SCRS/DetRep/DET-POR.pdf ; https://www.iccat.int/en/accesingdb.HTM
Region: North East Atlantic , Wide ranging
Catch data used from years 1925 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 1985 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.015 - 0.1 default , prior range for k = 31.7 - 845
Prior range of q = 1.33e-05 - 6.86e-05

Results of CMSY analysis with altogether 4920 viable trajectories for 1488 r-k pairs
r = 0.0611 , 95% CL = 0.0385 - 0.097 , k = 61.5 , 95% CL = 34.6 - 109
MSY = 0.939 , 95% CL = 0.724 - 1.22
Relative biomass last year = 0.229 k, 2.5th = 0.0191 , 97.5th = 0.397
Exploitation F/(r/2) in last year = 0.158

Results from Bayesian Schaefer model using catch & CPUE
r = 0.0296 , 95% CL = 0.0136 - 0.0642 , k = 96.1 , 95% CL = 60.9 - 152
MSY = 0.711 , 95% CL = 0.372 - 1.36
Relative biomass in last year = 0.0317 k, 2.5th perc = 0.0124 , 97.5th perc = 0.123
Exploitation F/(r/2) in last year = 0.406
q = 2.31e-05 , lcl = 1.64e-05 , ucl = 3.27e-05

Results for Management (based on BSM analysis)
Fmsy = 0.0148 , 95% CL = 0.00681 - 0.0321 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.00188 , 95% CL = 0.000865 - 0.00407 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.711 , 95% CL = 0.372 - 1.36
Bmsy = 48.1 , 95% CL = 30.5 - 75.9
Biomass in last year = 3.05 , 2.5th perc = 1.19 , 97.5 perc = 11.8
B/Bmsy in last year = 0.0635 , 2.5th perc = 0.0247 , 97.5 perc = 0.246
Fishing mortality in last year = 0.006 , 2.5th perc = 0.00155 , 97.5 perc = 0.0154
F/Fmsy = 3.2 , 2.5th perc = 0.824 , 97.5 perc = 8.21

Stock status and exploitation in 2014
Biomass = 3.05 , B/Bmsy = 0.0635 , fishing mortality F = 0.006 , F/Fmsy = 3.2
Comment: Catch and cpue from ICCAT POR assessment + recent catch from Task I database. Results plausible; Multiple CPUE series combined.


A: POR_NEA catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch POR_NEA
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1925
1985
2014
50% C.I.
80% C.I.
95% C.I.

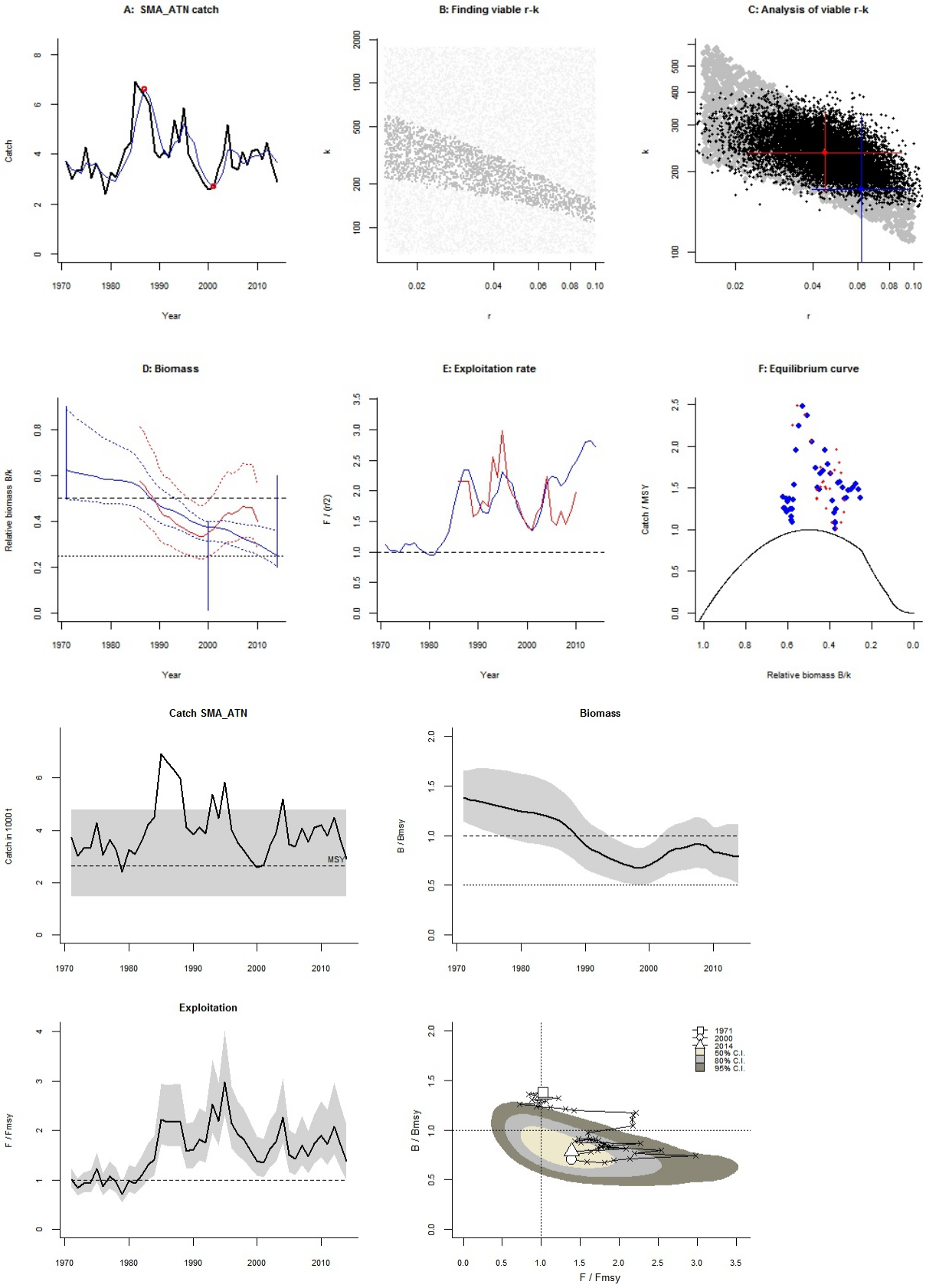
Species: Isurus oxyrinchus , stock: SMA_ATN
Shortfin mako shark - North Atlantic
Source: https://www.iccat.int/Documents/Meetings/Docs/2012_SHK_ASS_ENG.pdf ; https://www.iccat.int/en/accesingdb.HTM
Region: North East Atlantic , Wide ranging
Catch data used from years 1971 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.015 - 0.1 default , prior range for k = 66.1 - 1762
Prior range of q = 3.64e-06 - 1.88e-05

Results of CMSY analysis with altogether 4170 viable trajectories for 1996 r-k pairs
r = 0.062 , 95% CL = 0.0397 - 0.097 , k = 172 , 95% CL = 91.7 - 322
MSY = 2.66 , 95% CL = 1.87 - 3.81
Relative biomass last year = 0.253 k, 2.5th = 0.203 , 97.5th = 0.36
Exploitation F/(r/2) in last year = 2.72

Results from Bayesian Schaefer model using catch & CPUE
r = 0.0447 , 95% CL = 0.0224 - 0.0891 , k = 237 , 95% CL = 168 - 333
MSY = 2.65 , 95% CL = 1.47 - 4.77
Relative biomass in last year = 0.394 k, 2.5th perc = 0.26 , 97.5th perc = 0.561
Exploitation F/(r/2) in last year = 1.39
q = 7.05e-06 , lcl = 5.1e-06 , ucl = 9.76e-06

Results for Management (based on BSM analysis)
Fmsy = 0.0224 , 95% CL = 0.0112 - 0.0445 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0224 , 95% CL = 0.0112 - 0.0445 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 2.65 , 95% CL = 1.47 - 4.77
Bmsy = 118 , 95% CL = 84.2 - 167
Biomass in last year = 93.4 , 2.5th perc = 61.5 , 97.5 perc = 133
B/Bmsy in last year = 0.788 , 2.5th perc = 0.52 , 97.5 perc = 1.12
Fishing mortality in last year = 0.031 , 2.5th perc = 0.0218 , 97.5 perc = 0.0471
F/Fmsy = 1.39 , 2.5th perc = 0.976 , 97.5 perc = 2.11

Stock status and exploitation in 2014
Biomass = 93.4 , B/Bmsy = 0.788 , fishing mortality F = 0.031 , F/Fmsy = 1.39
Comment: Catch and CPUE from 2011 SMA ICCAT assessment + recent catch supplemented from Task I database. Multiple CPUE series combined. Results are coherent with Baum et al (2003)


A: SMA_ATN catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch SMA_ATN
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1971
2000
2014
50% C.I.
80% C.I.
95% C.I.

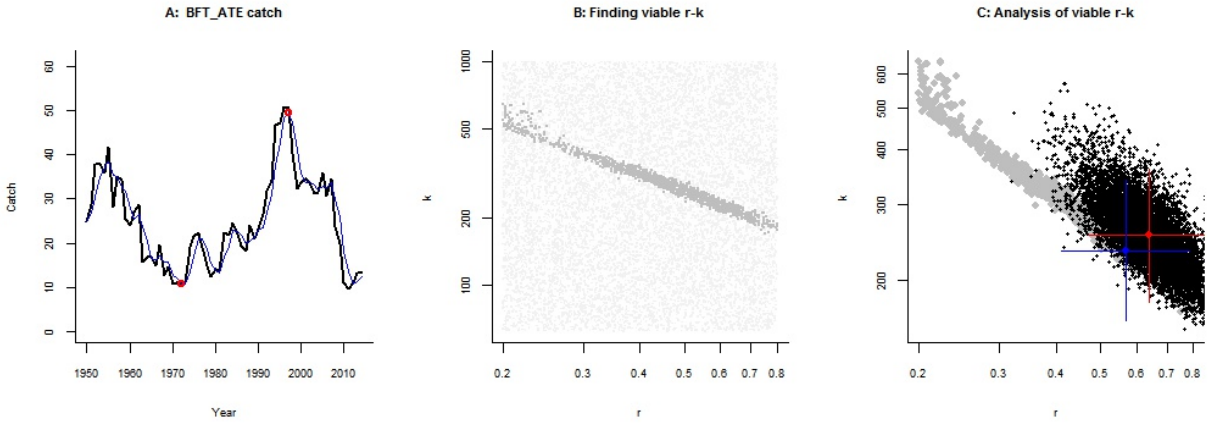
Species: Thunnus thynnus , stock: BFT_ATE
Bluefin tuna - East Atlantic
Source: https://www.iccat.int/Documents/Meetings/Docs/2014_BFT_ASSESS-ENG.pdf ; https://www.iccat.int/en/accesingdb.HTM
Region: North East Atlantic , Wide ranging
Catch data used from years 1950 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 61.9 - 991
Prior range of q = 1.78e-05 - 7.14e-05

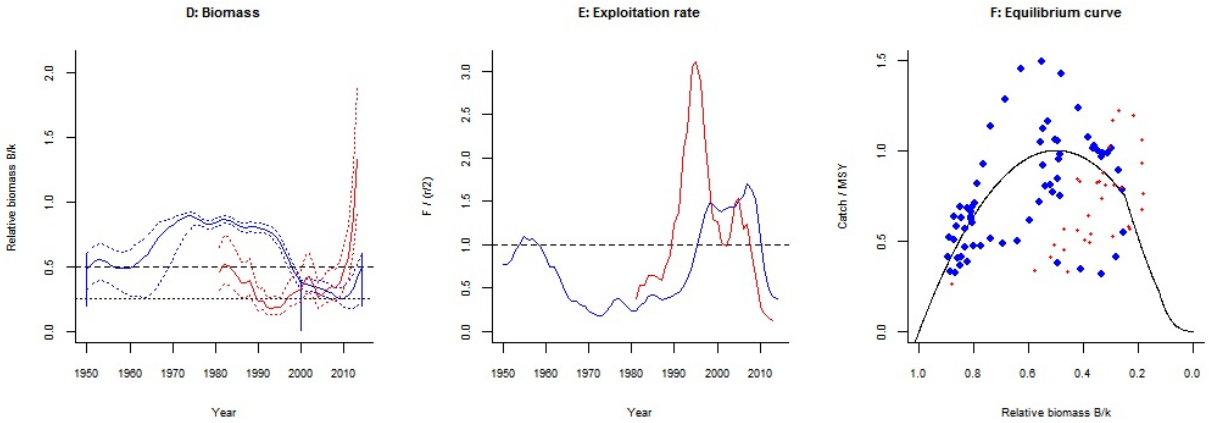
Results of CMSY analysis with altogether 1696 viable trajectories for 1116 r-k pairs
r = 0.568 , 95% CL = 0.411 - 0.785 , k = 234 , 95% CL = 161 - 340
MSY = 33.3 , 95% CL = 30.1 - 36.7
Relative biomass last year = 0.496 k, 2.5th = 0.225 , 97.5th = 0.596
Exploitation F/(r/2) in last year = 0.378

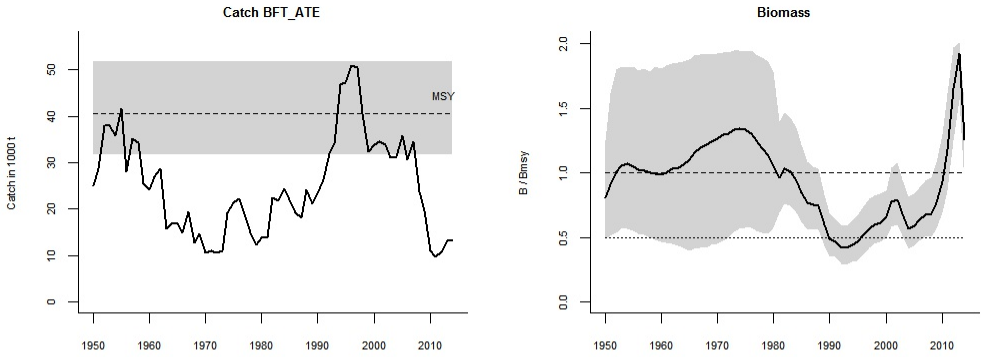
Results from Bayesian Schaefer model using catch & CPUE
r = 0.638 , 95% CL = 0.469 - 0.868 , k = 254 , 95% CL = 178 - 362
MSY = 40.5 , 95% CL = 31.6 - 51.8
Relative biomass in last year = 0.631 k, 2.5th perc = 0.457 , 97.5th perc = 0.766
Exploitation F/(r/2) in last year = 0.259
q = 1.49e-05 , lcl = 1.19e-05 , ucl = 1.87e-05

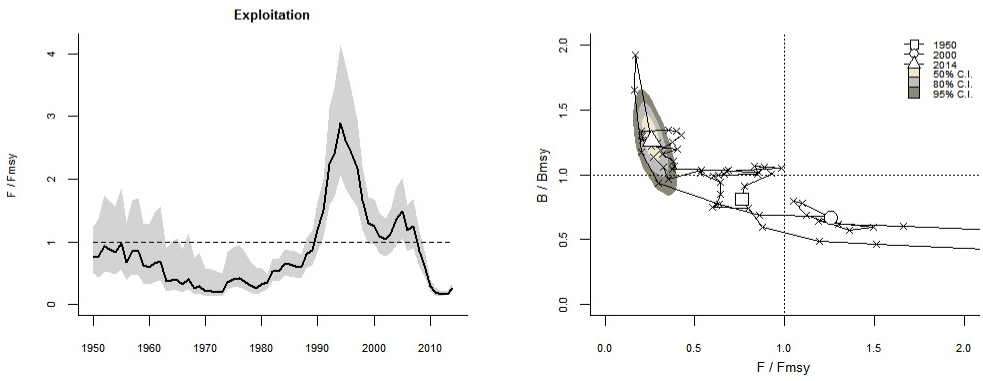
Results for Management (based on BSM analysis)
Fmsy = 0.319 , 95% CL = 0.235 - 0.434 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.319 , 95% CL = 0.235 - 0.434 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 40.5 , 95% CL = 31.6 - 51.8
Bmsy = 127 , 95% CL = 88.9 - 181
Biomass in last year = 160 , 2.5th perc = 116 , 97.5 perc = 194
B/Bmsy in last year = 1.26 , 2.5th perc = 0.915 , 97.5 perc = 1.53
Fishing mortality in last year = 0.0828 , 2.5th perc = 0.0682 , 97.5 perc = 0.114
F/Fmsy = 0.259 , 2.5th perc = 0.214 , 97.5 perc = 0.358

Stock status and exploitation in 2014
Biomass = 160 , B/Bmsy = 1.26 , fishing mortality F = 0.0828 , F/Fmsy = 0.259
Comment: Catch and CPUE from recent BFT ICCAT assessment, recent catch supplemented from ICAAT Task I data; Multiple CPUE series combined. BSM r appears outside plausible biological limits, likely driven by overoptimistic CPUE increase in recent years


A: BFT_ATE catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r


D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k


Catch BFT_ATE
Catch in 1000 t
MSY
Biomass
B / Bmsy


Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1950
2000
2014
50% C.I.
80% C.I.
95% C.I.

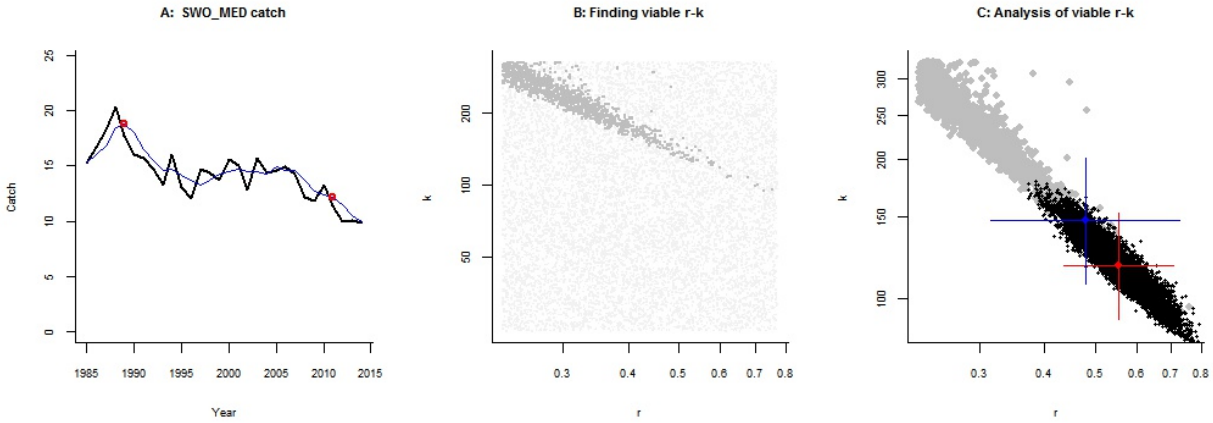
Species: Xiphias gladius , stock: SWO_MED
Swordfish - Mediterranean Sea
Source: https://www.iccat.int/Documents/Meetings/Docs/2014_SWO_MED_ASSESS_rep_ENG.pdf ; https://www.iccat.int/en/accesingdb.HTM
Region: Mediterranean , Wide ranging
Catch data used from years 1985 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.3 in year 1995 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.23 - 0.77 expert, , prior range for k = 24.4 - 327
Prior range of q = 0.000936 - 0.00343

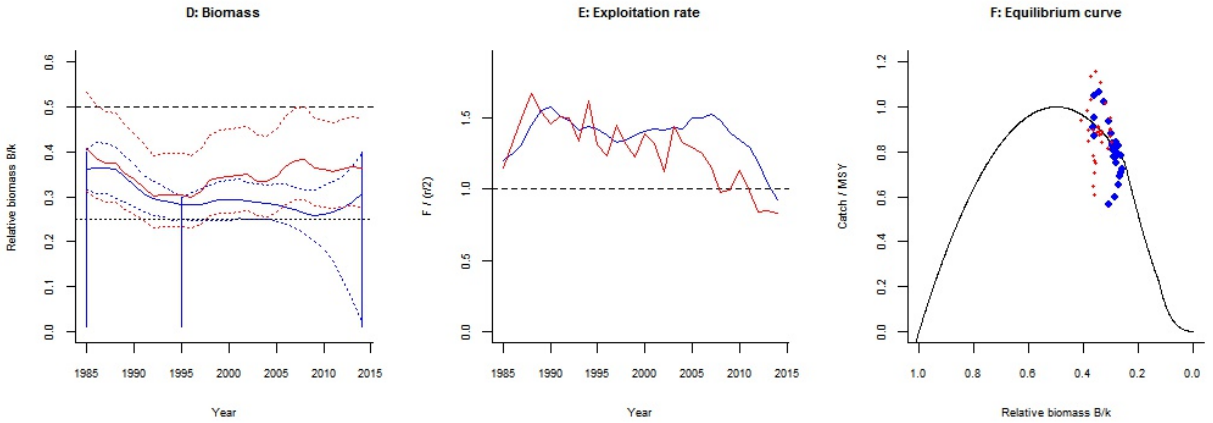
Results of CMSY analysis with altogether 1409 viable trajectories for 1260 r-k pairs
r = 0.478 , 95% CL = 0.315 - 0.725 , k = 147 , 95% CL = 108 - 202
MSY = 17.6 , 95% CL = 15 - 20.8
Relative biomass last year = 0.306 k, 2.5th = 0.0213 , 97.5th = 0.396
Exploitation F/(r/2) in last year = 0.922

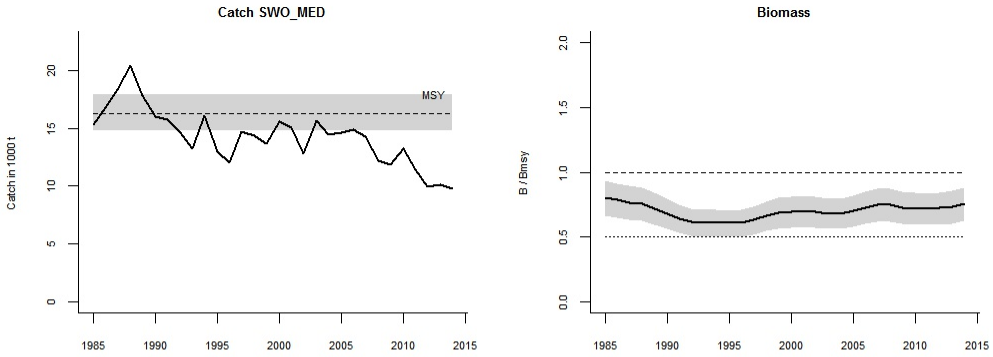
Results from Bayesian Schaefer model using catch & CPUE
r = 0.554 , 95% CL = 0.435 - 0.705 , k = 118 , 95% CL = 90.2 - 153
MSY = 16.3 , 95% CL = 14.8 - 17.9
Relative biomass in last year = 0.38 k, 2.5th perc = 0.312 , 97.5th perc = 0.441
Exploitation F/(r/2) in last year = 0.792
q = 0.00121 , lcl = 0.000964 , ucl = 0.00151

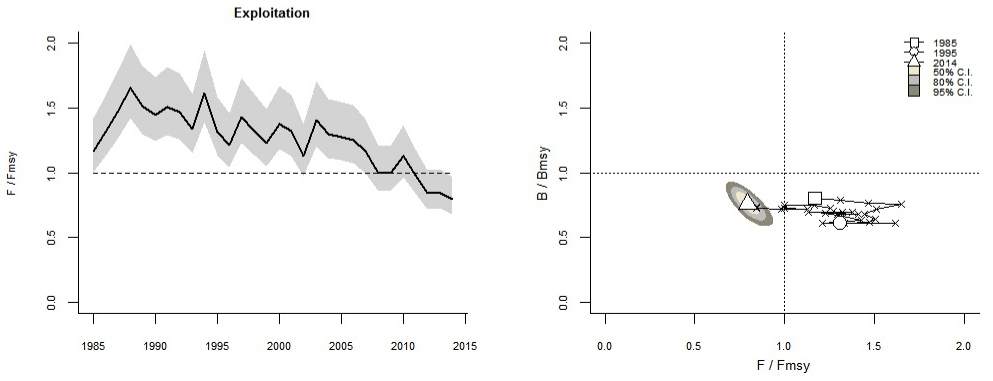
Results for Management (based on BSM analysis)
Fmsy = 0.277 , 95% CL = 0.218 - 0.352 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.277 , 95% CL = 0.218 - 0.352 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 16.3 , 95% CL = 14.8 - 17.9
Bmsy = 58.8 , 95% CL = 45.1 - 76.6
Biomass in last year = 44.6 , 2.5th perc = 36.7 , 97.5 perc = 51.8
B/Bmsy in last year = 0.759 , 2.5th perc = 0.625 , 97.5 perc = 0.882
Fishing mortality in last year = 0.219 , 2.5th perc = 0.189 , 97.5 perc = 0.267
F/Fmsy = 0.792 , 2.5th perc = 0.682 , 97.5 perc = 0.963

Stock status and exploitation in 2014
Biomass = 44.6 , B/Bmsy = 0.759 , fishing mortality F = 0.219 , F/Fmsy = 0.792
Comment: Catch and CPUE series from recent ICCAT assessment, recent catch supplemented from ICAAT Task I data.


A: SWO_MED catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r


D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k


Catch SWO_MED
Catch in 1000 t
MSY
Biomass
B / Bmsy


Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1985
1995
2014
50% C.I.
80% C.I.
95% C.I.

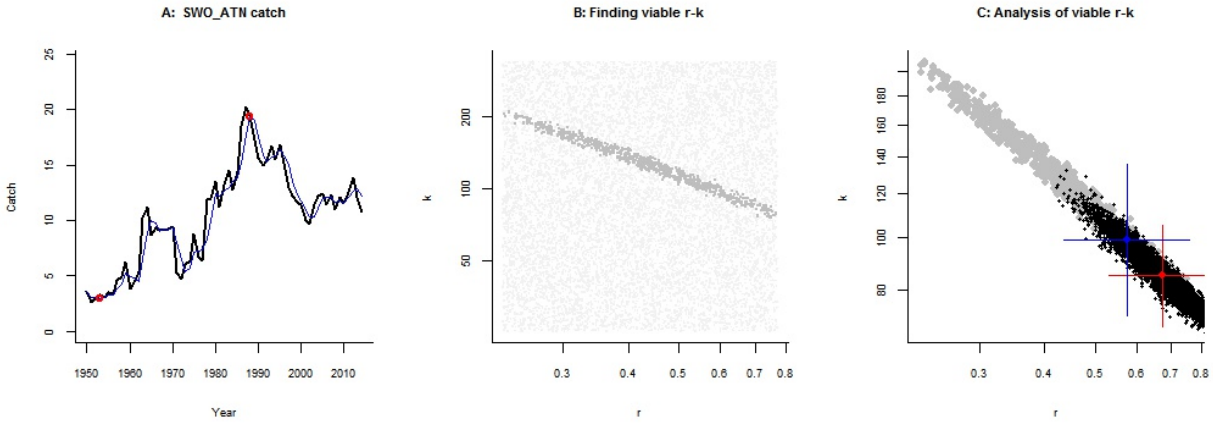
Species: Xiphias gladius , stock: SWO_ATN
Swordfish - North Atlantic
Source: https://www.iccat.int/Documents/Meetings/Docs/2013_SWO_ASSESS_REP_ENG.pdf ; https://www.iccat.int/en/accesingdb.HTM
Region: North East Atlantic , Wide ranging
Catch data used from years 1950 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.23 - 0.77 expert, , prior range for k = 25.2 - 338
Prior range of q = 1.5e-05 - 5.49e-05

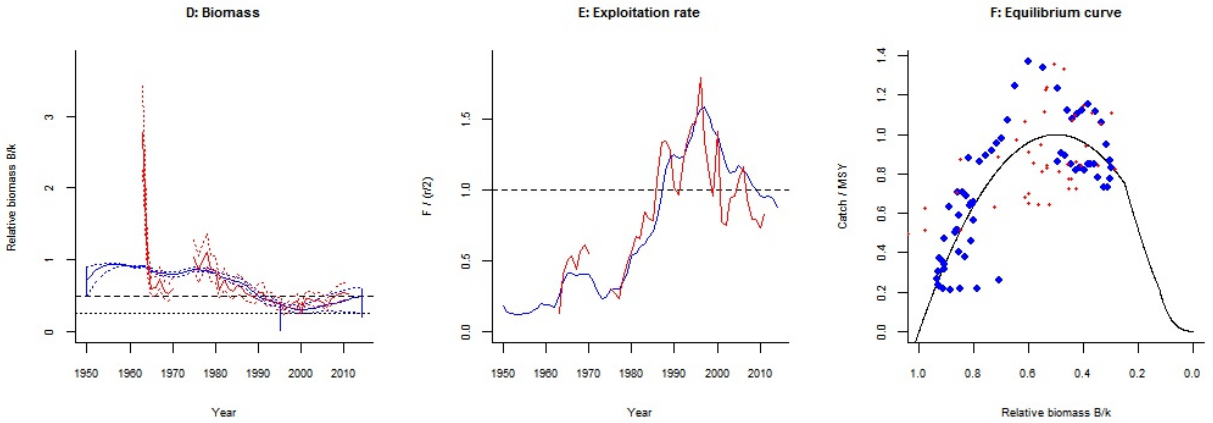
Results of CMSY analysis with altogether 1611 viable trajectories for 735 r-k pairs
r = 0.574 , 95% CL = 0.436 - 0.756 , k = 98.9 , 95% CL = 72.1 - 136
MSY = 14.2 , 95% CL = 13.1 - 15.4
Relative biomass last year = 0.492 k, 2.5th = 0.233 , 97.5th = 0.596
Exploitation F/(r/2) in last year = 0.877

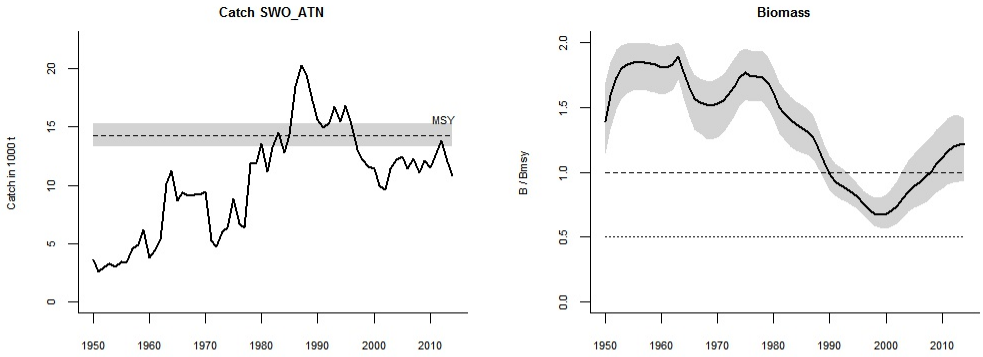
Results from Bayesian Schaefer model using catch & CPUE
r = 0.671 , 95% CL = 0.53 - 0.85 , k = 85.1 , 95% CL = 69 - 105
MSY = 14.3 , 95% CL = 13.3 - 15.3
Relative biomass in last year = 0.609 k, 2.5th perc = 0.463 , 97.5th perc = 0.707
Exploitation F/(r/2) in last year = 0.622
q = 1.9e-05 , lcl = 1.53e-05 , ucl = 2.35e-05

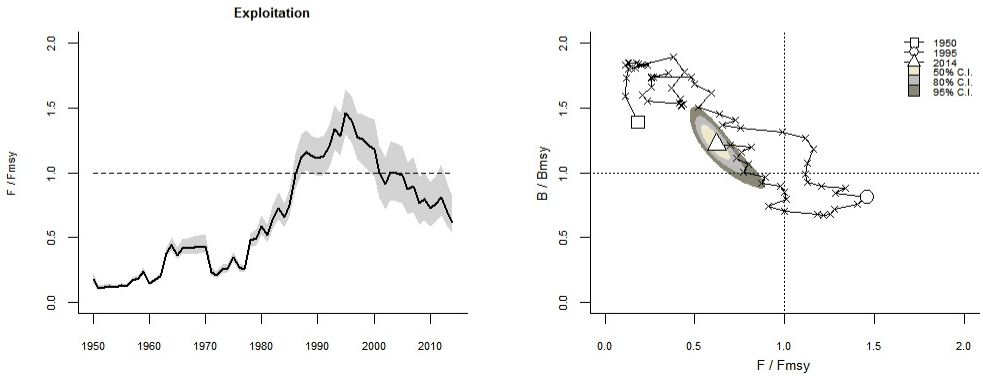
Results for Management (based on BSM analysis)
Fmsy = 0.336 , 95% CL = 0.265 - 0.425 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.336 , 95% CL = 0.265 - 0.425 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 14.3 , 95% CL = 13.3 - 15.3
Bmsy = 42.5 , 95% CL = 34.5 - 52.5
Biomass in last year = 51.8 , 2.5th perc = 39.4 , 97.5 perc = 60.2
B/Bmsy in last year = 1.22 , 2.5th perc = 0.926 , 97.5 perc = 1.41
Fishing mortality in last year = 0.209 , 2.5th perc = 0.18 , 97.5 perc = 0.274
F/Fmsy = 0.622 , 2.5th perc = 0.536 , 97.5 perc = 0.818

Stock status and exploitation in 2014
Biomass = 51.8 , B/Bmsy = 1.22 , fishing mortality F = 0.209 , F/Fmsy = 0.622
Comment: Catch and readily averaged CPUE from ICCAT SWO assessment, most recent catch from Task I database.


A: SWO_ATN catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r


D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k


Catch SWO_ATN
Catch in 1000 t
MSY
Biomass
B / Bmsy


Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1950
1995
2014
50% C.I.
80% C.I.
95% C.I.

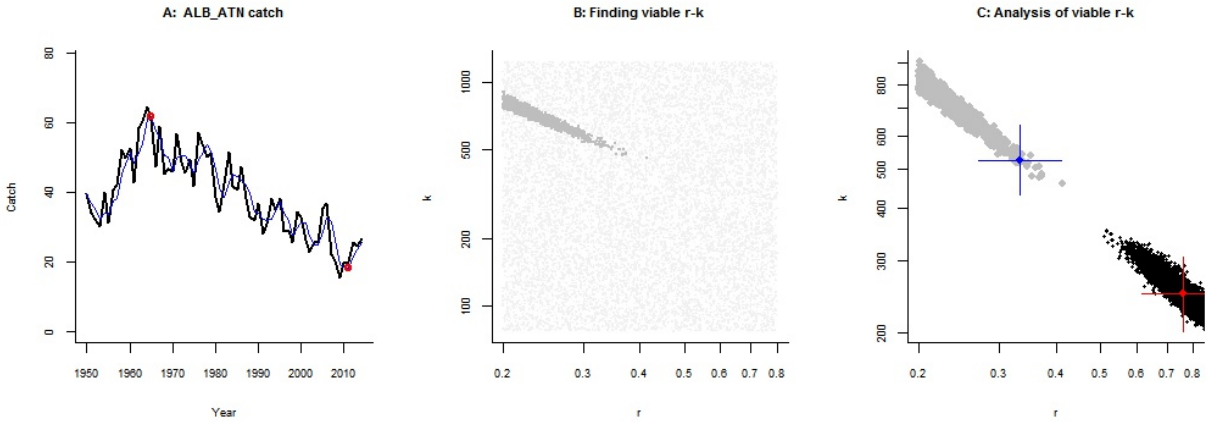
Species: Thunnus alalunga , stock: ALB_ATN
Albacore tuna - North Atlantic
Source: https://www.iccat.int/Documents/Meetings/Docs/2013_ALB_ASSESS_REP_ENG.pdf ; https://www.iccat.int/en/accesingdb.HTM
Region: North East Atlantic , Wide ranging
Catch data used from years 1950 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 77.3 - 1238
Prior range of q = 3.49e-05 - 0.00014

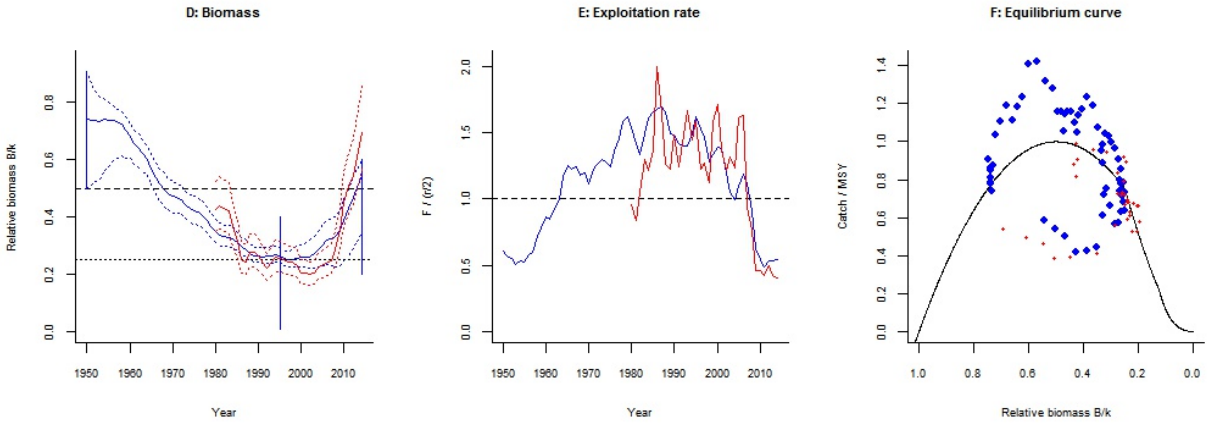
Results of CMSY analysis with altogether 1801 viable trajectories for 983 r-k pairs
r = 0.333 , 95% CL = 0.27 - 0.41 , k = 524 , 95% CL = 431 - 636
MSY = 43.6 , 95% CL = 41.3 - 46.1
Relative biomass last year = 0.543 k, 2.5th = 0.346 , 97.5th = 0.598
Exploitation F/(r/2) in last year = 0.541

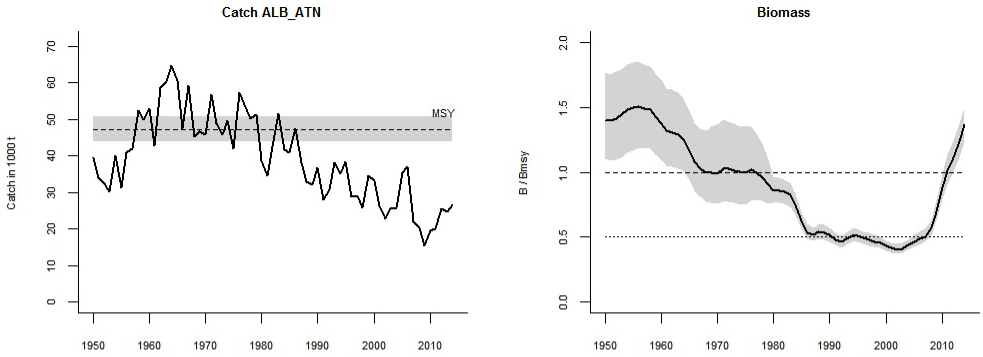
Results from Bayesian Schaefer model using catch & CPUE
r = 0.761 , 95% CL = 0.616 - 0.94 , k = 248 , 95% CL = 202 - 305
MSY = 47.2 , 95% CL = 43.9 - 50.8
Relative biomass in last year = 0.682 k, 2.5th perc = 0.618 , 97.5th perc = 0.751
Exploitation F/(r/2) in last year = 0.412
q = 2.82e-05 , lcl = 2.31e-05 , ucl = 3.45e-05

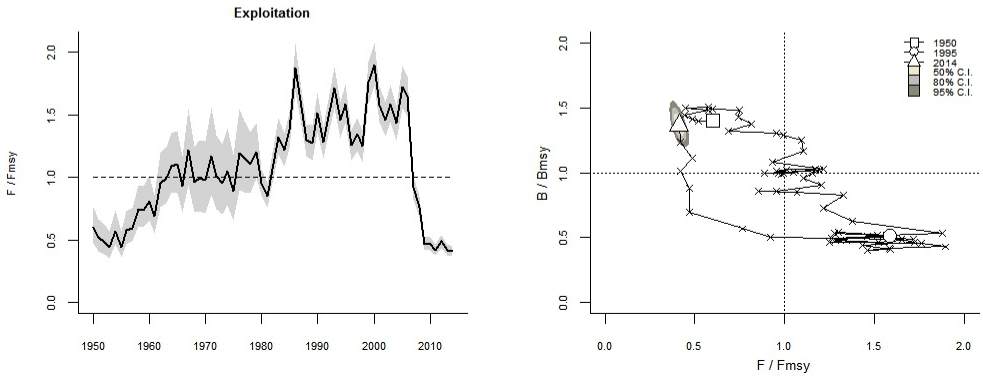
Results for Management (based on BSM analysis)
Fmsy = 0.38 , 95% CL = 0.308 - 0.47 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.38 , 95% CL = 0.308 - 0.47 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 47.2 , 95% CL = 43.9 - 50.8
Bmsy = 124 , 95% CL = 101 - 153
Biomass in last year = 169 , 2.5th perc = 153 , 97.5 perc = 186
B/Bmsy in last year = 1.36 , 2.5th perc = 1.24 , 97.5 perc = 1.5
Fishing mortality in last year = 0.157 , 2.5th perc = 0.142 , 97.5 perc = 0.173
F/Fmsy = 0.412 , 2.5th perc = 0.374 , 97.5 perc = 0.455

Stock status and exploitation in 2014
Biomass = 169 , B/Bmsy = 1.36 , fishing mortality F = 0.157 , F/Fmsy = 0.412
Comment: from ALB assessment + catches from ICCAT Task I and 2 nominal time series (TAI,JAP LL) extracted from Task II as used in ICCAT assessment


A: ALB_ATN catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r


D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k


Catch ALB_ATN
Catch in 1000 t
MSY
Biomass
B / Bmsy


Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1950
1995
2014
50% C.I.
80% C.I.
95% C.I.

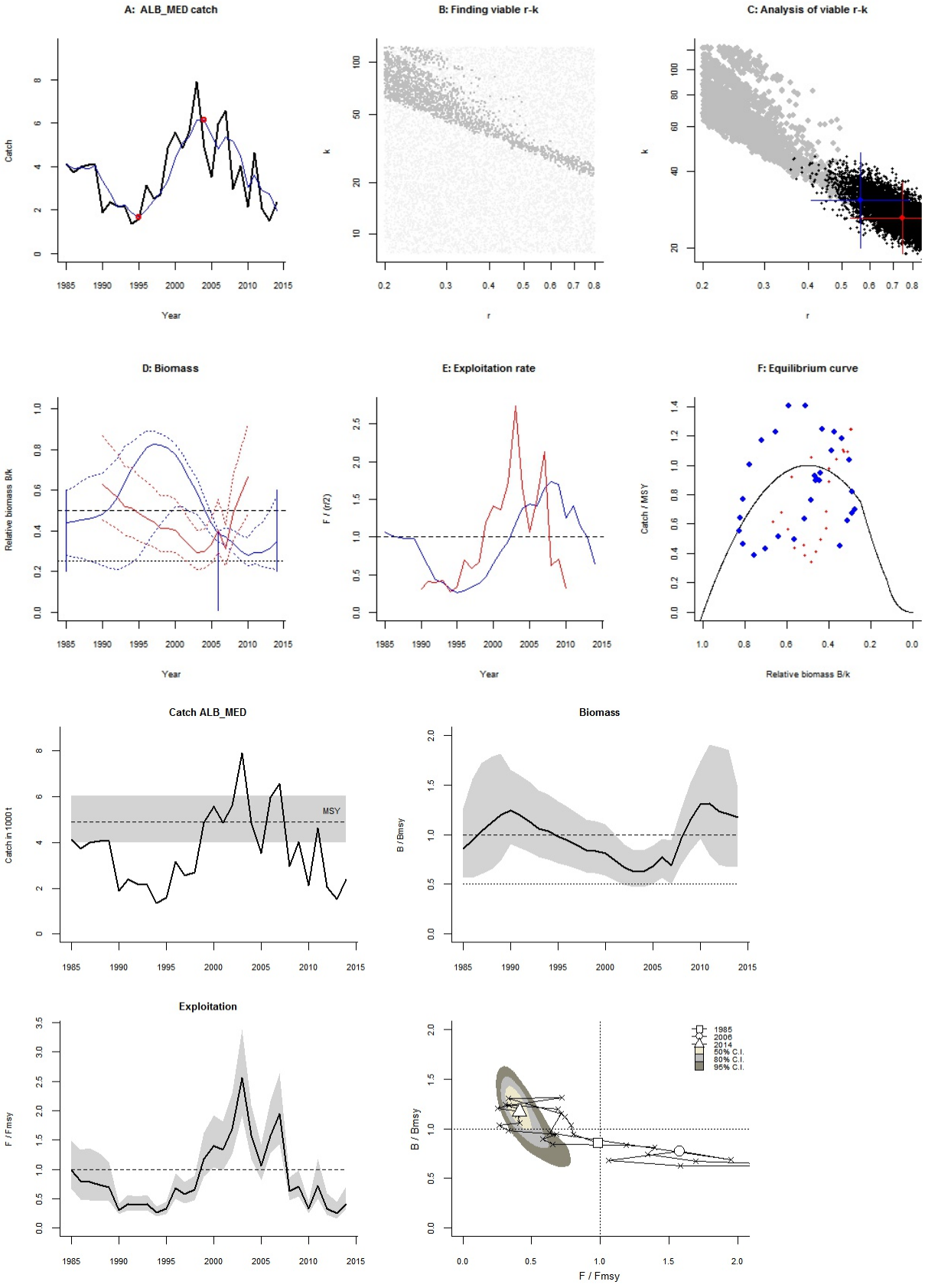
Species: Thunnus alalunga , stock: ALB_MED
Albacore tuna - Mediterranean Sea
Source: https://www.iccat.int/Documents/Meetings/Docs/2011_ALB_ASSESS_EN.pdf ; https://www.iccat.int/en/accesingdb.HTM
Region: Mediterranean , Wide ranging
Catch data used from years 1985 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2006 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 7.66 - 123
Prior range of q = 0.0116 - 0.0464

Results of CMSY analysis with altogether 2926 viable trajectories for 2017 r-k pairs
r = 0.567 , 95% CL = 0.409 - 0.785 , k = 30.8 , 95% CL = 20 - 47.5
MSY = 4.37 , 95% CL = 3.62 - 5.28
Relative biomass last year = 0.348 k, 2.5th = 0.211 , 97.5th = 0.572
Exploitation F/(r/2) in last year = 0.649

Results from Bayesian Schaefer model using catch & CPUE
r = 0.747 , 95% CL = 0.53 - 1.05 , k = 26.3 , 95% CL = 19 - 36.3
MSY = 4.91 , 95% CL = 3.99 - 6.05
Relative biomass in last year = 0.585 k, 2.5th perc = 0.339 , 97.5th perc = 0.734
Exploitation F/(r/2) in last year = 0.413
q = 0.0111 , lcl = 0.00907 , ucl = 0.0136

Results for Management (based on BSM analysis)
Fmsy = 0.374 , 95% CL = 0.265 - 0.526 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.374 , 95% CL = 0.265 - 0.526 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 4.91 , 95% CL = 3.99 - 6.05
Bmsy = 13.1 , 95% CL = 9.52 - 18.1
Biomass in last year = 15.4 , 2.5th perc = 8.91 , 97.5 perc = 19.3
B/Bmsy in last year = 1.17 , 2.5th perc = 0.678 , 97.5 perc = 1.47
Fishing mortality in last year = 0.154 , 2.5th perc = 0.123 , 97.5 perc = 0.267
F/Fmsy = 0.413 , 2.5th perc = 0.329 , 97.5 perc = 0.714

Stock status and exploitation in 2014
Biomass = 15.4 , B/Bmsy = 1.17 , fishing mortality F = 0.154 , F/Fmsy = 0.413
Comment: CPUE from ALB assessment + Catch from ICCAT Task I (ICCAT BSM unrealistic around k) CMY-BSM plausible and fairly insensitive to low or medium biomass priors (Catch data associated with high uncertainty, CPUE quality is poor) Multiple CPUE series combined.

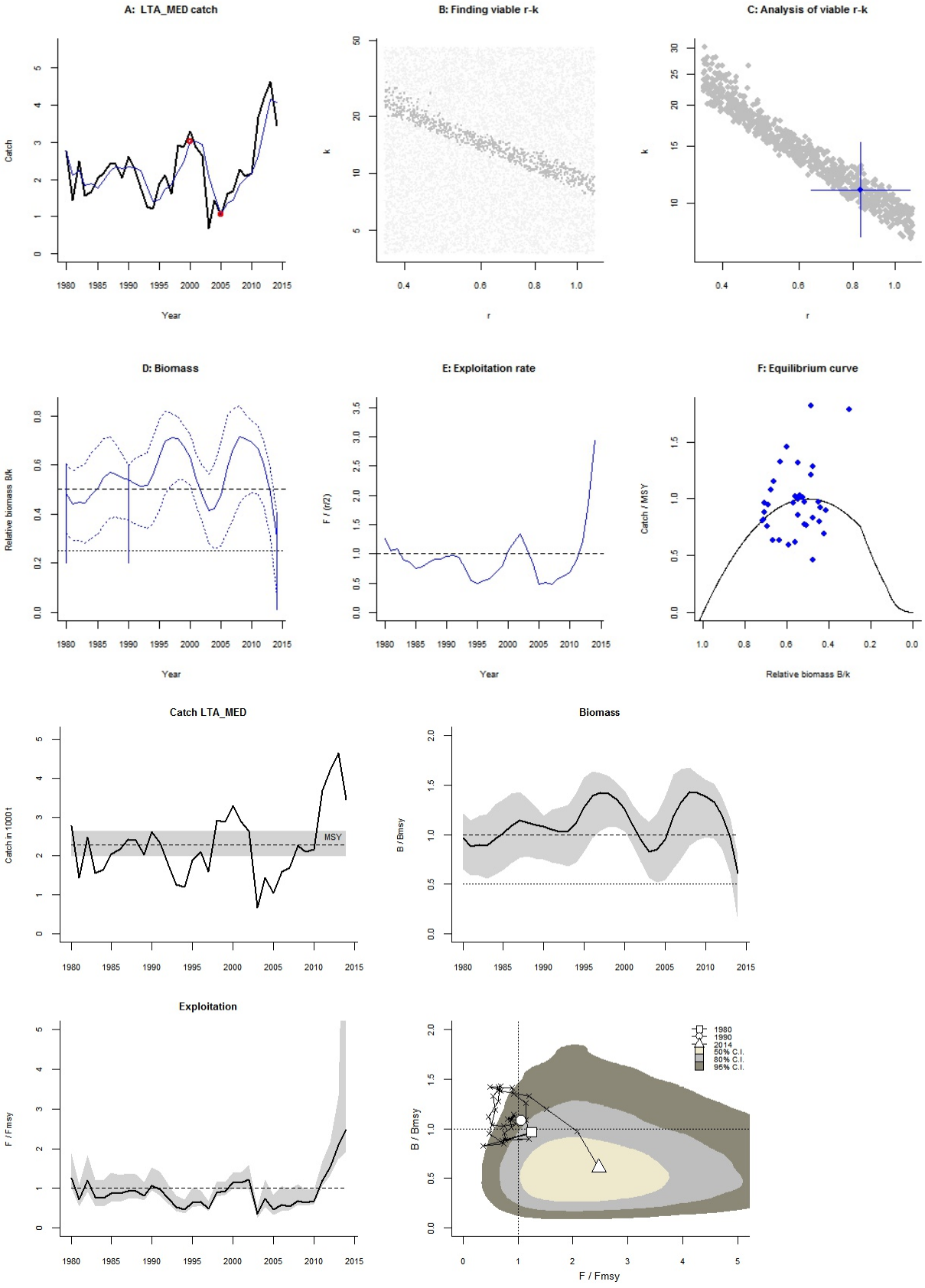

A: ALB_MED catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch ALB_MED
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1985
2006
2014
50% C.I.
80% C.I.
95% C.I.

Species: Euthynnus alletteratus , stock: LTA_MED
Little Thunny - Mediterranean Sea
Source: https://www.iccat.int/Documents/SCRS/ExecSum/SMT_EN.pdf ;
https://www.iccat.int/en/accesingdb.HTM
Region: Mediterranean , Wide ranging
Catch data used from years 1980 - 2014 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 1990 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.36 - 1.1 expert, , prior range for k = 3.78 - 46.2

Results of CMSY analysis with altogether 2393 viable trajectories for 798 r-k pairs
r = 0.833 , 95% CL = 0.64 - 1.08 , k = 11 , 95% CL = 7.87 - 15.4
MSY = 2.29 , 95% CL = 1.99 - 2.63
Relative biomass last year = 0.304 k, 2.5th = 0.0637 , 97.5th = 0.394
Exploitation F/(r/2) in last year = 2.94

Results for Management (based on CMSY analysis)
Fmsy = 0.417 , 95% CL = 0.32 - 0.542 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.417 , 95% CL = 0.32 - 0.542 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 2.29 , 95% CL = 1.99 - 2.63
Bmsy = 5.5 , 95% CL = 3.93 - 7.68
Biomass in last year = 3.34 , 2.5th perc = 0.7 , 97.5 perc = 4.33
B/Bmsy in last year = 0.608 , 2.5th perc = 0.127 , 97.5 perc = 0.788
Fishing mortality in last year = 1.03 , 2.5th perc = 0.795 , 97.5 perc = 4.92
F/Fmsy = 2.47 , 2.5th perc = 1.91 , 97.5 perc = 11.8

Stock status and exploitation in 2014
Biomass = 3.34 , B/Bmsy = 0.608 , fishing mortality F = 1.03 , F/Fmsy = 2.47
Comment: Catch data from Task I ICCAT. Data highly unreliable, likely strong underreporting, large quantity of small scale catch not reported. CMSY results appear plausible.

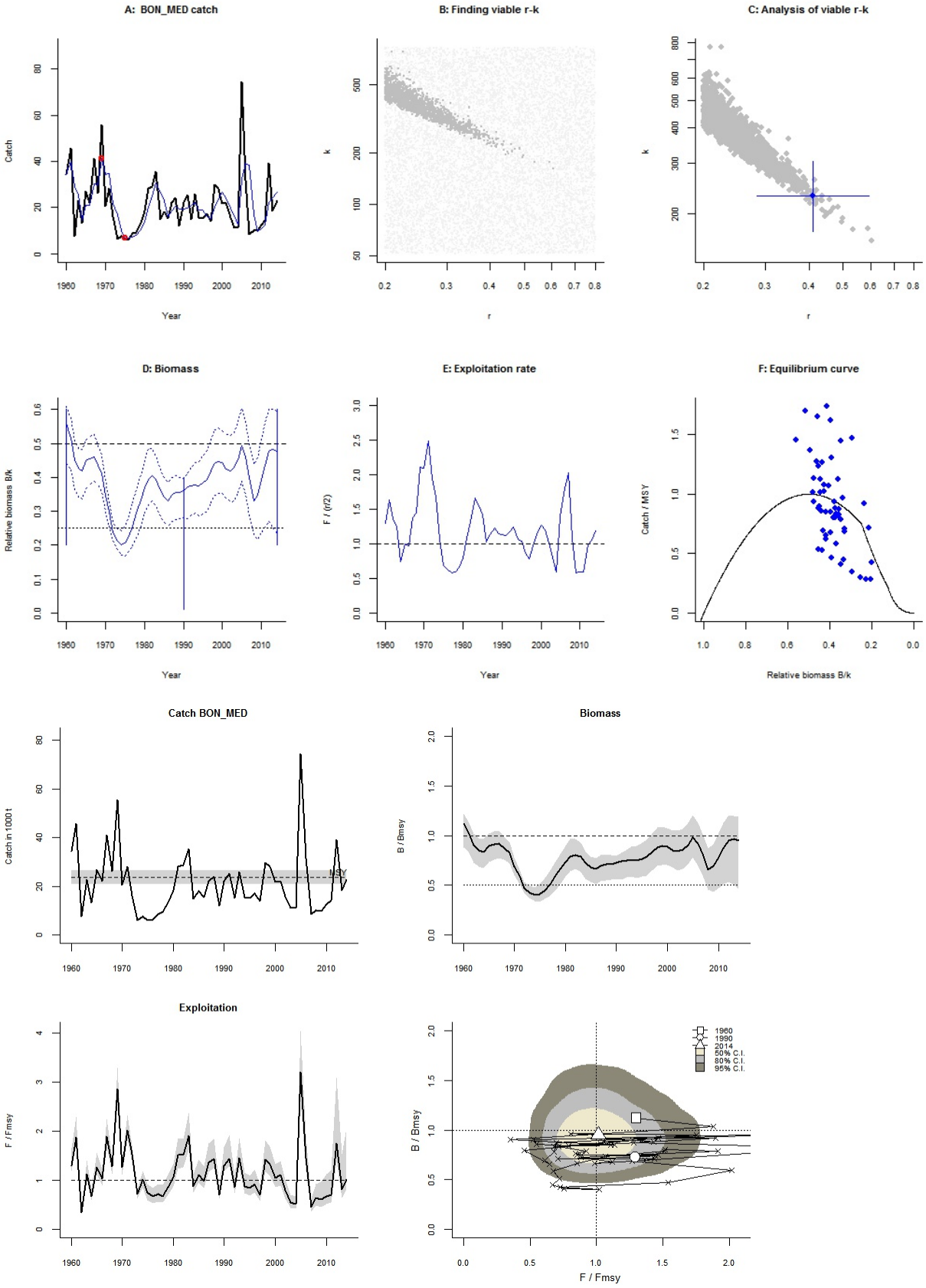

A: LTA_MED catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch LTA_MED
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1980
1990
2014
50% C.I.
80% C.I.
95% C.I.

Species: Sarda sarda , stock: BON_MED
Bonito - Mediterranean Sea
Source: https://www.iccat.int/Documents/SCRS/ExecSum/SMT_EN.pdf ;
https://www.iccat.int/en/accesingdb.HTM
Region: Mediterranean , Wide ranging
Catch data used from years 1960 - 2014 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 1990 expert
Prior final relative biomass = 0.2 - 0.6 , default
Prior range for r = 0.2 - 0.8 default , prior range for k = 51.3 - 821

Results of CMSY analysis with altogether 1944 viable trajectories for 1696 r-k pairs
r = 0.411 , 95% CL = 0.284 - 0.593 , k = 230 , 95% CL = 173 - 306
MSY = 23.6 , 95% CL = 21.1 - 26.5
Relative biomass last year = 0.476 k, 2.5th = 0.234 , 97.5th = 0.594
Exploitation F/(r/2) in last year = 1.19

Results for Management (based on CMSY analysis)
Fmsy = 0.205 , 95% CL = 0.142 - 0.297 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.205 , 95% CL = 0.142 - 0.297 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 23.6 , 95% CL = 21.1 - 26.5
Bmsy = 115 , 95% CL = 86.4 - 153
Biomass in last year = 110 , 2.5th perc = 53.7 , 97.5 perc = 137
B/Bmsy in last year = 0.953 , 2.5th perc = 0.467 , 97.5 perc = 1.19
Fishing mortality in last year = 0.208 , 2.5th perc = 0.167 , 97.5 perc = 0.425
F/Fmsy = 1.01 , 2.5th perc = 0.813 , 97.5 perc = 2.07

Stock status and exploitation in 2014
Biomass = 110 , B/Bmsy = 0.953 , fishing mortality F = 0.208 , F/Fmsy = 1.01
Comment: Catch dat from Task I ICCAT. Data unreliable, likely strong underreporting, large quantity of small scale catch not reported. CMSY results appear plausible.


A: BON_MED catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch BON_MED
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1960
1990
2014
50% C.I.
80% C.I.
95% C.I.

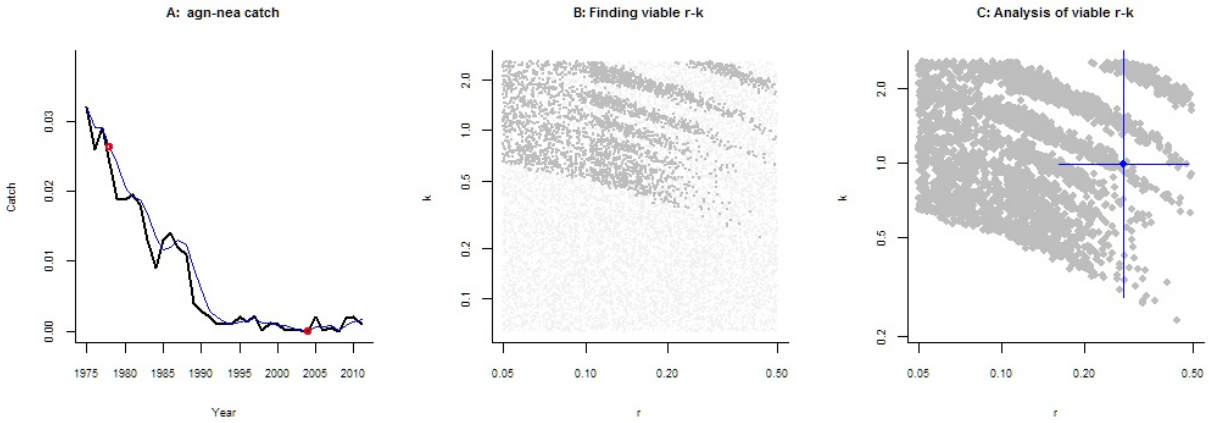
ICES Stocks (analyzed with CMSY_O_7l.R)

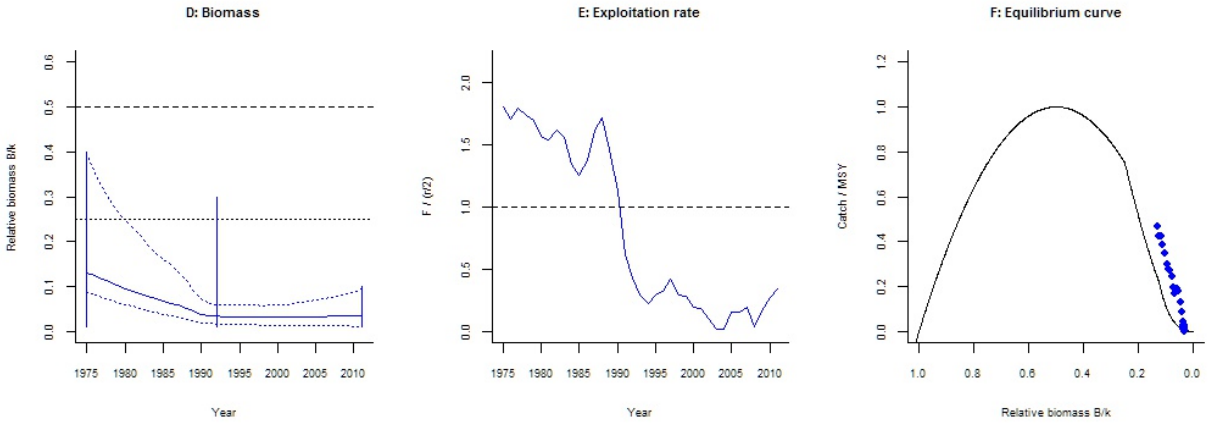
Species: Squatina squatina , stock: agn-nea
Angel shark in the Northeast Atlantic
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/agn-nea.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1975 - 2011 , abundance = None
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.3 in year 1992 expert
Prior final relative biomass = 0.01 - 0.1 expert
Prior range for r = 0.05 - 0.5 default , prior range for k = 0.064 - 2.56

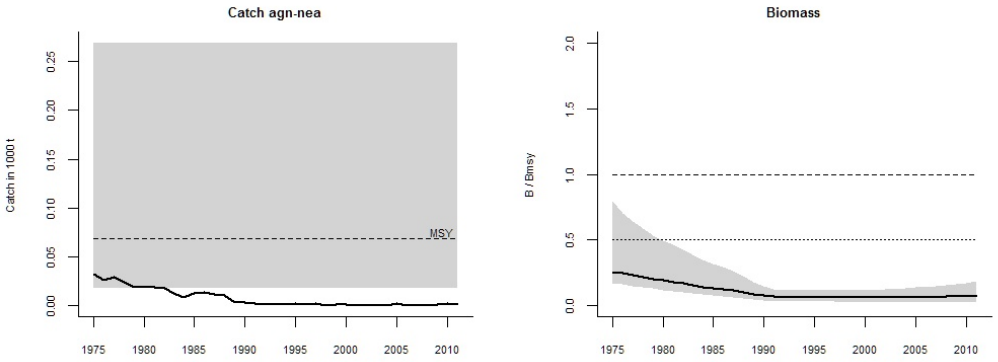
Results of CMSY analysis with altogether 3448 viable trajectories for 3376 r-k pairs
r = 0.278 , 95% CL = 0.162 - 0.478 , k = 0.987 , 95% CL = 0.286 - 3.41
MSY = 0.0686 , 95% CL = 0.0175 - 0.269
Relative biomass last year = 0.0357 k, 2.5th = 0.0111 , 97.5th = 0.0942
Exploitation F/(r/2) in last year = 0.34

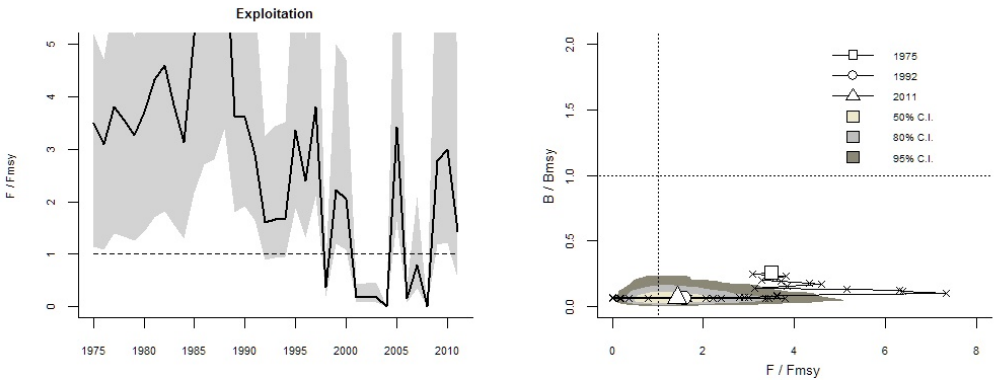
Results for Management (based on CMSY analysis)
Fmsy = 0.139 , 95% CL = 0.0809 - 0.239 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0199 , 95% CL = 0.0116 - 0.0341 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.0686 , 95% CL = 0.0175 - 0.269
Bmsy = 0.494 , 95% CL = 0.143 - 1.7
Biomass in last year = 0.0353 , 2.5th perc = 0.0109 , 97.5 perc = 0.093
B/Bmsy in last year = 0.0714 , 2.5th perc = 0.0222 , 97.5 perc = 0.188
Fishing mortality in last year = 0.0284 , 2.5th perc = 0.0108 , 97.5 perc = 0.0914
F/Fmsy = 1.43 , 2.5th perc = 0.541 , 97.5 perc = 4.6

Stock status and exploitation in 2014
Biomass = , B/Bmsy = , fishing mortality F = , F/Fmsy =
Comment: OK (RF 11.05.2016)


A: agn-nea catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r


D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k


Catch agn-nea
Catch in 1000 t
MSY
Biomass
B / Bmsy


Exploitation
F / Fmsy
1975
1992
2011
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

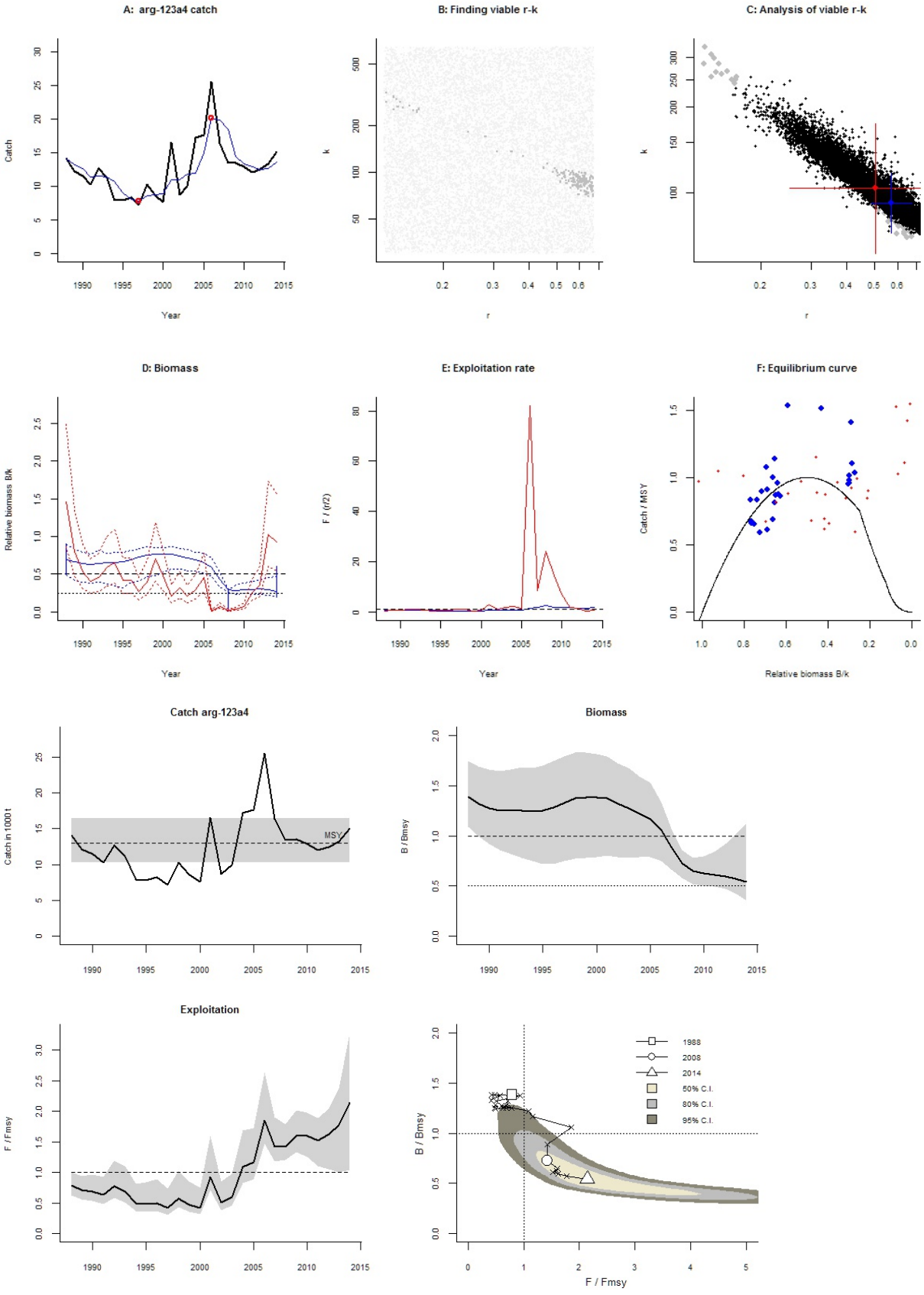
Species: Argentina silus , stock: arg-123a4
Greater silver smelt in Subareas I, II, IV, and Division IIIa (Northeast Arctic, North Sea, Skagerrak and Kattegat)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/arg-123a4.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1988 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.01 - 0.3 in year 2008 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.12 - 0.68 expert, , prior range for k = 29.8 - 643
Prior range of q = 0.00028 - 0.0013

Results of CMSY analysis with altogether 171 viable trajectories for 171 r-k pairs
r = 0.571 , 95% CL = 0.486 - 0.671 , k = 91.9 , 95% CL = 72.2 - 117
MSY = 13.1 , 95% CL = 11.2 - 15.4
Relative biomass last year = 0.27 k, 2.5th = 0.205 , 97.5th = 0.474
Exploitation F/(r/2) in last year = 1.92

Results from Bayesian Schaefer model using catch & CPUE
r = 0.503 , 95% CL = 0.252 - 1 , k = 103 , 95% CL = 60.9 - 175
MSY = 13 , 95% CL = 10.2 - 16.4
Relative biomass in last year = 0.271 k, 2.5th perc = 0.177 , 97.5th perc = 0.56
Exploitation F/(r/2) in last year = 2.14
q = 0.000404 , lcl = 0.000288 , ucl = 0.000567

Results for Management (based on BSM analysis)
Fmsy = 0.251 , 95% CL = 0.126 - 0.502 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.251 , 95% CL = 0.126 - 0.502 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 13 , 95% CL = 10.2 - 16.4
Bmsy = 51.6 , 95% CL = 30.4 - 87.4
Biomass in last year = 28 , 2.5th perc = 18.2 , 97.5 perc = 57.8
B/Bmsy in last year = 0.542 , 2.5th perc = 0.354 , 97.5 perc = 1.12
Fishing mortality in last year = 0.538 , 2.5th perc = 0.261 , 97.5 perc = 0.826
F/Fmsy = 2.14 , 2.5th perc = 1.04 , 97.5 perc = 3.28

Stock status and exploitation in 2014
Biomass = 28 , B/Bmsy = 0.542 , fishing mortality F = 0.538 , F/Fmsy = 2.14
Comment: OK (RF(13.05.16) No ICES update in 2016.


A: arg-123a4 catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch arg-123a4
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1988
2008
2014
50% C.I.
80% C.I.
95% C.I.

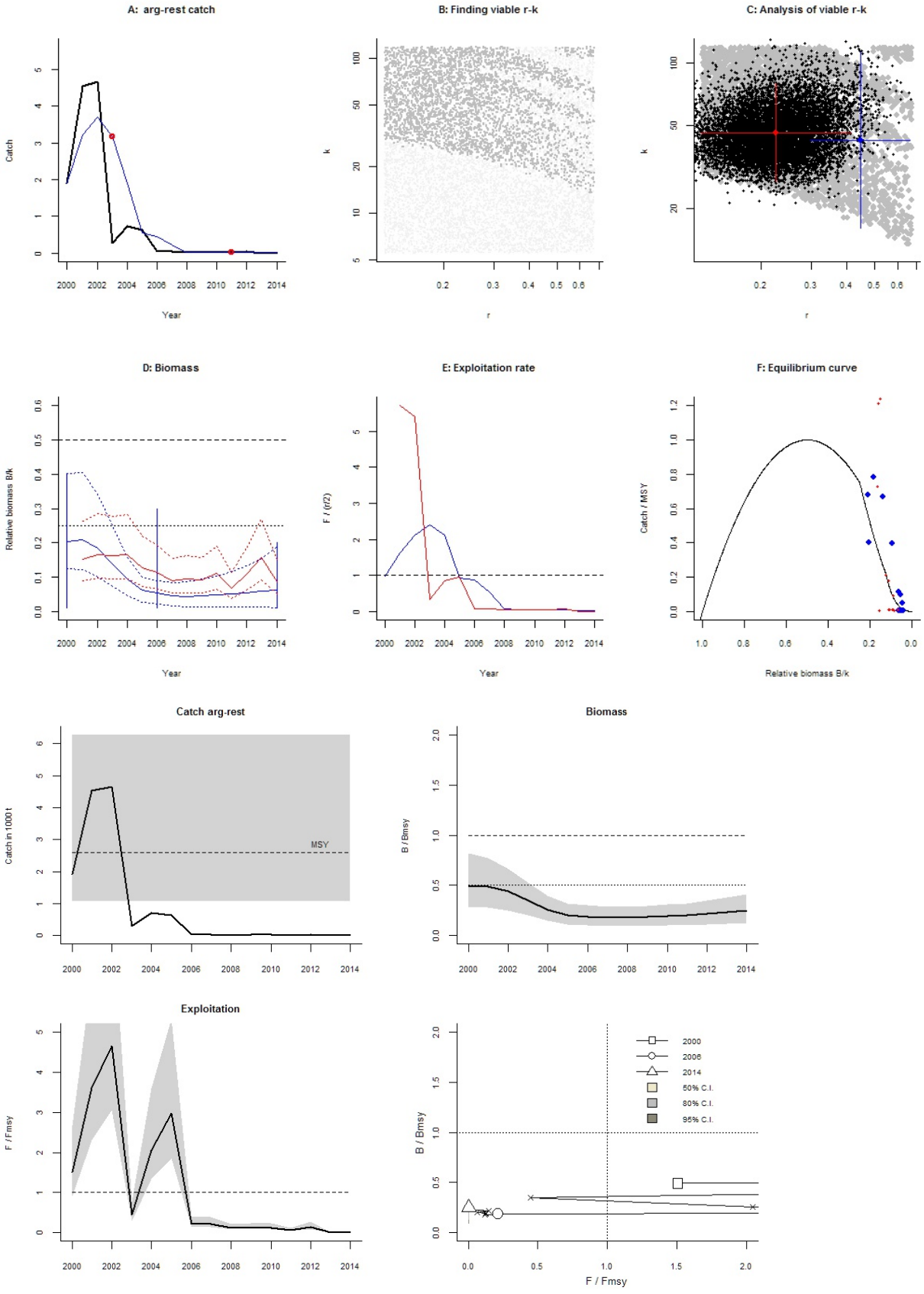
Species: Argentina silus , stock: arg-rest
Greater silver smelt in Subareas VII-X, XII, and Division VIb (other areas)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/arg-rest.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 2000 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.3 in year 2006 expert
Prior final relative biomass = 0.01 - 0.2 expert
Prior range for r = 0.12 - 0.68 expert, , prior range for k = 5.49 - 119
Prior range of q = 0.0102 - 0.0476

Results of CMSY analysis with altogether 4994 viable trajectories for 3852 r-k pairs
r = 0.445 , 95% CL = 0.298 - 0.663 , k = 42.6 , 95% CL = 16 - 113
MSY = 4.74 , 95% CL = 1.52 - 14.8
Relative biomass last year = 0.0632 k, 2.5th = 0.0116 , 97.5th = 0.189
Exploitation F/(r/2) in last year = 0.0211

Results from Bayesian Schaefer model using catch & CPUE
r = 0.225 , 95% CL = 0.123 - 0.415 , k = 46.2 , 95% CL = 26.9 - 79.3
MSY = 2.61 , 95% CL = 1.08 - 6.28
Relative biomass in last year = 0.125 k, 2.5th perc = 0.0617 , 97.5th perc = 0.207
Exploitation F/(r/2) in last year = 0.00153
q = 0.0188 , lcl = 0.0139 , ucl = 0.0255

Results for Management (based on BSM analysis)
Fmsy = 0.113 , 95% CL = 0.0613 - 0.207 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0565 , 95% CL = 0.0308 - 0.104 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 2.61 , 95% CL = 1.08 - 6.28
Bmsy = 23.1 , 95% CL = 13.5 - 39.7
Biomass in last year = 5.8 , 2.5th perc = 2.85 , 97.5 perc = 9.56
B/Bmsy in last year = 0.251 , 2.5th perc = 0.123 , 97.5 perc = 0.414
Fishing mortality in last year = 0.000173 , 2.5th perc = 0.000105 , 97.5 perc = 0.000351
F/Fmsy = 0.00305 , 2.5th perc = 0.00185 , 97.5 perc = 0.0062

Stock status and exploitation in 2014
Biomass = 5.8 , B/Bmsy = 0.251 , fishing mortality F = 0.000173 , F/Fmsy = 0.00305
Comment: OK (RF 09.06.16). Start year set to 2000. No ICES update in 2016.

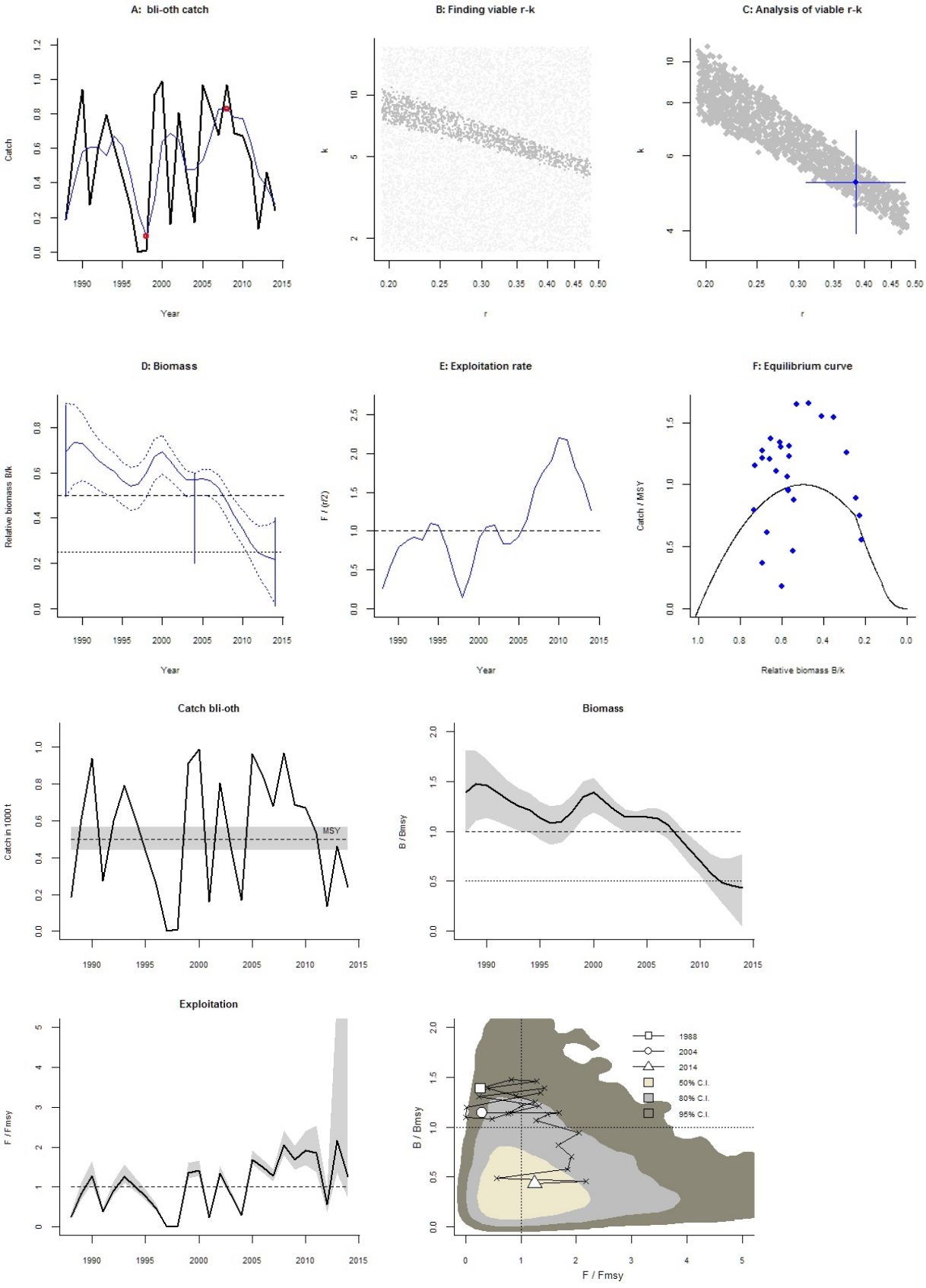

A: arg-rest catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch arg-rest
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
2000
2006
2014
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

Species: Molva dypterygia , stock: bli-oth
Blue ling in Subareas I, II, VIII, IX, and XII, and Divisions IIIa and IVa (other areas)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/bli-oth.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1988 - 2014 , abundance = None
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2004 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.19 - 0.48 expert, , prior range for k = 1.72 - 17.1

Results of CMSY analysis with altogether 7082 viable trajectories for 1169 r-k pairs
r = 0.386 , 95% CL = 0.311 - 0.479 , k = 5.2 , 95% CL = 3.93 - 6.88
MSY = 0.502 , 95% CL = 0.443 - 0.568
Relative biomass last year = 0.219 k, 2.5th = 0.0218 , 97.5th = 0.385
Exploitation F/(r/2) in last year = 1.27

Results for Management (based on CMSY analysis)
Fmsy = 0.193 , 95% CL = 0.155 - 0.239 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.169 , 95% CL = 0.136 - 0.21 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.502 , 95% CL = 0.443 - 0.568
Bmsy = 2.6 , 95% CL = 1.97 - 3.44
Biomass in last year = 1.14 , 2.5th perc = 0.113 , 97.5 perc = 2
B/Bmsy in last year = 0.438 , 2.5th perc = 0.0436 , 97.5 perc = 0.769
Fishing mortality in last year = 0.211 , 2.5th perc = 0.12 , 97.5 perc = 2.12
F/Fmsy = 1.25 , 2.5th perc = 0.711 , 97.5 perc = 12.5

Stock status and exploitation in 2014
Biomass = 1.14 , B/Bmsy = 0.438 , fishing mortality F = 0.211 , F/Fmsy = 1.25
Comment: No update in 2016. OK (RF 16.05.16)


A: bli-oth catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch bli-oth
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1988
2004
2014
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

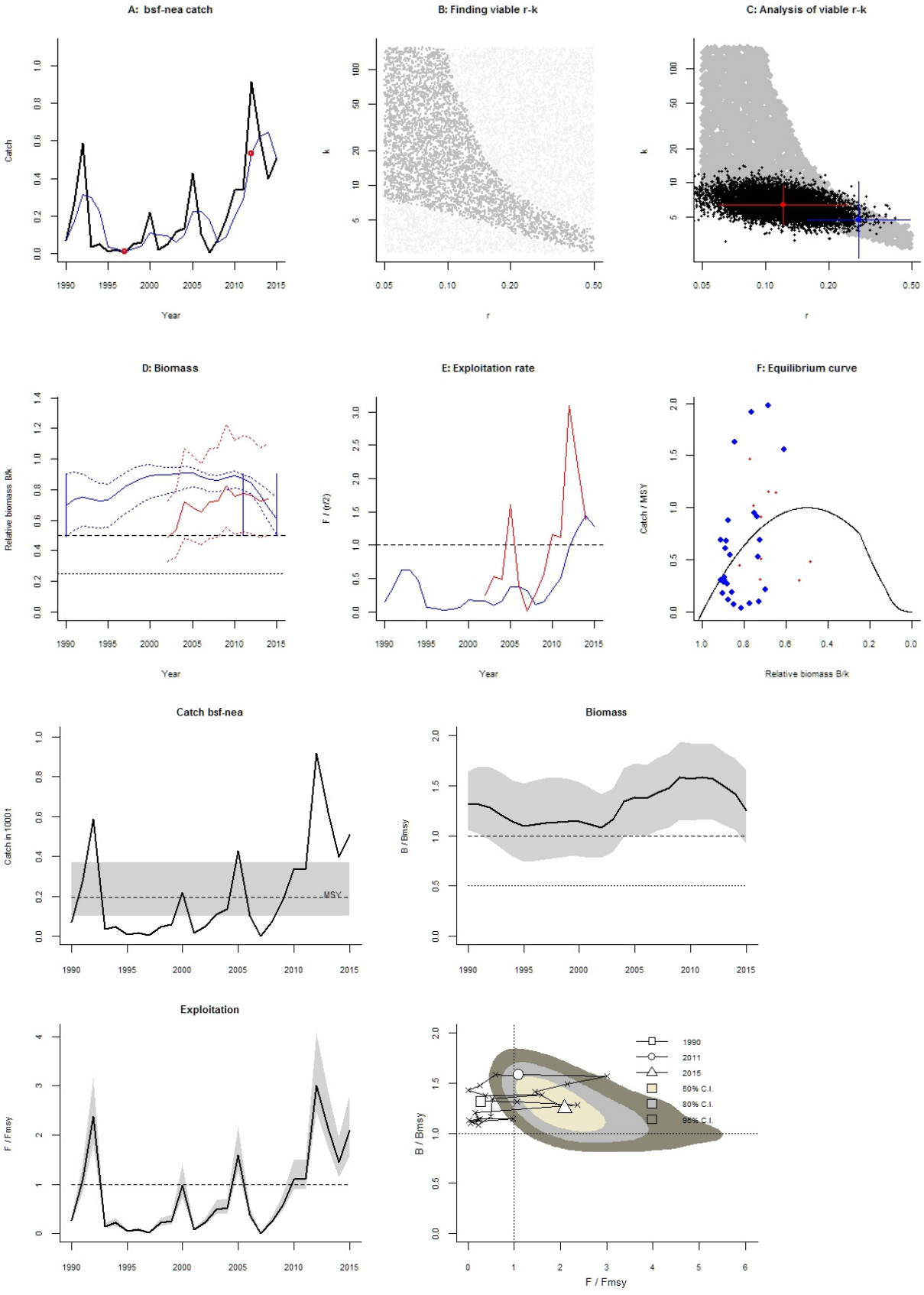
Species: Aphanopus carbo , stock: bsf-nea
Black scabbardfish in subareas 1, 2, 4, 6–8, 10, and 14, and in divisions 3.a, 5.a–b, 9.a, and 12.b (Northeast Atlantic)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/bsf-nea.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1990 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.5 - 0.9 in year 2011 default
Prior final relative biomass = 0.5 - 0.9 expert
Prior range for r = 0.05 - 0.5 default , prior range for k = 2.58 - 155
Prior range of q = 0.0105 - 0.0664

Results of CMSY analysis with altogether 29387 viable trajectories for 4031 r-k pairs
r = 0.278 , 95% CL = 0.159 - 0.487 , k = 4.7 , 95% CL = 2.17 - 10.2
MSY = 0.326 , 95% CL = 0.207 - 0.515
Relative biomass last year = 0.608 k, 2.5th = 0.504 , 97.5th = 0.749
Exploitation F/(r/2) in last year = 1.28

Results from Bayesian Schaefer model using catch & CPUE
r = 0.122 , 95% CL = 0.0601 - 0.246 , k = 6.39 , 95% CL = 4.3 - 9.5
MSY = 0.194 , 95% CL = 0.102 - 0.369
Relative biomass in last year = 0.625 k, 2.5th perc = 0.461 , 97.5th perc = 0.829
Exploitation F/(r/2) in last year = 2.09
q = 0.0183 , lcl = 0.0126 , ucl = 0.0266

Results for Management (based on BSM analysis)
Fmsy = 0.0608 , 95% CL = 0.0301 - 0.123 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0608 , 95% CL = 0.0301 - 0.123 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.194 , 95% CL = 0.102 - 0.369
Bmsy = 3.19 , 95% CL = 2.15 - 4.75
Biomass in last year = 3.99 , 2.5th perc = 2.94 , 97.5 perc = 5.29
B/Bmsy in last year = 1.25 , 2.5th perc = 0.921 , 97.5 perc = 1.66
Fishing mortality in last year = 0.127 , 2.5th perc = 0.096 , 97.5 perc = 0.173
F/Fmsy = 2.09 , 2.5th perc = 1.58 , 97.5 perc = 2.84

Stock status and exploitation in 2014
Biomass = 4.51 , B/Bmsy = 1.41 , fishing mortality F = 0.0882 , F/Fmsy = 1.45
Comment: OK (RF 08.06.16) Total abundance index used.

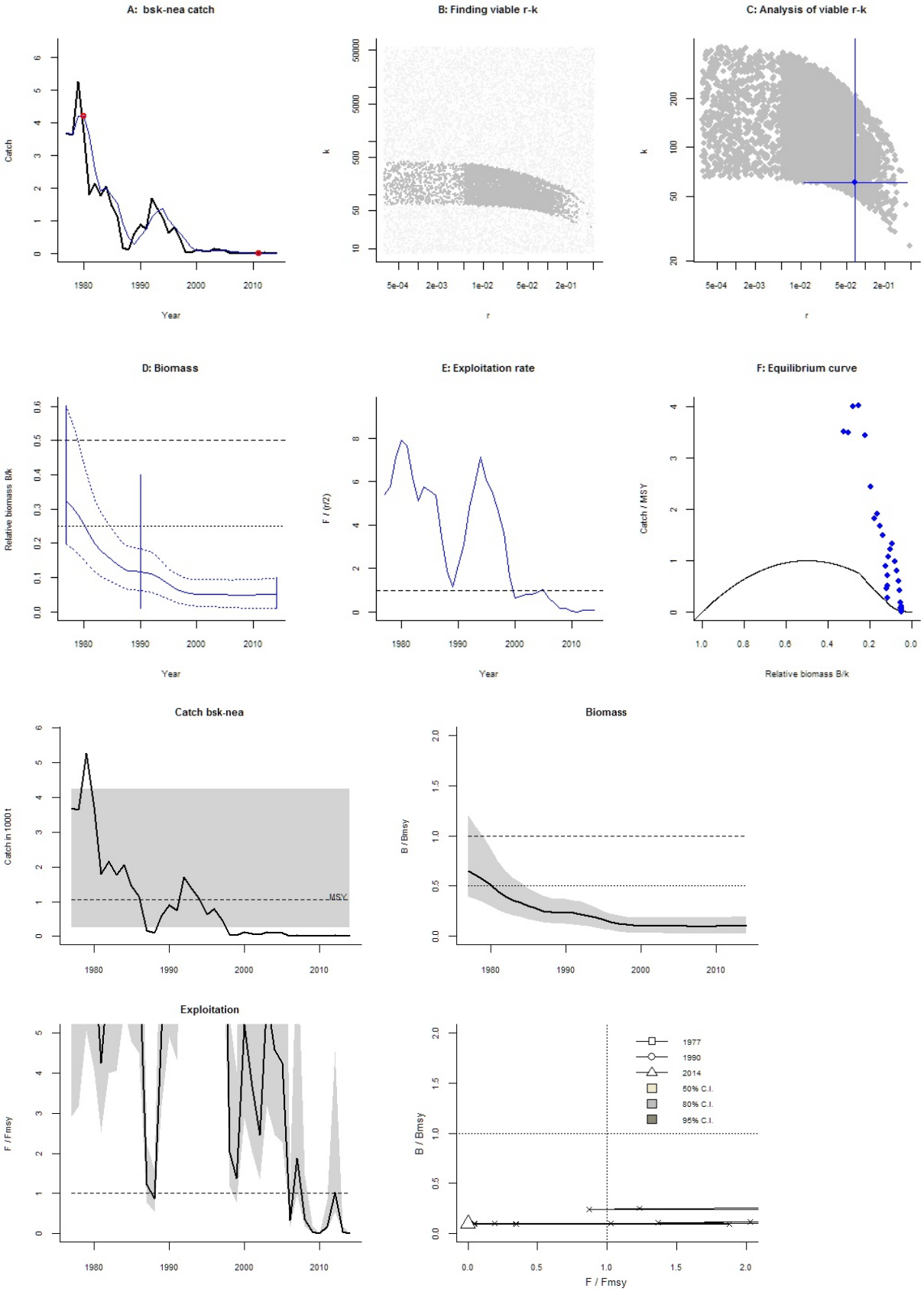

A: bsf-nea catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch bsf-nea
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1990
2011
2015
50% C.I.
80% C.I.
95% C.I.

Species: Cetorhinus maximus , stock: bsk-nea
Basking shark in the Northeast Atlantic
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/bsk-nea.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1977 - 2014 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 1990 expert
Prior final relative biomass = 0.01 - 0.1 expert
Prior range for r = 3e-04 - 0.52 expert, , prior range for k = 8.1 - 56142

Results of CMSY analysis with altogether 8701 viable trajectories for 5310 r-k pairs
r = 0.0689 , 95% CL = 0.011 - 0.431 , k = 60.8 , 95% CL = 5.25 - 704
MSY = 1.05 , 95% CL = 0.258 - 4.26
Relative biomass last year = 0.0513 k, 2.5th = 0.0113 , 97.5th = 0.0982
Exploitation F/(r/2) in last year = 0.0714

Results for Management (based on CMSY analysis)
Fmsy = 0.0345 , 95% CL = 0.00551 - 0.216 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.00707 , 95% CL = 0.00113 - 0.0442 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1.05 , 95% CL = 0.258 - 4.26
Bmsy = 30.4 , 95% CL = 2.63 - 352
Biomass in last year = 3.12 , 2.5th perc = 0.689 , 97.5 perc = 5.97
B/Bmsy in last year = 0.103 , 2.5th perc = 0.0227 , 97.5 perc = 0.196
Fishing mortality in last year = 0 , 2.5th perc = 0 , 97.5 perc = 0
F/Fmsy = 0 , 2.5th perc = 0 , 97.5 perc = 0

Stock status and exploitation in 2014
Biomass = 3.12 , B/Bmsy = 0.103 , fishing mortality F = 0 , F/Fmsy = 0
Comment: Catches given as + assumed to be 1. OK (RF 17.04.16)


A: bsk-nea catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch bsk-nea
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1977
1990
2014
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

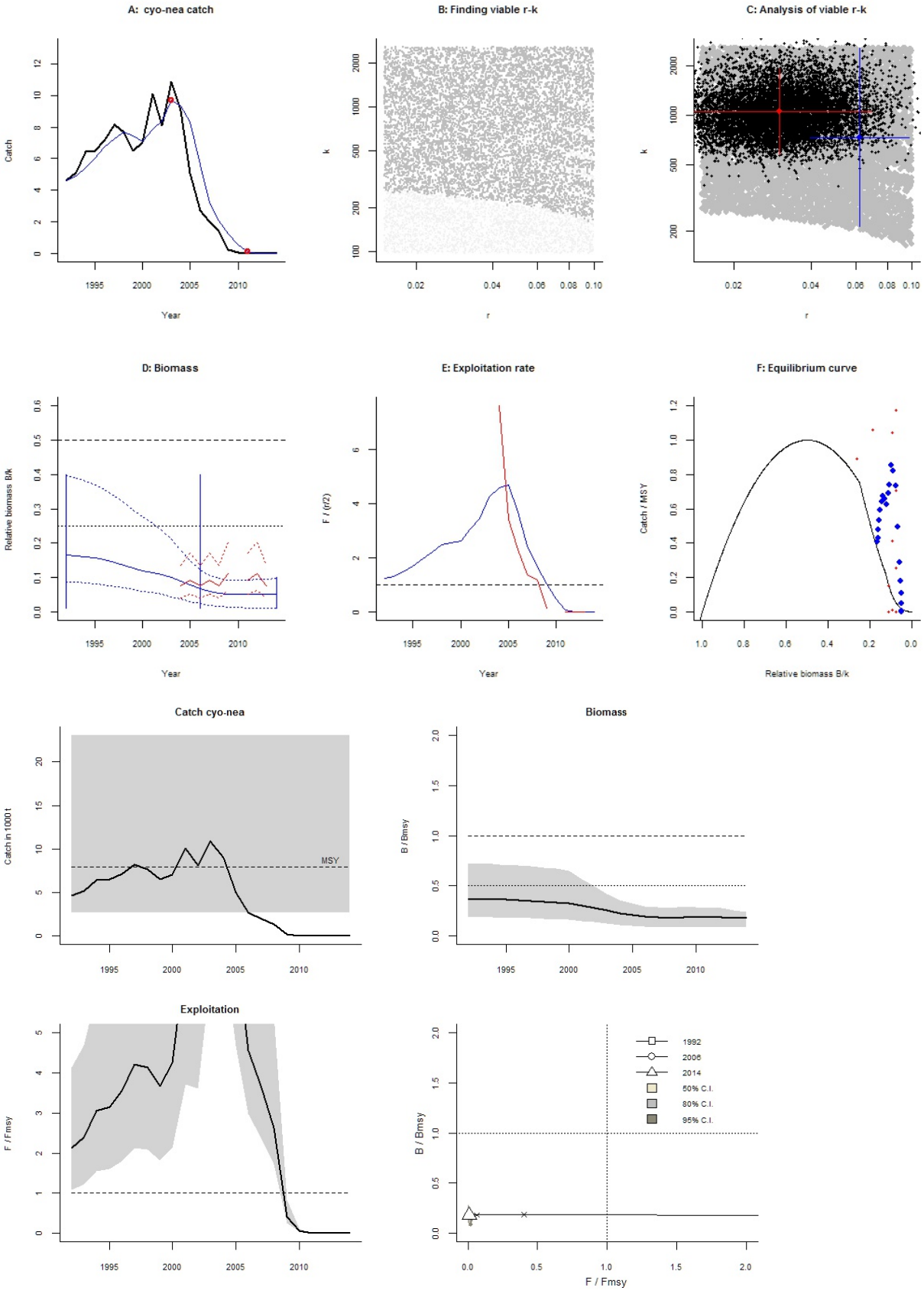
Species: Centroscymnus coelolepis , stock: cyo-nea
Portuguese dogfish in the Northeast Atlantic
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/cyo-nea.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1992 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2006 expert
Prior final relative biomass = 0.01 - 0.1 expert
Prior range for r = 0.015 - 0.1 default , prior range for k = 96.9 - 2584
Prior range of q = 1.82e-05 - 9.4e-05

Results of CMSY analysis with altogether 10681 viable trajectories for 7325 r-k pairs
r = 0.062 , 95% CL = 0.0397 - 0.097 , k = 734 , 95% CL = 212 - 2544
MSY = 11.4 , 95% CL = 2.39 - 54.2
Relative biomass last year = 0.052 k, 2.5th = 0.011 , 97.5th = 0.098
Exploitation F/(r/2) in last year = 0.00169

Results from Bayesian Schaefer model using catch & CPUE
r = 0.0303 , 95% CL = 0.0131 - 0.0697 , k = 1051 , 95% CL = 576 - 1917
MSY = 7.95 , 95% CL = 2.74 - 23.1
Relative biomass in last year = 0.0916 k, 2.5th perc = 0.0435 , 97.5th perc = 0.122
Exploitation F/(r/2) in last year = 0.00343
q = 5.09e-05 , lcl = 3.5e-05 , ucl = 7.41e-05

Results for Management (based on BSM analysis)
Fmsy = 0.0151 , 95% CL = 0.00657 - 0.0348 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.00554 , 95% CL = 0.00241 - 0.0128 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 7.95 , 95% CL = 2.74 - 23.1
Bmsy = 526 , 95% CL = 288 - 958
Biomass in last year = 96.3 , 2.5th perc = 45.8 , 97.5 perc = 128
B/Bmsy in last year = 0.183 , 2.5th perc = 0.0871 , 97.5 perc = 0.244
Fishing mortality in last year = 5.19e-05 , 2.5th perc = 3.89e-05 , 97.5 perc = 0.000109
F/Fmsy = 0.00937 , 2.5th perc = 0.00702 , 97.5 perc = 0.0197

Stock status and exploitation in 2014
Biomass = 96.3 , B/Bmsy = 0.183 , fishing mortality F = 5.19e-05 , F/Fmsy = 0.00937
Comment: OK (RF 11.05.16)


A: cyo-nea catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch cyo-nea
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1992
2006
2014
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

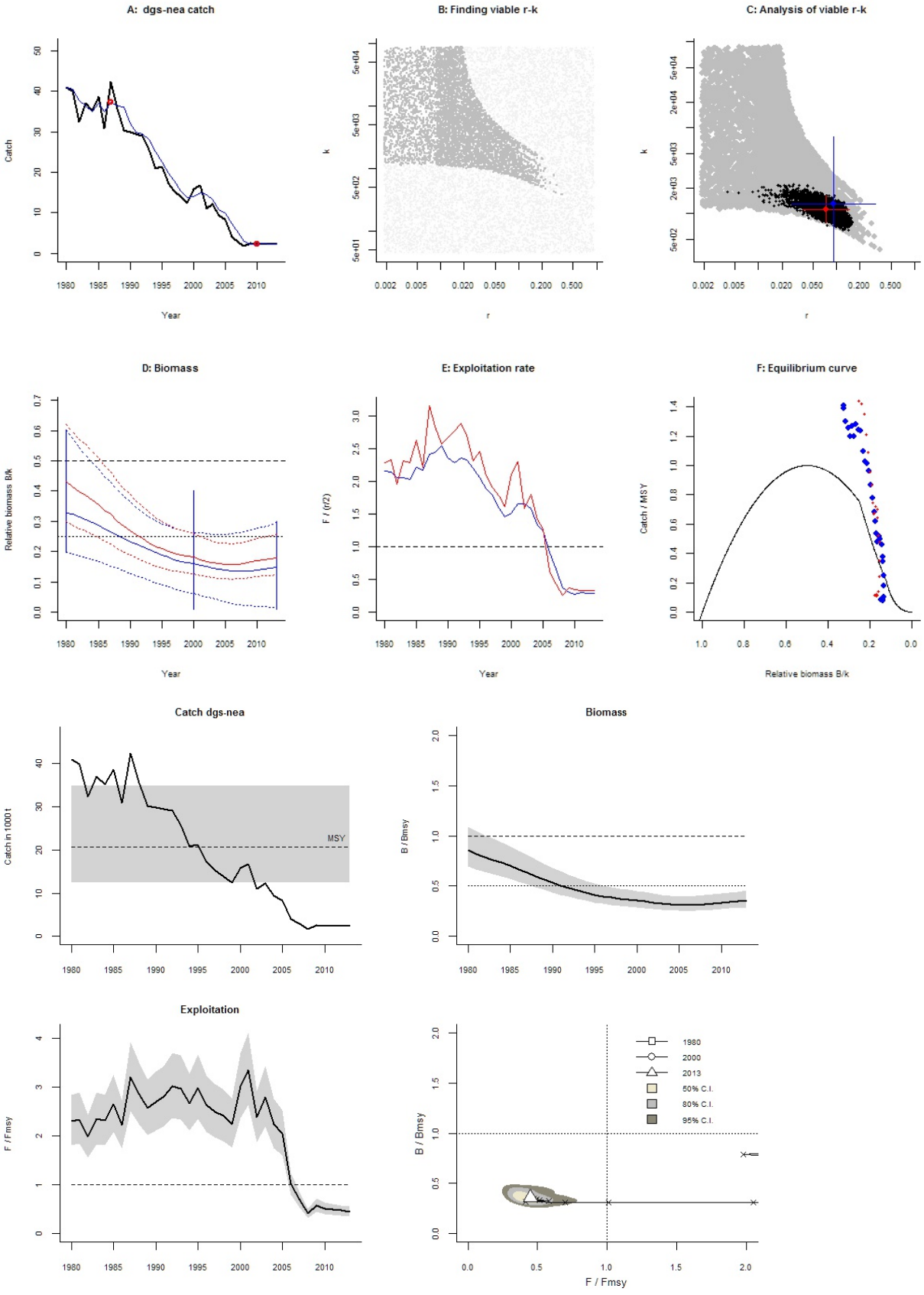
Species: Squalus acanthias , stock: dgs-nea
Spurdog in Northeast Atlantic
Source: http://ices.dk/sites/pub/Publication%20Reports/Advice/2014/2014/dgs-nea.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1980 - 2013 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.0019 - 0.93 expert, , prior range for k = 44.1 - 86248
Prior range of q = 0.849 - 37.5

Results of CMSY analysis with altogether 16979 viable trajectories for 5794 r-k pairs
r = 0.0907 , 95% CL = 0.0264 - 0.312 , k = 1284 , 95% CL = 208 - 7913
MSY = 29.1 , 95% CL = 9.27 - 91.4
Relative biomass last year = 0.147 k, 2.5th = 0.0139 , 97.5th = 0.296
Exploitation F/(r/2) in last year = 0.279

Results from Bayesian Schaefer model using catch & CPUE
r = 0.0744 , 95% CL = 0.0374 - 0.148 , k = 1118 , 95% CL = 777 - 1609
MSY = 20.8 , 95% CL = 12.4 - 34.8
Relative biomass in last year = 0.179 k, 2.5th perc = 0.145 , 97.5th perc = 0.228
Exploitation F/(r/2) in last year = 0.321
q = 1.22 , lcl = 0.865 , ucl = 1.71

Results for Management (based on BSM analysis)
Fmsy = 0.0372 , 95% CL = 0.0187 - 0.074 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0266 , 95% CL = 0.0134 - 0.0529 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 20.8 , 95% CL = 12.4 - 34.8
Bmsy = 559 , 95% CL = 389 - 804
Biomass in last year = 200 , 2.5th perc = 162 , 97.5 perc = 255
B/Bmsy in last year = 0.358 , 2.5th perc = 0.289 , 97.5 perc = 0.456
Fishing mortality in last year = 0.0119 , 2.5th perc = 0.00935 , 97.5 perc = 0.0147
F/Fmsy = 0.448 , 2.5th perc = 0.352 , 97.5 perc = 0.554

Stock status and exploitation in 2014
Biomass = , B/Bmsy = , fishing mortality F = , F/Fmsy =
Comment: OK (RF 23.05.16)


A: dgs-nea catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch dgs-nea
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1980
2000
2013
50% C.I.
80% C.I.
95% C.I.

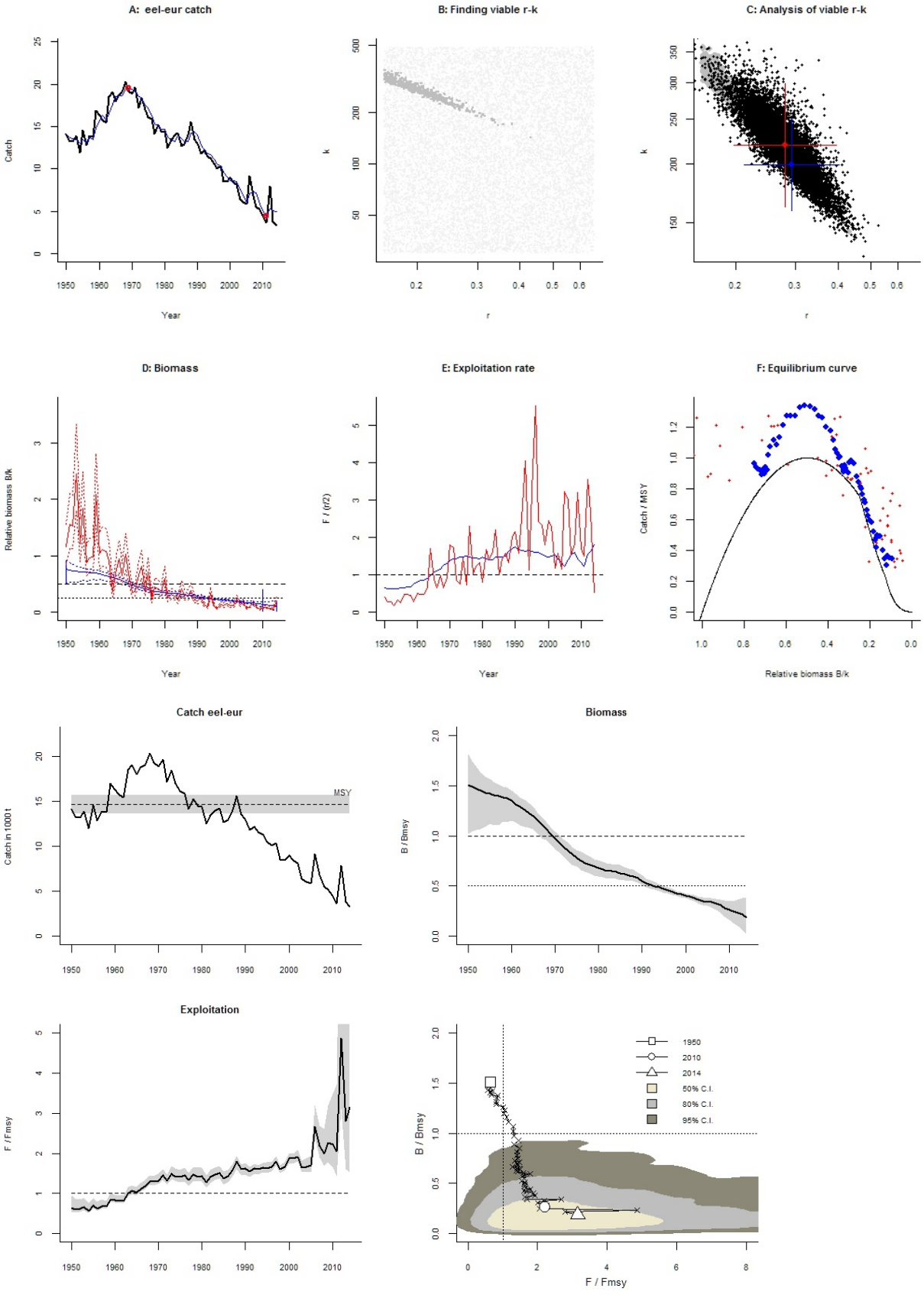
Species: Anguilla anguilla , stock: eel-eur
European eel throughout its natural range
Source: Recruitment index:
http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/eel-eur.pdf Catch statistics:
FAO FishstatJ Global Capture Production
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1950 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2010 default
Prior final relative biomass = 0.01 - 0.2 expert
Prior range for r = 0.16 - 0.66 expert, , prior range for k = 29.6 - 488
Prior range of q = 0.000422 - 0.00171

Results of CMSY analysis with altogether 756 viable trajectories for 673 r-k pairs
r = 0.292 , 95% CL = 0.212 - 0.403 , k = 200 , 95% CL = 159 - 251
MSY = 14.6 , 95% CL = 13.6 - 15.7
Relative biomass last year = 0.0951 k, 2.5th = 0.0115 , 97.5th = 0.195
Exploitation F/(r/2) in last year = 1.8

Results from Bayesian Schaefer model using catch & CPUE
r = 0.279 , 95% CL = 0.198 - 0.395 , k = 220 , 95% CL = 162 - 298
MSY = 15.4 , 95% CL = 12.9 - 18.3
Relative biomass in last year = 0.0756 k, 2.5th perc = 0.0384 , 97.5th perc = 0.145
Exploitation F/(r/2) in last year = 1.43
q = 0.000691 , lcl = 0.000524 , ucl = 0.00091

Results for Management (based on CMSY analysis)
Fmsy = 0.146 , 95% CL = 0.106 - 0.201 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0556 , 95% CL = 0.0404 - 0.0765 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 14.6 , 95% CL = 13.6 - 15.7
Bmsy = 99.9 , 95% CL = 79.6 - 125
Biomass in last year = 19 , 2.5th perc = 2.3 , 97.5 perc = 39
B/Bmsy in last year = 0.19 , 2.5th perc = 0.023 , 97.5 perc = 0.391
Fishing mortality in last year = 0.175 , 2.5th perc = 0.0853 , 97.5 perc = 1.45
F/Fmsy = 3.15 , 2.5th perc = 1.53 , 97.5 perc = 26.1

Stock status and exploitation in 2014
Biomass = 19 , B/Bmsy = 0.19 , fishing mortality F = 0.175 , F/Fmsy = 3.15
Comment: OK (RF 09.07.16) Endbio set to 0.01-0.2. Elver abundance is recruitment and cannot be used for adult abundance. Using CMSY for management results.

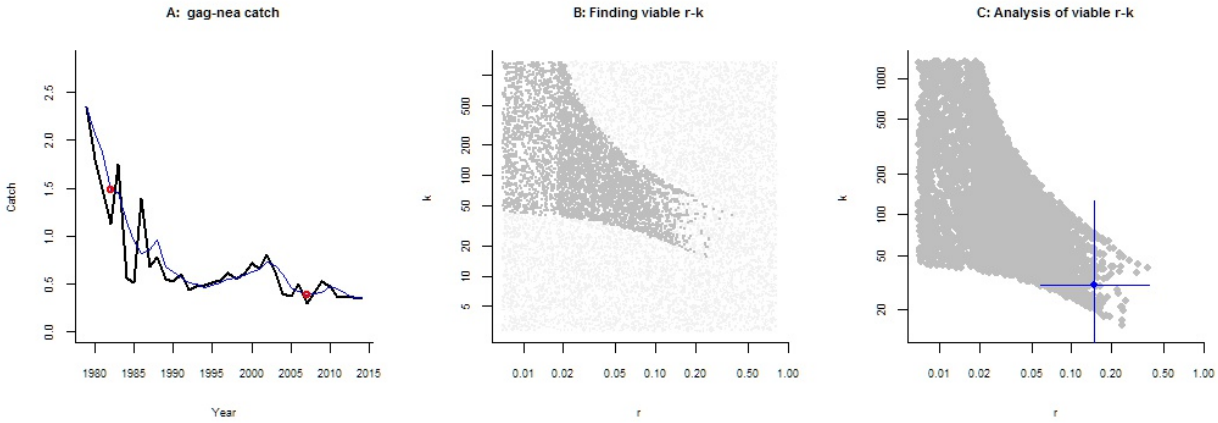

A: eel-eur catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch eel-eur
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1950
2010
2014
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

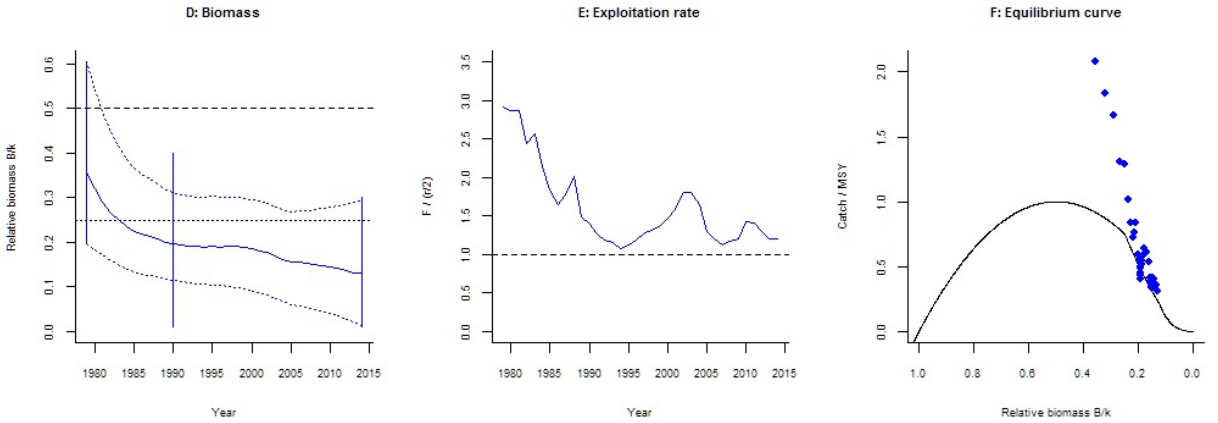
Species: Galeorhinus galeus , stock: gag-nea
Tope in the Northeast Atlantic
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/gag-nea.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1979 - 2014 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 1990 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.007 - 0.83 expert, , prior range for k = 2.83 - 1343

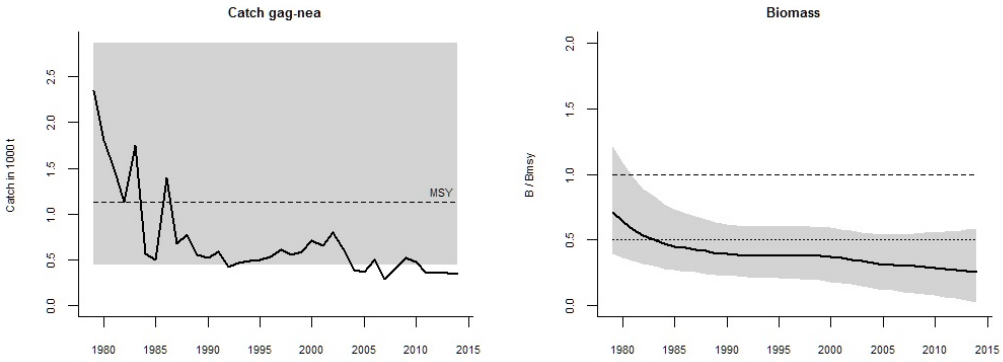
Results of CMSY analysis with altogether 11589 viable trajectories for 4731 r-k pairs
r = 0.15 , 95% CL = 0.0578 - 0.387 , k = 30.3 , 95% CL = 7.28 - 126
MSY = 1.13 , 95% CL = 0.447 - 2.87
Relative biomass last year = 0.13 k, 2.5th = 0.0134 , 97.5th = 0.296
Exploitation F/(r/2) in last year = 1.2

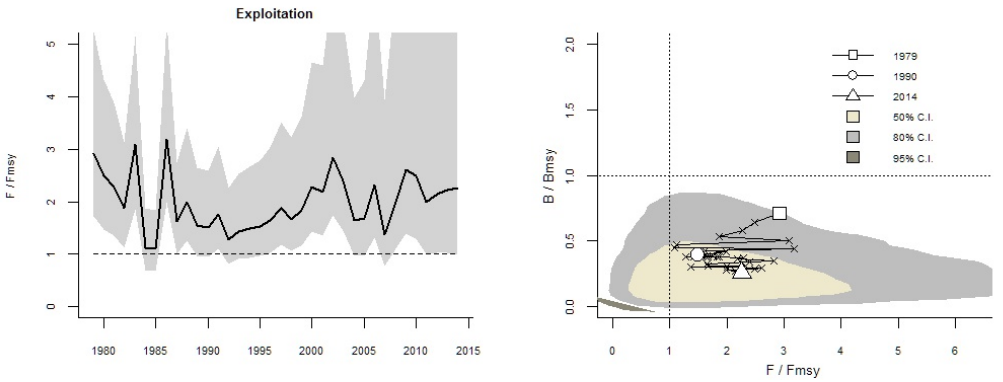
Results for Management (based on CMSY analysis)
Fmsy = 0.0748 , 95% CL = 0.0289 - 0.193 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0389 , 95% CL = 0.0151 - 0.101 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1.13 , 95% CL = 0.447 - 2.87
Bmsy = 15.1 , 95% CL = 3.64 - 62.9
Biomass in last year = 3.94 , 2.5th perc = 0.405 , 97.5 perc = 8.95
B/Bmsy in last year = 0.26 , 2.5th perc = 0.0267 , 97.5 perc = 0.592
Fishing mortality in last year = 0.0881 , 2.5th perc = 0.0388 , 97.5 perc = 0.857
F/Fmsy = 2.26 , 2.5th perc = 0.995 , 97.5 perc = 22

Stock status and exploitation in 2014
Biomass = 3.94 , B/Bmsy = 0.26 , fishing mortality F = 0.0881 , F/Fmsy = 2.26
Comment: OK (RF 12.05.16)


A: gag-nea catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r


D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k


Catch gag-nea
Catch in 1000 t
MSY
Biomass
B / Bmsy


Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1979
1990
2014
50% C.I.
80% C.I.
95% C.I.

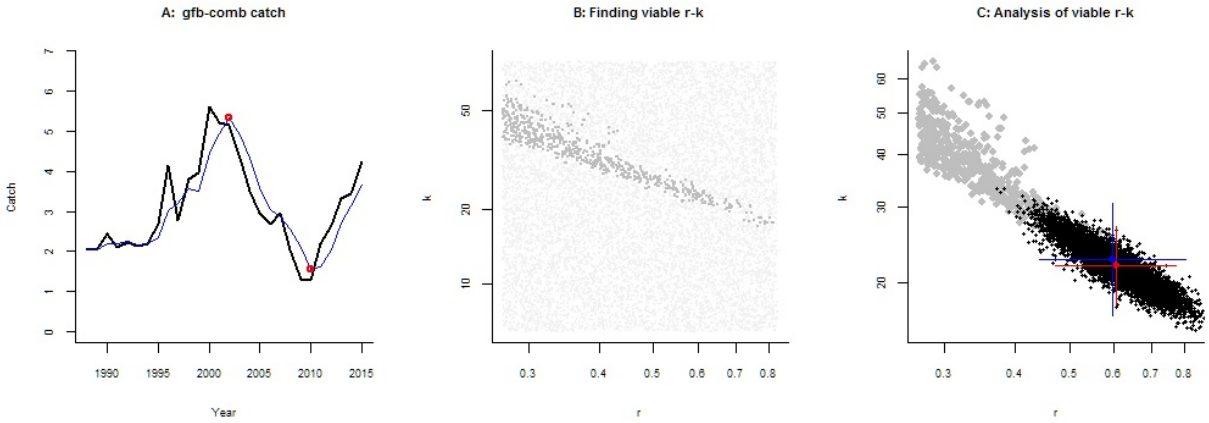
Species: Phycis blennoides , stock: gfb-comb
Great forkbeard in Northeast Atlantic
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/gfb-comb.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1988 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2009 default
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.27 - 0.83 expert, , prior range for k = 6.41 - 78.8
Prior range of q = 0.000102 - 0.000356

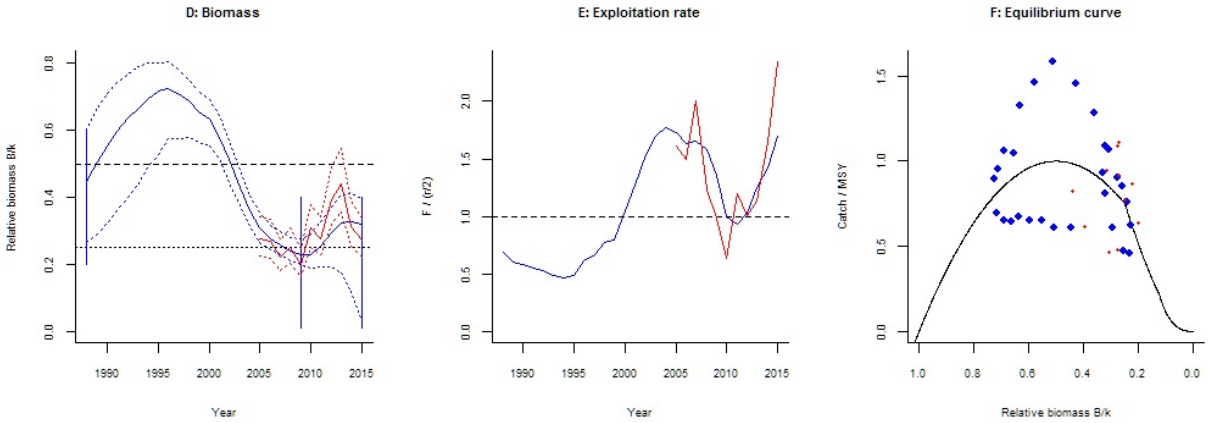
Results of CMSY analysis with altogether 1376 viable trajectories for 628 r-k pairs
r = 0.596 , 95% CL = 0.442 - 0.804 , k = 22.6 , 95% CL = 16.7 - 30.6
MSY = 3.36 , 95% CL = 3.03 - 3.73
Relative biomass last year = 0.322 k, 2.5th = 0.0311 , 97.5th = 0.397
Exploitation F/(r/2) in last year = 1.69

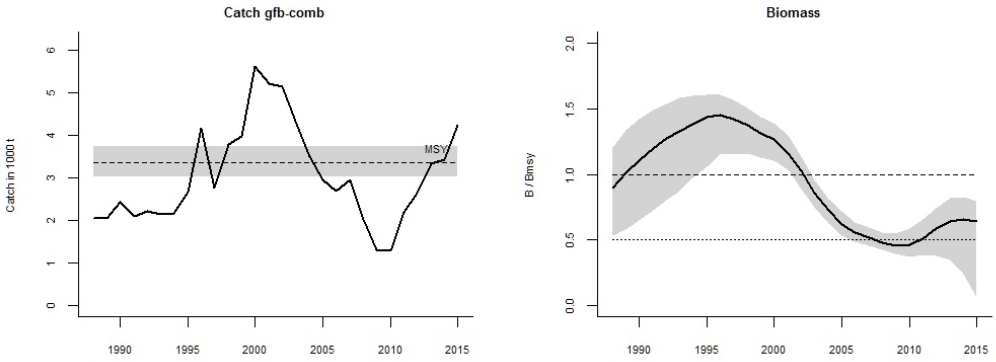
Results from Bayesian Schaefer model using catch & CPUE
r = 0.604 , 95% CL = 0.473 - 0.772 , k = 21.9 , 95% CL = 17.8 - 27
MSY = 3.31 , 95% CL = 2.97 - 3.69
Relative biomass in last year = 0.334 k, 2.5th perc = 0.24 , 97.5th perc = 0.432
Exploitation F/(r/2) in last year = 1.92
q = 0.000143 , lcl = 0.000113 , ucl = 0.000182

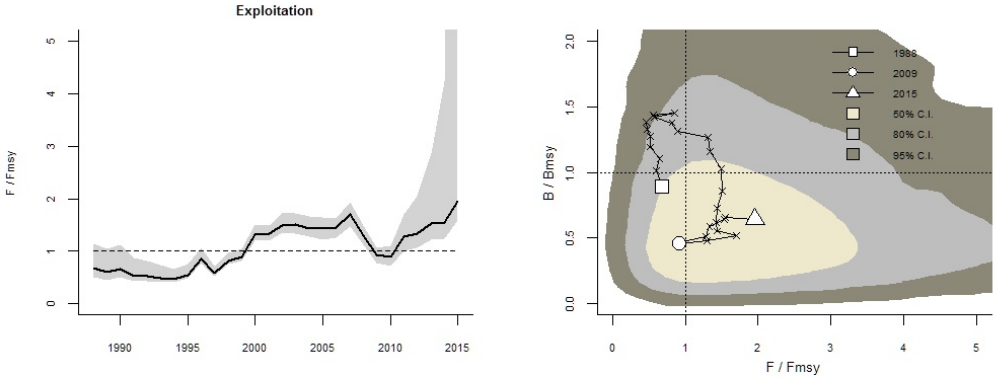
Results for Management (based on CMSY analysis)
Fmsy = 0.298 , 95% CL = 0.221 - 0.402 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.298 , 95% CL = 0.221 - 0.402 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 3.36 , 95% CL = 3.03 - 3.73
Bmsy = 11.3 , 95% CL = 8.34 - 15.3
Biomass in last year = 7.27 , 2.5th perc = 0.701 , 97.5 perc = 8.95
B/Bmsy in last year = 0.644 , 2.5th perc = 0.0621 , 97.5 perc = 0.793
Fishing mortality in last year = 0.584 , 2.5th perc = 0.474 , 97.5 perc = 6.05
F/Fmsy = 1.96 , 2.5th perc = 1.59 , 97.5 perc = 20.3

Stock status and exploitation in 2014
Biomass = 7.42 , B/Bmsy = 0.657 , fishing mortality F = 0.463 , F/Fmsy = 1.55
Comment: OK (RF 09.06.16)


A: gfb-comb catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r


D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (F/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k


Catch gfb-comb
Catch in 1000 t
MSY
Biomass
B / Bmsy

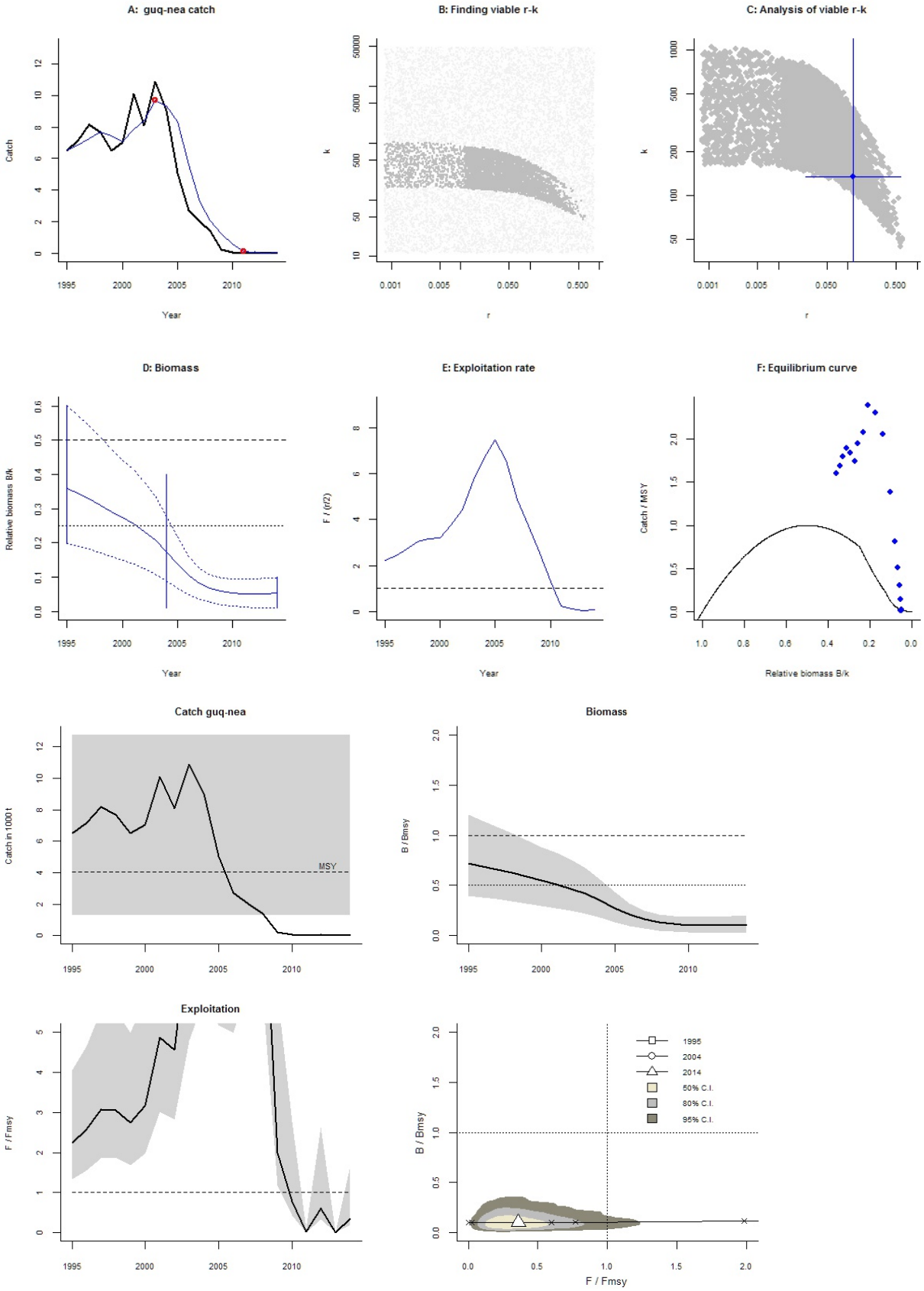

Exploitation
F / Fmsy
1988
2009
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

Species: Centrophorus squamosus , stock: guq-nea
Leafscale gulper shark in the Northeast Atlantic
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/guq-nea.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1995 - 2014 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2004 expert
Prior final relative biomass = 0.01 - 0.1 expert
Prior range for r = 8e-04 - 0.85 expert, , prior range for k = 11.5 - 48457

Results of CMSY analysis with altogether 8353 viable trajectories for 4975 r-k pairs
r = 0.119 , 95% CL = 0.0243 - 0.586 , k = 136 , 95% CL = 15.4 - 1197
MSY = 4.06 , 95% CL = 1.29 - 12.8
Relative biomass last year = 0.0531 k, 2.5th = 0.0115 , 97.5th = 0.0984
Exploitation F/(r/2) in last year = 0.0658

Results for Management (based on CMSY analysis)
Fmsy = 0.0597 , 95% CL = 0.0122 - 0.293 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0127 , 95% CL = 0.00258 - 0.0623 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 4.06 , 95% CL = 1.29 - 12.8
Bmsy = 67.9 , 95% CL = 7.71 - 599
Biomass in last year = 7.21 , 2.5th perc = 1.56 , 97.5 perc = 13.4
B/Bmsy in last year = 0.106 , 2.5th perc = 0.023 , 97.5 perc = 0.197
Fishing mortality in last year = 0.00457 , 2.5th perc = 0.00247 , 97.5 perc = 0.0211
F/Fmsy = 0.361 , 2.5th perc = 0.195 , 97.5 perc = 1.67

Stock status and exploitation in 2014
Biomass = 7.21 , B/Bmsy = 0.106 , fishing mortality F = 0.00457 , F/Fmsy = 0.361
Comment: OK (RF 23.05.16)

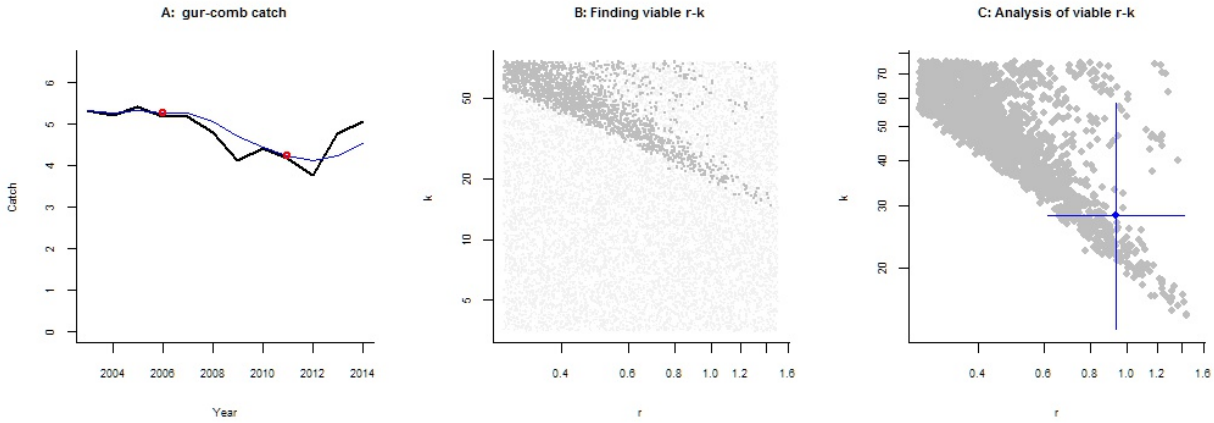

A: guq-nea catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch guq-nea
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1995
2004
2014
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

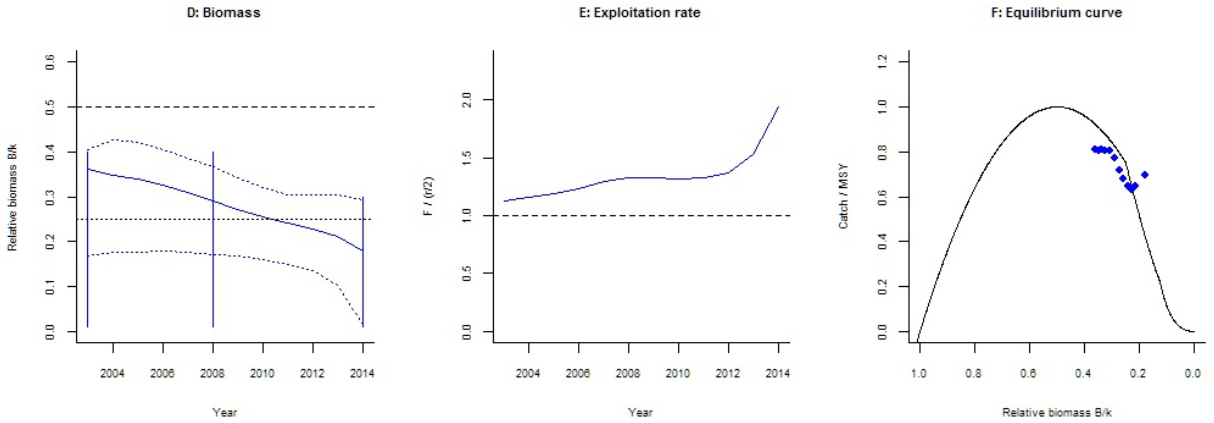
Species: Chelidonichthys cuculus , stock: gur-comb
Red gurnard in Subareas III, IV, V, VI, VII, and VIII (Northeast Atlantic)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/gur-comb.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 2003 - 2014 , abundance = None
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2008 default
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.28 - 1.5 expert, , prior range for k = 3.51 - 75.7

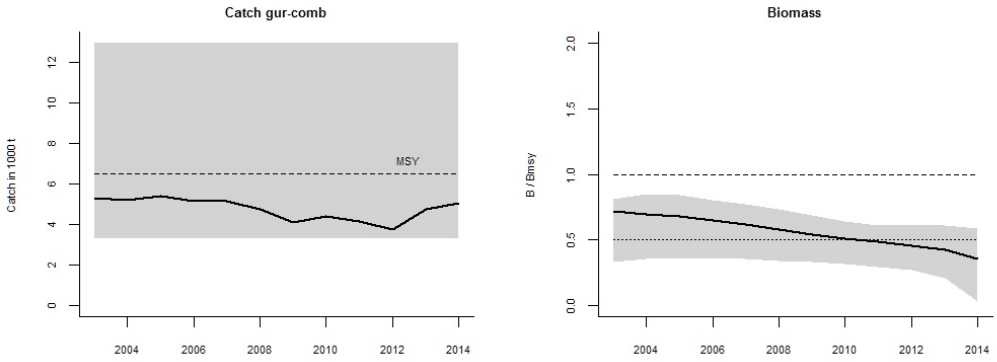
Results of CMSY analysis with altogether 2721 viable trajectories for 1899 r-k pairs
r = 0.932 , 95% CL = 0.613 - 1.42 , k = 28 , 95% CL = 13.5 - 58.1
MSY = 6.53 , 95% CL = 3.29 - 13
Relative biomass last year = 0.179 k, 2.5th = 0.0164 , 97.5th = 0.295
Exploitation F/(r/2) in last year = 1.94

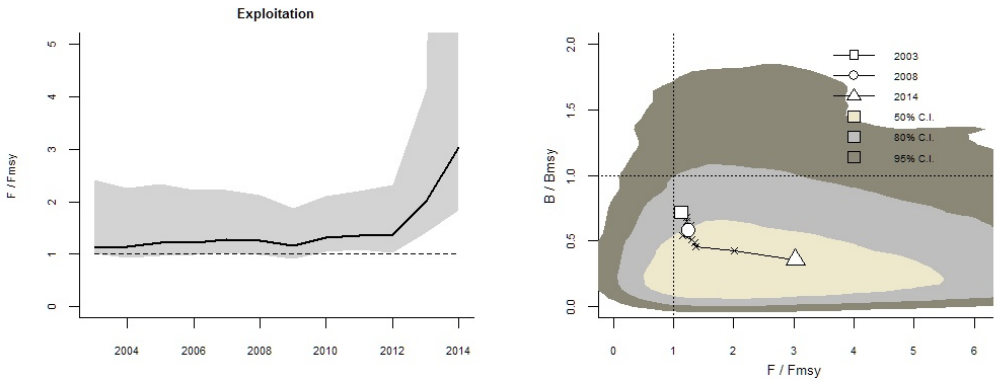
Results for Management (based on CMSY analysis)
Fmsy = 0.466 , 95% CL = 0.306 - 0.71 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.333 , 95% CL = 0.219 - 0.507 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 6.53 , 95% CL = 3.29 - 13
Bmsy = 14 , 95% CL = 6.75 - 29.1
Biomass in last year = 5.01 , 2.5th perc = 0.458 , 97.5 perc = 8.25
B/Bmsy in last year = 0.358 , 2.5th perc = 0.0327 , 97.5 perc = 0.589
Fishing mortality in last year = 1.01 , 2.5th perc = 0.613 , 97.5 perc = 11
F/Fmsy = 3.03 , 2.5th perc = 1.84 , 97.5 perc = 33.1

Stock status and exploitation in 2014
Biomass = 5.01 , B/Bmsy = 0.358 , fishing mortality F = 1.01 , F/Fmsy = 3.03
Comment: OK (RF 11.05.16)


A: gur-comb catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r


D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k


Catch gur-comb
Catch in 1000 t
MSY
Biomass
B / Bmsy


Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
2003
2008
2014
50% C.I.
80% C.I.
95% C.I.

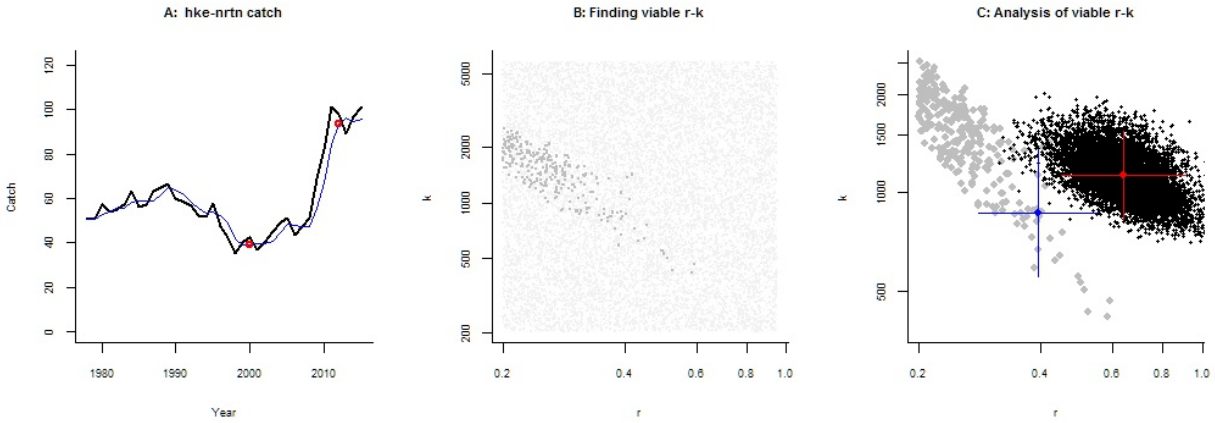
Species: Merluccius merluccius , stock: hke-nrtn
Hake in Division IIIa, Subareas IV, VI and VII and Divisions VIIIa,b,d (Northern stock)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/hke-nrtn.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1978 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2005 expert
Prior final relative biomass = 0.5 - 0.9 , default
Prior range for r = 0.2 - 0.95 expert, , prior range for k = 203 - 5772
Prior range of q = 0.297 - 1.29

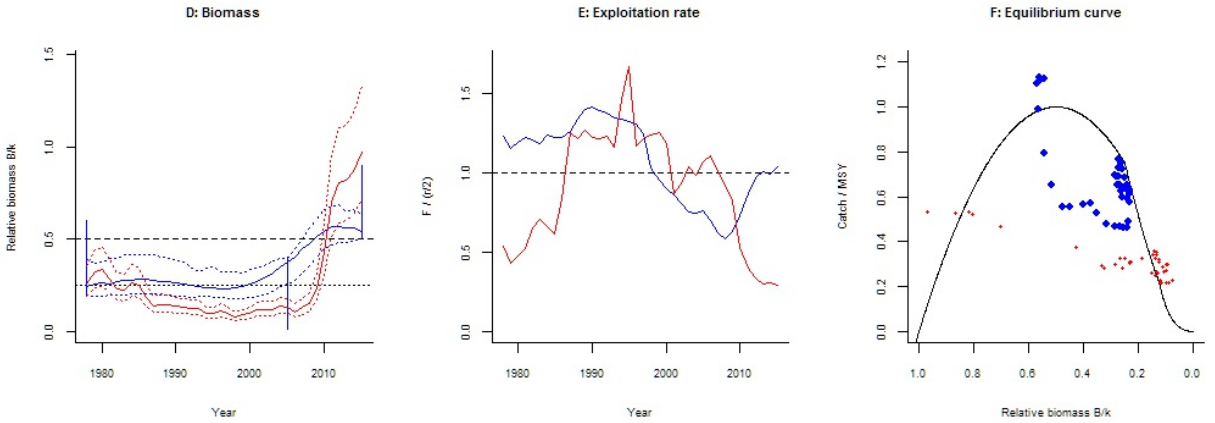
Results of CMSY analysis with altogether 257 viable trajectories for 256 r-k pairs
r = 0.393 , 95% CL = 0.28 - 0.55 , k = 866 , 95% CL = 553 - 1356
MSY = 85 , 95% CL = 53.7 - 135
Relative biomass last year = 0.543 k, 2.5th = 0.501 , 97.5th = 0.637
Exploitation F/(r/2) in last year = 1.04

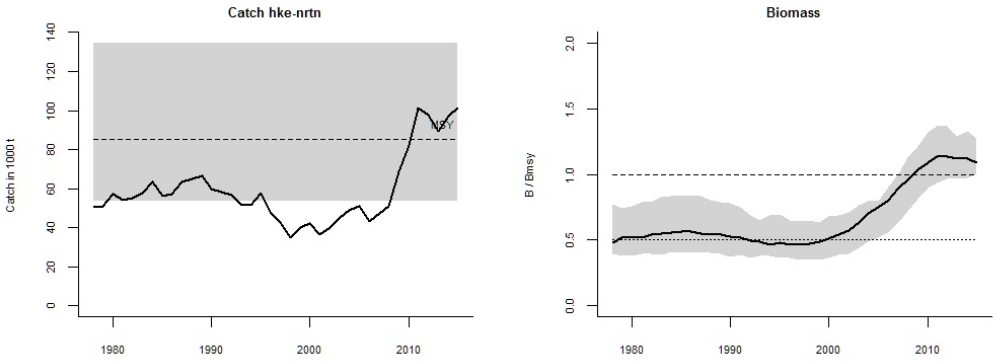
Results from Bayesian Schaefer model using catch & CPUE
r = 0.639 , 95% CL = 0.45 - 0.907 , k = 1131 , 95% CL = 828 - 1546
MSY = 181 , 95% CL = 130 - 251
Relative biomass in last year = 0.939 k, 2.5th perc = 0.781 , 97.5th perc = 1
Exploitation F/(r/2) in last year = 0.298
q = 0.279 , lcl = 0.219 , ucl = 0.356

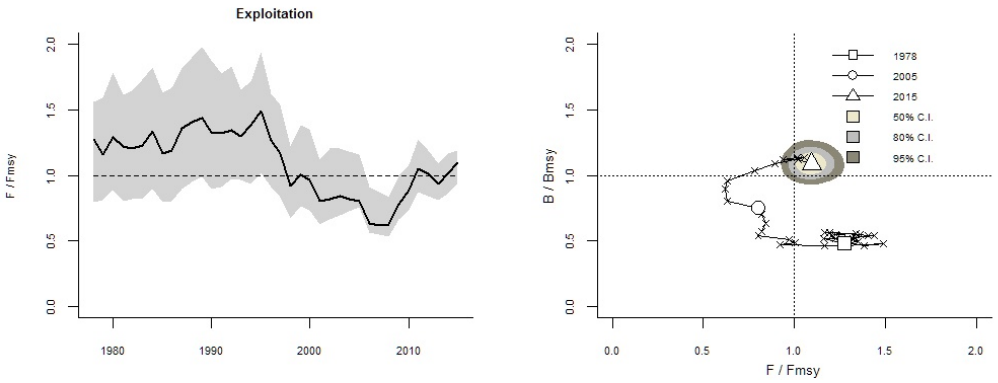
Results for Management (based on CMSY analysis)
Fmsy = 0.196 , 95% CL = 0.14 - 0.275 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.196 , 95% CL = 0.14 - 0.275 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 85 , 95% CL = 53.7 - 135
Bmsy = 433 , 95% CL = 277 - 678
Biomass in last year = 471 , 2.5th perc = 434 , 97.5 perc = 552
B/Bmsy in last year = 1.09 , 2.5th perc = 1 , 97.5 perc = 1.27
Fishing mortality in last year = 0.215 , 2.5th perc = 0.183 , 97.5 perc = 0.233
F/Fmsy = 1.09 , 2.5th perc = 0.933 , 97.5 perc = 1.19

Stock status and exploitation in 2014
Biomass = 485 , B/Bmsy = 1.12 , fishing mortality F = 0.2 , F/Fmsy = 1.02
Comment: OK (RF 25.04.16)


A: hke-nrtn catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r


D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (rf2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k


Catch hke-nrtn
Catch in 1000 t
MSY
Biomass
B / Bmsy


Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1978
2005
2015
50% C.I.
80% C.I.
95% C.I.

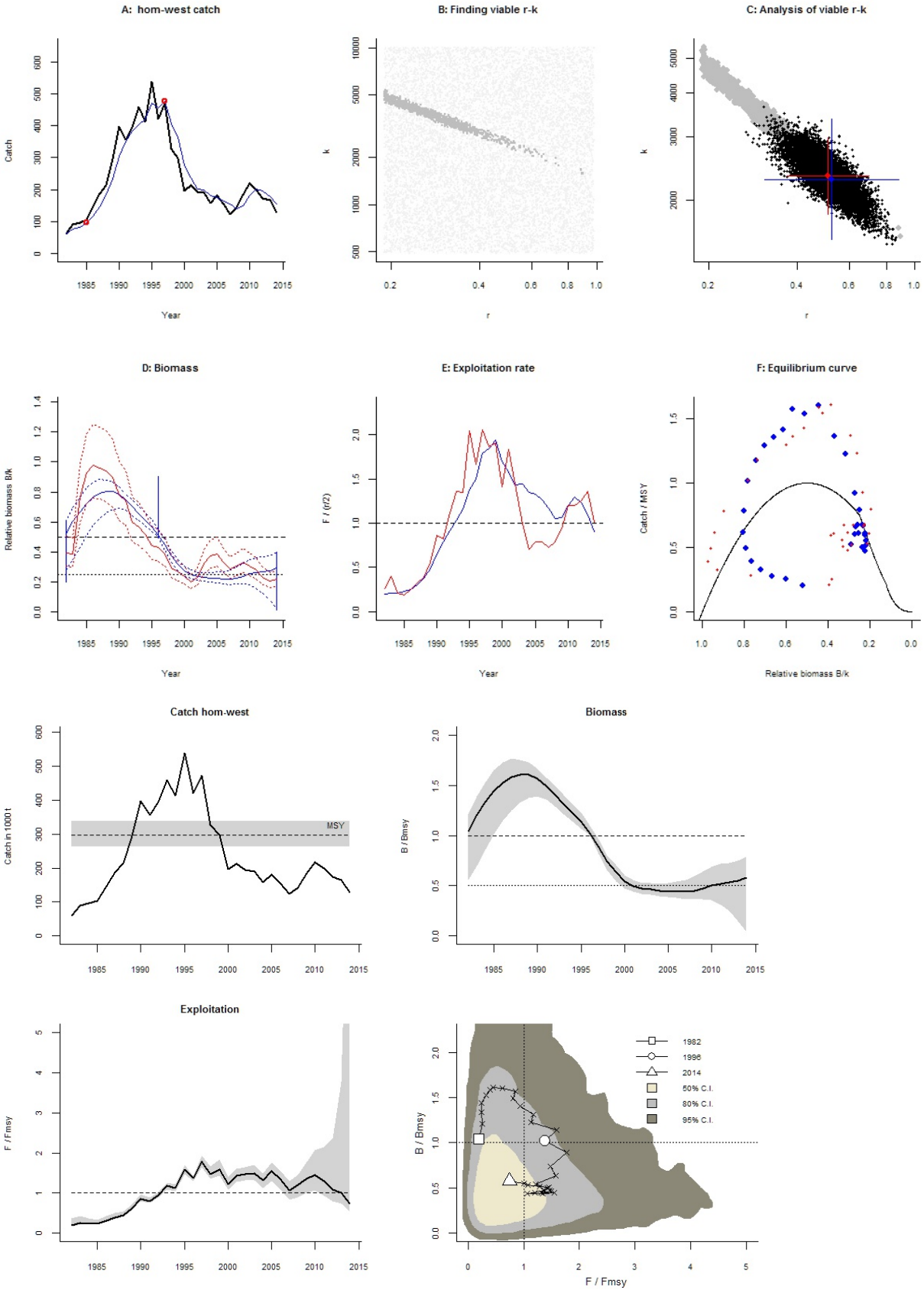
Species: Trachurus trachurus , stock: hom-west
Horse mackerel in Subarea VIII and Divisions IIa, IVa, Vb, VIa, and VIIa–c, e–k
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/hom-west.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1982 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.5 - 0.9 in year 1996 default
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.19 - 0.98 expert, , prior range for k = 488 - 10041
Prior range of q = 1.69 - 7.69

Results of CMSY analysis with altogether 1376 viable trajectories for 1146 r-k pairs
r = 0.522 , 95% CL = 0.309 - 0.881 , k = 2283 , 95% CL = 1548 - 3366
MSY = 298 , 95% CL = 262 - 339
Relative biomass last year = 0.29 k, 2.5th = 0.0192 , 97.5th = 0.396
Exploitation F/(r/2) in last year = 0.902

Results from Bayesian Schaefer model using catch & CPUE
r = 0.506 , 95% CL = 0.367 - 0.699 , k = 2339 , 95% CL = 1825 - 2996
MSY = 296 , 95% CL = 244 - 359
Relative biomass in last year = 0.214 k, 2.5th perc = 0.184 , 97.5th perc = 0.25
Exploitation F/(r/2) in last year = 1.02
q = 2.28 , lcl = 1.79 , ucl = 2.89

Results for Management (based on CMSY analysis)
Fmsy = 0.261 , 95% CL = 0.155 - 0.44 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.261 , 95% CL = 0.155 - 0.44 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 298 , 95% CL = 262 - 339
Bmsy = 1141 , 95% CL = 774 - 1683
Biomass in last year = 662 , 2.5th perc = 43.9 , 97.5 perc = 904
B/Bmsy in last year = 0.58 , 2.5th perc = 0.0384 , 97.5 perc = 0.792
Fishing mortality in last year = 0.195 , 2.5th perc = 0.143 , 97.5 perc = 2.94
F/Fmsy = 0.747 , 2.5th perc = 0.547 , 97.5 perc = 11.3

Stock status and exploitation in 2014
Biomass = 662 , B/Bmsy = 0.58 , fishing mortality F = 0.195 , F/Fmsy = 0.747
Comment: OK (RF 17.04.16)


A: hom-west catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch hom-west
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1982
1996
2014
50% C.I.
80% C.I.
95% C.I.

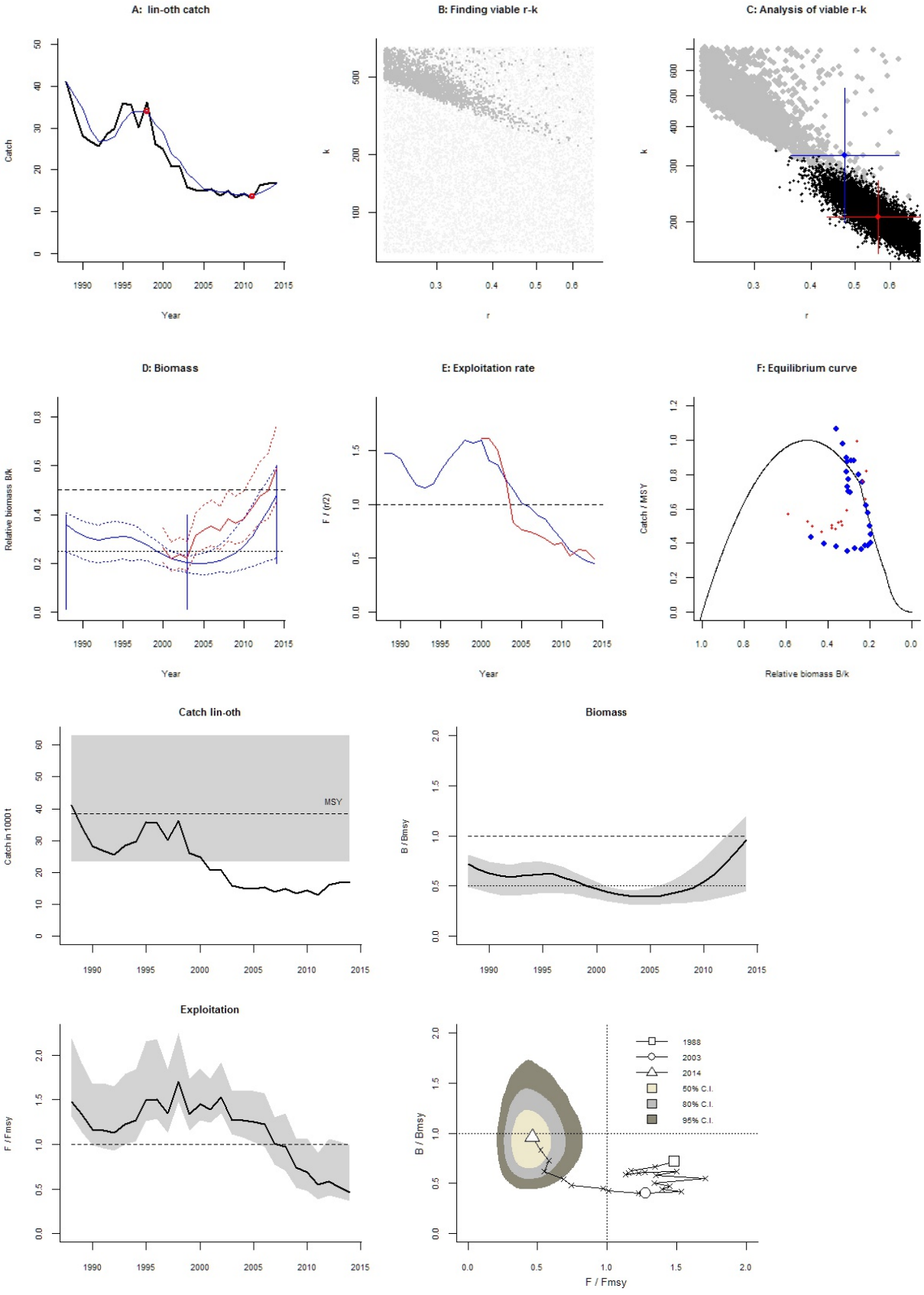
Species: Molva molva , stock: lin-oth
Ling in Subareas VI-IX, XII, and XIV, and in Divisions IIIa and IVa (other areas)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/lin-oth.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1988 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2003 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.23 - 0.67 expert, , prior range for k = 61.3 - 714
Prior range of q = 0.00107 - 0.00364

Results of CMSY analysis with altogether 2764 viable trajectories for 2410 r-k pairs
r = 0.476 , 95% CL = 0.361 - 0.627 , k = 323 , 95% CL = 199 - 527
MSY = 38.5 , 95% CL = 23.5 - 63
Relative biomass last year = 0.48 k, 2.5th = 0.223 , 97.5th = 0.597
Exploitation F/(r/2) in last year = 0.452

Results from Bayesian Schaefer model using catch & CPUE
r = 0.563 , 95% CL = 0.434 - 0.731 , k = 207 , 95% CL = 159 - 270
MSY = 29.2 , 95% CL = 25.3 - 33.7
Relative biomass in last year = 0.591 k, 2.5th perc = 0.461 , 97.5th perc = 0.698
Exploitation F/(r/2) in last year = 0.493
q = 0.00118 , lcl = 0.000936 , ucl = 0.00149

Results for Management (based on CMSY analysis)
Fmsy = 0.238 , 95% CL = 0.181 - 0.313 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.238 , 95% CL = 0.181 - 0.313 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 38.5 , 95% CL = 23.5 - 63
Bmsy = 162 , 95% CL = 99.3 - 263
Biomass in last year = 155 , 2.5th perc = 72.2 , 97.5 perc = 193
B/Bmsy in last year = 0.959 , 2.5th perc = 0.446 , 97.5 perc = 1.19
Fishing mortality in last year = 0.11 , 2.5th perc = 0.0881 , 97.5 perc = 0.236
F/Fmsy = 0.461 , 2.5th perc = 0.37 , 97.5 perc = 0.991

Stock status and exploitation in 2014
Biomass = 155 , B/Bmsy = 0.959 , fishing mortality F = 0.11 , F/Fmsy = 0.461
Comment: OK (RF 11.05.2016) No ICES update in 2016.


A: lin-oth catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch lin-oth
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1988
2003
2014
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

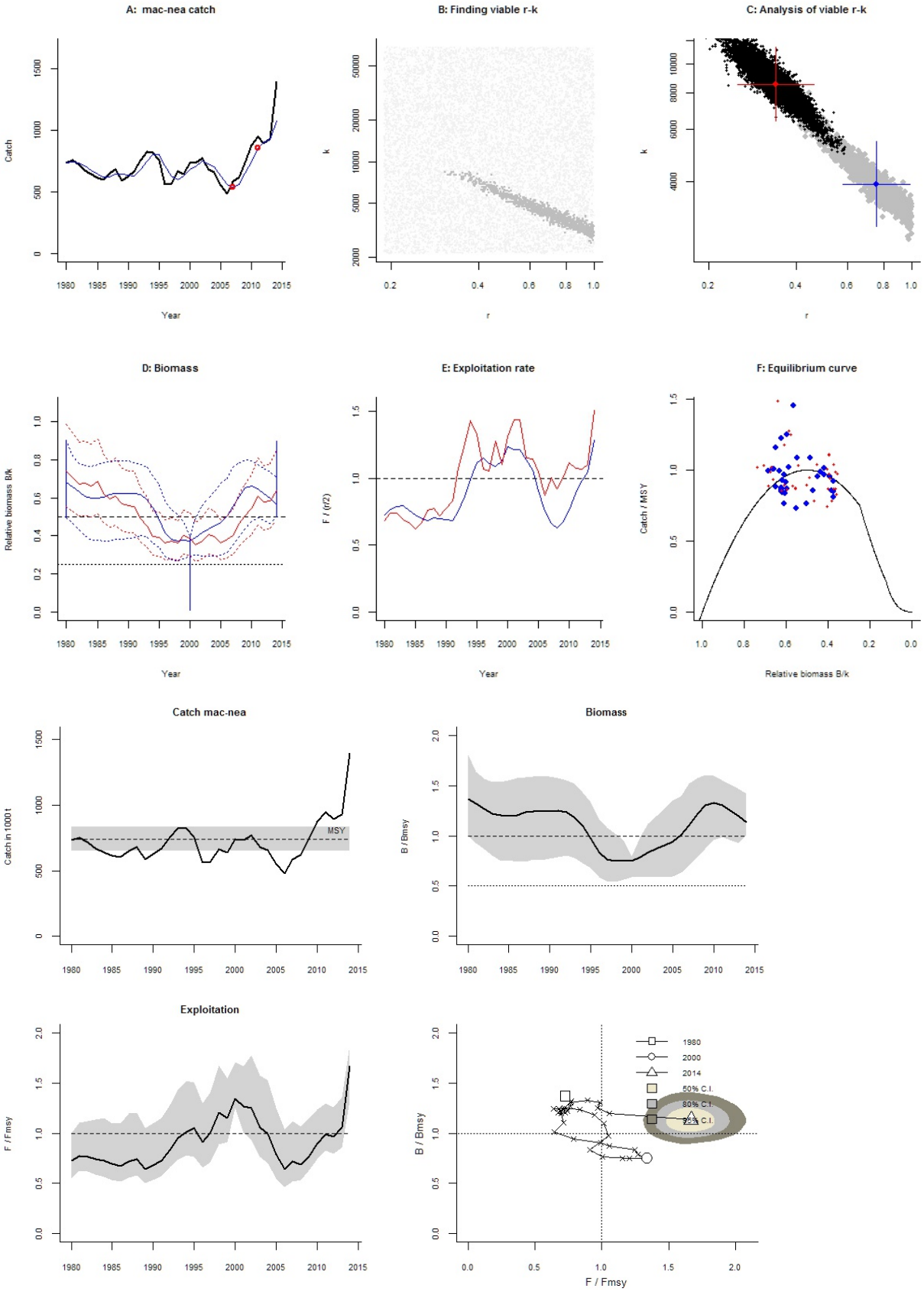
Species: Scomber scombrus , stock: mac-nea
Mackerel (combined Southern, Western & N.Sea spawn.comp.)
Source: www.ices.dk
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1980 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert
Prior final relative biomass = 0.5 - 0.9 , default
Prior range for r = 0.19 - 1 expert, , prior range for k = 2146 - 67759
Prior range of q = 0.477 - 2.19

Results of CMSY analysis with altogether 1429 viable trajectories for 1217 r-k pairs
r = 0.752 , 95% CL = 0.576 - 0.981 , k = 3930 , 95% CL = 2828 - 5460
MSY = 739 , 95% CL = 653 - 836
Relative biomass last year = 0.566 k, 2.5th = 0.503 , 97.5th = 0.709
Exploitation F/(r/2) in last year = 1.28

Results from Bayesian Schaefer model using catch & CPUE
r = 0.339 , 95% CL = 0.251 - 0.459 , k = 8526 , 95% CL = 6402 - 11355
MSY = 723 , 95% CL = 636 - 822
Relative biomass in last year = 0.614 k, 2.5th perc = 0.518 , 97.5th perc = 0.726
Exploitation F/(r/2) in last year = 1.57
q = 0.943 , lcl = 0.721 , ucl = 1.23

Results for Management (based on CMSY analysis)
Fmsy = 0.376 , 95% CL = 0.288 - 0.491 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.376 , 95% CL = 0.288 - 0.491 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 739 , 95% CL = 653 - 836
Bmsy = 1965 , 95% CL = 1414 - 2730
Biomass in last year = 2223 , 2.5th perc = 1976 , 97.5 perc = 2786
B/Bmsy in last year = 1.13 , 2.5th perc = 1.01 , 97.5 perc = 1.42
Fishing mortality in last year = 0.627 , 2.5th perc = 0.5 , 97.5 perc = 0.706
F/Fmsy = 1.67 , 2.5th perc = 1.33 , 97.5 perc = 1.88

Stock status and exploitation in 2014
Biomass = 2223 , B/Bmsy = 1.13 , fishing mortality F = 0.627 , F/Fmsy = 1.67
Comment: OK (RF 17.04.16)

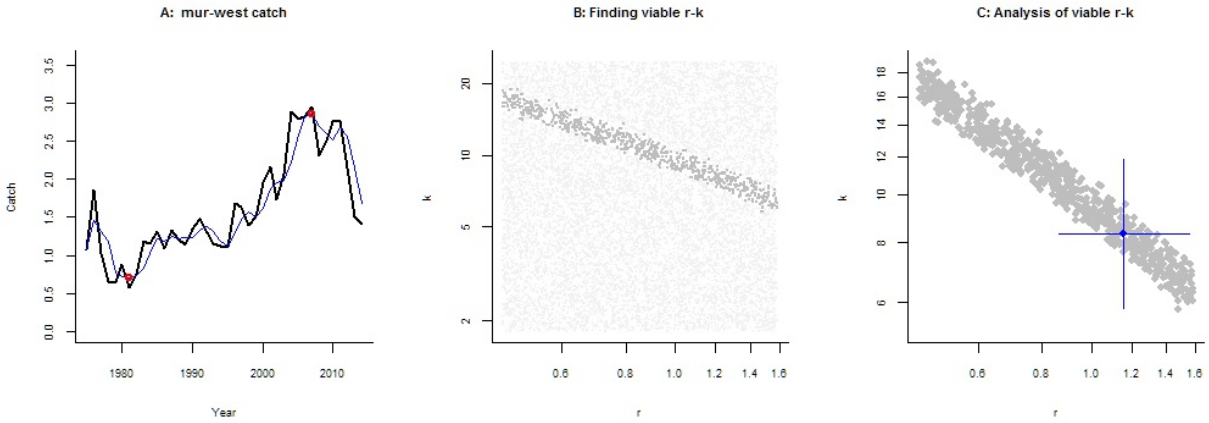

A: mac-nea catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch mac-nea
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1980
2000
2014
50% C.I.
80% C.I.
95% C.I.

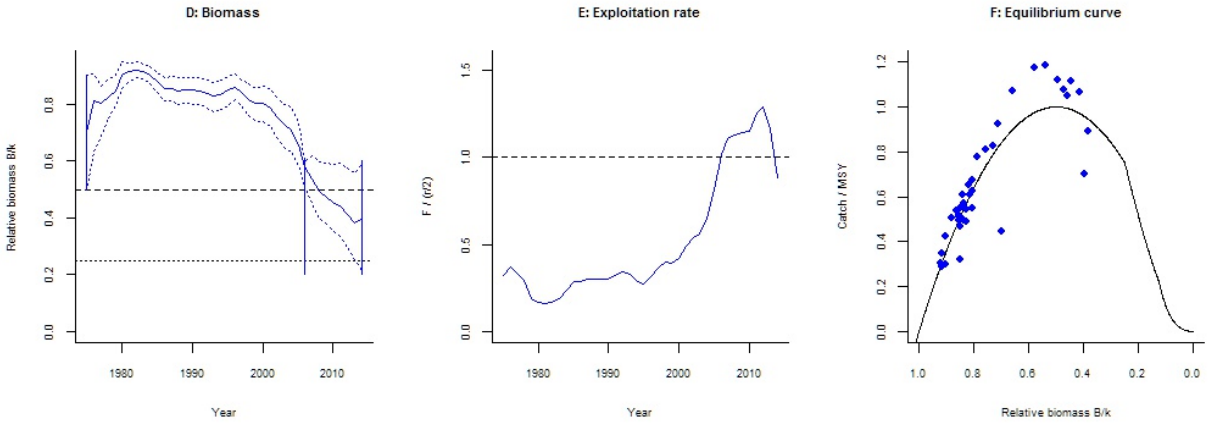
Species: Mullus surmuletus , stock: mur-west
Striped red mullet in Subareas VI and VIII and Divisions VIIa–c, e–k and IXa (West of Scotland, Bay of Biscay, Southern Celtic Seas, Atlantic Iberian Waters)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/mur-west.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1975 - 2014 , abundance = None
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2006 default
Prior final relative biomass = 0.2 - 0.6 , default
Prior range for r = 0.46 - 1.6 expert, , prior range for k = 1.8 - 24.8

Results of CMSY analysis with altogether 1811 viable trajectories for 674 r-k pairs
r = 1.16 , 95% CL = 0.865 - 1.55 , k = 8.32 , 95% CL = 5.81 - 11.9
MSY = 2.41 , 95% CL = 2.11 - 2.75
Relative biomass last year = 0.397 k, 2.5th = 0.214 , 97.5th = 0.588
Exploitation F/(r/2) in last year = 0.882

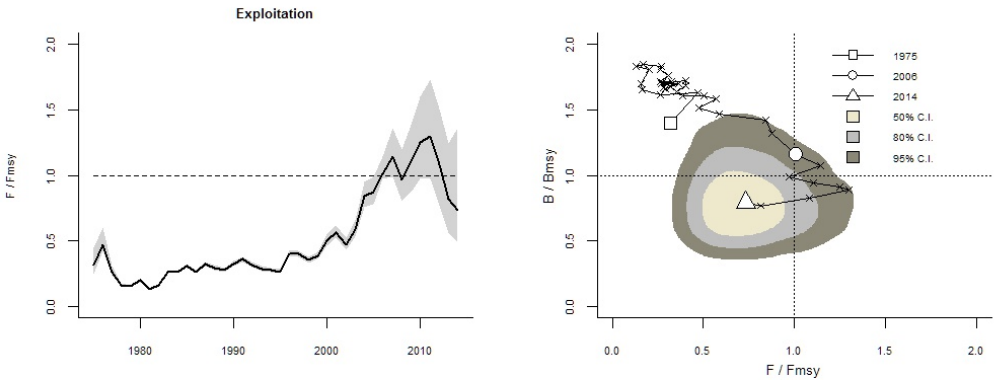
Results for Management (based on CMSY analysis)
Fmsy = 0.579 , 95% CL = 0.433 - 0.776 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.579 , 95% CL = 0.433 - 0.776 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 2.41 , 95% CL = 2.11 - 2.75
Bmsy = 4.16 , 95% CL = 2.9 - 5.95
Biomass in last year = 3.3 , 2.5th perc = 1.78 , 97.5 perc = 4.89
B/Bmsy in last year = 0.795 , 2.5th perc = 0.427 , 97.5 perc = 1.18
Fishing mortality in last year = 0.424 , 2.5th perc = 0.287 , 97.5 perc = 0.789
F/Fmsy = 0.732 , 2.5th perc = 0.494 , 97.5 perc = 1.36

Stock status and exploitation in 2014
Biomass = 3.3 , B/Bmsy = 0.795 , fishing mortality F = 0.424 , F/Fmsy = 0.732
Comment: OK (RF 12.05.16)


A: mur-west catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r


D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k


Catch mur-west
Catch in 1000 t
MSY
Biomass
B / Bmsy

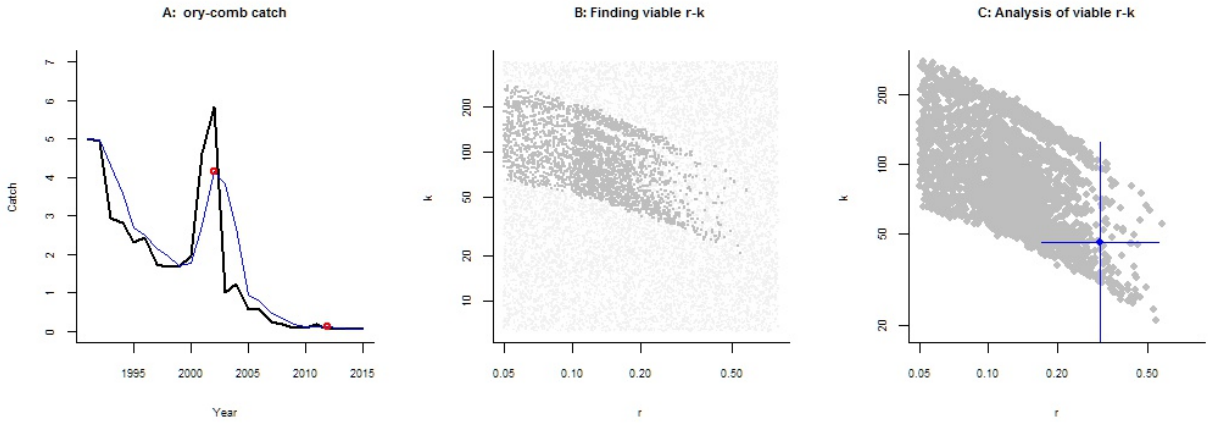

Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1975
2006
2014
50% C.I.
80% C.I.
95% C.I.

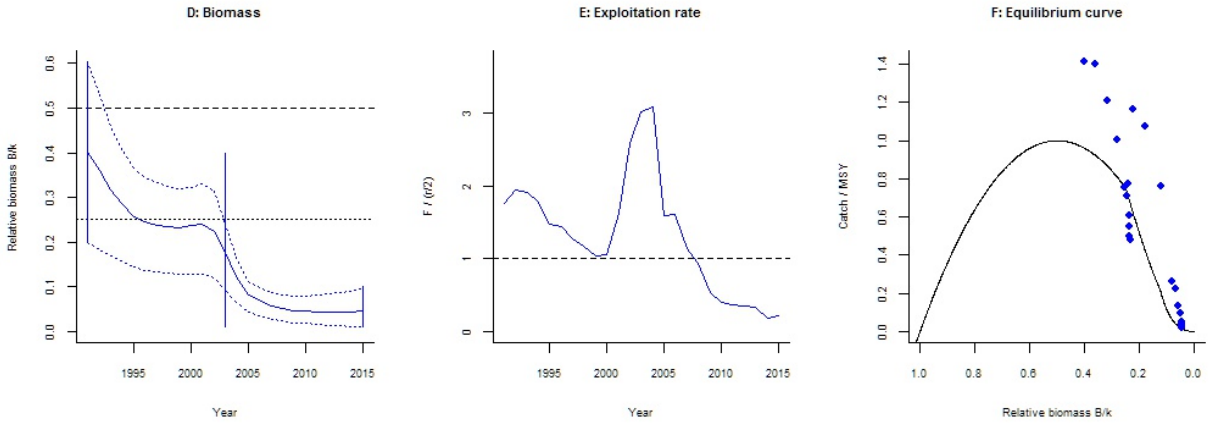
Species: Hoplostethus atlanticus , stock: ory-comb
Orange roughy in the Northeast Atlantic
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/ory-comb.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1991 - 2015 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2003 expert
Prior final relative biomass = 0.01 - 0.1 expert
Prior range for r = 0.05 - 0.8 expert, , prior range for k = 6.28 - 402

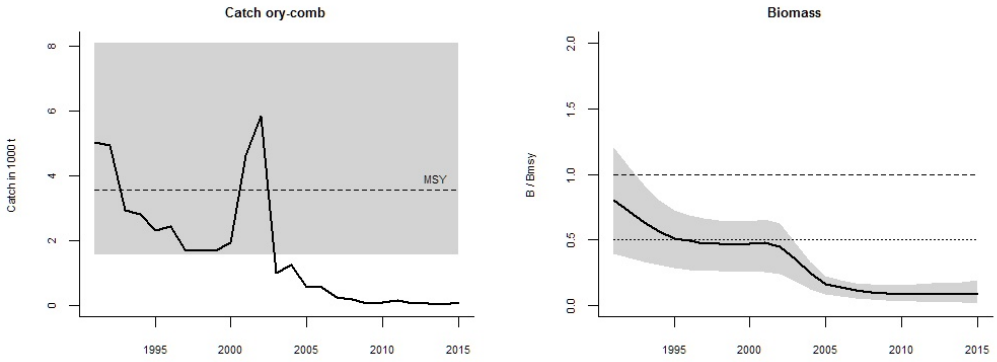
Results of CMSY analysis with altogether 3264 viable trajectories for 2824 r-k pairs
r = 0.309 , 95% CL = 0.171 - 0.557 , k = 46.1 , 95% CL = 17.1 - 124
MSY = 3.56 , 95% CL = 1.56 - 8.09
Relative biomass last year = 0.045 k, 2.5th = 0.0109 , 97.5th = 0.0968
Exploitation F/(r/2) in last year = 0.213

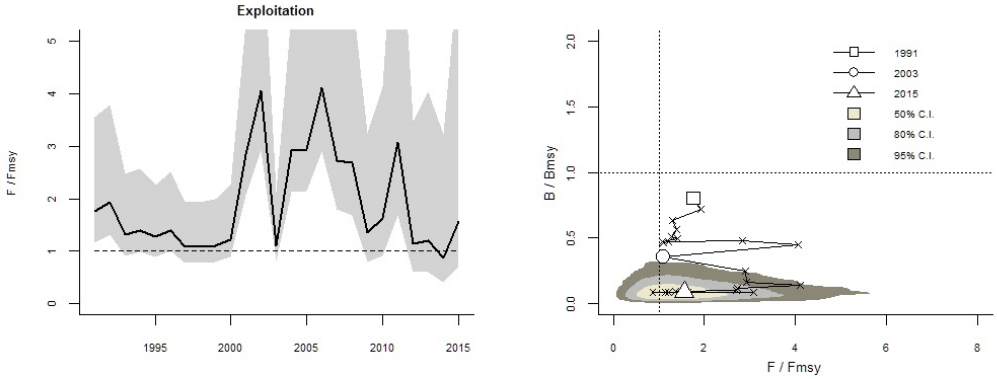
Results for Management (based on CMSY analysis)
Fmsy = 0.154 , 95% CL = 0.0856 - 0.279 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0278 , 95% CL = 0.0154 - 0.0502 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 3.56 , 95% CL = 1.56 - 8.09
Bmsy = 23 , 95% CL = 8.56 - 61.9
Biomass in last year = 2.07 , 2.5th perc = 0.503 , 97.5 perc = 4.46
B/Bmsy in last year = 0.0901 , 2.5th perc = 0.0219 , 97.5 perc = 0.194
Fishing mortality in last year = 0.0434 , 2.5th perc = 0.0202 , 97.5 perc = 0.179
F/Fmsy = 1.56 , 2.5th perc = 0.726 , 97.5 perc = 6.43

Stock status and exploitation in 2014
Biomass = 2.03 , B/Bmsy = 0.0883 , fishing mortality F = 0.0236 , F/Fmsy = 0.866
Comment: OK (RF 09.06.16)


A: ory-comb catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r


D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k


Catch ory-comb
Catch in 1000 t
MSY
Biomass
B / Bmsy

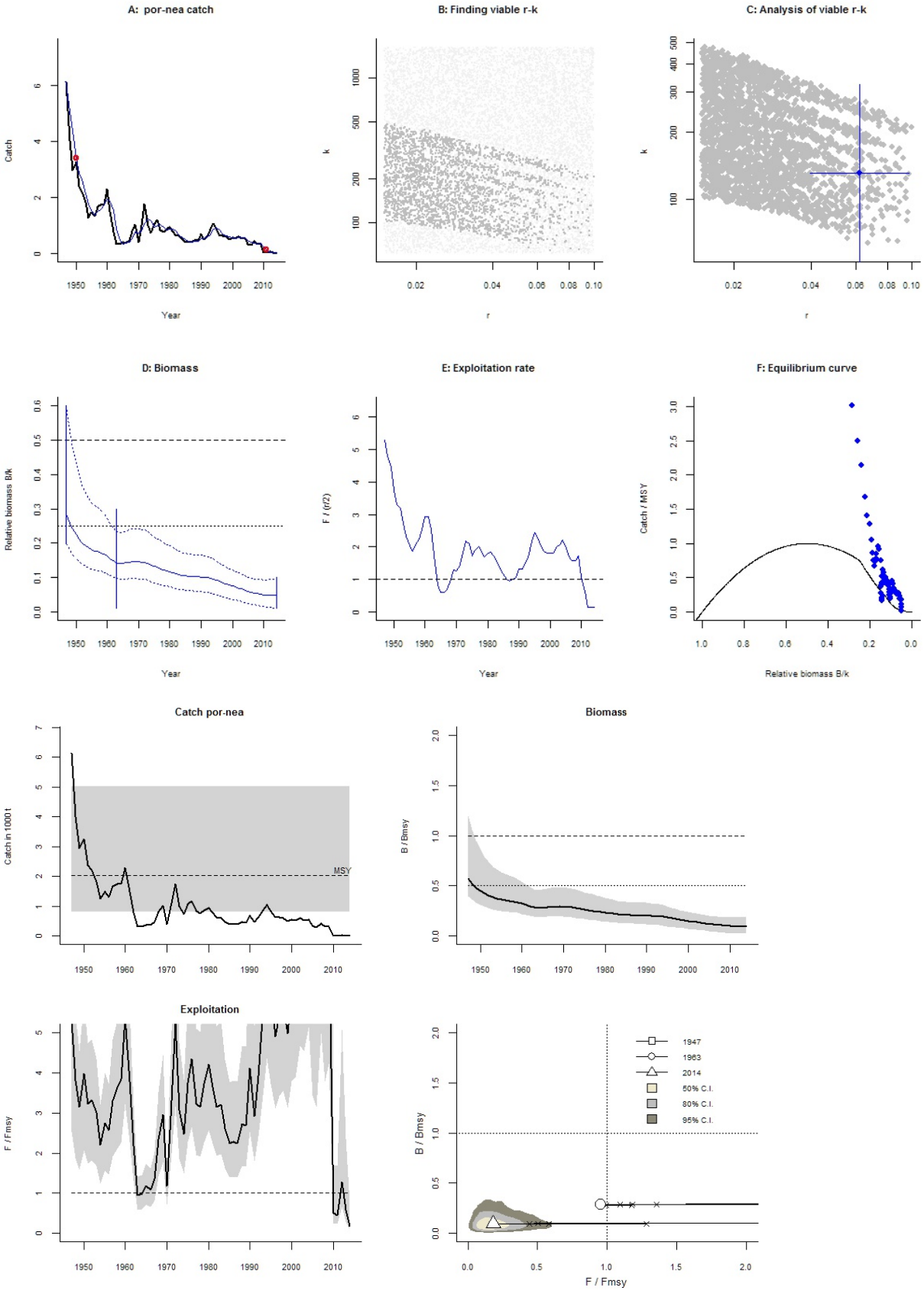

Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1991
2003
2015
50% C.I.
80% C.I.
95% C.I.

Species: Lamna nasus , stock: por-nea
Porbeagle in the Northeast Atlantic
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/por-nea.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1947 - 2014 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.01 - 0.3 in year 1963 expert
Prior final relative biomass = 0.01 - 0.1 expert
Prior range for r = 0.015 - 0.1 default , prior range for k = 61.2 - 1633

Results of CMSY analysis with altogether 2846 viable trajectories for 2604 r-k pairs
r = 0.062 , 95% CL = 0.0397 - 0.097 , k = 131 , 95% CL = 52.8 - 325
MSY = 2.03 , 95% CL = 0.822 - 5.02
Relative biomass last year = 0.0486 k, 2.5th = 0.0116 , 97.5th = 0.0972
Exploitation F/(r/2) in last year = 0.13

Results for Management (based on CMSY analysis)
Fmsy = 0.031 , 95% CL = 0.0198 - 0.0485 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.00604 , 95% CL = 0.00386 - 0.00943 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 2.03 , 95% CL = 0.822 - 5.02
Bmsy = 65.5 , 95% CL = 26.4 - 162
Biomass in last year = 6.37 , 2.5th perc = 1.52 , 97.5 perc = 12.7
B/Bmsy in last year = 0.0973 , 2.5th perc = 0.0233 , 97.5 perc = 0.194
Fishing mortality in last year = 0.0011 , 2.5th perc = 0.00055 , 97.5 perc = 0.00459
F/Fmsy = 0.182 , 2.5th perc = 0.0911 , 97.5 perc = 0.761

Stock status and exploitation in 2014
Biomass = 6.37 , B/Bmsy = 0.0973 , fishing mortality F = 0.0011 , F/Fmsy = 0.182
Comment: OK (RF 13.05.16)


A: por-nea catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch por-nea
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1947
1963
2014
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

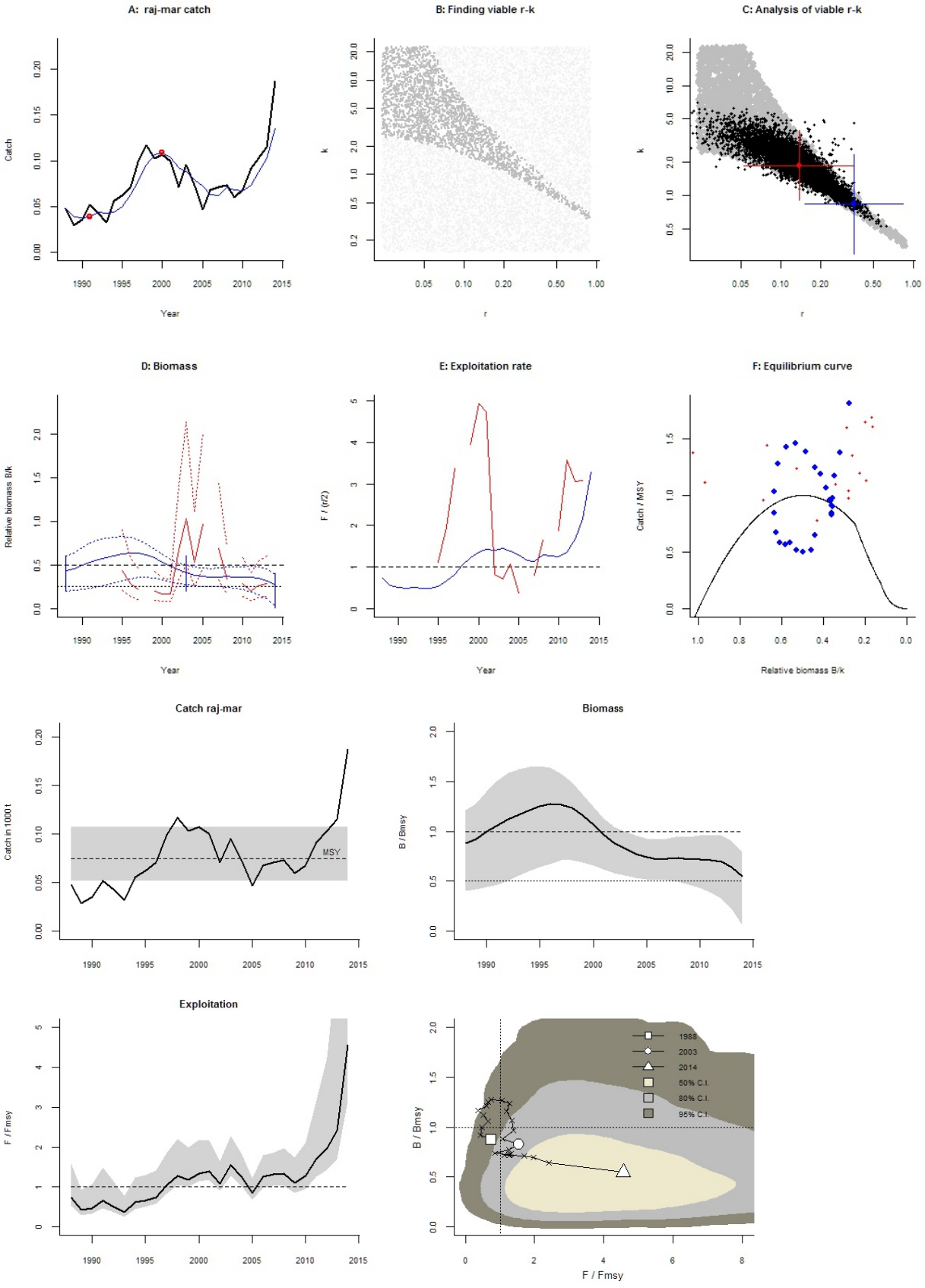
Species: Raja clavata , stock: raj-mar
Rays and skates, mainly thornback ray, in Subareas X and XII (Azores grounds and north of Azores)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/raj-mar.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1988 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2003 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.024 - 0.9 expert, , prior range for k = 0.15 - 22.5
Prior range of q = 0.546 - 6.7

Results of CMSY analysis with altogether 8463 viable trajectories for 2356 r-k pairs
r = 0.359 , 95% CL = 0.153 - 0.844 , k = 0.832 , 95% CL = 0.295 - 2.35
MSY = 0.0747 , 95% CL = 0.0521 - 0.107
Relative biomass last year = 0.275 k, 2.5th = 0.0334 , 97.5th = 0.396
Exploitation F/(r/2) in last year = 3.29

Results from Bayesian Schaefer model using catch & CPUE
r = 0.138 , 95% CL = 0.0526 - 0.361 , k = 1.87 , 95% CL = 0.901 - 3.88
MSY = 0.0645 , 95% CL = 0.0395 - 0.105
Relative biomass in last year = 0.288 k, 2.5th perc = 0.079 , 97.5th perc = 0.468
Exploitation F/(r/2) in last year = 5.04
q = 1.27 , lcl = 0.768 , ucl = 2.1

Results for Management (based on CMSY analysis)
Fmsy = 0.179 , 95% CL = 0.0763 - 0.422 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.179 , 95% CL = 0.0763 - 0.422 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.0747 , 95% CL = 0.0521 - 0.107
Bmsy = 0.416 , 95% CL = 0.147 - 1.18
Biomass in last year = 0.229 , 2.5th perc = 0.0278 , 97.5 perc = 0.329
B/Bmsy in last year = 0.549 , 2.5th perc = 0.0669 , 97.5 perc = 0.792
Fishing mortality in last year = 0.818 , 2.5th perc = 0.568 , 97.5 perc = 6.72
F/Fmsy = 4.56 , 2.5th perc = 3.16 , 97.5 perc = 37.4

Stock status and exploitation in 2014
Biomass = 0.229 , B/Bmsy = 0.549 , fishing mortality F = 0.818 , F/Fmsy = 4.56
Comment: OK (RF 18.05.16)

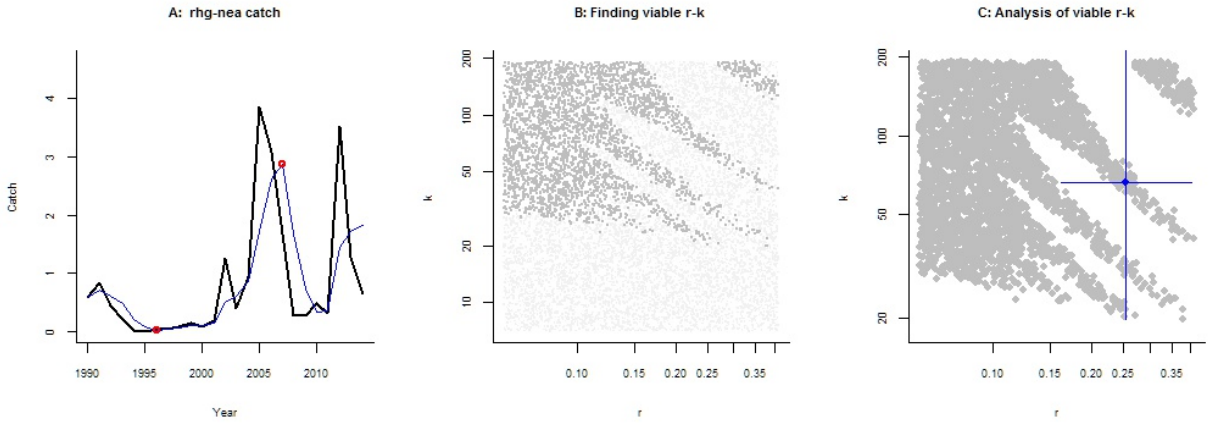

A: raj-mar catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch raj-mar
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1988
2003
2014
50% C.I.
80% C.I.
95% C.I.

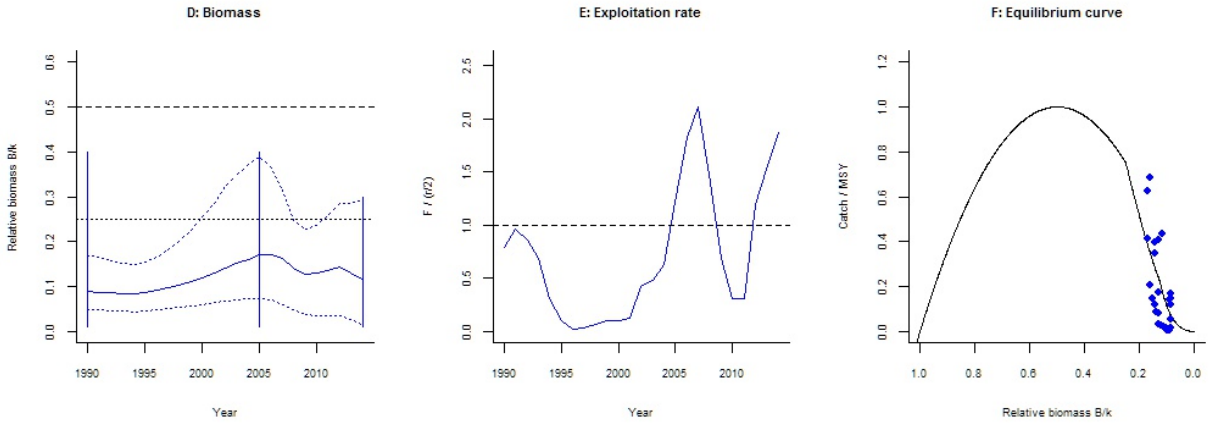
Species: Macrourus berglax , stock: rhg-nea
Roughhead grenadier in the Northeast Atlantic
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/rhg-nea.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1990 - 2014 , abundance = None
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2005 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.06 - 0.41 expert, , prior range for k = 7 - 191

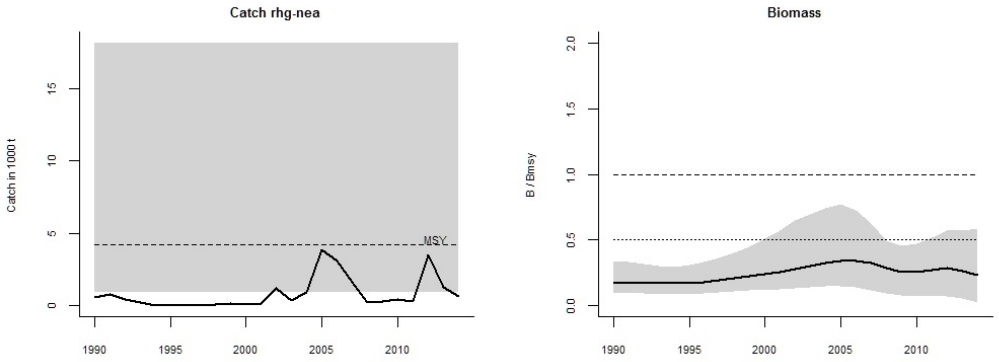
Results of CMSY analysis with altogether 4228 viable trajectories for 3251 r-k pairs
r = 0.254 , 95% CL = 0.161 - 0.401 , k = 66 , 95% CL = 19.8 - 220
MSY = 4.19 , 95% CL = 0.966 - 18.2
Relative biomass last year = 0.117 k, 2.5th = 0.0133 , 97.5th = 0.292
Exploitation F/(r/2) in last year = 1.87

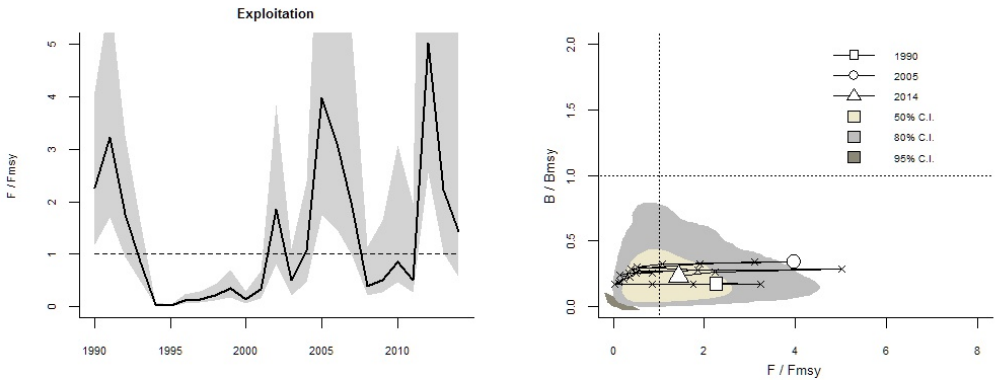
Results for Management (based on CMSY analysis)
Fmsy = 0.127 , 95% CL = 0.0805 - 0.2 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0593 , 95% CL = 0.0376 - 0.0935 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 4.19 , 95% CL = 0.966 - 18.2
Bmsy = 33 , 95% CL = 9.89 - 110
Biomass in last year = 7.69 , 2.5th perc = 0.877 , 97.5 perc = 19.3
B/Bmsy in last year = 0.233 , 2.5th perc = 0.0266 , 97.5 perc = 0.585
Fishing mortality in last year = 0.085 , 2.5th perc = 0.0339 , 97.5 perc = 0.745
F/Fmsy = 1.43 , 2.5th perc = 0.572 , 97.5 perc = 12.6

Stock status and exploitation in 2014
Biomass = 7.69 , B/Bmsy = 0.233 , fishing mortality F = 0.085 , F/Fmsy = 1.43
Comment: OK (RF 23.05.16) No ICES update in 2016.


A: rhg-nea catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r


D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k


Catch rhg-nea
Catch in 1000 t
MSY
Biomass
B / Bmsy

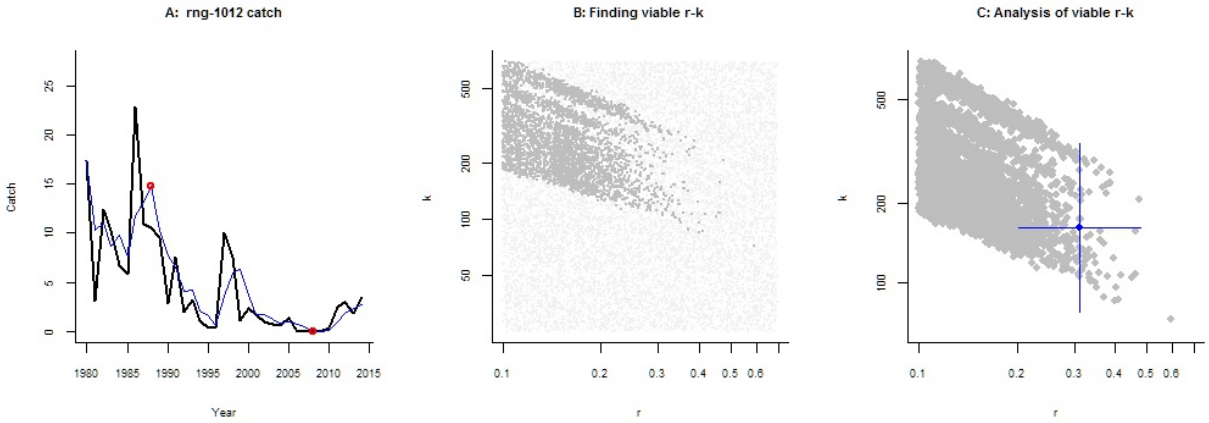

Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1990
2005
2014
50% C.I.
80% C.I.
95% C.I.

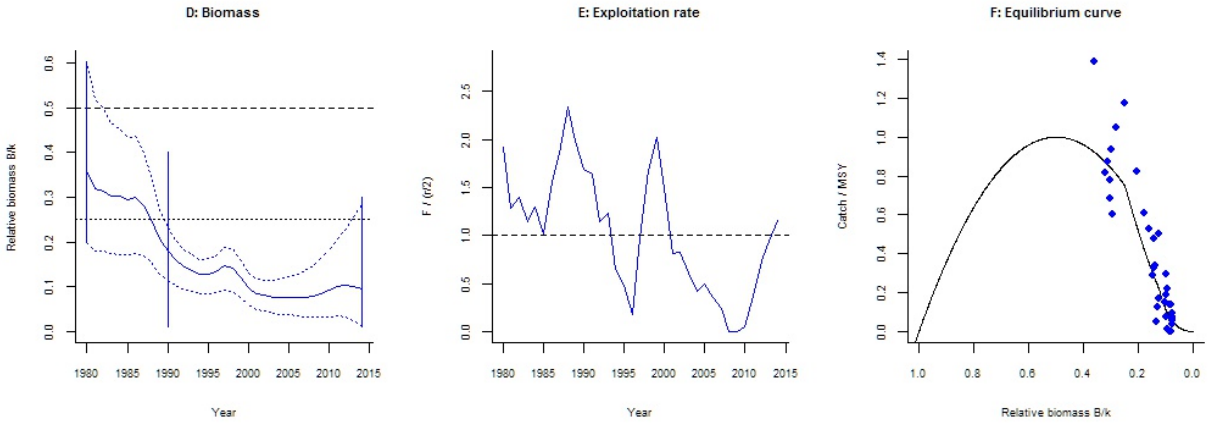
Species: Coryphaenoides rupestris , stock: rng-1012
Roundnose grenadier in in Divisions Xb and XIIc, and Subdivisions XIIa1, XIVb1, and Va1 (Oceanic Northeast Atlantic and Northern Reykjanes Ridge)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/rng-1012.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1980 - 2014 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 1990 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.1 - 0.69 expert, , prior range for k = 25.1 - 697

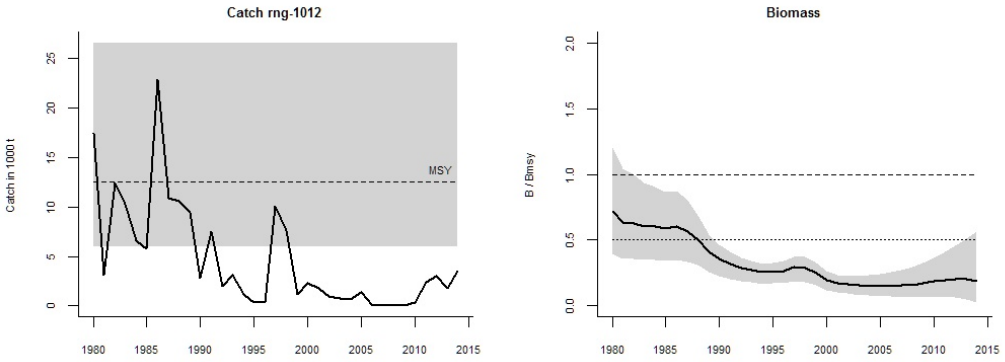
Results of CMSY analysis with altogether 3888 viable trajectories for 3472 r-k pairs
r = 0.31 , 95% CL = 0.202 - 0.478 , k = 162 , 95% CL = 77 - 341
MSY = 12.6 , 95% CL = 5.93 - 26.6
Relative biomass last year = 0.0944 k, 2.5th = 0.0118 , 97.5th = 0.283
Exploitation F/(r/2) in last year = 1.16

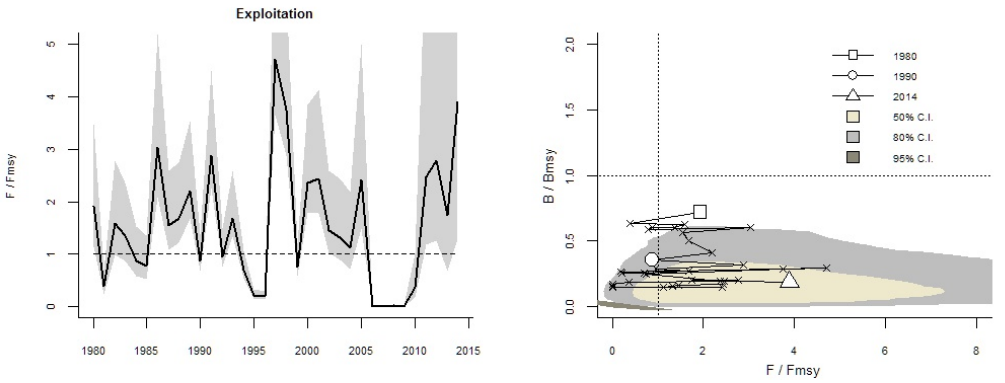
Results for Management (based on CMSY analysis)
Fmsy = 0.155 , 95% CL = 0.101 - 0.239 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0586 , 95% CL = 0.0381 - 0.0901 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 12.6 , 95% CL = 5.93 - 26.6
Bmsy = 81 , 95% CL = 38.5 - 170
Biomass in last year = 15.3 , 2.5th perc = 1.91 , 97.5 perc = 45.8
B/Bmsy in last year = 0.189 , 2.5th perc = 0.0236 , 97.5 perc = 0.566
Fishing mortality in last year = 0.228 , 2.5th perc = 0.076 , 97.5 perc = 1.82
F/Fmsy = 3.89 , 2.5th perc = 1.3 , 97.5 perc = 31.1

Stock status and exploitation in 2014
Biomass = 15.3 , B/Bmsy = 0.189 , fishing mortality F = 0.228 , F/Fmsy = 3.89
Comment: OK (RF 13.05.16)


A: rng-1012 catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r


D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k


Catch rng-1012
Catch in 1000 t
MSY
Biomass
B / Bmsy

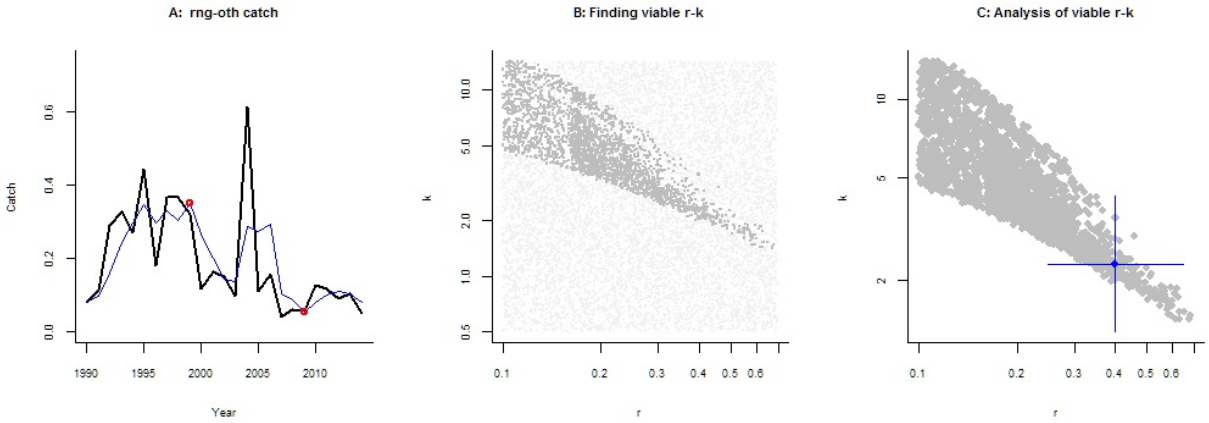

Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1980
1990
2014
50% C.I.
80% C.I.
95% C.I.

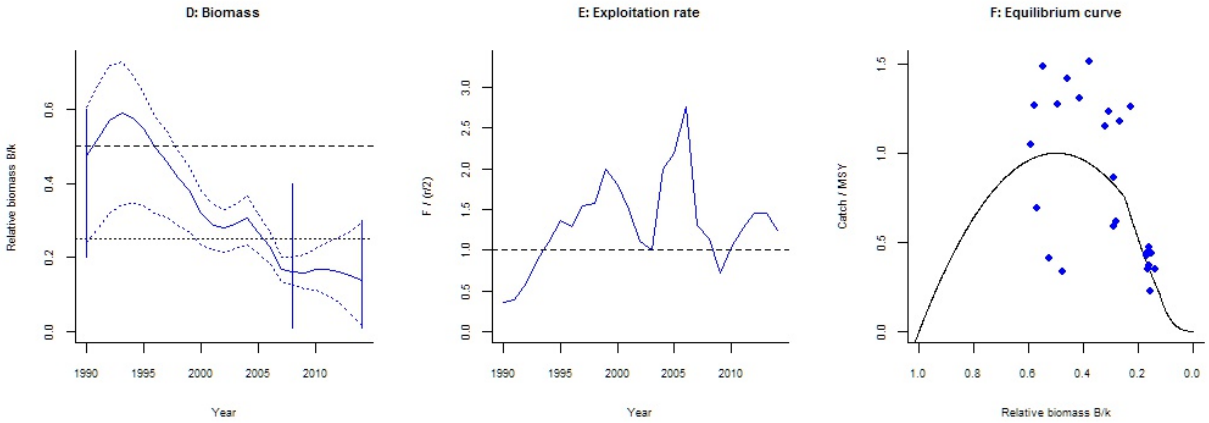
Species: Coryphaenoides rupestris , stock: rng-oth
Roundnose grenadier in Subareas I, II, IV, VIII, and IX, Division XIVa, and Subdivisions XIVb2 and Va2 (Northeast Atlantic)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/rng-oth.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1990 - 2014 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2008 default
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.1 - 0.69 expert, , prior range for k = 0.505 - 14

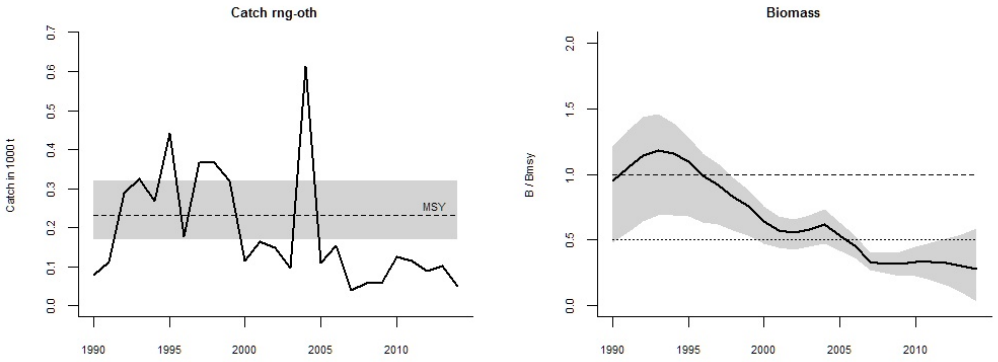
Results of CMSY analysis with altogether 3746 viable trajectories for 2512 r-k pairs
r = 0.401 , 95% CL = 0.248 - 0.646 , k = 2.32 , 95% CL = 1.27 - 4.25
MSY = 0.232 , 95% CL = 0.169 - 0.32
Relative biomass last year = 0.14 k, 2.5th = 0.0155 , 97.5th = 0.294
Exploitation F/(r/2) in last year = 1.25

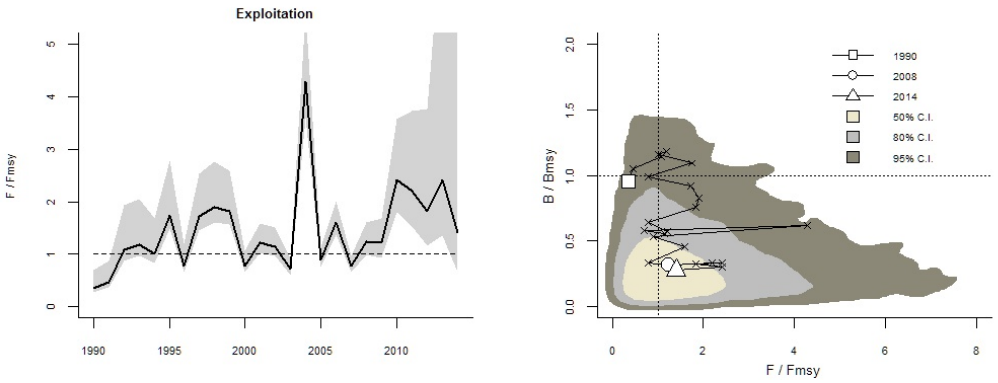
Results for Management (based on CMSY analysis)
Fmsy = 0.2 , 95% CL = 0.124 - 0.323 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.112 , 95% CL = 0.0694 - 0.181 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.232 , 95% CL = 0.169 - 0.32
Bmsy = 1.16 , 95% CL = 0.633 - 2.12
Biomass in last year = 0.324 , 2.5th perc = 0.0359 , 97.5 perc = 0.682
B/Bmsy in last year = 0.279 , 2.5th perc = 0.031 , 97.5 perc = 0.589
Fishing mortality in last year = 0.157 , 2.5th perc = 0.0747 , 97.5 perc = 1.42
F/Fmsy = 1.41 , 2.5th perc = 0.668 , 97.5 perc = 12.7

Stock status and exploitation in 2014
Biomass = 0.324 , B/Bmsy = 0.279 , fishing mortality F = 0.157 , F/Fmsy = 1.41
Comment: OK (RF 11.05.16)


A: rng-oth catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r


D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k


Catch rng-oth
Catch in 1000 t
MSY
Biomass
B / Bmsy

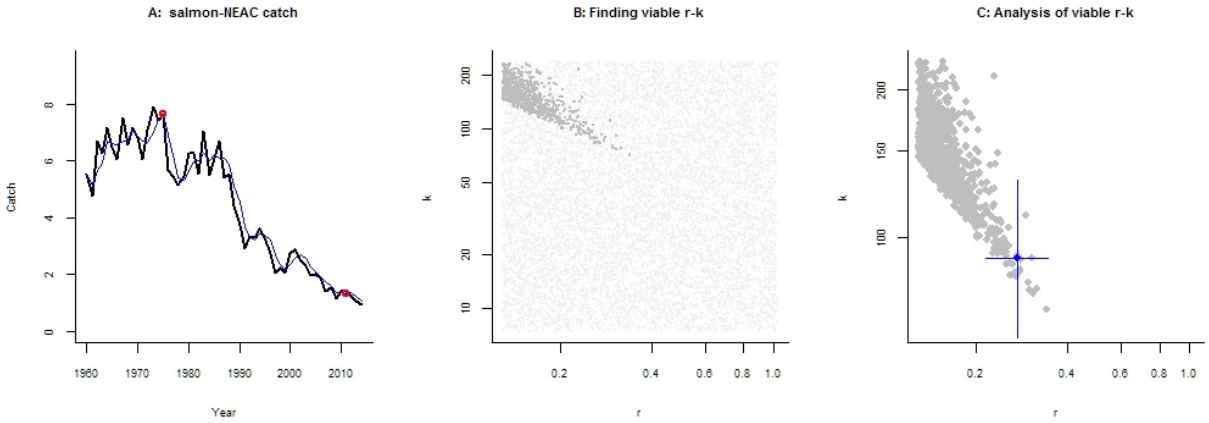

Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1990
2008
2014
50% C.I.
80% C.I.
95% C.I.

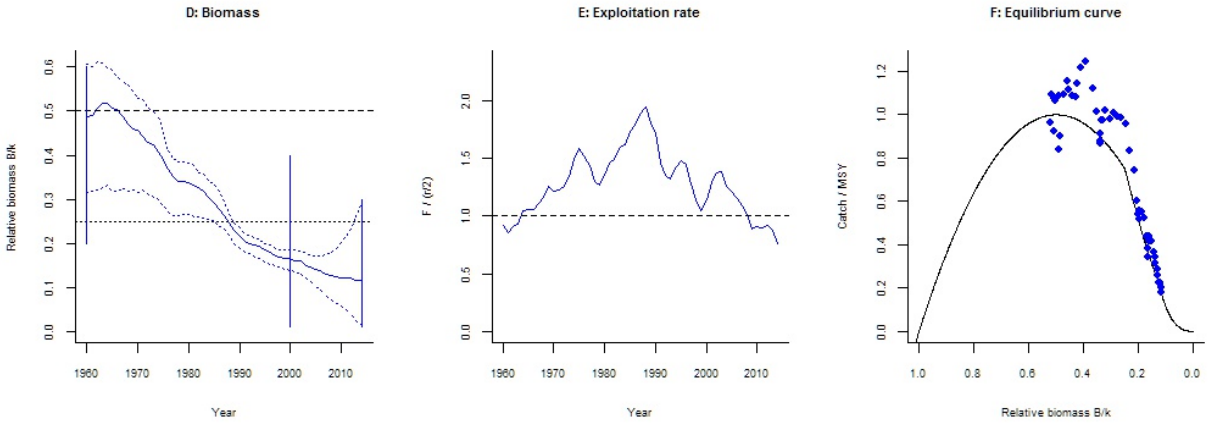
Species: Salmo salar , stock: salmon-NEAC
Atlantic salmon from the Northeast Atlantic
Source:
http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/Salmon_NEAC_2015.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1960 - 2014 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.13 - 1 expert, , prior range for k = 7.42 - 235

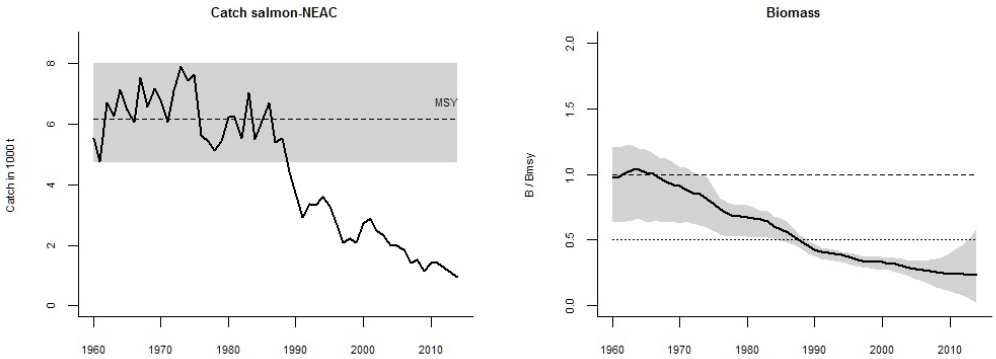
Results of CMSY analysis with altogether 905 viable trajectories for 834 r-k pairs
r = 0.273 , 95% CL = 0.215 - 0.346 , k = 90.3 , 95% CL = 62.2 - 131
MSY = 6.15 , 95% CL = 4.72 - 8.01
Relative biomass last year = 0.116 k, 2.5th = 0.0132 , 97.5th = 0.293
Exploitation F/(r/2) in last year = 0.764

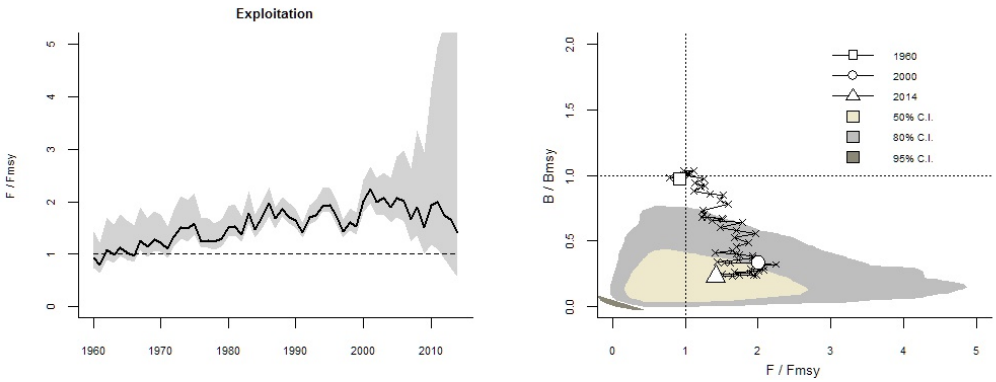
Results for Management (based on CMSY analysis)
Fmsy = 0.136 , 95% CL = 0.107 - 0.173 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0632 , 95% CL = 0.0498 - 0.0801 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 6.15 , 95% CL = 4.72 - 8.01
Bmsy = 45.1 , 95% CL = 31.1 - 65.5
Biomass in last year = 10.5 , 2.5th perc = 1.19 , 97.5 perc = 26.4
B/Bmsy in last year = 0.232 , 2.5th perc = 0.0264 , 97.5 perc = 0.586
Fishing mortality in last year = 0.0897 , 2.5th perc = 0.0355 , 97.5 perc = 0.786
F/Fmsy = 1.42 , 2.5th perc = 0.561 , 97.5 perc = 12.4

Stock status and exploitation in 2014
Biomass = 10.5 , B/Bmsy = 0.232 , fishing mortality F = 0.0897 , F/Fmsy = 1.42
Comment: OK (RF 09.07.16)


A: salmon-NEAC catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r


D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k


Catch salmon-NEAC
Catch in 1000 t
MSY
Biomass
B / Bmsy

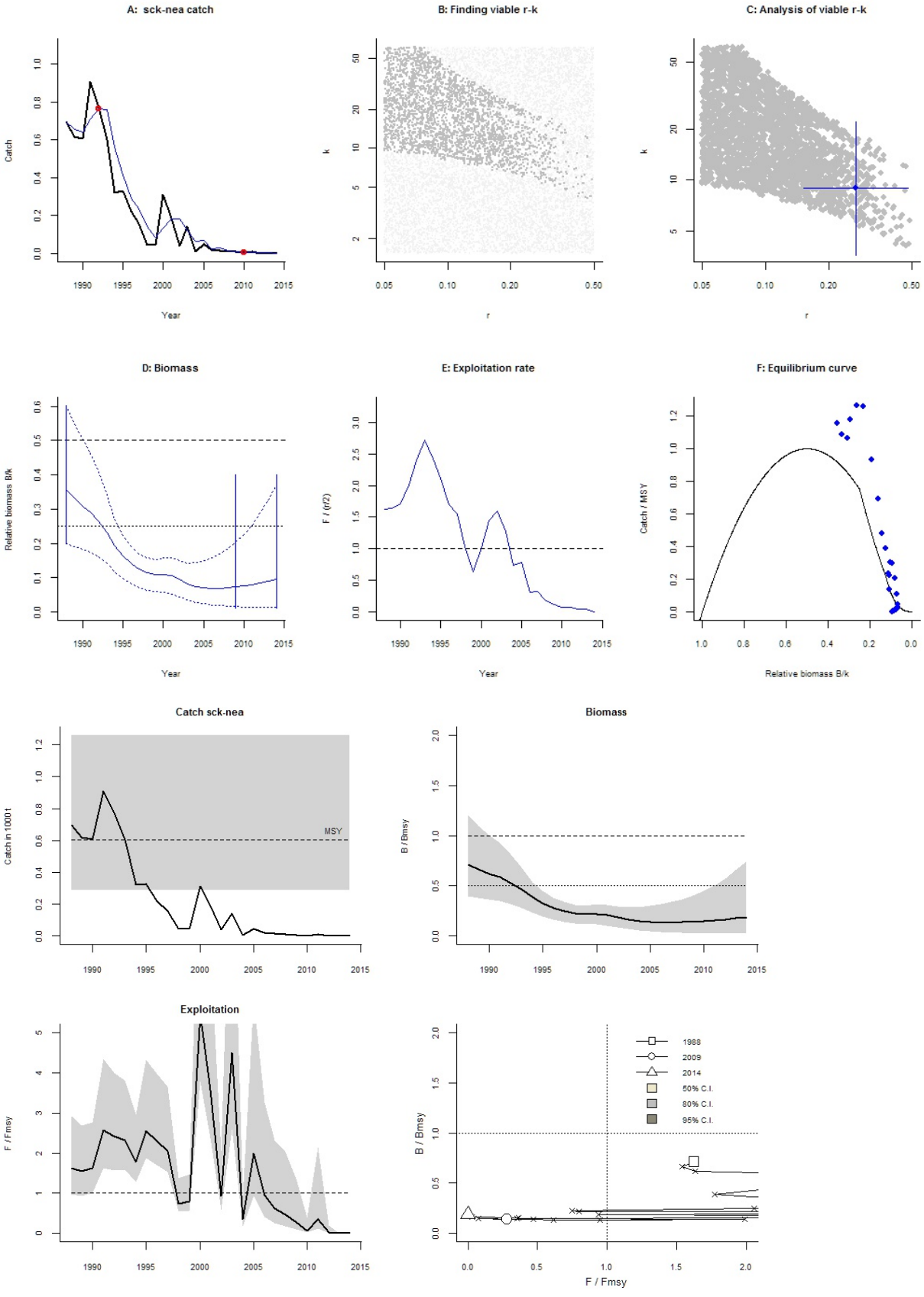

Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1960
2000
2014
50% C.I.
80% C.I.
95% C.I.

Species: Dalatias licha , stock: sck-nea
Kitefin shark in the Northeast Atlantic
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/sck-nea.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1988 - 2014 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2009 default
Prior final relative biomass = 0.01 - 0.4 , default
Prior range for r = 0.05 - 0.5 default , prior range for k = 1.53 - 61

Results of CMSY analysis with altogether 5370 viable trajectories for 2839 r-k pairs
r = 0.27 , 95% CL = 0.152 - 0.478 , k = 8.95 , 95% CL = 3.61 - 22.2
MSY = 0.604 , 95% CL = 0.289 - 1.26
Relative biomass last year = 0.0955 k, 2.5th = 0.0122 , 97.5th = 0.371
Exploitation F/(r/2) in last year = 0.00289

Results for Management (based on CMSY analysis)
Fmsy = 0.135 , 95% CL = 0.0761 - 0.239 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0516 , 95% CL = 0.0291 - 0.0914 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.604 , 95% CL = 0.289 - 1.26
Bmsy = 4.48 , 95% CL = 1.81 - 11.1
Biomass in last year = 0.856 , 2.5th perc = 0.109 , 97.5 perc = 3.33
B/Bmsy in last year = 0.191 , 2.5th perc = 0.0244 , 97.5 perc = 0.743
Fishing mortality in last year = 0 , 2.5th perc = 0 , 97.5 perc = 0
F/Fmsy = 0 , 2.5th perc = 0 , 97.5 perc = 0

Stock status and exploitation in 2014
Biomass = 0.856 , B/Bmsy = 0.191 , fishing mortality F = 0 , F/Fmsy = 0
Comment: OK (RF 15.04.16)


A: sck-nea catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch sck-nea
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1988
2009
2014
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

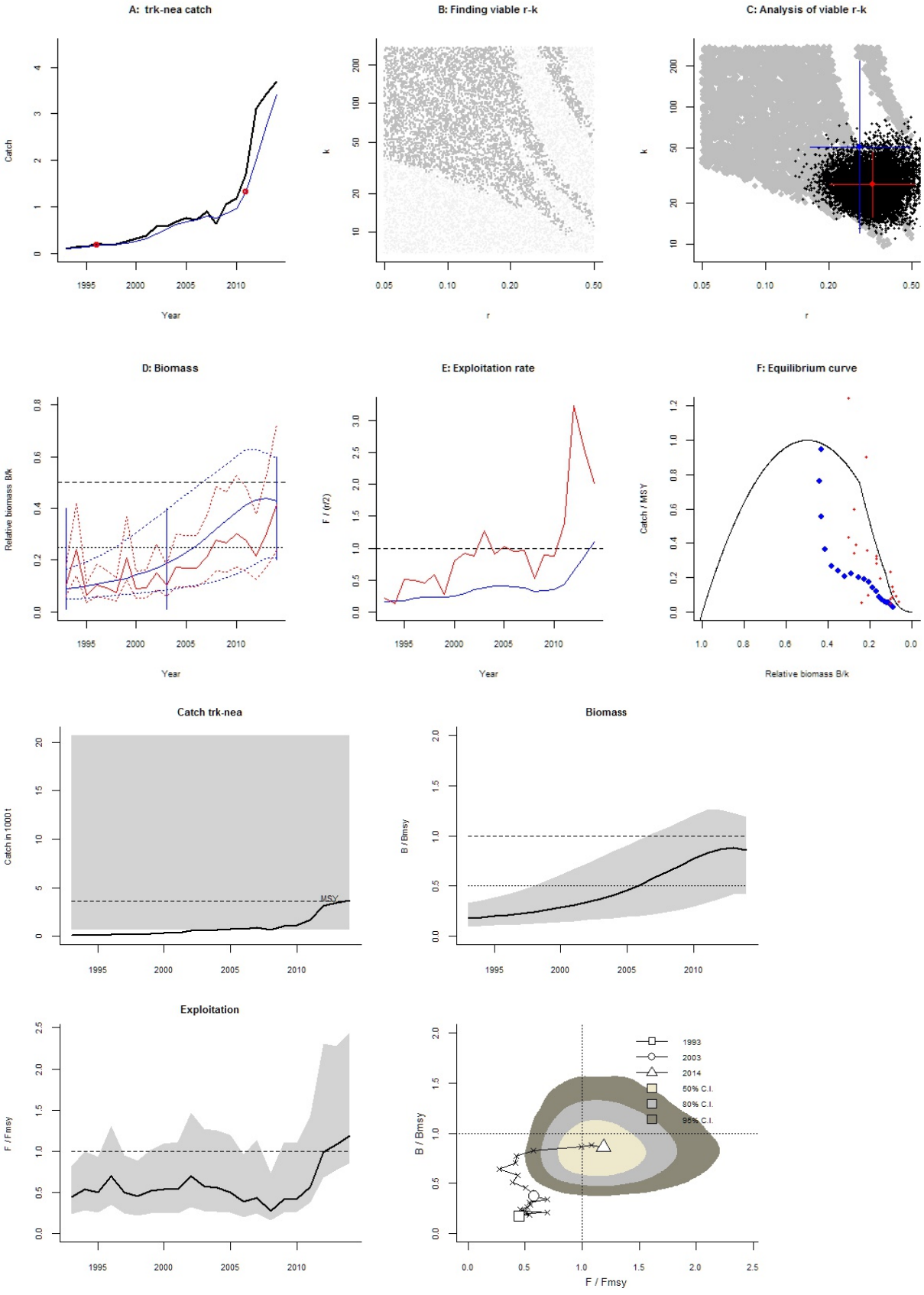
Species: Mustelus spp. , stock: trk-nea
Smooth-hound in the Northeast Atlantic
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/trk-nea.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1993 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2003 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.05 - 0.5 default , prior range for k = 6.82 - 273
Prior range of q = 0.000128 - 0.000812

Results of CMSY analysis with altogether 8941 viable trajectories for 4890 r-k pairs
r = 0.282 , 95% CL = 0.163 - 0.487 , k = 51.2 , 95% CL = 12.2 - 215
MSY = 3.61 , 95% CL = 0.629 - 20.7
Relative biomass last year = 0.43 k, 2.5th = 0.209 , 97.5th = 0.594
Exploitation F/(r/2) in last year = 1.1

Results from Bayesian Schaefer model using catch & CPUE
r = 0.323 , 95% CL = 0.202 - 0.516 , k = 27.3 , 95% CL = 15.7 - 47.5
MSY = 2.21 , 95% CL = 1.03 - 4.7
Relative biomass in last year = 0.301 k, 2.5th perc = 0.191 , 97.5th perc = 0.469
Exploitation F/(r/2) in last year = 2.78
q = 0.000205 , lcl = 0.00014 , ucl = 3e-04

Results for Management (based on CMSY analysis)
Fmsy = 0.141 , 95% CL = 0.0817 - 0.244 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.141 , 95% CL = 0.0817 - 0.244 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 3.61 , 95% CL = 0.629 - 20.7
Bmsy = 25.6 , 95% CL = 6.08 - 108
Biomass in last year = 22 , 2.5th perc = 10.7 , 97.5 perc = 30.4
B/Bmsy in last year = 0.861 , 2.5th perc = 0.419 , 97.5 perc = 1.19
Fishing mortality in last year = 0.168 , 2.5th perc = 0.121 , 97.5 perc = 0.344
F/Fmsy = 1.19 , 2.5th perc = 0.861 , 97.5 perc = 2.44

Stock status and exploitation in 2014
Biomass = 22 , B/Bmsy = 0.861 , fishing mortality F = 0.168 , F/Fmsy = 1.19
Comment: OK (RF 23.05.16)

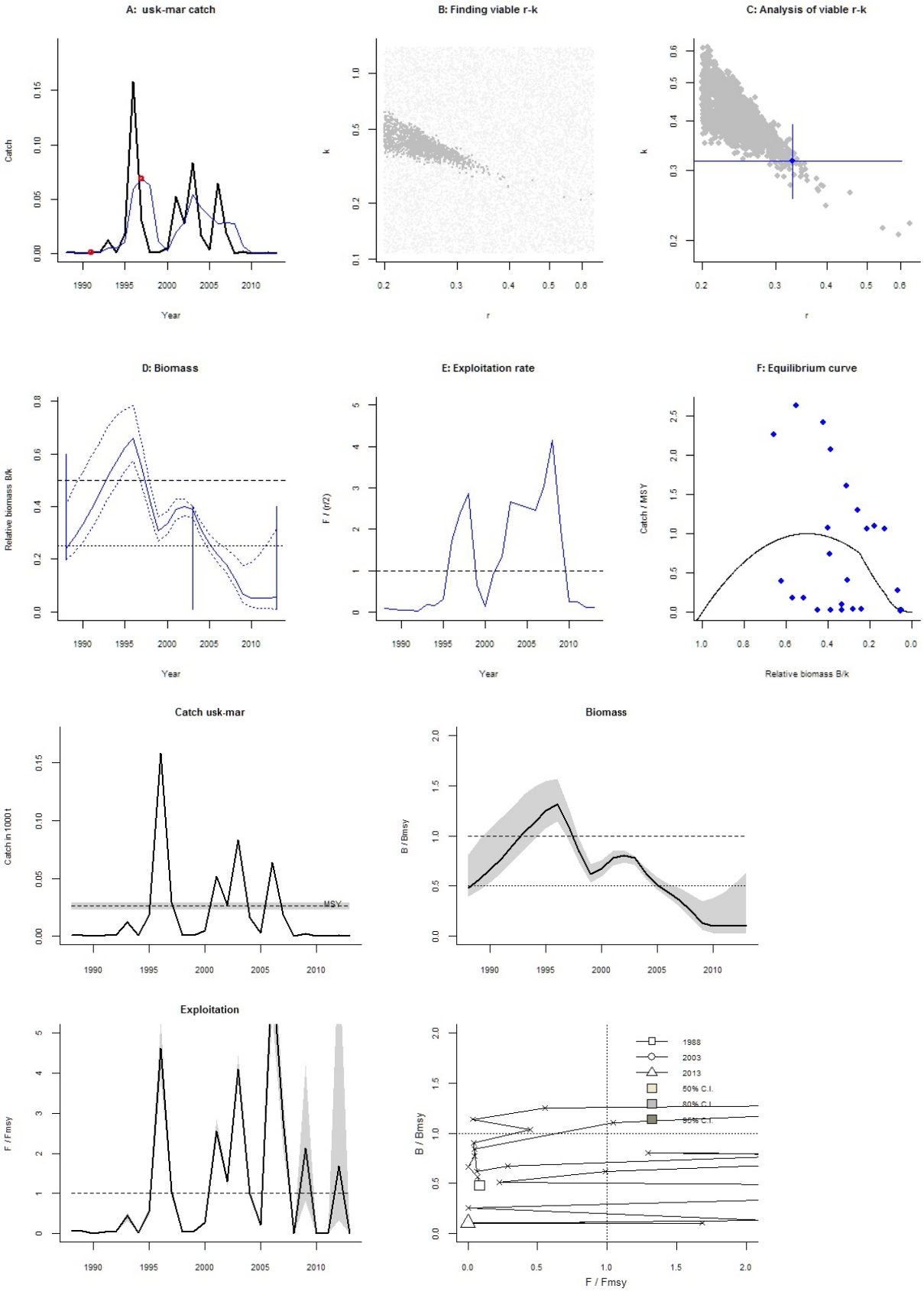

A: trk-nea catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch trk-nea
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1993
2003
2014
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

Species: Brosme brosme , stock: usk-mar
Tusk in Subarea XII, excluding Division XIIb (Southern Mid-Atlantic Ridge)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/usk-mar.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 1988 - 2013 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2003 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.2 - 0.64 expert, , prior range for k = 0.107 - 1.37

Results of CMSY analysis with altogether 1977 viable trajectories for 1510 r-k pairs
r = 0.33 , 95% CL = 0.18 - 0.604 , k = 0.317 , 95% CL = 0.256 - 0.393
MSY = 0.0261 , 95% CL = 0.0233 - 0.0292
Relative biomass last year = 0.0552 k, 2.5th = 0.0116 , 97.5th = 0.316
Exploitation F/(r/2) in last year = 0.116

Results for Management (based on CMSY analysis)
Fmsy = 0.165 , 95% CL = 0.0899 - 0.302 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0364 , 95% CL = 0.0199 - 0.0667 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.0261 , 95% CL = 0.0233 - 0.0292
Bmsy = 0.158 , 95% CL = 0.128 - 0.196
Biomass in last year = 0.0175 , 2.5th perc = 0.00368 , 97.5 perc = 0.1
B/Bmsy in last year = 0.11 , 2.5th perc = 0.0232 , 97.5 perc = 0.633
Fishing mortality in last year = 0 , 2.5th perc = 0 , 97.5 perc = 0
F/Fmsy = 0 , 2.5th perc = 0 , 97.5 perc = 0

Stock status and exploitation in 2014
Biomass = , B/Bmsy = , fishing mortality F = , F/Fmsy =
Comment: OK (RF 28.06.16)


A: usk-mar catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch usk-mar
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1988
2003
2013
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

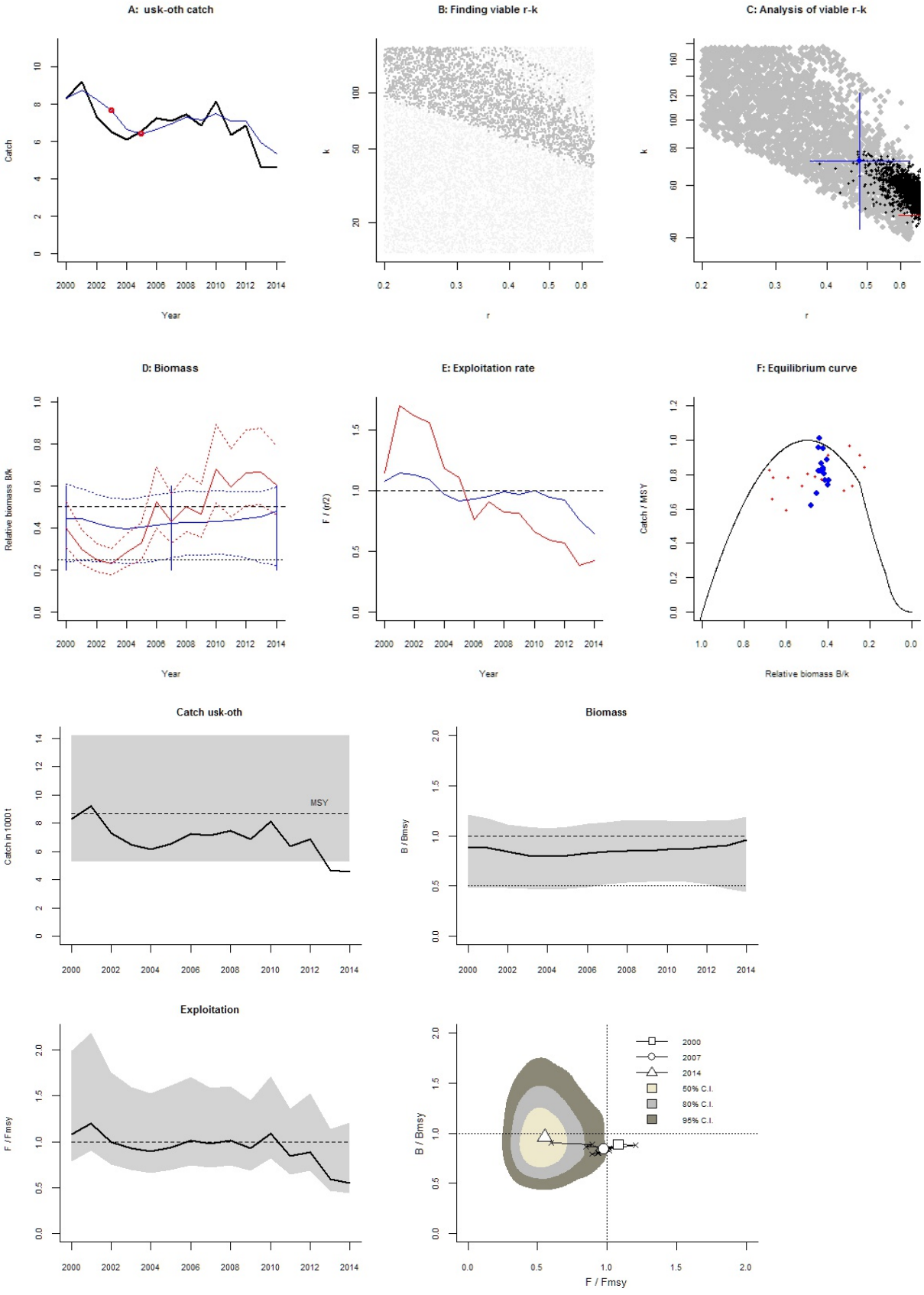
Species: Brosme brosme , stock: usk-oth
Tusk in Divisions IIIa, Vb, VIa, and XIIb and Subareas IV, VII, VIII, and IX (other areas).
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/usk-oth.pdf
Region: Northeast Atlantic , Wide ranging
Catch data used from years 2000 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2007 default
Prior final relative biomass = 0.2 - 0.6 , default
Prior range for r = 0.2 - 0.64 expert, , prior range for k = 13.7 - 175
Prior range of q = 0.00301 - 0.0108

Results of CMSY analysis with altogether 10212 viable trajectories for 2883 r-k pairs
r = 0.48 , 95% CL = 0.364 - 0.632 , k = 72.3 , 95% CL = 42.7 - 123
MSY = 8.67 , 95% CL = 5.29 - 14.2
Relative biomass last year = 0.48 k, 2.5th = 0.22 , 97.5th = 0.595
Exploitation F/(r/2) in last year = 0.645

Results from Bayesian Schaefer model using catch & CPUE
r = 0.761 , 95% CL = 0.594 - 0.976 , k = 47.6 , 95% CL = 36.4 - 62.4
MSY = 9.07 , 95% CL = 7.98 - 10.3
Relative biomass in last year = 0.66 k, 2.5th perc = 0.546 , 97.5th perc = 0.757
Exploitation F/(r/2) in last year = 0.383
q = 0.00457 , lcl = 0.00357 , ucl = 0.00585

Results for Management (based on CMSY analysis)
Fmsy = 0.24 , 95% CL = 0.182 - 0.316 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.24 , 95% CL = 0.182 - 0.316 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 8.67 , 95% CL = 5.29 - 14.2
Bmsy = 36.2 , 95% CL = 21.3 - 61.3
Biomass in last year = 34.7 , 2.5th perc = 15.9 , 97.5 perc = 43
B/Bmsy in last year = 0.961 , 2.5th perc = 0.439 , 97.5 perc = 1.19
Fishing mortality in last year = 0.132 , 2.5th perc = 0.107 , 97.5 perc = 0.289
F/Fmsy = 0.551 , 2.5th perc = 0.445 , 97.5 perc = 1.2

Stock status and exploitation in 2014
Biomass = 34.7 , B/Bmsy = 0.961 , fishing mortality F = 0.132 , F/Fmsy = 0.551
Comment: OK (RF 15.04.16) Standardized cpue for 4–5 longliners (<110 GRT) fishing in Faroese waters (criteria: ling & tusk >60% of catch and depth below 200 m). Set from Low to Medium resilience.


A: usk-oth catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (rF2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch usk-oth
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
2000
2007
2014
50% C.I.
80% C.I.
95% C.I.