Appendix I

Detailed stock assessment reports for the Northeast Atlantic

Barents Sea and Norwegian Sea (analyzed with CMSY_O_7m.R)

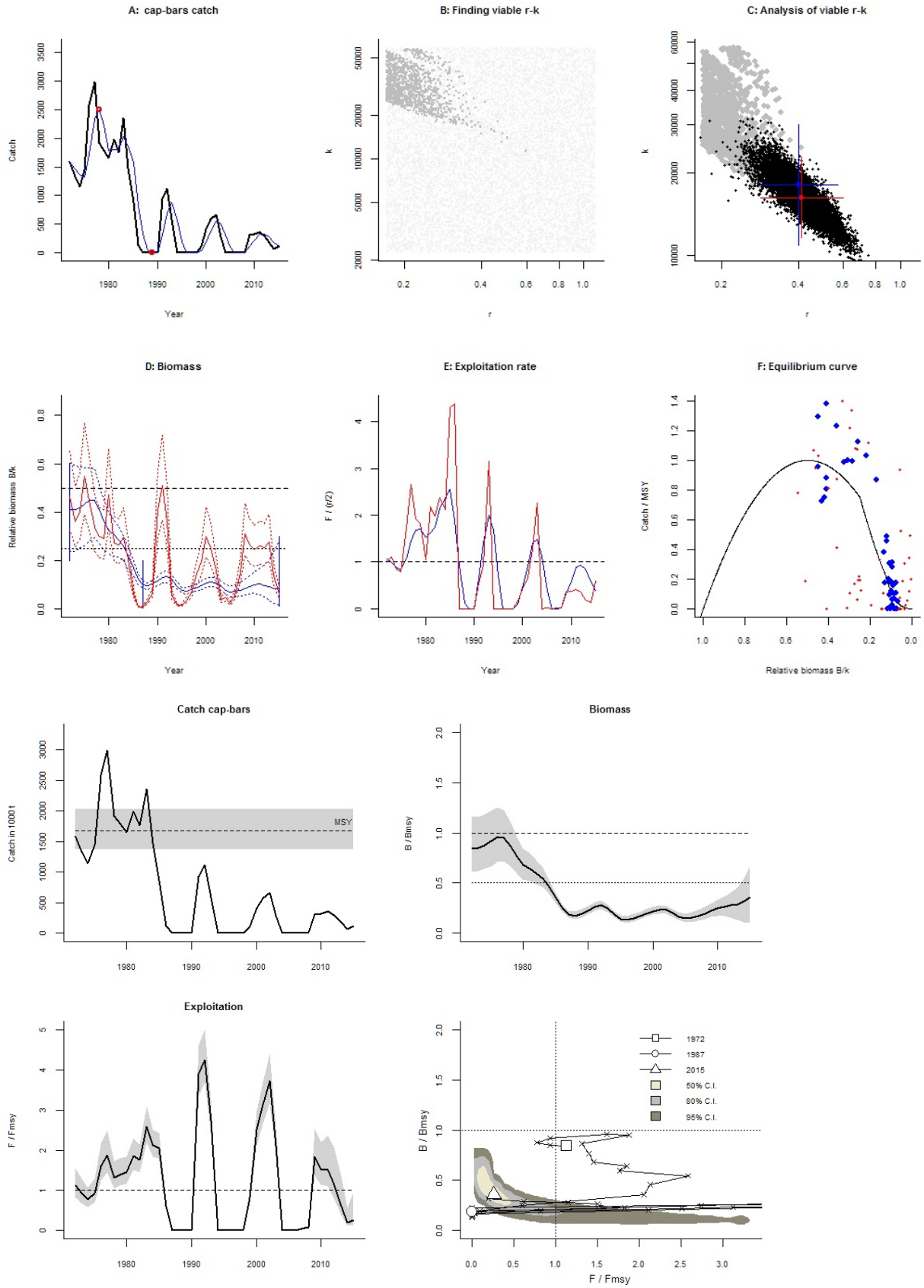
Species: *Mallotus villosus* , stock: cap-bars
Capelin in Subareas I and II (Northeast Arctic), excluding Division IIa west of 5°W
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/cap-bars.pdf
Region: Northeast Atlantic , Barents Sea
Catch data used from years 1972 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.01 - 0.2 in year 1987 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.17 - 1.1 expert, , prior range for k = 2249 - 58737
Prior range of q = 0.521 - 2.66

Results of CMSY analysis with altogether 1305 viable trajectories for 1247 r-k pairs
r = 0.402 , 95% CL = 0.285 - 0.567 , k = 18034 , 95% CL = 10887 - 29874
MSY = 1810 , 95% CL = 1150 - 2850
Relative biomass last year = 0.0835 k, 2.5th = 0.0147 , 97.5th = 0.281
Exploitation F/(r/2) in last year = 0.395

Results from Bayesian Schaefer model using catch & CPUE
r = 0.413 , 95% CL = 0.284 - 0.6 , k = 16197 , 95% CL = 11523 - 22767
MSY = 1670 , 95% CL = 1372 - 2034
Relative biomass in last year = 0.18 k, 2.5th perc = 0.0504 , 97.5th perc = 0.335
Exploitation F/(r/2) in last year = 0.191
q = 0.88 , lcl = 0.634 , ucl = 1.22

Results for Management (based on BSM analysis)
Fmsy = 0.206 , 95% CL = 0.142 - 0.3 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.149 , 95% CL = 0.102 - 0.216 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1670 , 95% CL = 1372 - 2034
Bmsy = 8098 , 95% CL = 5761 - 11383
Biomass in last year = 2921 , 2.5th perc = 817 , 97.5 perc = 5434
B/Bmsy in last year = 0.361 , 2.5th perc = 0.101 , 97.5 perc = 0.671
Fishing mortality in last year = 0.0394 , 2.5th perc = 0.0212 , 97.5 perc = 0.141
F/Fmsy = 0.265 , 2.5th perc = 0.142 , 97.5 perc = 0.946

Stock status and exploitation in 2014
Biomass = 2551 , B/Bmsy = 0.315 , fishing mortality F = 0.0259 , F/Fmsy = 0.199
Comment: OK (RF 26.09.16) r updated


A: cap-bars 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 cap-bars
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1972
1987
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

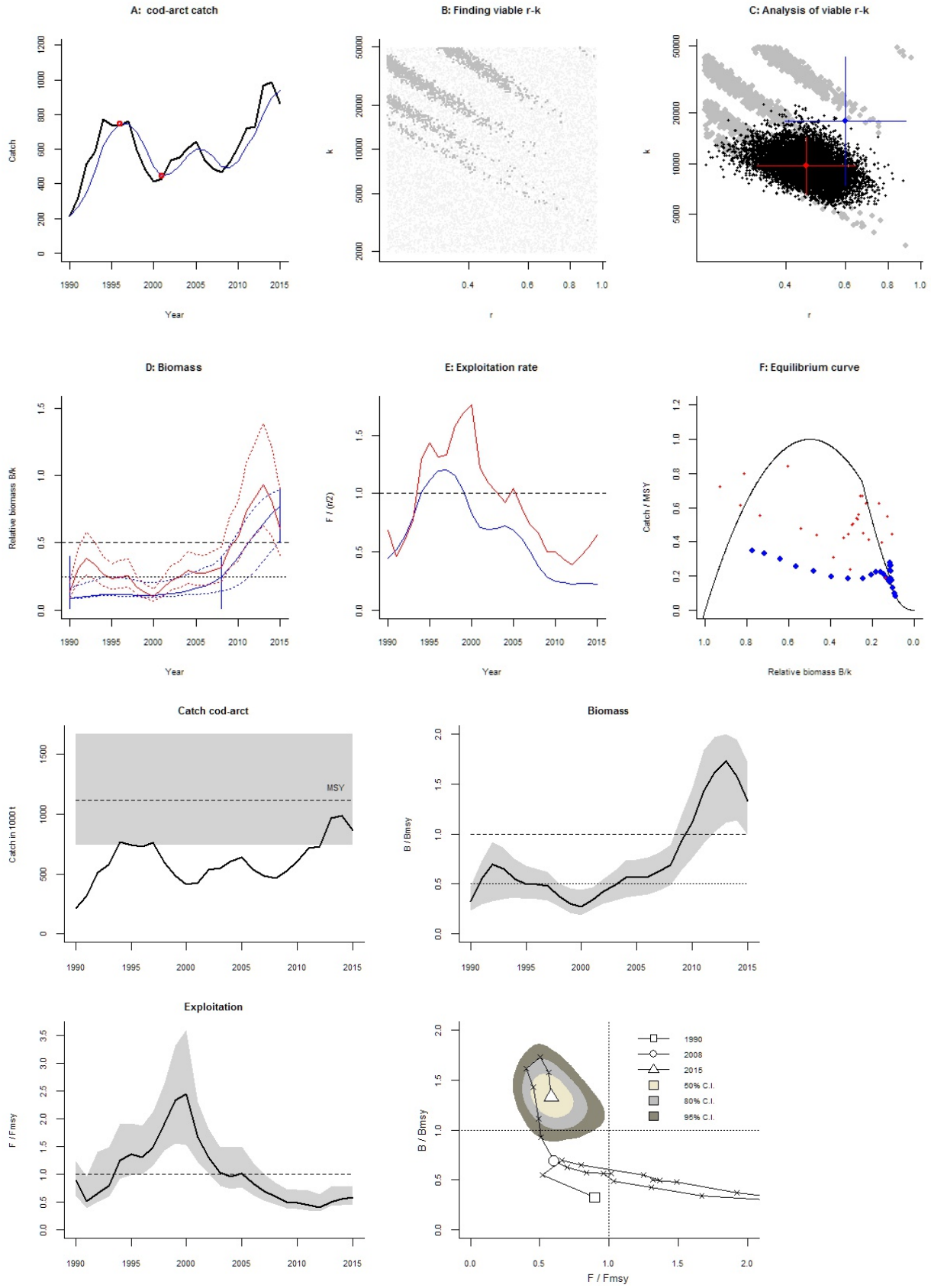
Species: *Gadus morhua* , stock: cod-arct
Cod in Subareas I and II (Northeast Arctic cod)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/cod-arct.pdf
Region: Northeast Atlantic , Barents Sea
Catch data used from years 1990 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2008 expert
Prior final relative biomass = 0.5 - 0.9 expert
Prior range for r = 0.23 - 0.96 expert, , prior range for k = 1956 - 48992
Prior range of q = 0.139 - 0.57

Results of CMSY analysis with altogether 1708 viable trajectories for 1707 r-k pairs
r = 0.6 , 95% CL = 0.398 - 0.907 , k = 17945 , 95% CL = 7459 - 43172
MSY = 2694 , 95% CL = 875 - 8297
Relative biomass last year = 0.775 k, 2.5th = 0.516 , 97.5th = 0.894
Exploitation F/(r/2) in last year = 0.225

Results from Bayesian Schaefer model using catch & CPUE
r = 0.46 , 95% CL = 0.328 - 0.644 , k = 9714 , 95% CL = 6536 - 14438
MSY = 1116 , 95% CL = 745 - 1671
Relative biomass in last year = 0.664 k, 2.5th perc = 0.495 , 97.5th perc = 0.855
Exploitation F/(r/2) in last year = 0.583
q = 0.236 , lcl = 0.178 , ucl = 0.313

Results for Management (based on BSM analysis)
Fmsy = 0.23 , 95% CL = 0.164 - 0.322 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.23 , 95% CL = 0.164 - 0.322 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1116 , 95% CL = 745 - 1671
Bmsy = 4857 , 95% CL = 3268 - 7219
Biomass in last year = 6451 , 2.5th perc = 4804 , 97.5 perc = 8310
B/Bmsy in last year = 1.33 , 2.5th perc = 0.989 , 97.5 perc = 1.71
Fishing mortality in last year = 0.134 , 2.5th perc = 0.104 , 97.5 perc = 0.18
F/Fmsy = 0.583 , 2.5th perc = 0.453 , 97.5 perc = 0.783

Stock status and exploitation in 2014
Biomass = 7639 , B/Bmsy = 1.57 , fishing mortality F = 0.129 , F/Fmsy = 0.562
Comment: OK (RF 26.09.2016)


A: cod-arct 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 cod-arct
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1990
2008
2015
50% C.I.
80% C.I.
95% C.I.

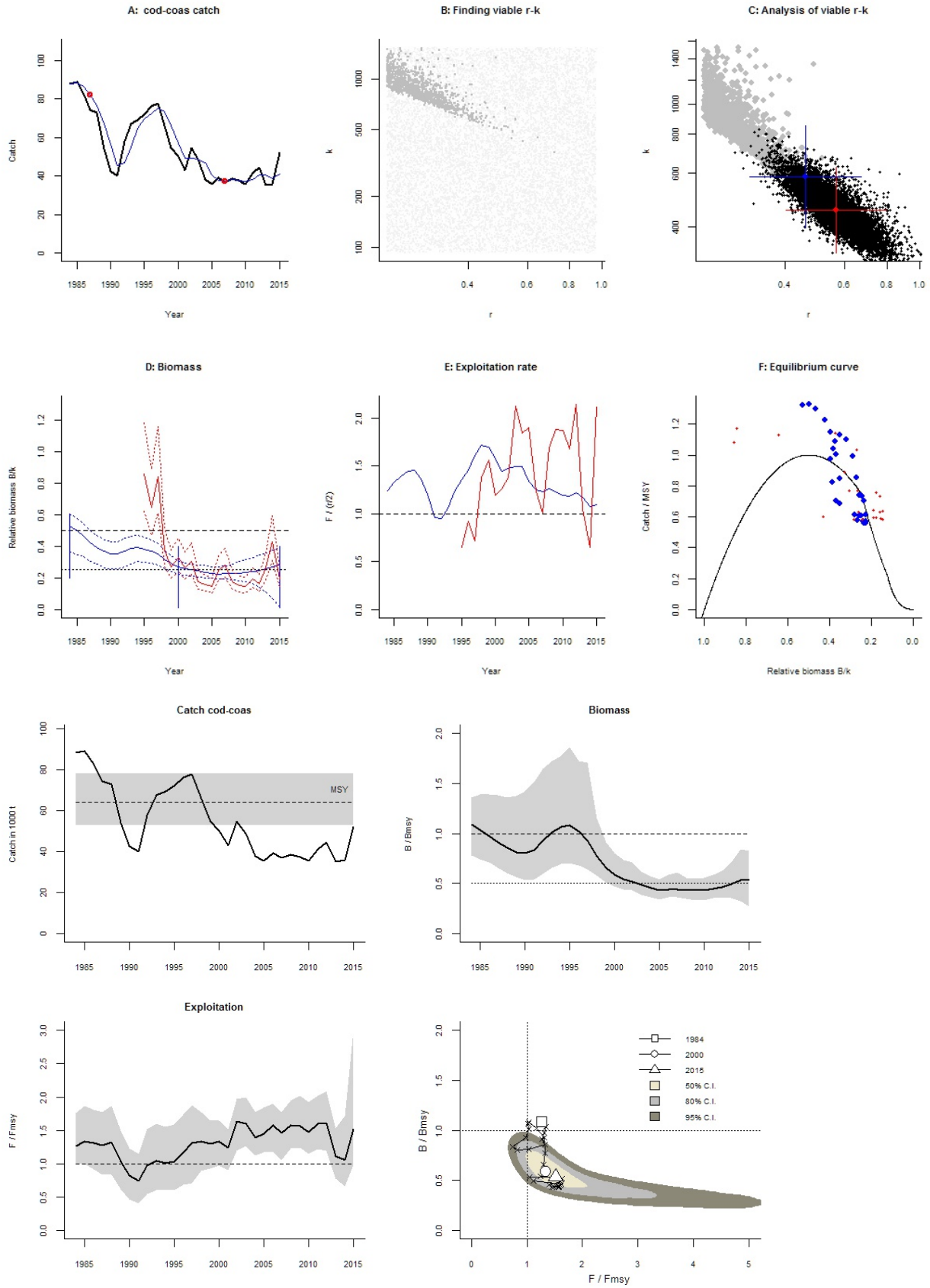
Species: *Gadus morhua* , stock: cod-coas
Cod in Subareas I and II (Norwegian coastal waters cod)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/cod-coas.pdf
Region: Northeast Atlantic , Norwegian Sea
Catch data used from years 1984 - 2015 , abundance = CPUE
Prior initial 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 - 0.4 expert
Prior range for r = 0.23 - 0.96 expert, , prior range for k = 92.2 - 1539
Prior range of q = 0.121 - 0.493

Results of CMSY analysis with altogether 1448 viable trajectories for 1205 r-k pairs
r = 0.458 , 95% CL = 0.313 - 0.671 , k = 582 , 95% CL = 399 - 850
MSY = 66.7 , 95% CL = 48.8 - 91.2
Relative biomass last year = 0.28 k, 2.5th = 0.0198 , 97.5th = 0.397
Exploitation F/(r/2) in last year = 1.1

Results from Bayesian Schaefer model using catch & CPUE
r = 0.566 , 95% CL = 0.401 - 0.798 , k = 454 , 95% CL = 330 - 624
MSY = 64.2 , 95% CL = 52.8 - 78
Relative biomass in last year = 0.268 k, 2.5th perc = 0.135 , 97.5th perc = 0.412
Exploitation F/(r/2) in last year = 1.52
q = 0.192 , lcl = 0.146 , ucl = 0.252

Results for Management (based on BSM analysis)
Fmsy = 0.283 , 95% CL = 0.2 - 0.399 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.283 , 95% CL = 0.2 - 0.399 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 64.2 , 95% CL = 52.8 - 78
Bmsy = 227 , 95% CL = 165 - 312
Biomass in last year = 122 , 2.5th perc = 61.4 , 97.5 perc = 187
B/Bmsy in last year = 0.536 , 2.5th perc = 0.27 , 97.5 perc = 0.824
Fishing mortality in last year = 0.429 , 2.5th perc = 0.279 , 97.5 perc = 0.85
F/Fmsy = 1.52 , 2.5th perc = 0.986 , 97.5 perc = 3

Stock status and exploitation in 2014
Biomass = 120 , B/Bmsy = 0.531 , fishing mortality F = 0.298 , F/Fmsy = 1.05
Comment: OK (RF 26.09.16)


A: cod-coas 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 cod-coas
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1984
2000
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

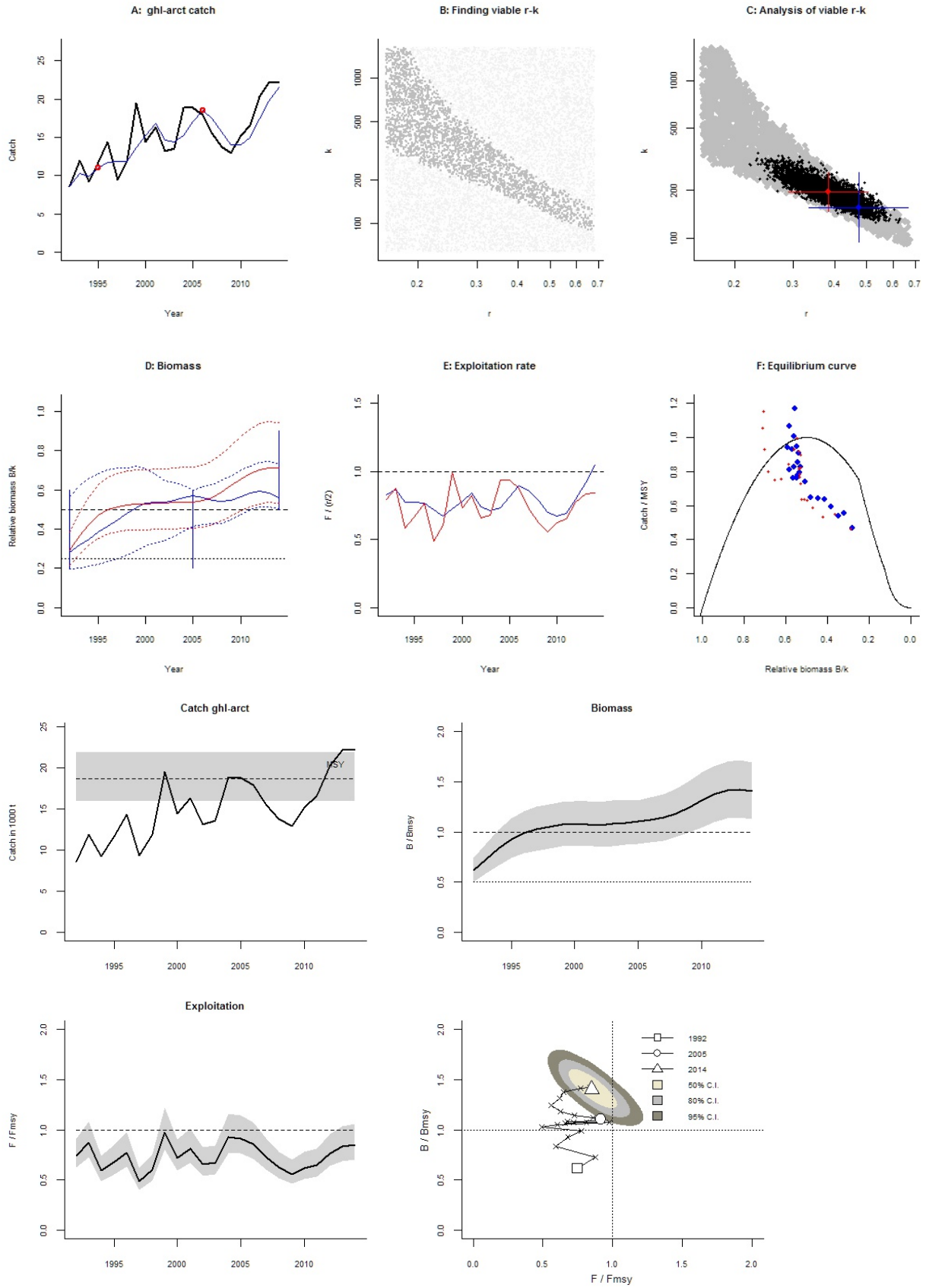
Species: *Reinhardtius hippoglossoides* , stock: ghl-arct
Greenland halibut in Subareas I and II
Source: http://ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/ghl-arct.pdf
Region: Northeast Atlantic , Barents Sea
Catch data used from years 1992 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2005 default
Prior final relative biomass = 0.5 - 0.9 expert
Prior range for r = 0.16 - 0.68 expert, , prior range for k = 63.4 - 1617
Prior range of q = 3.15 - 13

Results of CMSY analysis with altogether 5563 viable trajectories for 2572 r-k pairs
r = 0.472 , 95% CL = 0.336 - 0.665 , k = 156 , 95% CL = 93.6 - 261
MSY = 18.4 , 95% CL = 13.2 - 25.7
Relative biomass last year = 0.558 k, 2.5th = 0.503 , 97.5th = 0.728
Exploitation F/(r/2) in last year = 1.05

Results from Bayesian Schaefer model using catch & CPUE
r = 0.383 , 95% CL = 0.291 - 0.504 , k = 195 , 95% CL = 147 - 259
MSY = 18.7 , 95% CL = 15.9 - 21.9
Relative biomass in last year = 0.701 k, 2.5th perc = 0.564 , 97.5th perc = 0.844
Exploitation F/(r/2) in last year = 0.849
q = 5.3 , lcl = 3.92 , ucl = 7.18

Results for Management (based on BSM analysis)
Fmsy = 0.192 , 95% CL = 0.146 - 0.252 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.192 , 95% CL = 0.146 - 0.252 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 18.7 , 95% CL = 15.9 - 21.9
Bmsy = 97.5 , 95% CL = 73.3 - 130
Biomass in last year = 137 , 2.5th perc = 110 , 97.5 perc = 165
B/Bmsy in last year = 1.4 , 2.5th perc = 1.13 , 97.5 perc = 1.69
Fishing mortality in last year = 0.163 , 2.5th perc = 0.135 , 97.5 perc = 0.202
F/Fmsy = 0.849 , 2.5th perc = 0.706 , 97.5 perc = 1.06

Stock status and exploitation in 2014
Biomass = 137 , B/Bmsy = 1.4 , fishing mortality F = 0.163 , F/Fmsy = 0.849
Comment: OK (RF 26.09.16)


A: ghl-arct 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 ghl-arct
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1992
2005
2014
50% C.I.
80% C.I.
95% C.I.

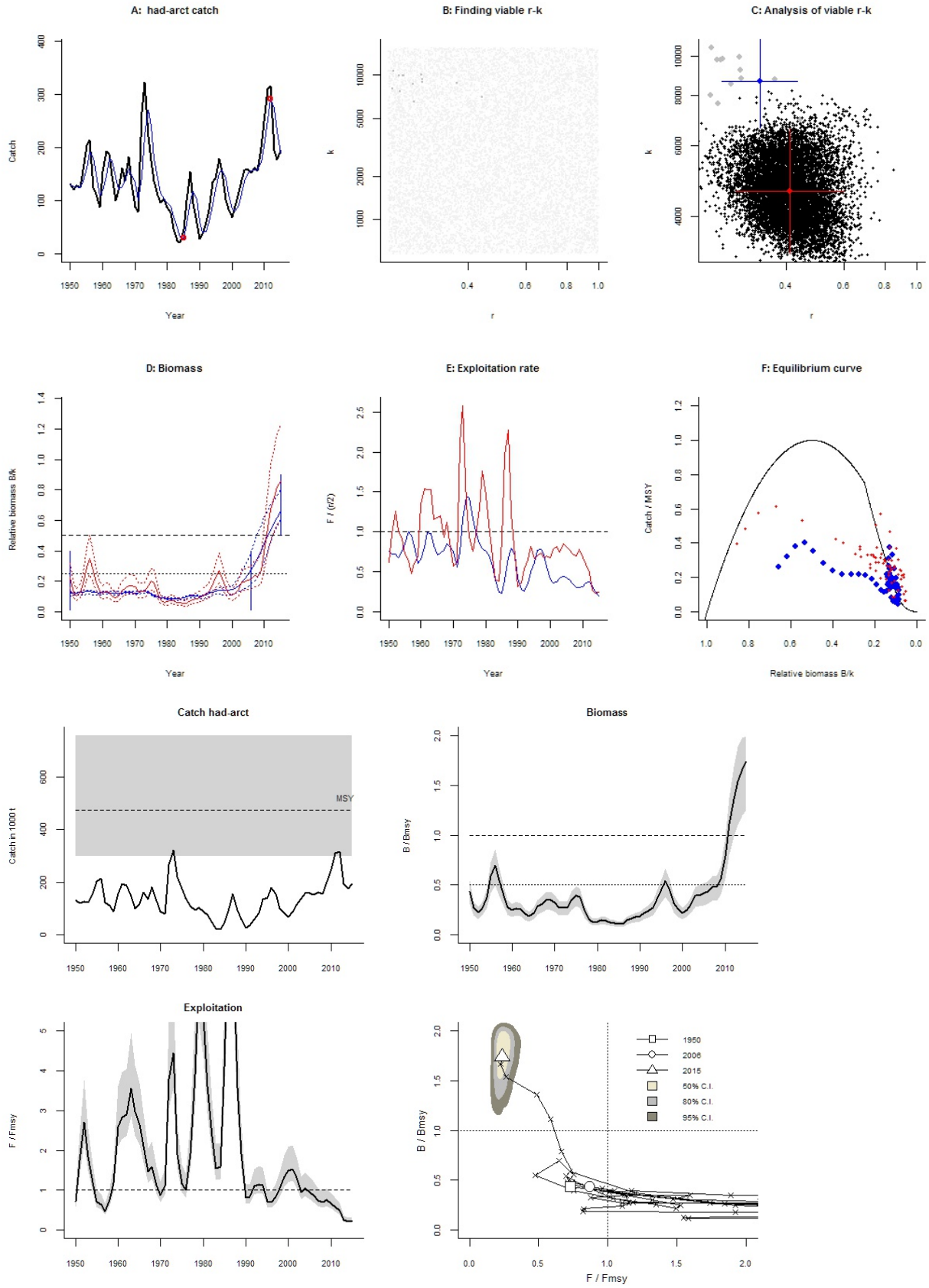
Species: *Melanogrammus aeglefinus* , stock: had-arct
Haddock in Subareas I and II (Northeast Arctic)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/had-arct.pdf
Region: Northeast Atlantic , Barents Sea
Catch data used from years 1950 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2006 expert
Prior final relative biomass = 0.5 - 0.9 expert
Prior range for r = 0.23 - 1 expert, , prior range for k = 583 - 15211
Prior range of q = 0.165 - 0.69

Results of CMSY analysis with altogether 13 viable trajectories for 13 r-k pairs
r = 0.333 , 95% CL = 0.256 - 0.433 , k = 8663 , 95% CL = 6648 - 11288
MSY = 721 , 95% CL = 600 - 866
Relative biomass last year = 0.66 k, 2.5th = 0.609 , 97.5th = 0.8
Exploitation F/(r/2) in last year = 0.198

Results from Bayesian Schaefer model using catch & CPUE
r = 0.411 , 95% CL = 0.282 - 0.6 , k = 4623 , 95% CL = 3234 - 6608
MSY = 475 , 95% CL = 298 - 758
Relative biomass in last year = 0.87 k, 2.5th perc = 0.627 , 97.5th perc = 0.995
Exploitation F/(r/2) in last year = 0.236
q = 0.202 , lcl = 0.158 , ucl = 0.259

Results for Management (based on BSM analysis)
Fmsy = 0.205 , 95% CL = 0.141 - 0.3 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.205 , 95% CL = 0.141 - 0.3 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 475 , 95% CL = 298 - 758
Bmsy = 2311 , 95% CL = 1617 - 3304
Biomass in last year = 4020 , 2.5th perc = 2899 , 97.5 perc = 4598
B/Bmsy in last year = 1.74 , 2.5th perc = 1.25 , 97.5 perc = 1.99
Fishing mortality in last year = 0.0484 , 2.5th perc = 0.0424 , 97.5 perc = 0.0672
F/Fmsy = 0.236 , 2.5th perc = 0.206 , 97.5 perc = 0.327

Stock status and exploitation in 2014
Biomass = 3843 , B/Bmsy = 1.66 , fishing mortality F = 0.0462 , F/Fmsy = 0.225
Comment: OK (RF 26.09.2016)


A: had-arct 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 had-arct
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1950
2006
2015
50% C.I.
80% C.I.
95% C.I.

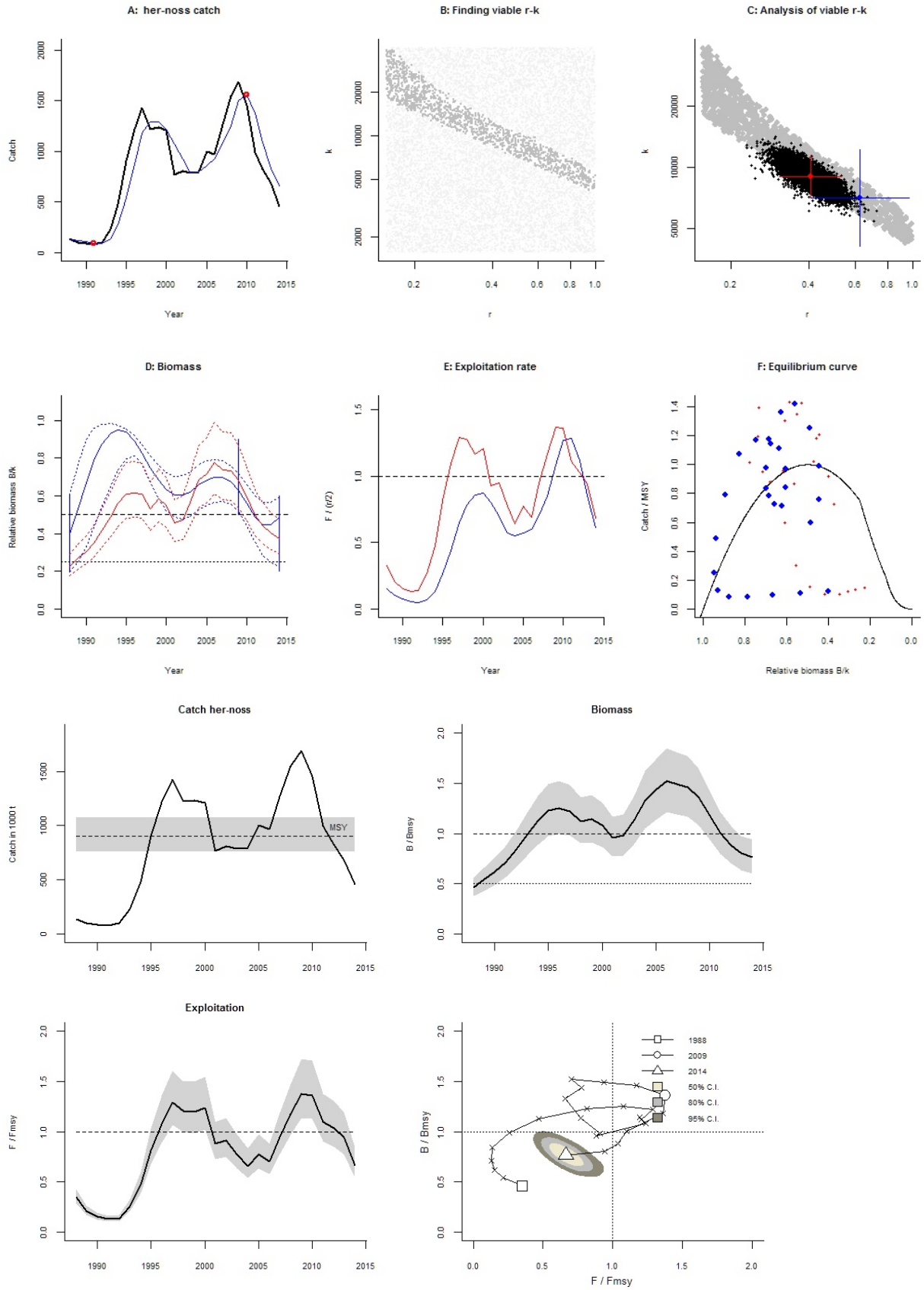
Species: *Clupea harengus* , stock: her-noss
Norwegian spring-spawning herring
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/her-noss.pdf
Region: Northeast Atlantic , Norwegian Sea
Catch data used from years 1988 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.5 - 0.9 in year 2009 default
Prior final relative biomass = 0.2 - 0.6 , default
Prior range for r = 0.16 - 1 expert, , prior range for k = 1570 - 40086
Prior range of q = 1.26 - 6.39

Results of CMSY analysis with altogether 10057 viable trajectories for 1431 r-k pairs
r = 0.625 , 95% CL = 0.404 - 0.968 , k = 7052 , 95% CL = 4069 - 12222
MSY = 1102 , 95% CL = 883 - 1375
Relative biomass last year = 0.484 k, 2.5th = 0.226 , 97.5th = 0.596
Exploitation F/(r/2) in last year = 0.616

Results from Bayesian Schaefer model using catch & CPUE
r = 0.404 , 95% CL = 0.306 - 0.532 , k = 8974 , 95% CL = 7064 - 11401
MSY = 905 , 95% CL = 763 - 1074
Relative biomass in last year = 0.384 k, 2.5th perc = 0.302 , 97.5th perc = 0.469
Exploitation F/(r/2) in last year = 0.664
q = 1.68 , lcl = 1.31 , ucl = 2.15

Results for Management (based on BSM analysis)
Fmsy = 0.202 , 95% CL = 0.153 - 0.266 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.202 , 95% CL = 0.153 - 0.266 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 905 , 95% CL = 763 - 1074
Bmsy = 4487 , 95% CL = 3532 - 5700
Biomass in last year = 3443 , 2.5th perc = 2712 , 97.5 perc = 4212
B/Bmsy in last year = 0.767 , 2.5th perc = 0.604 , 97.5 perc = 0.939
Fishing mortality in last year = 0.134 , 2.5th perc = 0.11 , 97.5 perc = 0.17
F/Fmsy = 0.664 , 2.5th perc = 0.543 , 97.5 perc = 0.843

Stock status and exploitation in 2014
Biomass = 3443 , B/Bmsy = 0.767 , fishing mortality F = 0.134 , F/Fmsy = 0.664
Comment: OK (RF 26.09.16)


A: her-noss 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 her-noss
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1988
2009
2014
50% C.I.
80% C.I.
95% C.I.

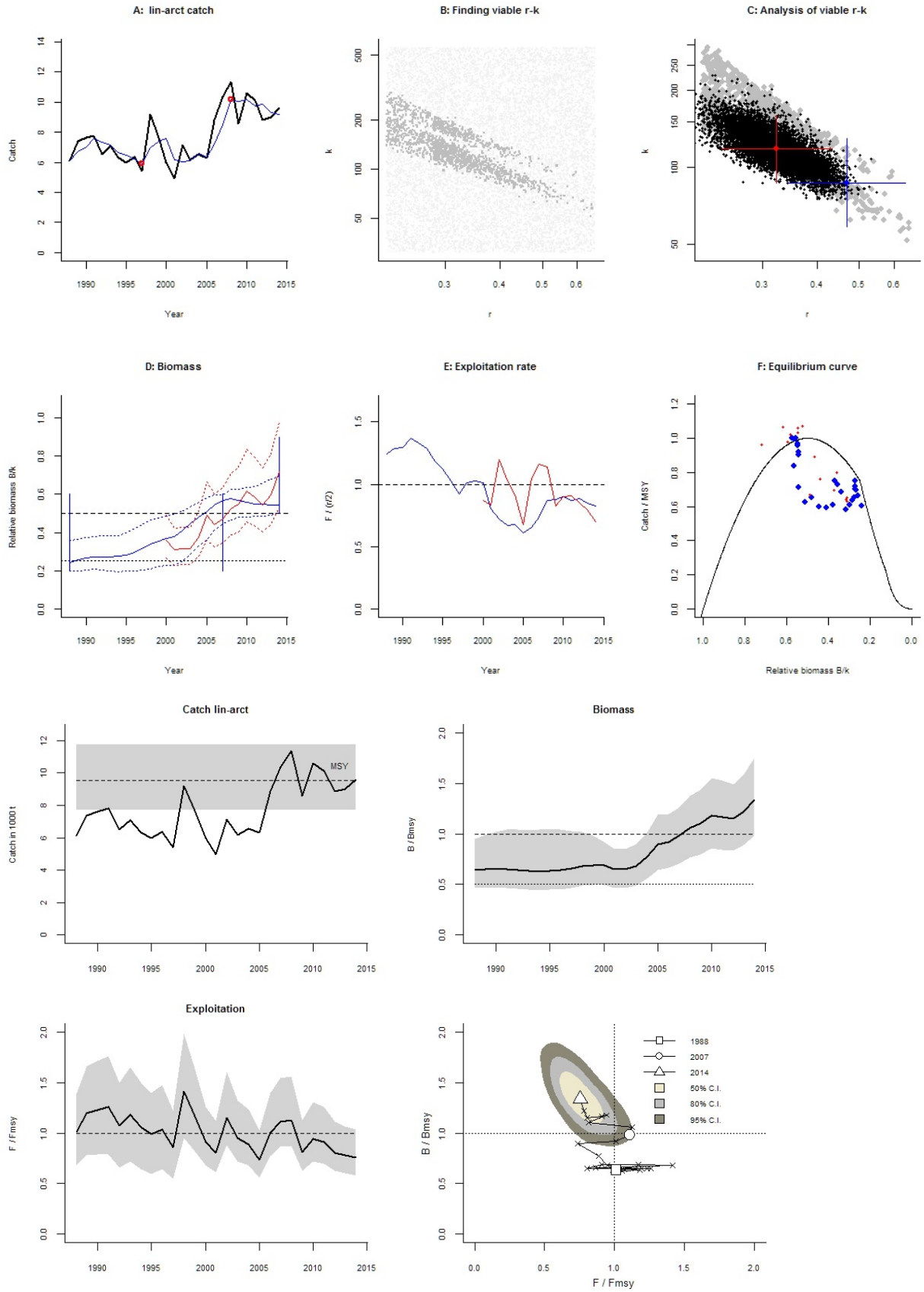
Species: *Molva molva* , stock: lin-arct
Ling in Subareas I and II (Northeast Arctic)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/lin-arct.pdf
Region: Northeast Atlantic , Barents Sea
Catch data used from years 1988 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2007 default
Prior final relative biomass = 0.5 - 0.9 , default
Prior range for r = 0.22 - 0.66 expert, , prior range for k = 30.8 - 555
Prior range of q = 0.000674 - 0.00234

Results of CMSY analysis with altogether 1985 viable trajectories for 1690 r-k pairs
r = 0.469 , 95% CL = 0.345 - 0.637 , k = 86.7 , 95% CL = 58.4 - 129
MSY = 10.2 , 95% CL = 7.5 - 13.8
Relative biomass last year = 0.544 k, 2.5th = 0.503 , 97.5th = 0.694
Exploitation F/(r/2) in last year = 0.828

Results from Bayesian Schaefer model using catch & CPUE
r = 0.323 , 95% CL = 0.242 - 0.432 , k = 118 , 95% CL = 86.8 - 160
MSY = 9.52 , 95% CL = 7.7 - 11.8
Relative biomass in last year = 0.668 k, 2.5th perc = 0.489 , 97.5th perc = 0.874
Exploitation F/(r/2) in last year = 0.756
q = 0.00117 , lcl = 0.000892 , ucl = 0.00153

Results for Management (based on BSM analysis)
Fmsy = 0.162 , 95% CL = 0.121 - 0.216 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.162 , 95% CL = 0.121 - 0.216 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 9.52 , 95% CL = 7.7 - 11.8
Bmsy = 58.9 , 95% CL = 43.4 - 79.8
Biomass in last year = 78.6 , 2.5th perc = 57.6 , 97.5 perc = 103
B/Bmsy in last year = 1.34 , 2.5th perc = 0.979 , 97.5 perc = 1.75
Fishing mortality in last year = 0.122 , 2.5th perc = 0.0934 , 97.5 perc = 0.167
F/Fmsy = 0.756 , 2.5th perc = 0.577 , 97.5 perc = 1.03

Stock status and exploitation in 2014
Biomass = 78.6 , B/Bmsy = 1.34 , fishing mortality F = 0.122 , F/Fmsy = 0.756
Comment: OK (RF 26.09.16)


A: lin-arct 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-arct
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1988
2007
2014
50% C.I.
80% C.I.
95% C.I.

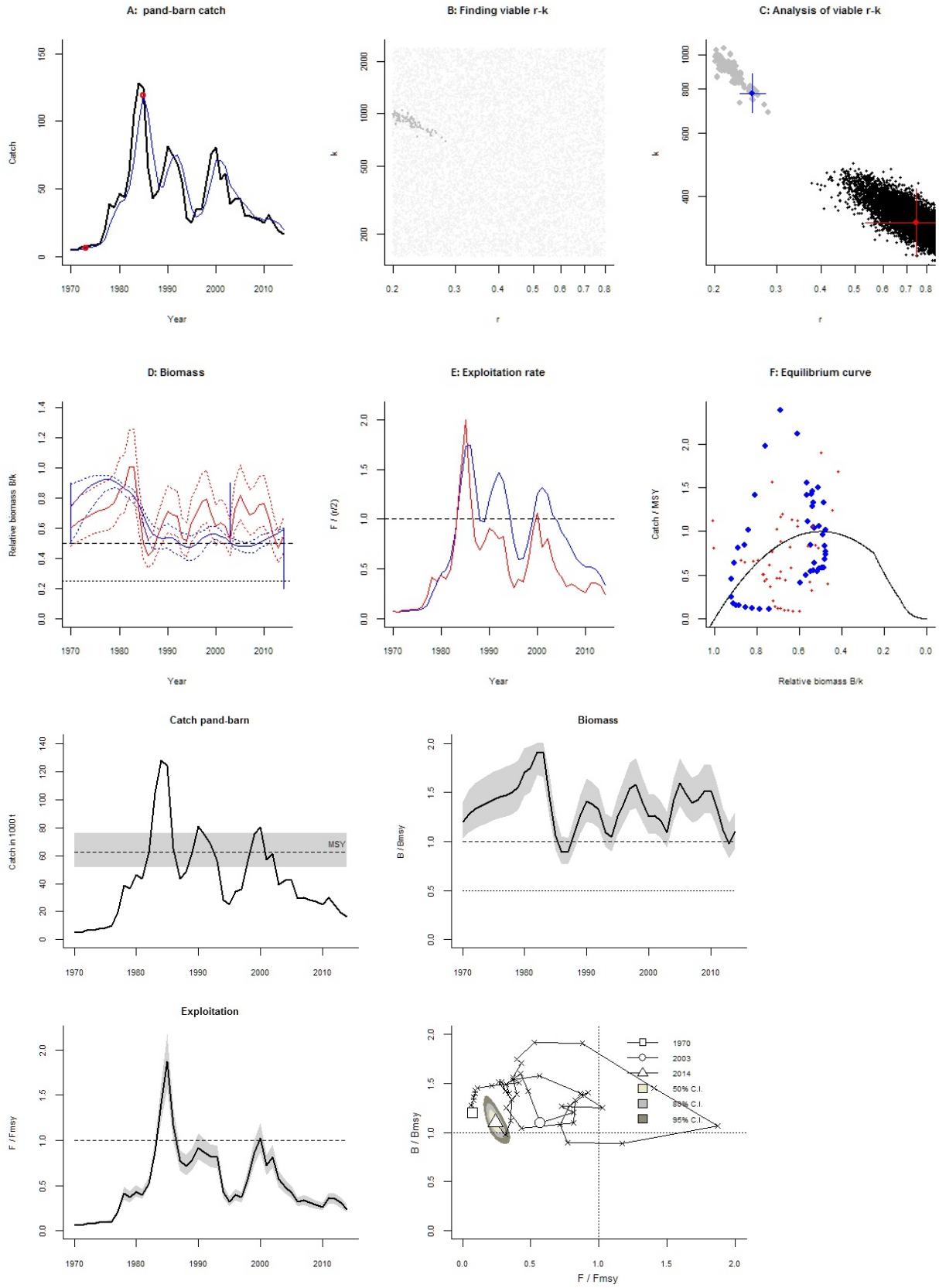
Species: *Pandalus borealis* , stock: pand-barn
Northern shrimp in Subareas I and II (Northeast Arctic)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/pand-barn.pdf
Region: Northeast Atlantic , Barents Sea
Catch data used from years 1970 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.5 - 0.9 in year 2003 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 149 - 2382
Prior range of q = 1.21e-05 - 4.84e-05

Results of CMSY analysis with altogether 93 viable trajectories for 90 r-k pairs
r = 0.256 , 95% CL = 0.236 - 0.278 , k = 780 , 95% CL = 687 - 885
MSY = 49.9 , 95% CL = 45.8 - 54.3
Relative biomass last year = 0.594 k, 2.5th = 0.543 , 97.5th = 0.599
Exploitation F/(r/2) in last year = 0.341

Results from Bayesian Schaefer model using catch & CPUE
r = 0.746 , 95% CL = 0.537 - 1.04 , k = 336 , 95% CL = 270 - 419
MSY = 62.7 , 95% CL = 51.6 - 76.3
Relative biomass in last year = 0.55 k, 2.5th perc = 0.467 , 97.5th perc = 0.651
Exploitation F/(r/2) in last year = 0.241
q = 7.97e-06 , lcl = 6.53e-06 , ucl = 9.72e-06

Results for Management (based on BSM analysis)
Fmsy = 0.373 , 95% CL = 0.268 - 0.519 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.373 , 95% CL = 0.268 - 0.519 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 62.7 , 95% CL = 51.6 - 76.3
Bmsy = 168 , 95% CL = 135 - 209
Biomass in last year = 185 , 2.5th perc = 157 , 97.5 perc = 219
B/Bmsy in last year = 1.1 , 2.5th perc = 0.933 , 97.5 perc = 1.3
Fishing mortality in last year = 0.0901 , 2.5th perc = 0.0761 , 97.5 perc = 0.106
F/Fmsy = 0.241 , 2.5th perc = 0.204 , 97.5 perc = 0.285

Stock status and exploitation in 2014
Biomass = 185 , B/Bmsy = 1.1 , fishing mortality F = 0.0901 , F/Fmsy = 0.241
Comment: OK (RF 26.09.16)


A: pand-barn 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 pand-barn
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1970
2003
2014
50% C.I.
80% C.I.
95% C.I.

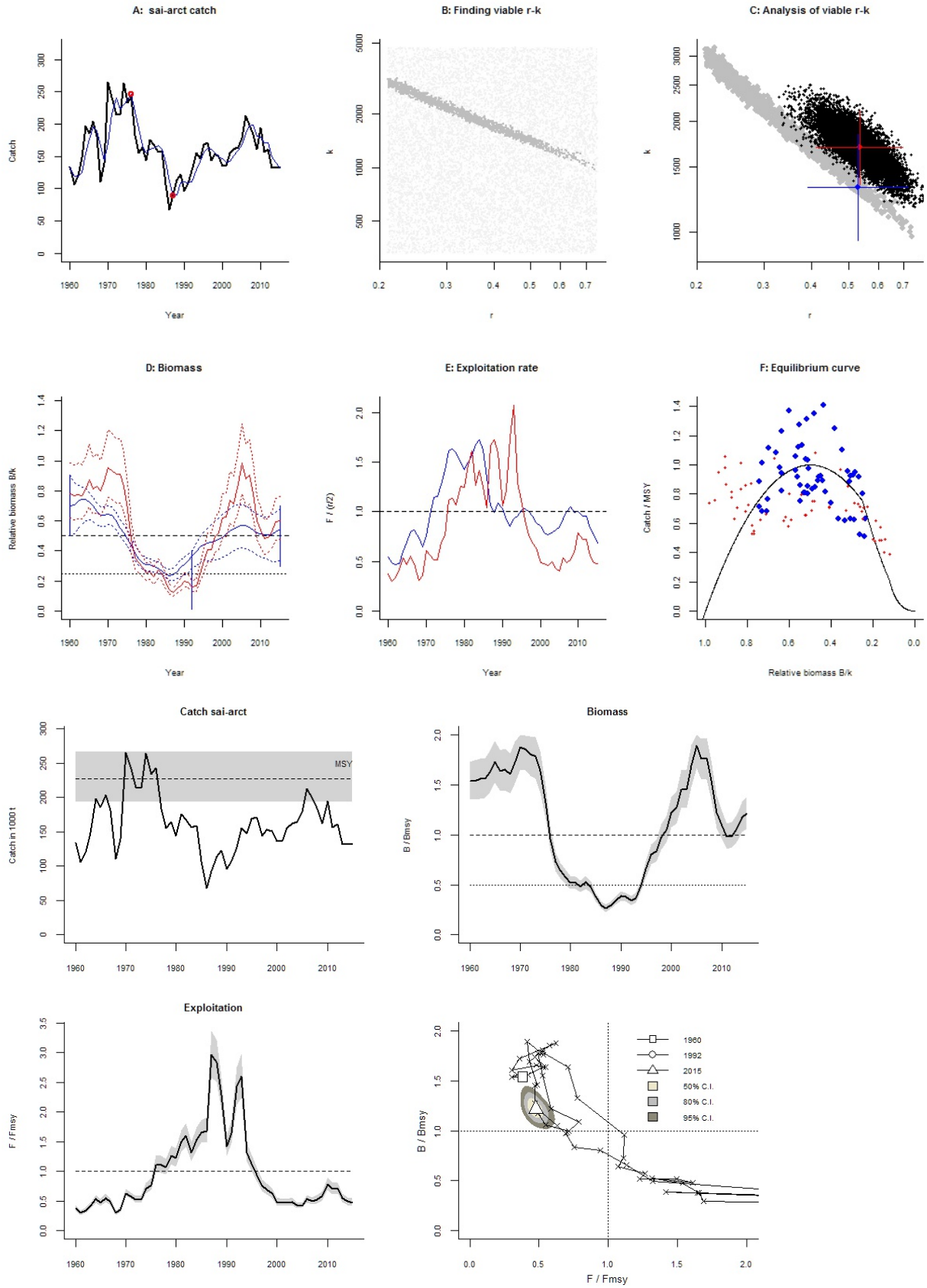
Species: *Pollachius virens* , stock: sai-arct
Saithe in Subareas I and II (Northeast Arctic)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/sai-arct.pdf
Region: Northeast Atlantic , Barents Sea
Catch data used from years 1960 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 1992 expert
Prior final relative biomass = 0.3 - 0.7 expert
Prior range for r = 0.21 - 0.75 expert, , prior range for k = 329 - 4699
Prior range of q = 0.231 - 0.873

Results of CMSY analysis with altogether 2096 viable trajectories for 1255 r-k pairs
r = 0.531 , 95% CL = 0.391 - 0.722 , k = 1320 , 95% CL = 948 - 1838
MSY = 175 , 95% CL = 162 - 189
Relative biomass last year = 0.547 k, 2.5th = 0.336 , 97.5th = 0.68
Exploitation F/(r/2) in last year = 0.688

Results from Bayesian Schaefer model using catch & CPUE
r = 0.535 , 95% CL = 0.411 - 0.697 , k = 1698 , 95% CL = 1344 - 2146
MSY = 227 , 95% CL = 194 - 267
Relative biomass in last year = 0.608 k, 2.5th perc = 0.531 , 97.5th perc = 0.69
Exploitation F/(r/2) in last year = 0.477
q = 0.348 , lcl = 0.28 , ucl = 0.433

Results for Management (based on BSM analysis)
Fmsy = 0.268 , 95% CL = 0.205 - 0.349 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.268 , 95% CL = 0.205 - 0.349 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 227 , 95% CL = 194 - 267
Bmsy = 849 , 95% CL = 672 - 1073
Biomass in last year = 1033 , 2.5th perc = 901 , 97.5 perc = 1173
B/Bmsy in last year = 1.22 , 2.5th perc = 1.06 , 97.5 perc = 1.38
Fishing mortality in last year = 0.128 , 2.5th perc = 0.112 , 97.5 perc = 0.146
F/Fmsy = 0.477 , 2.5th perc = 0.42 , 97.5 perc = 0.546

Stock status and exploitation in 2014
Biomass = 999 , B/Bmsy = 1.18 , fishing mortality F = 0.132 , F/Fmsy = 0.494
Comment: OK (RF 26.09.2016)


A: sai-arct 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 sai-arct
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1960
1992
2015
50% C.I.
80% C.I.
95% C.I.

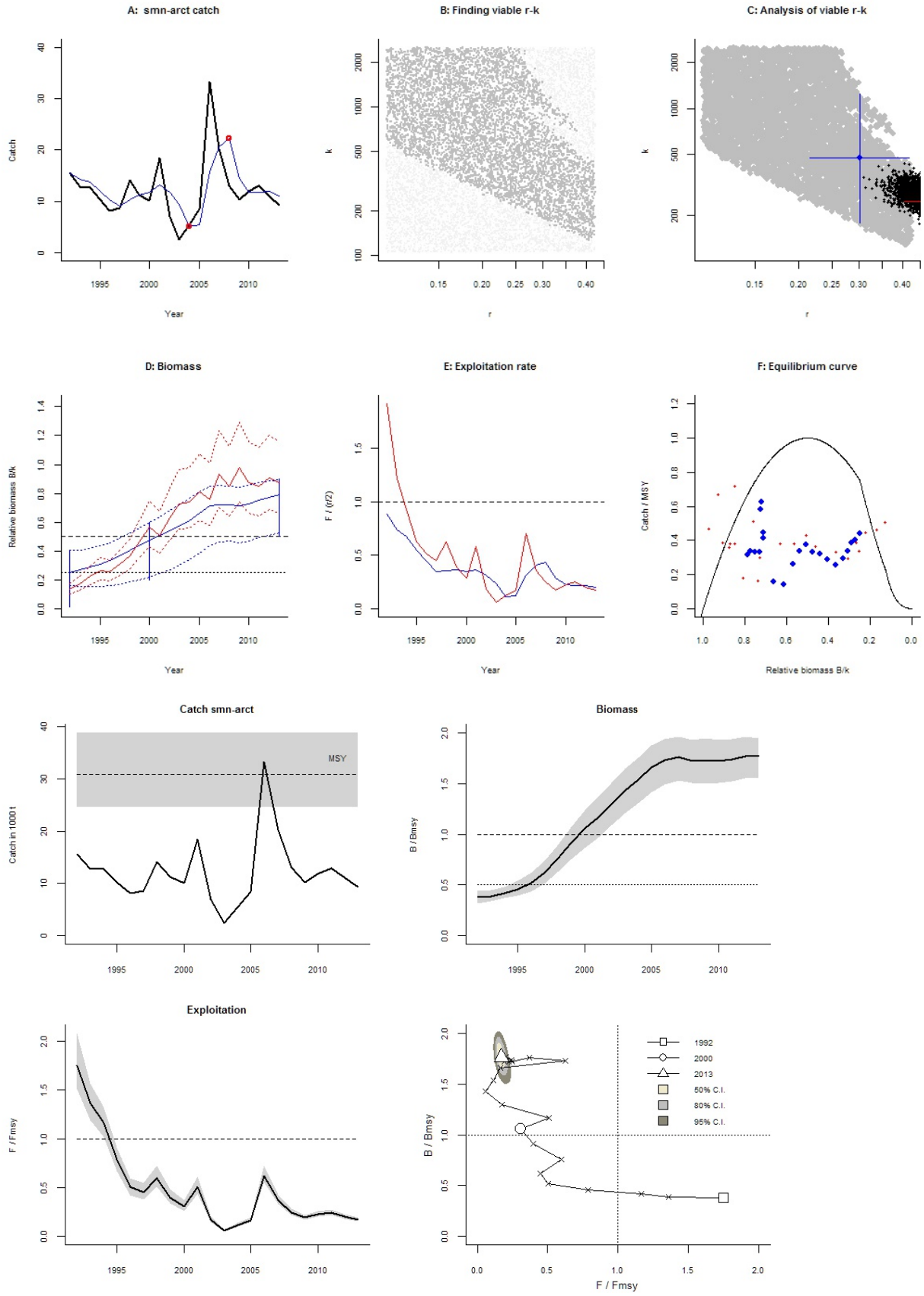
Species: *Sebastes mentella* , stock: smn-arct
Beaked redfish (Sebastes mentella) in Subareas I and II
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2014/2014/smn-arct.pdf
Region: Northeast Atlantic , Barents Sea
Catch data used from years 1992 - 2013 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2000 expert
Prior final relative biomass = 0.5 - 0.9 expert
Prior range for r = 0.11 - 0.43 expert, , prior range for k = 104 - 2512
Prior range of q = 3.37 - 13.5

Results of CMSY analysis with altogether 21558 viable trajectories for 5908 r-k pairs
r = 0.3 , 95% CL = 0.216 - 0.418 , k = 471 , 95% CL = 177 - 1257
MSY = 35.4 , 95% CL = 9.9 - 127
Relative biomass last year = 0.789 k, 2.5th = 0.529 , 97.5th = 0.897
Exploitation F/(r/2) in last year = 0.199

Results from Bayesian Schaefer model using catch & CPUE
r = 0.502 , 95% CL = 0.406 - 0.621 , k = 246 , 95% CL = 186 - 326
MSY = 30.9 , 95% CL = 24.6 - 38.8
Relative biomass in last year = 0.883 k, 2.5th perc = 0.774 , 97.5th perc = 0.972
Exploitation F/(r/2) in last year = 0.17
q = 3.86 , lcl = 2.91 , ucl = 5.12

Results for Management (based on BSM analysis)
Fmsy = 0.251 , 95% CL = 0.203 - 0.311 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.251 , 95% CL = 0.203 - 0.311 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 30.9 , 95% CL = 24.6 - 38.8
Bmsy = 123 , 95% CL = 93.1 - 163
Biomass in last year = 218 , 2.5th perc = 191 , 97.5 perc = 240
B/Bmsy in last year = 1.77 , 2.5th perc = 1.55 , 97.5 perc = 1.94
Fishing mortality in last year = 0.0427 , 2.5th perc = 0.0388 , 97.5 perc = 0.0488
F/Fmsy = 0.17 , 2.5th perc = 0.155 , 97.5 perc = 0.194

Stock status and exploitation in 2014
Biomass = , B/Bmsy = , fishing mortality F = , F/Fmsy =
Comment: OK (RF 26.09.16)


A: smn-arct 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 smn-arct
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1992
2000
2013
50% C.I.
80% C.I.
95% C.I.

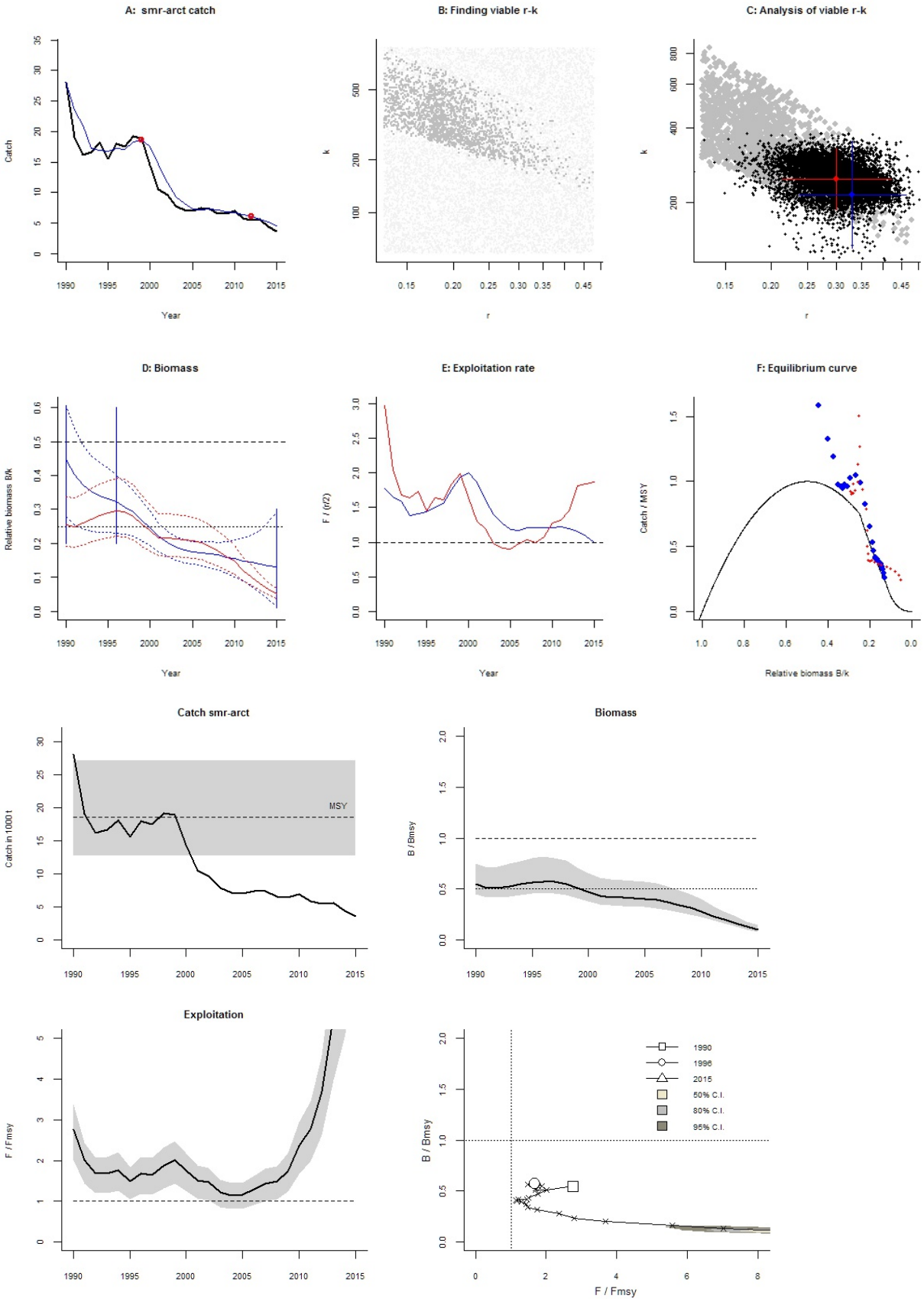
Species: *Sebastes norvegicus* , stock: smr-arct
Golden redfish (Sebastes norvegicus) in subareas 1 and 2 (Northeast Arctic)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/smr-arct.pdf
Region: Northeast Atlantic , Barents Sea
Catch data used from years 1990 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 1996 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.13 - 0.48 expert, , prior range for k = 58.5 - 864
Prior range of q = 1.47e-05 - 5.63e-05

Results of CMSY analysis with altogether 2265 viable trajectories for 1967 r-k pairs
r = 0.331 , 95% CL = 0.237 - 0.463 , k = 214 , 95% CL = 130 - 353
MSY = 17.7 , 95% CL = 11.9 - 26.6
Relative biomass last year = 0.13 k, 2.5th = 0.0158 , 97.5th = 0.294
Exploitation F/(r/2) in last year = 0.988

Results from Bayesian Schaefer model using catch & CPUE
r = 0.3 , 95% CL = 0.213 - 0.421 , k = 249 , 95% CL = 187 - 331
MSY = 18.6 , 95% CL = 12.8 - 27.1
Relative biomass in last year = 0.051 k, 2.5th perc = 0.0406 , 97.5th perc = 0.0729
Exploitation F/(r/2) in last year = 1.91
q = 1.96e-05 , lcl = 1.58e-05 , ucl = 2.43e-05

Results for Management (based on BSM analysis)
Fmsy = 0.15 , 95% CL = 0.107 - 0.21 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0306 , 95% CL = 0.0218 - 0.0429 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 18.6 , 95% CL = 12.8 - 27.1
Bmsy = 124 , 95% CL = 93.4 - 165
Biomass in last year = 12.7 , 2.5th perc = 10.1 , 97.5 perc = 18.1
B/Bmsy in last year = 0.102 , 2.5th perc = 0.0812 , 97.5 perc = 0.146
Fishing mortality in last year = 0.286 , 2.5th perc = 0.2 , 97.5 perc = 0.36
F/Fmsy = 9.37 , 2.5th perc = 6.55 , 97.5 perc = 11.8

Stock status and exploitation in 2014
Biomass = 16.2 , B/Bmsy = 0.13 , fishing mortality F = 0.274 , F/Fmsy = 7.02
Comment: OK (RF 26.09.16)


A: smr-arct 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 smr-arct
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1990
1996
2015
50% C.I.
80% C.I.
95% C.I.

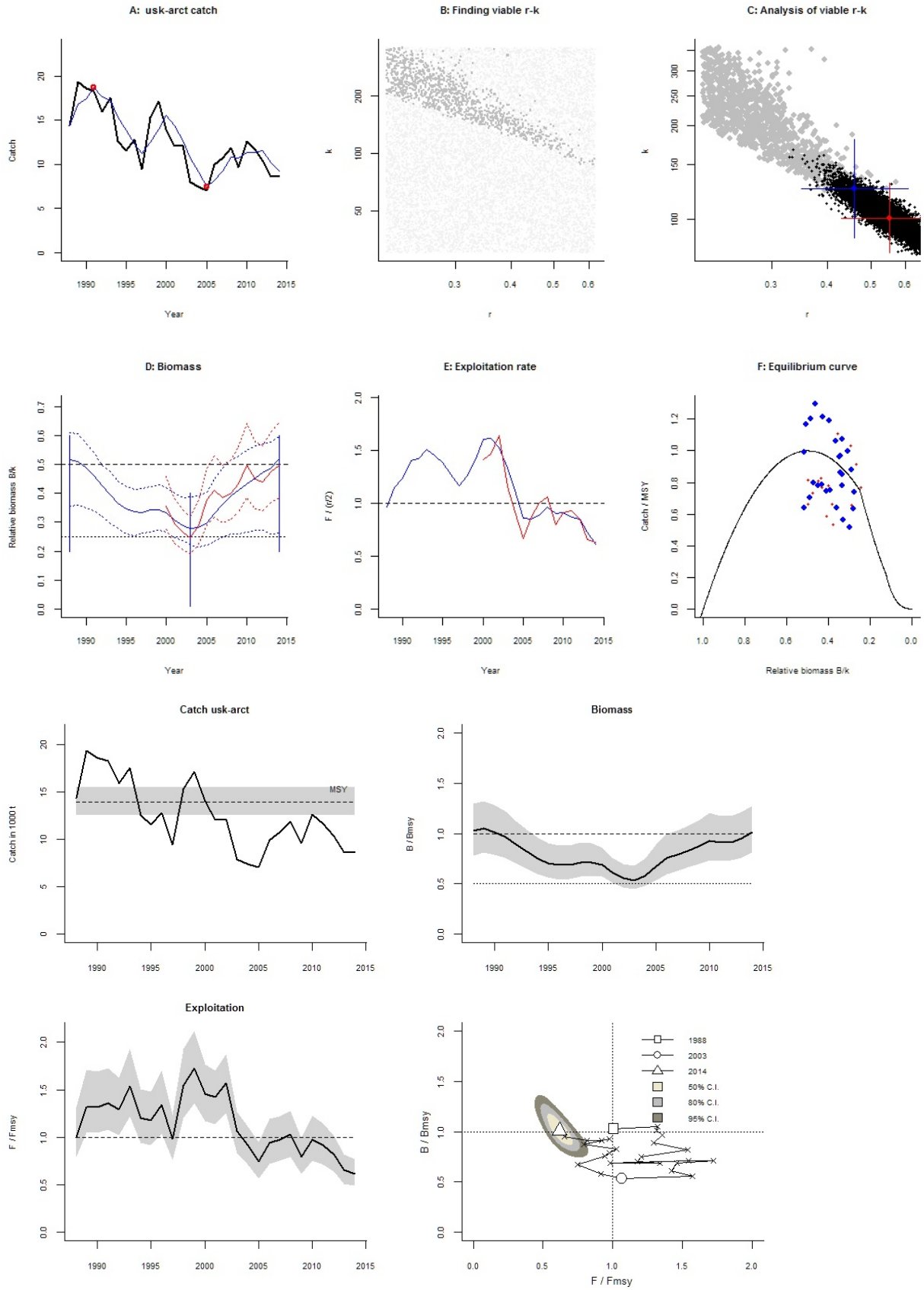
Species: *Brosme brosme* , stock: usk-arct
Tusk in Subareas I and II (Northeast Arctic)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/usk-arct.pdf
Region: Northeast Atlantic , Barents Sea
Catch data used from years 1988 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2003 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.21 - 0.62 expert, , prior range for k = 30.3 - 357
Prior range of q = 0.00169 - 0.0058

Results of CMSY analysis with altogether 2198 viable trajectories for 1157 r-k pairs
r = 0.461 , 95% CL = 0.349 - 0.608 , k = 126 , 95% CL = 87.3 - 181
MSY = 14.5 , 95% CL = 11.5 - 18.3
Relative biomass last year = 0.518 k, 2.5th = 0.264 , 97.5th = 0.597
Exploitation F/(r/2) in last year = 0.616

Results from Bayesian Schaefer model using catch & CPUE
r = 0.551 , 95% CL = 0.43 - 0.708 , k = 101 , 95% CL = 78.4 - 131
MSY = 14 , 95% CL = 12.5 - 15.6
Relative biomass in last year = 0.506 k, 2.5th perc = 0.404 , 97.5th perc = 0.637
Exploitation F/(r/2) in last year = 0.618
q = 0.00219 , lcl = 0.00175 , ucl = 0.00274

Results for Management (based on BSM analysis)
Fmsy = 0.276 , 95% CL = 0.215 - 0.354 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.276 , 95% CL = 0.215 - 0.354 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 14 , 95% CL = 12.5 - 15.6
Bmsy = 50.6 , 95% CL = 39.2 - 65.4
Biomass in last year = 51.2 , 2.5th perc = 40.9 , 97.5 perc = 64.5
B/Bmsy in last year = 1.01 , 2.5th perc = 0.809 , 97.5 perc = 1.27
Fishing mortality in last year = 0.171 , 2.5th perc = 0.135 , 97.5 perc = 0.213
F/Fmsy = 0.618 , 2.5th perc = 0.491 , 97.5 perc = 0.774

Stock status and exploitation in 2014
Biomass = 51.2 , B/Bmsy = 1.01 , fishing mortality F = 0.171 , F/Fmsy = 0.618
Comment: OK (RF 26.09.16)


A: usk-arct 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-arct
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.

Iceland, Faroes and Greenland (analyzed with CMSY_O_7m.R)

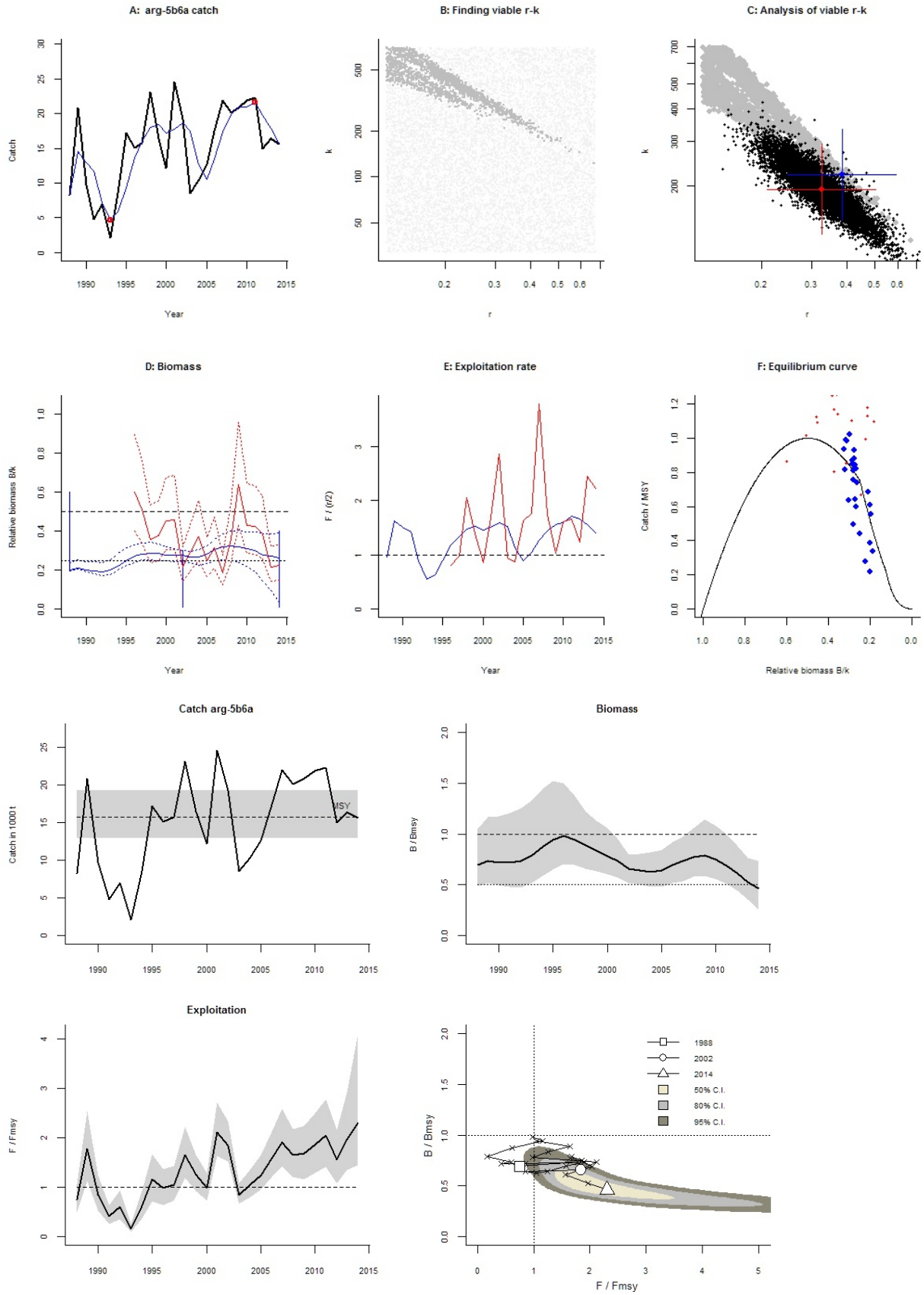
Species: *Argentina silus* , stock: arg-5b6a
Greater silver smelt in Divisions Vb and VIa (Faroes grounds, West of Scotland)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/arg-5b6a.pdf
Region: Northeast Atlantic , Faroes
Catch data used from years 1988 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.3 in year 2002 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.12 - 0.68 expert, , prior range for k = 32.1 - 694
Prior range of q = 0.000254 - 0.00118

Results of CMSY analysis with altogether 1827 viable trajectories for 1806 r-k pairs
r = 0.383 , 95% CL = 0.247 - 0.594 , k = 222 , 95% CL = 147 - 334
MSY = 21.2 , 95% CL = 19 - 23.8
Relative biomass last year = 0.262 k, 2.5th = 0.0341 , 97.5th = 0.392
Exploitation F/(r/2) in last year = 1.41

Results from Bayesian Schaefer model using catch & CPUE
r = 0.325 , 95% CL = 0.21 - 0.502 , k = 195 , 95% CL = 130 - 291
MSY = 15.8 , 95% CL = 12.9 - 19.3
Relative biomass in last year = 0.232 k, 2.5th perc = 0.13 , 97.5th perc = 0.368
Exploitation F/(r/2) in last year = 2.14
q = 0.000453 , lcl = 0.000339 , ucl = 0.000606

Results for Management (based on BSM analysis)
Fmsy = 0.162 , 95% CL = 0.105 - 0.251 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.151 , 95% CL = 0.0973 - 0.233 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 15.8 , 95% CL = 12.9 - 19.3
Bmsy = 97.3 , 95% CL = 65 - 146
Biomass in last year = 45.1 , 2.5th perc = 25.3 , 97.5 perc = 71.6
B/Bmsy in last year = 0.464 , 2.5th perc = 0.26 , 97.5 perc = 0.736
Fishing mortality in last year = 0.347 , 2.5th perc = 0.218 , 97.5 perc = 0.619
F/Fmsy = 2.3 , 2.5th perc = 1.45 , 97.5 perc = 4.11

Stock status and exploitation in 2014
Biomass = 45.1 , B/Bmsy = 0.464 , fishing mortality F = 0.347 , F/Fmsy = 2.3
Comment: OK (RF 27.9.16)


A: arg-5b6a 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-5b6a
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1988
2002
2014
50% C.I.
80% C.I.
95% C.I.

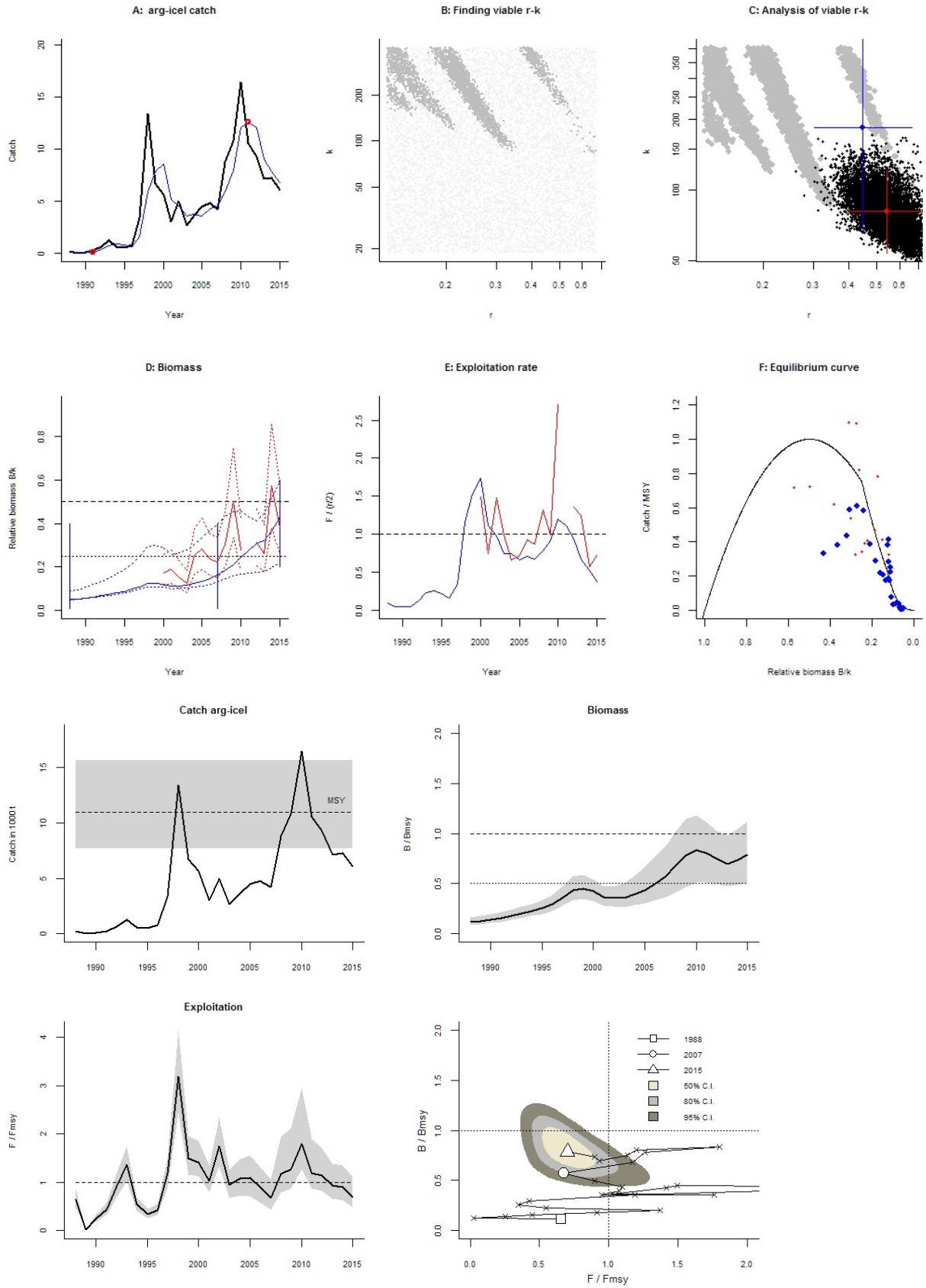
Species: *Argentina silus* , stock: arg-icel
Greater silver smelt in Subarea 14 and Division 5.a (East Greenland and Iceland grounds)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/arg-icel.pdf
Region: Northeast Atlantic , Greenland Sea
Catch data used from years 1988 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2007 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.12 - 0.68 expert, , prior range for k = 18.7 - 403
Prior range of q = 1.07 - 4.99

Results of CMSY analysis with altogether 2927 viable trajectories for 2927 r-k pairs
r = 0.447 , 95% CL = 0.301 - 0.663 , k = 185 , 95% CL = 66.1 - 517
MSY = 20.7 , 95% CL = 6.2 - 68.8
Relative biomass last year = 0.43 k, 2.5th = 0.217 , 97.5th = 0.592
Exploitation F/(r/2) in last year = 0.384

Results from Bayesian Schaefer model using catch & CPUE
r = 0.541 , 95% CL = 0.394 - 0.743 , k = 81.1 , 95% CL = 54.1 - 122
MSY = 11 , 95% CL = 7.71 - 15.6
Relative biomass in last year = 0.394 k, 2.5th perc = 0.25 , 97.5th perc = 0.561
Exploitation F/(r/2) in last year = 0.701
q = 1.48 , lcl = 1.08 , ucl = 2.03

Results for Management (based on BSM analysis)
Fmsy = 0.271 , 95% CL = 0.197 - 0.371 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.271 , 95% CL = 0.197 - 0.371 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 11 , 95% CL = 7.71 - 15.6
Bmsy = 40.6 , 95% CL = 27 - 60.8
Biomass in last year = 31.9 , 2.5th perc = 20.3 , 97.5 perc = 45.5
B/Bmsy in last year = 0.788 , 2.5th perc = 0.501 , 97.5 perc = 1.12
Fishing mortality in last year = 0.19 , 2.5th perc = 0.133 , 97.5 perc = 0.298
F/Fmsy = 0.701 , 2.5th perc = 0.492 , 97.5 perc = 1.1

Stock status and exploitation in 2014
Biomass = 29.9 , B/Bmsy = 0.737 , fishing mortality F = 0.242 , F/Fmsy = 0.895
Comment: OK (RF 27.09.16)


A: arg-icel 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-icel
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1988
2007
2015
50% C.I.
80% C.I.
95% C.I.

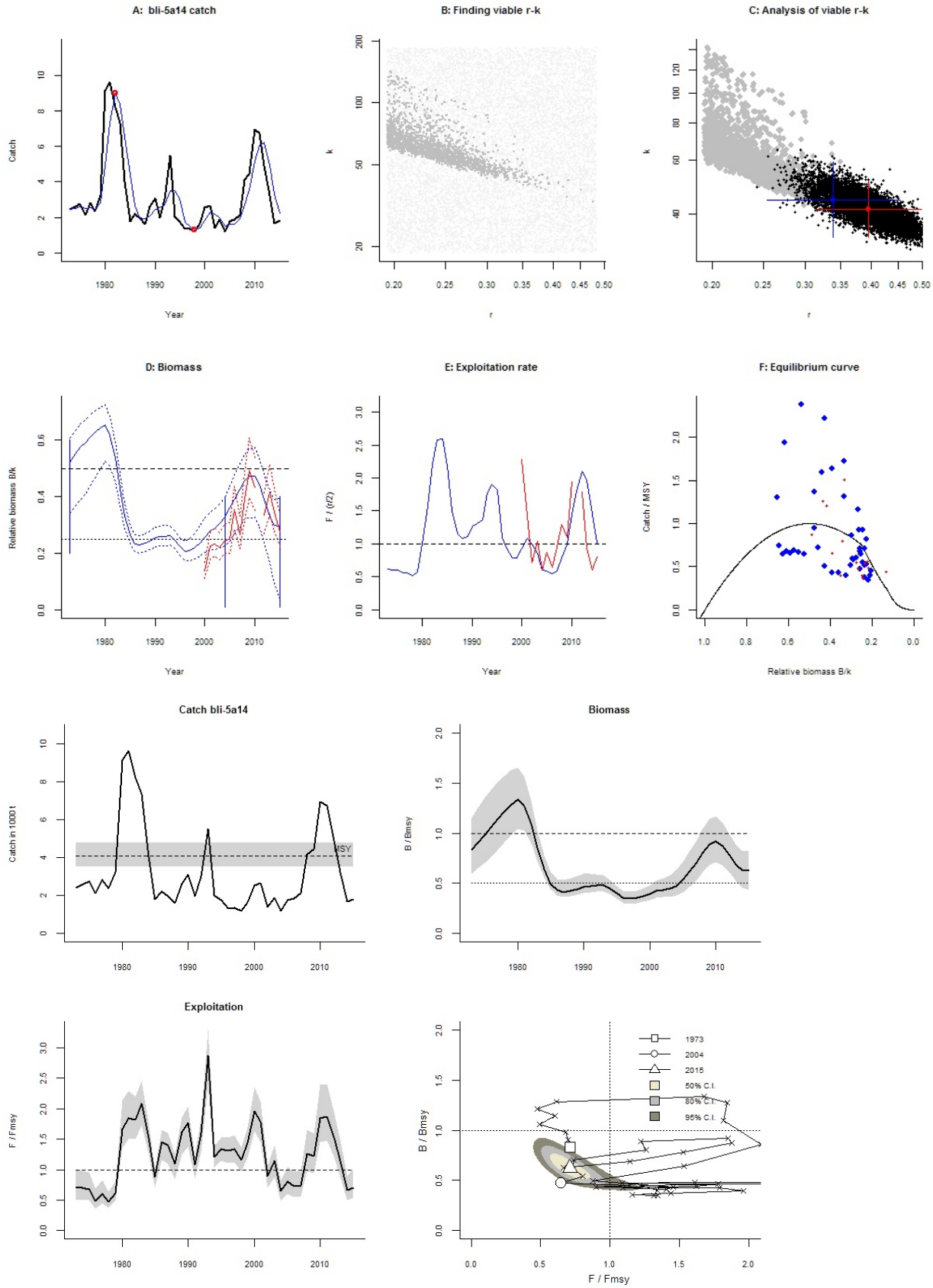
Species: *Molva dypterygia* , stock: bli-5a14
Blue ling in Subarea 14 and Division 5.a (East Greenland and Iceland grounds)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/bli-5a14.pdf
Region: Northeast Atlantic , Greenland Sea
Catch data used from years 1973 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 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 = 18.6 - 185
Prior range of q = 0.0796 - 0.251

Results of CMSY analysis with altogether 2569 viable trajectories for 2040 r-k pairs
r = 0.34 , 95% CL = 0.254 - 0.453 , k = 44.5 , 95% CL = 33.4 - 59.3
MSY = 3.78 , 95% CL = 3.04 - 4.7
Relative biomass last year = 0.295 k, 2.5th = 0.0354 , 97.5th = 0.396
Exploitation F/(r/2) in last year = 1.01

Results from Bayesian Schaefer model using catch & CPUE
r = 0.395 , 95% CL = 0.314 - 0.498 , k = 41.5 , 95% CL = 33.5 - 51.3
MSY = 4.1 , 95% CL = 3.52 - 4.76
Relative biomass in last year = 0.312 k, 2.5th perc = 0.218 , 97.5th perc = 0.414
Exploitation F/(r/2) in last year = 0.709
q = 0.102 , lcl = 0.081 , ucl = 0.128

Results for Management (based on BSM analysis)
Fmsy = 0.198 , 95% CL = 0.157 - 0.249 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.198 , 95% CL = 0.157 - 0.249 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 4.1 , 95% CL = 3.52 - 4.76
Bmsy = 20.7 , 95% CL = 16.8 - 25.6
Biomass in last year = 12.9 , 2.5th perc = 9.04 , 97.5 perc = 17.2
B/Bmsy in last year = 0.624 , 2.5th perc = 0.436 , 97.5 perc = 0.828
Fishing mortality in last year = 0.14 , 2.5th perc = 0.106 , 97.5 perc = 0.201
F/Fmsy = 0.709 , 2.5th perc = 0.535 , 97.5 perc = 1.02

Stock status and exploitation in 2014
Biomass = 12.9 , B/Bmsy = 0.624 , fishing mortality F = 0.131 , F/Fmsy = 0.662
Comment: OK (RF 27.09.16)


A: bli-5a14 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-5a14
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1973
2004
2015
50% C.I.
80% C.I.
95% C.I.

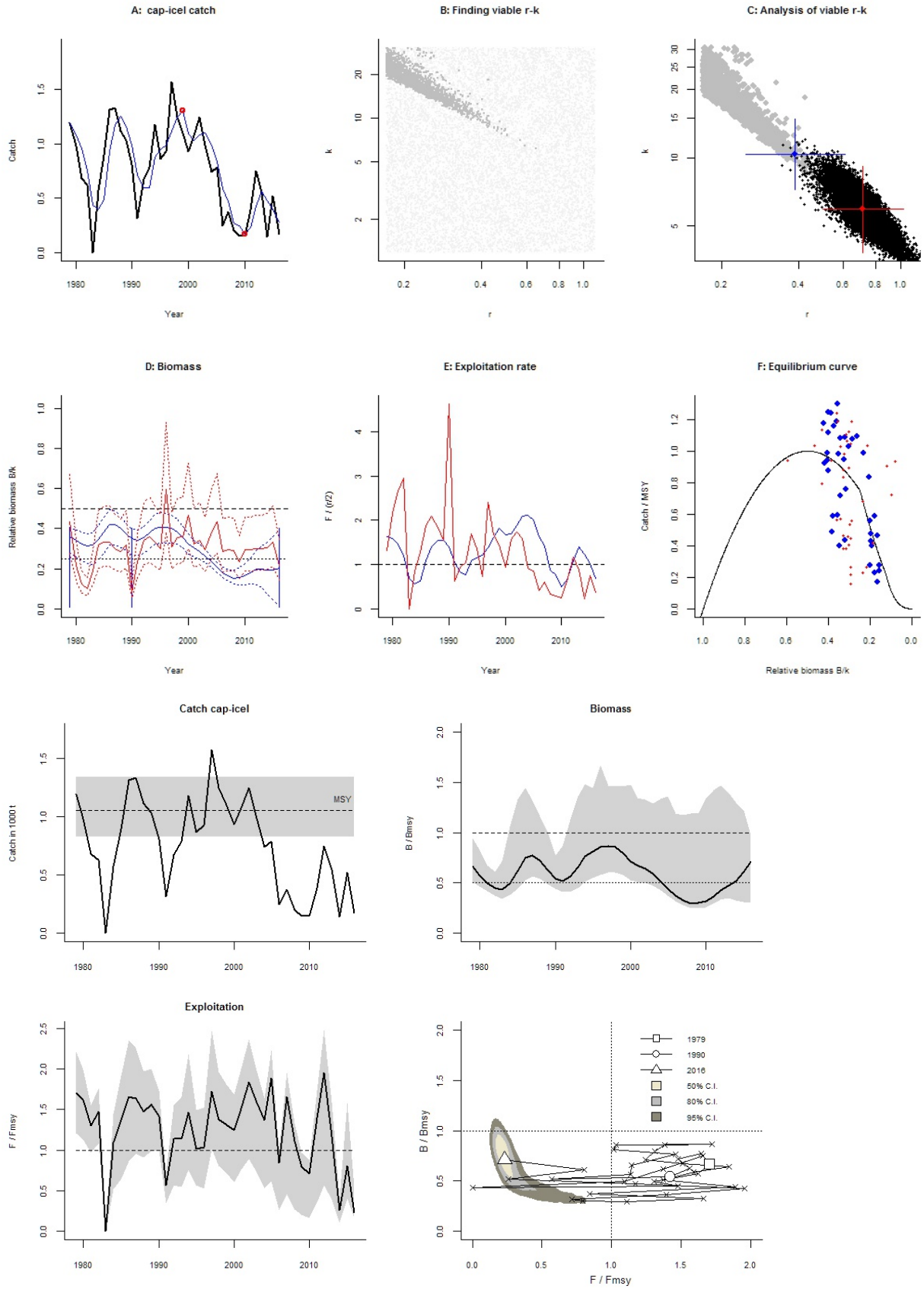
Species: *Mallotus villosus* , stock: cap-icel
Capelin in Subareas V and XIV and Division IIa west of 5°W (Iceland and Faroes grounds, East Greenland, Jan Mayen area)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/cap-icel.pdf
Region: Northeast Atlantic , Iceland Sea
Catch data used from years 1979 - 2016 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 1990 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.17 - 1.1 expert, , prior range for k = 1.18 - 30.7
Prior range of q = 0.222 - 1.13

Results of CMSY analysis with altogether 2041 viable trajectories for 1817 r-k pairs
r = 0.389 , 95% CL = 0.249 - 0.607 , k = 10.4 , 95% CL = 7.23 - 14.8
MSY = 1.01 , 95% CL = 0.83 - 1.22
Relative biomass last year = 0.201 k, 2.5th = 0.0143 , 97.5th = 0.394
Exploitation F/(r/2) in last year = 0.687

Results from Bayesian Schaefer model using catch & CPUE
r = 0.713 , 95% CL = 0.496 - 1.02 , k = 5.91 , 95% CL = 3.81 - 9.17
MSY = 1.05 , 95% CL = 0.827 - 1.34
Relative biomass in last year = 0.357 k, 2.5th perc = 0.151 , 97.5th perc = 0.487
Exploitation F/(r/2) in last year = 0.231
q = 0.235 , lcl = 0.16 , ucl = 0.344

Results for Management (based on BSM analysis)
Fmsy = 0.357 , 95% CL = 0.248 - 0.512 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.357 , 95% CL = 0.248 - 0.512 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1.05 , 95% CL = 0.827 - 1.34
Bmsy = 2.95 , 95% CL = 1.9 - 4.59
Biomass in last year = 2.11 , 2.5th perc = 0.89 , 97.5 perc = 2.88
B/Bmsy in last year = 0.715 , 2.5th perc = 0.301 , 97.5 perc = 0.974
Fishing mortality in last year = 0.0824 , 2.5th perc = 0.0605 , 97.5 perc = 0.195
F/Fmsy = 0.231 , 2.5th perc = 0.17 , 97.5 perc = 0.548

Stock status and exploitation in 2014
Biomass = 1.53 , B/Bmsy = 0.519 , fishing mortality F = 0.0925 , F/Fmsy = 0.26
Comment: OK (RF 27.09.16)


A: cap-icel 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 cap-icel
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1979
1990
2016
50% C.I.
80% C.I.
95% C.I.

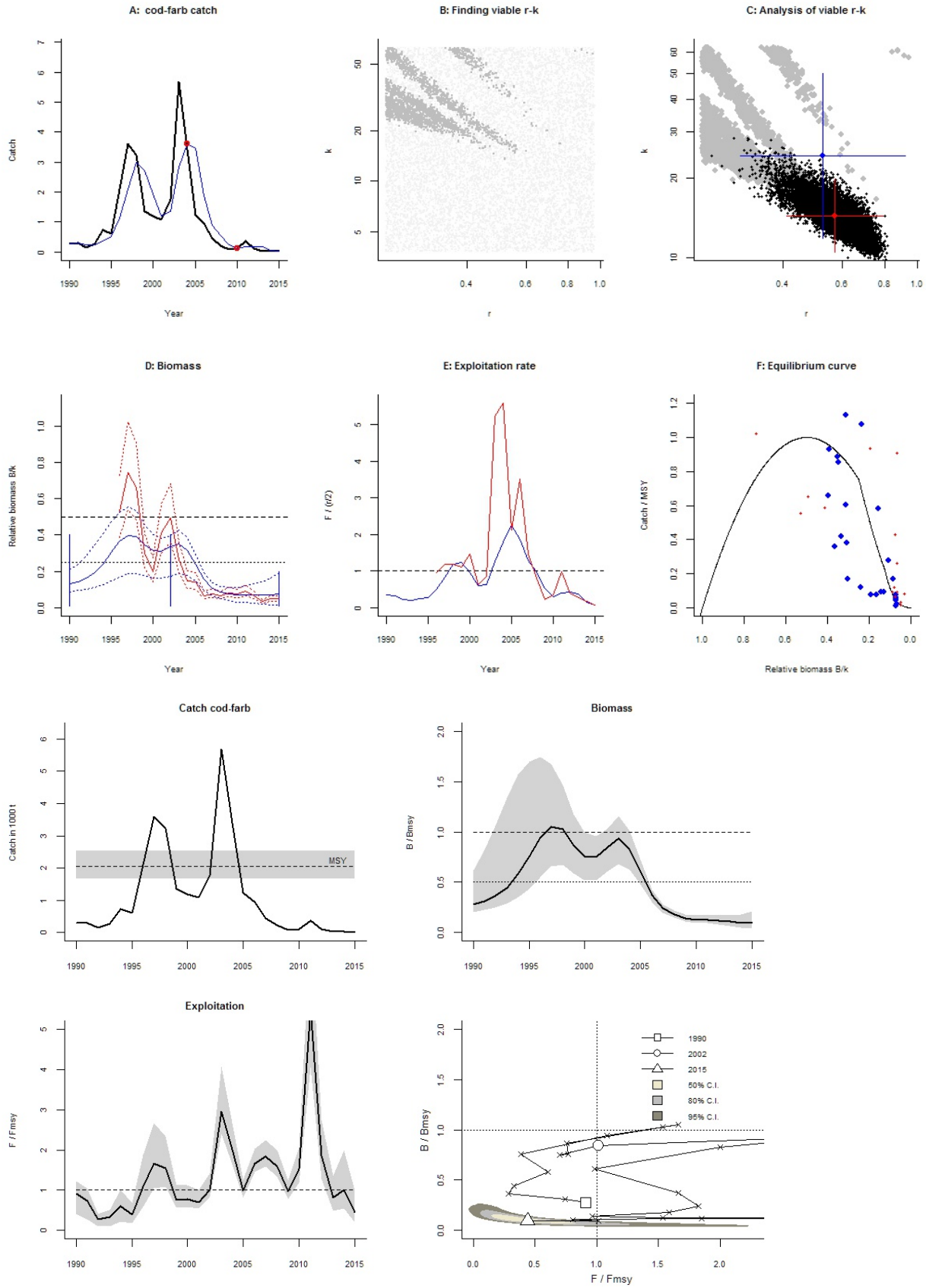
Species: *Gadus morhua* , stock: cod-farb
Cod in Subdivision Vb2 (Faroe Bank)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/cod-farb.pdf
Region: Northeast Atlantic , Faroes
Catch data used from years 1990 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2002 expert
Prior final relative biomass = 0.01 - 0.2 expert
Prior range for r = 0.23 - 0.96 expert, , prior range for k = 3.76 - 62.9
Prior range of q = 0.0353 - 0.144

Results of CMSY analysis with altogether 2321 viable trajectories for 2227 r-k pairs
r = 0.525 , 95% CL = 0.297 - 0.925 , k = 24.4 , 95% CL = 11.9 - 50
MSY = 3.2 , 95% CL = 1.3 - 7.85
Relative biomass last year = 0.0739 k, 2.5th = 0.0122 , 97.5th = 0.191
Exploitation F/(r/2) in last year = 0.0656

Results from Bayesian Schaefer model using catch & CPUE
r = 0.569 , 95% CL = 0.409 - 0.792 , k = 14.4 , 95% CL = 10.5 - 19.8
MSY = 2.06 , 95% CL = 1.67 - 2.52
Relative biomass in last year = 0.0484 k, 2.5th perc = 0.0217 , 97.5th perc = 0.104
Exploitation F/(r/2) in last year = 0.0854
q = 0.0419 , lcl = 0.0318 , ucl = 0.0552

Results for Management (based on BSM analysis)
Fmsy = 0.285 , 95% CL = 0.205 - 0.396 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0551 , 95% CL = 0.0396 - 0.0767 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 2.06 , 95% CL = 1.67 - 2.52
Bmsy = 7.22 , 95% CL = 5.26 - 9.92
Biomass in last year = 0.699 , 2.5th perc = 0.314 , 97.5 perc = 1.5
B/Bmsy in last year = 0.0968 , 2.5th perc = 0.0435 , 97.5 perc = 0.207
Fishing mortality in last year = 0.0243 , 2.5th perc = 0.0113 , 97.5 perc = 0.0541
F/Fmsy = 0.441 , 2.5th perc = 0.206 , 97.5 perc = 0.982

Stock status and exploitation in 2014
Biomass = 0.689 , B/Bmsy = 0.0954 , fishing mortality F = 0.0552 , F/Fmsy = 1.02
Comment: OK (RF 27.9.16) Abundance in Summer Survey read off graph.


A: cod-farb 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 cod-farb
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1990
2002
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

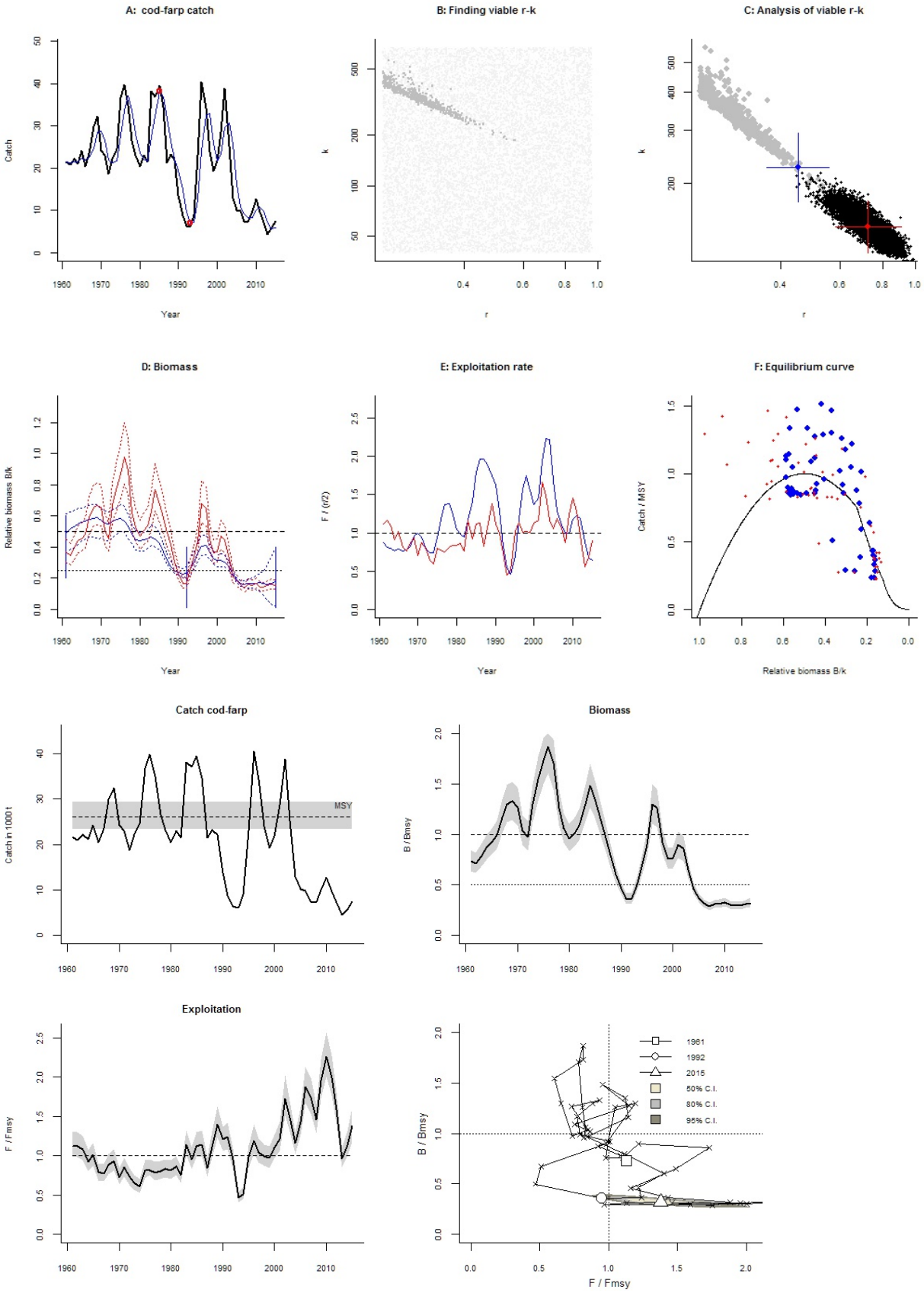
Species: *Gadus morhua* , stock: cod-farp
Cod in Subdivision Vb1 (Faroe Plateau)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/cod-farp.pdf
Region: Northeast Atlantic , Faroes
Catch data used from years 1961 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 1992 default
Prior final relative biomass = 0.01 - 0.4 , default
Prior range for r = 0.23 - 0.96 expert, , prior range for k = 39.8 - 664
Prior range of q = 0.55 - 2.25

Results of CMSY analysis with altogether 647 viable trajectories for 596 r-k pairs
r = 0.449 , 95% CL = 0.363 - 0.556 , k = 225 , 95% CL = 173 - 293
MSY = 25.3 , 95% CL = 23 - 27.8
Relative biomass last year = 0.179 k, 2.5th = 0.0152 , 97.5th = 0.392
Exploitation F/(r/2) in last year = 0.647

Results from Bayesian Schaefer model using catch & CPUE
r = 0.727 , 95% CL = 0.582 - 0.909 , k = 144 , 95% CL = 118 - 176
MSY = 26.1 , 95% CL = 23.3 - 29.4
Relative biomass in last year = 0.16 k, 2.5th perc = 0.137 , 97.5th perc = 0.188
Exploitation F/(r/2) in last year = 0.883
q = 0.873 , lcl = 0.723 , ucl = 1.05

Results for Management (based on BSM analysis)
Fmsy = 0.364 , 95% CL = 0.291 - 0.454 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.233 , 95% CL = 0.186 - 0.291 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 26.1 , 95% CL = 23.3 - 29.4
Bmsy = 71.9 , 95% CL = 59 - 87.8
Biomass in last year = 23 , 2.5th perc = 19.7 , 97.5 perc = 27
B/Bmsy in last year = 0.32 , 2.5th perc = 0.273 , 97.5 perc = 0.375
Fishing mortality in last year = 0.321 , 2.5th perc = 0.274 , 97.5 perc = 0.376
F/Fmsy = 1.38 , 2.5th perc = 1.18 , 97.5 perc = 1.62

Stock status and exploitation in 2014
Biomass = 22.4 , B/Bmsy = 0.311 , fishing mortality F = 0.256 , F/Fmsy = 1.13
Comment: OK (RF 27.9.16)


A: cod-farp 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 cod-farp
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1961
1992
2015
50% C.I.
80% C.I.
95% C.I.

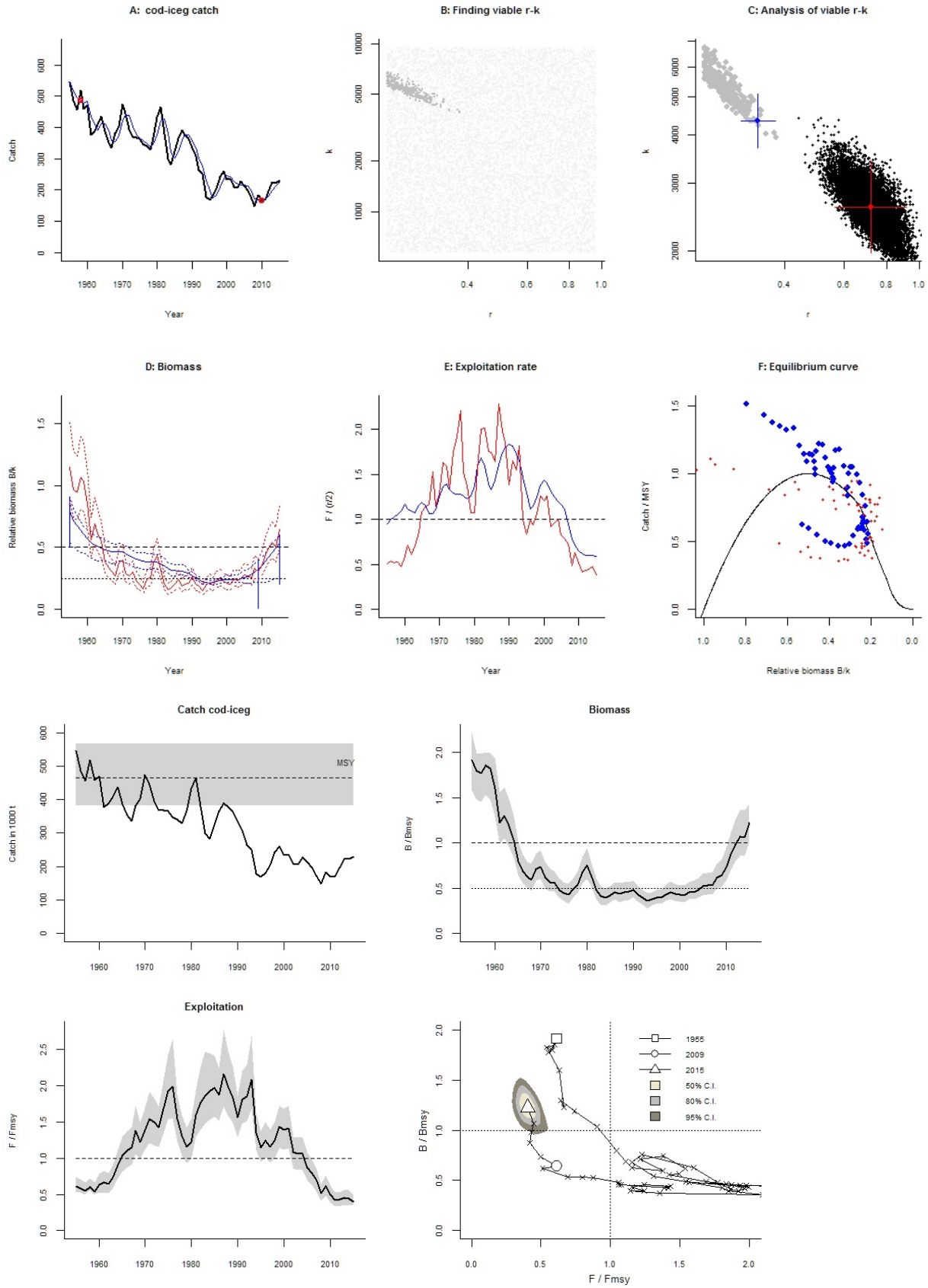
Species: *Gadus morhua* , stock: cod-iceg
Cod in Division Va (Icelandic cod)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/cod-iceg.pdf
Region: Northeast Atlantic , Iceland Sea
Catch data used from years 1955 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2009 default
Prior final relative biomass = 0.2 - 0.6 , default
Prior range for r = 0.23 - 0.96 expert, , prior range for k = 568 - 9483
Prior range of q = 0.501 - 2.05

Results of CMSY analysis with altogether 331 viable trajectories for 312 r-k pairs
r = 0.333 , 95% CL = 0.296 - 0.375 , k = 4336 , 95% CL = 3685 - 5103
MSY = 361 , 95% CL = 331 - 393
Relative biomass last year = 0.531 k, 2.5th = 0.246 , 97.5th = 0.595
Exploitation F/(r/2) in last year = 0.588

Results from Bayesian Schaefer model using catch & CPUE
r = 0.718 , 95% CL = 0.564 - 0.915 , k = 2592 , 95% CL = 1974 - 3404
MSY = 466 , 95% CL = 382 - 568
Relative biomass in last year = 0.613 k, 2.5th perc = 0.506 , 97.5th perc = 0.716
Exploitation F/(r/2) in last year = 0.403
q = 0.32 , lcl = 0.256 , ucl = 0.4

Results for Management (based on BSM analysis)
Fmsy = 0.359 , 95% CL = 0.282 - 0.458 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.359 , 95% CL = 0.282 - 0.458 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 466 , 95% CL = 382 - 568
Bmsy = 1296 , 95% CL = 987 - 1702
Biomass in last year = 1589 , 2.5th perc = 1311 , 97.5 perc = 1855
B/Bmsy in last year = 1.23 , 2.5th perc = 1.01 , 97.5 perc = 1.43
Fishing mortality in last year = 0.145 , 2.5th perc = 0.124 , 97.5 perc = 0.176
F/Fmsy = 0.403 , 2.5th perc = 0.346 , 97.5 perc = 0.489

Stock status and exploitation in 2014
Biomass = 1383 , B/Bmsy = 1.07 , fishing mortality F = 0.16 , F/Fmsy = 0.447
Comment: OK (RF 27.09.16)


A: cod-iceg 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 cod-iceg
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1955
2009
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

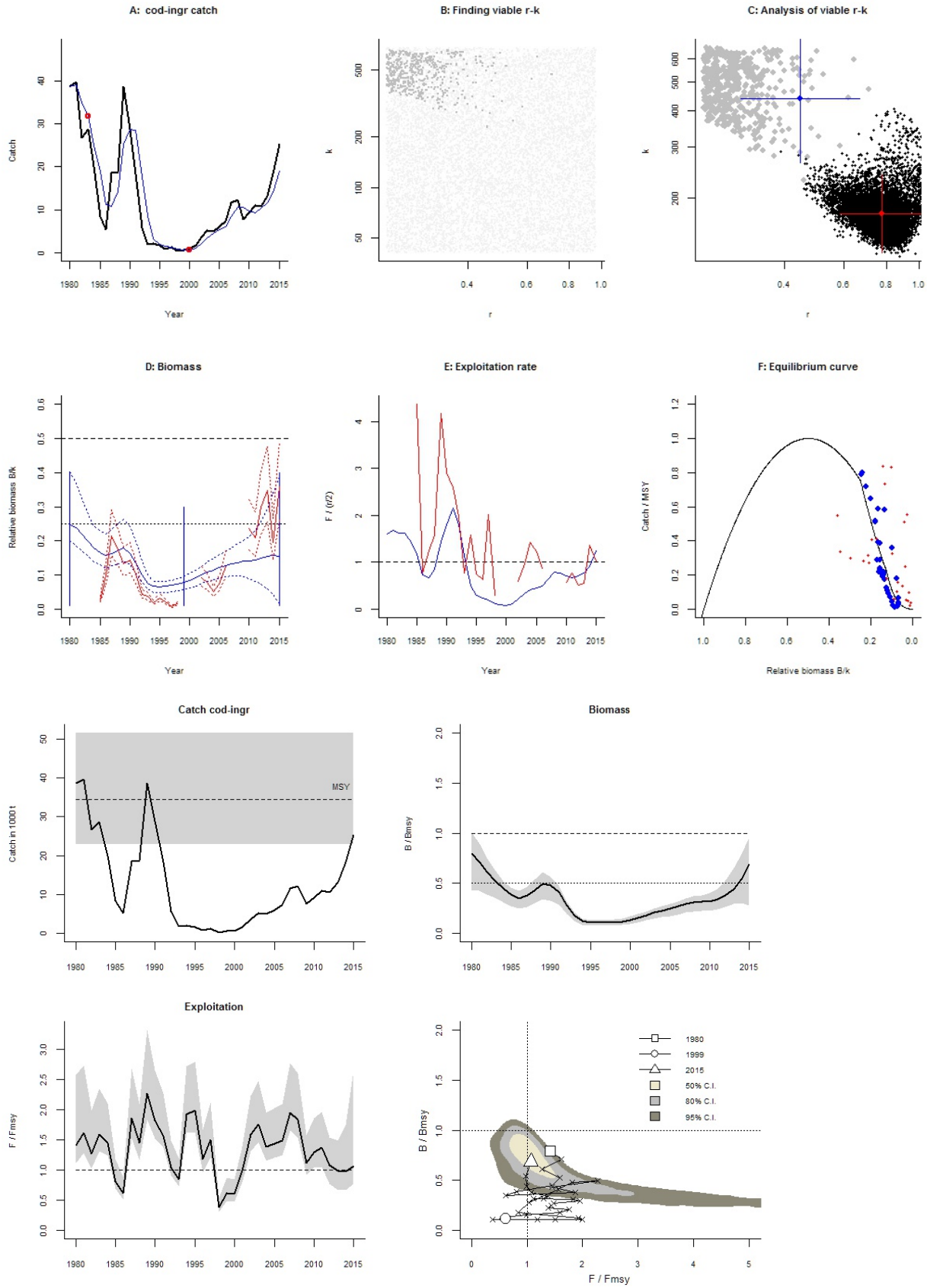
Species: *Gadus morhua* , stock: cod-ingr
Cod in in NAFO Subarea 1, inshore (West Greenland cod)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/cod-ingr.pdf
Region: Northeast Atlantic , Greenland Sea
Catch data used from years 1980 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.3 in year 1999 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.23 - 0.96 expert, , prior range for k = 40.8 - 681
Prior range of q = 0.00671 - 0.0274

Results of CMSY analysis with altogether 485 viable trajectories for 482 r-k pairs
r = 0.445 , 95% CL = 0.297 - 0.667 , k = 440 , 95% CL = 265 - 731
MSY = 48.9 , 95% CL = 27.3 - 87.8
Relative biomass last year = 0.155 k, 2.5th = 0.0168 , 97.5th = 0.389
Exploitation F/(r/2) in last year = 1.25

Results from Bayesian Schaefer model using catch & CPUE
r = 0.779 , 95% CL = 0.585 - 1.04 , k = 177 , 95% CL = 130 - 240
MSY = 34.4 , 95% CL = 22.9 - 51.6
Relative biomass in last year = 0.343 k, 2.5th perc = 0.139 , 97.5th perc = 0.479
Exploitation F/(r/2) in last year = 1.07
q = 0.00725 , lcl = 0.00532 , ucl = 0.00988

Results for Management (based on BSM analysis)
Fmsy = 0.389 , 95% CL = 0.292 - 0.519 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.389 , 95% CL = 0.292 - 0.519 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 34.4 , 95% CL = 22.9 - 51.6
Bmsy = 88.3 , 95% CL = 64.9 - 120
Biomass in last year = 60.6 , 2.5th perc = 24.5 , 97.5 perc = 84.6
B/Bmsy in last year = 0.686 , 2.5th perc = 0.277 , 97.5 perc = 0.958
Fishing mortality in last year = 0.417 , 2.5th perc = 0.299 , 97.5 perc = 1.03
F/Fmsy = 1.07 , 2.5th perc = 0.767 , 97.5 perc = 2.65

Stock status and exploitation in 2014
Biomass = 47.9 , B/Bmsy = 0.542 , fishing mortality F = 0.383 , F/Fmsy = 0.983
Comment: OK (RF 27.09.16)


A: cod-ingr 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 cod-ingr
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1980
1999
2015
50% C.I.
80% C.I.
95% C.I.

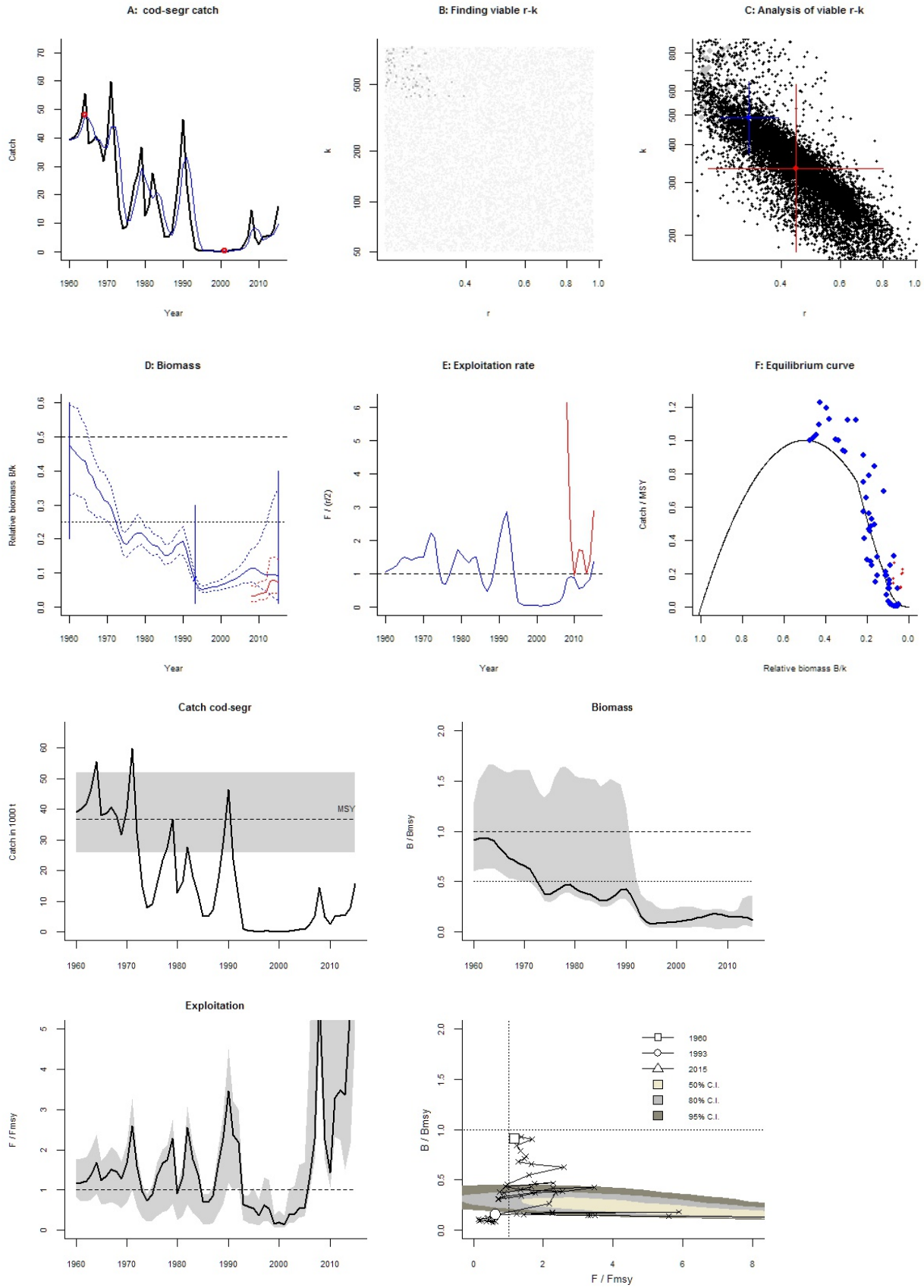
Species: *Gadus morhua* , stock: cod-segr
Cod in ICES Subarea XIV and NAFO Subdivision 1F (East Greenland, South Greenland)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/cod-segr.pdf
Region: Northeast Atlantic , Greenland Sea
Catch data used from years 1960 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.01 - 0.3 in year 1993 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.23 - 0.96 expert, , prior range for k = 50 - 834
Prior range of q = 4.65 - 19

Results of CMSY analysis with altogether 60 viable trajectories for 60 r-k pairs
r = 0.321 , 95% CL = 0.262 - 0.392 , k = 489 , 95% CL = 372 - 643
MSY = 39.2 , 95% CL = 28.3 - 54.3
Relative biomass last year = 0.0912 k, 2.5th = 0.0177 , 97.5th = 0.35
Exploitation F/(r/2) in last year = 1.36

Results from Bayesian Schaefer model using catch & CPUE
r = 0.442 , 95% CL = 0.242 - 0.805 , k = 333 , 95% CL = 177 - 628
MSY = 36.8 , 95% CL = 25.9 - 52.1
Relative biomass in last year = 0.0591 k, 2.5th perc = 0.0236 , 97.5th perc = 0.183
Exploitation F/(r/2) in last year = 3.62
q = 6.36 , lcl = 4.19 , ucl = 9.67

Results for Management (based on BSM analysis)
Fmsy = 0.221 , 95% CL = 0.121 - 0.402 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0522 , 95% CL = 0.0287 - 0.0951 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 36.8 , 95% CL = 25.9 - 52.1
Bmsy = 167 , 95% CL = 88.4 - 314
Biomass in last year = 19.7 , 2.5th perc = 7.88 , 97.5 perc = 61.1
B/Bmsy in last year = 0.118 , 2.5th perc = 0.0473 , 97.5 perc = 0.367
Fishing mortality in last year = 0.8 , 2.5th perc = 0.258 , 97.5 perc = 2
F/Fmsy = 15.3 , 2.5th perc = 4.94 , 97.5 perc = 38.3

Stock status and exploitation in 2014
Biomass = 23.1 , B/Bmsy = 0.139 , fishing mortality F = 0.342 , F/Fmsy = 5.59
Comment: OK (RF 27.09.16)

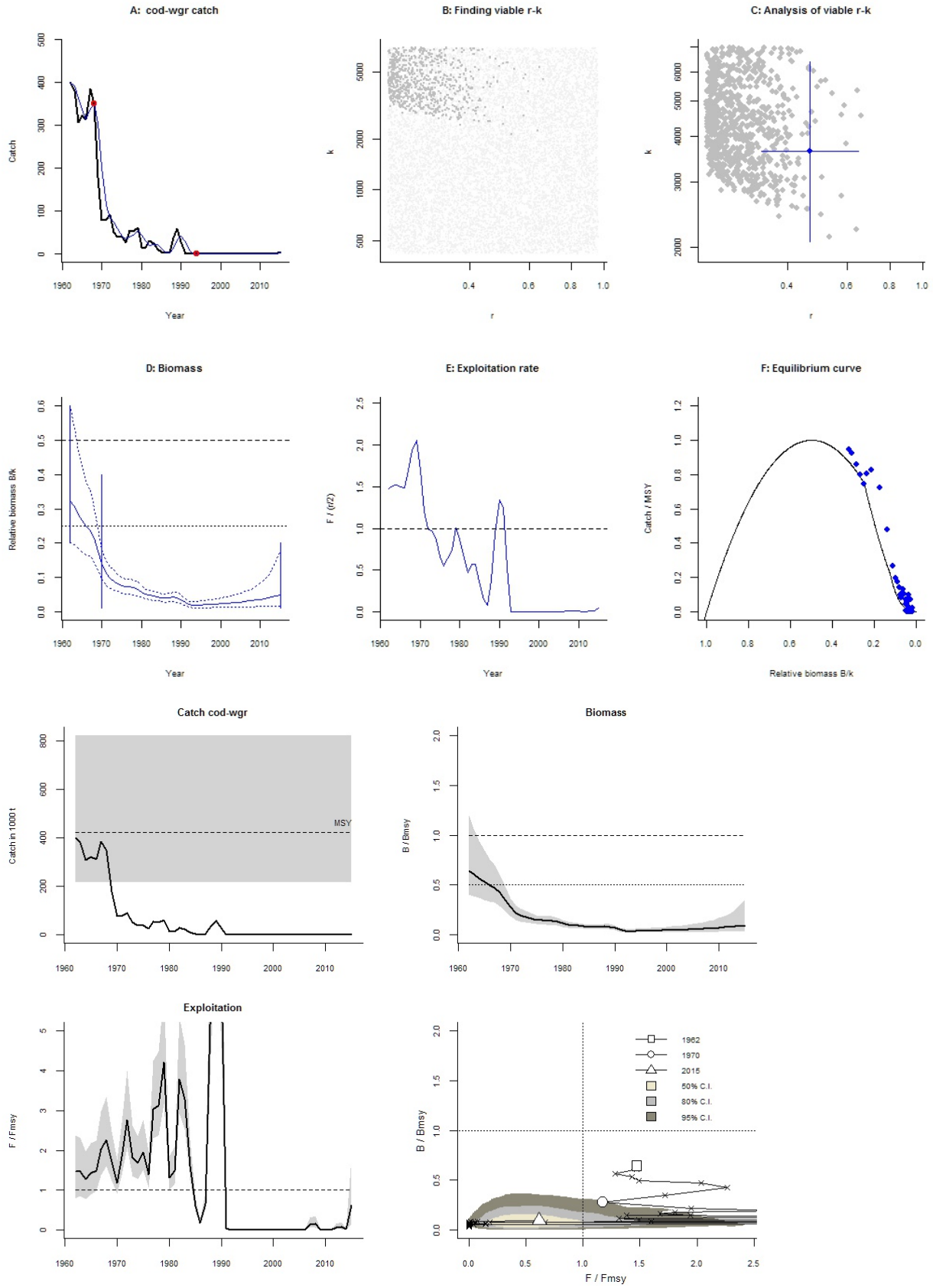

A: cod-segr catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch cod-segr
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1960
1993
2015
50% C.I.
80% C.I.
95% C.I.

Species: *Gadus morhua* , stock: cod-wgr
Cod in in NAFO Subdivisions 1A–E, offshore (West Greenland)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/cod-wgr.pdf
Region: Northeast Atlantic , Greenland Sea
Catch data used from years 1962 - 2015 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 1970 expert
Prior final relative biomass = 0.01 - 0.2 expert
Prior range for r = 0.23 - 0.96 expert, , prior range for k = 417 - 6969

Results of CMSY analysis with altogether 761 viable trajectories for 753 r-k pairs
r = 0.465 , 95% CL = 0.334 - 0.648 , k = 3637 , 95% CL = 2071 - 6389
MSY = 423 , 95% CL = 217 - 824
Relative biomass last year = 0.0483 k, 2.5th = 0.0165 , 97.5th = 0.179
Exploitation F/(r/2) in last year = 0.0445

Results for Management (based on CMSY analysis)
Fmsy = 0.233 , 95% CL = 0.167 - 0.324 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0449 , 95% CL = 0.0322 - 0.0626 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 423 , 95% CL = 217 - 824
Bmsy = 1819 , 95% CL = 1035 - 3194
Biomass in last year = 176 , 2.5th perc = 60 , 97.5 perc = 649
B/Bmsy in last year = 0.0965 , 2.5th perc = 0.033 , 97.5 perc = 0.357
Fishing mortality in last year = 0.0277 , 2.5th perc = 0.00749 , 97.5 perc = 0.0811
F/Fmsy = 0.617 , 2.5th perc = 0.167 , 97.5 perc = 1.81

Stock status and exploitation in 2014
Biomass = 165 , B/Bmsy = 0.0906 , fishing mortality F = 0.000704 , F/Fmsy = 0.0167
Comment: OK (RF 27.09.16)


A: cod-wgr 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 cod-wgr
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1962
1970
2015
50% C.I.
80% C.I.
95% C.I.

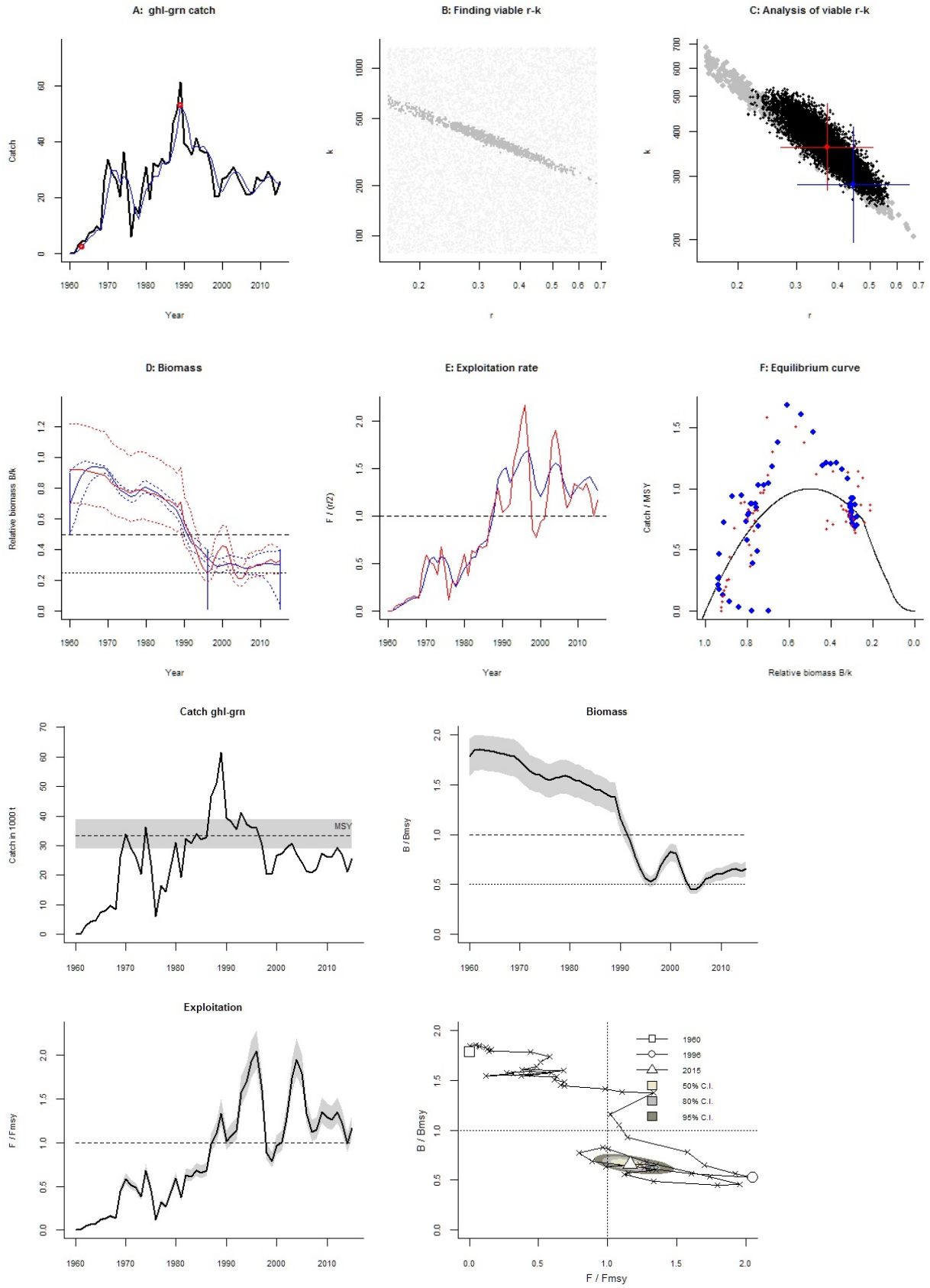
Species: *Reinhardtius hippoglossoides* , stock: ghl-grn
Greenland halibut in Subareas V, VI, XII, and XIV (Iceland and Faroes grounds, West of Scotland, North of Azores, East of Greenland)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/ghl-grn.pdf
Region: Northeast Atlantic , Iceland Sea
Catch data used from years 1960 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 1996 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.16 - 0.68 expert, , prior range for k = 78 - 1326
Prior range of q = 4.21e-06 - 1.74e-05

Results of CMSY analysis with altogether 3138 viable trajectories for 968 r-k pairs
r = 0.445 , 95% CL = 0.302 - 0.654 , k = 284 , 95% CL = 196 - 410
MSY = 31.5 , 95% CL = 28.8 - 34.6
Relative biomass last year = 0.306 k, 2.5th = 0.0384 , 97.5th = 0.396
Exploitation F/(r/2) in last year = 1.27

Results from Bayesian Schaefer model using catch & CPUE
r = 0.371 , 95% CL = 0.269 - 0.51 , k = 361 , 95% CL = 274 - 476
MSY = 33.5 , 95% CL = 28.9 - 38.8
Relative biomass in last year = 0.329 k, 2.5th perc = 0.29 , 97.5th perc = 0.366
Exploitation F/(r/2) in last year = 1.16
q = 6.01e-06 , lcl = 4.65e-06 , ucl = 7.77e-06

Results for Management (based on BSM analysis)
Fmsy = 0.185 , 95% CL = 0.135 - 0.255 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.185 , 95% CL = 0.135 - 0.255 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 33.5 , 95% CL = 28.9 - 38.8
Bmsy = 181 , 95% CL = 137 - 238
Biomass in last year = 119 , 2.5th perc = 105 , 97.5 perc = 132
B/Bmsy in last year = 0.659 , 2.5th perc = 0.581 , 97.5 perc = 0.731
Fishing mortality in last year = 0.216 , 2.5th perc = 0.194 , 97.5 perc = 0.245
F/Fmsy = 1.16 , 2.5th perc = 1.05 , 97.5 perc = 1.32

Stock status and exploitation in 2014
Biomass = 115 , B/Bmsy = 0.638 , fishing mortality F = 0.183 , F/Fmsy = 0.986
Comment: OK (RF 27.09.16)


A: ghl-grn 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 ghl-grn
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1960
1996
2015
50% C.I.
80% C.I.
95% C.I.

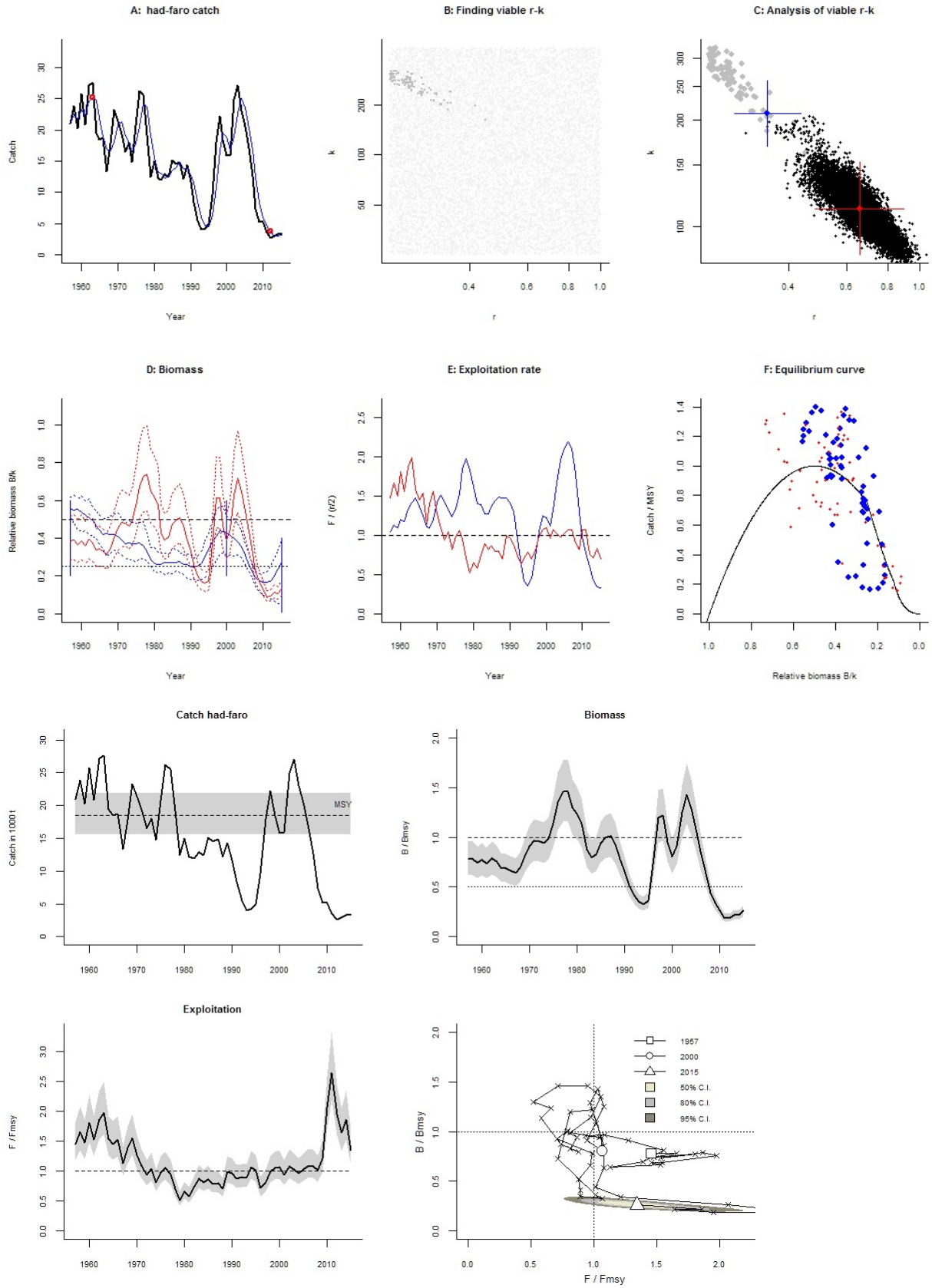
Species: *Melanogrammus aeglefinus* , stock: had-faro
Haddock in Division Vb
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/had-faro.pdf
Region: Northeast Atlantic , Faroes
Catch data used from years 1957 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2000 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.23 - 1 expert, , prior range for k = 25.2 - 438
Prior range of q = 0.897 - 3.74

Results of CMSY analysis with altogether 93 viable trajectories for 90 r-k pairs
r = 0.346 , 95% CL = 0.274 - 0.435 , k = 209 , 95% CL = 169 - 258
MSY = 18 , 95% CL = 15.4 - 21.2
Relative biomass last year = 0.271 k, 2.5th = 0.0444 , 97.5th = 0.389
Exploitation F/(r/2) in last year = 0.328

Results from Bayesian Schaefer model using catch & CPUE
r = 0.655 , 95% CL = 0.481 - 0.893 , k = 113 , 95% CL = 83.4 - 152
MSY = 18.5 , 95% CL = 15.6 - 21.9
Relative biomass in last year = 0.131 k, 2.5th perc = 0.103 , 97.5th perc = 0.161
Exploitation F/(r/2) in last year = 0.703
q = 1.18 , lcl = 0.916 , ucl = 1.51

Results for Management (based on BSM analysis)
Fmsy = 0.328 , 95% CL = 0.241 - 0.446 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.172 , 95% CL = 0.126 - 0.234 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 18.5 , 95% CL = 15.6 - 21.9
Bmsy = 56.3 , 95% CL = 41.7 - 76.1
Biomass in last year = 14.7 , 2.5th perc = 11.6 , 97.5 perc = 18.1
B/Bmsy in last year = 0.262 , 2.5th perc = 0.206 , 97.5 perc = 0.321
Fishing mortality in last year = 0.23 , 2.5th perc = 0.188 , 97.5 perc = 0.293
F/Fmsy = 1.34 , 2.5th perc = 1.09 , 97.5 perc = 1.71

Stock status and exploitation in 2014
Biomass = 12.3 , B/Bmsy = 0.218 , fishing mortality F = 0.266 , F/Fmsy = 1.86
Comment: OK (RF 27.9.16)


A: had-faro 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 had-faro
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1957
2000
2015
50% C.I.
80% C.I.
95% C.I.

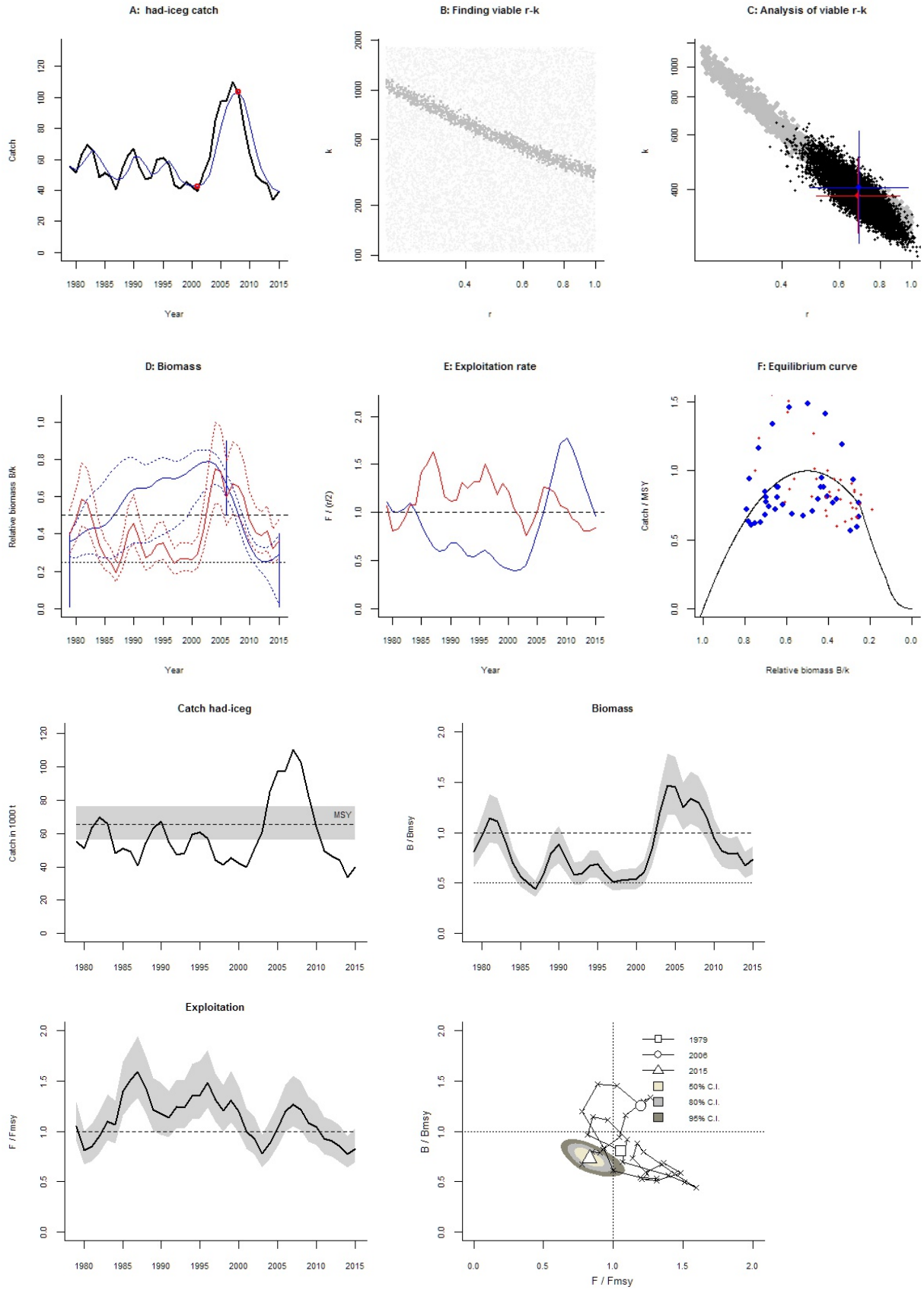
Species: *Melanogrammus aeglefinus* , stock: had-iceg
Haddock in Division Va (Icelandic haddock)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/had-iceg.pdf
Region: Northeast Atlantic , Iceland Sea
Catch data used from years 1979 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.5 - 0.9 in year 2006 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.23 - 1 expert, , prior range for k = 103 - 1800
Prior range of q = 0.417 - 1.74

Results of CMSY analysis with altogether 2288 viable trajectories for 1231 r-k pairs
r = 0.687 , 95% CL = 0.486 - 0.972 , k = 405 , 95% CL = 266 - 618
MSY = 69.7 , 95% CL = 60.1 - 80.7
Relative biomass last year = 0.292 k, 2.5th = 0.0208 , 97.5th = 0.395
Exploitation F/(r/2) in last year = 0.962

Results from Bayesian Schaefer model using catch & CPUE
r = 0.684 , 95% CL = 0.511 - 0.916 , k = 381 , 95% CL = 287 - 506
MSY = 65.2 , 95% CL = 56 - 76
Relative biomass in last year = 0.366 k, 2.5th perc = 0.296 , 97.5th perc = 0.434
Exploitation F/(r/2) in last year = 0.829
q = 0.633 , lcl = 0.492 , ucl = 0.815

Results for Management (based on BSM analysis)
Fmsy = 0.342 , 95% CL = 0.256 - 0.458 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.342 , 95% CL = 0.256 - 0.458 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 65.2 , 95% CL = 56 - 76
Bmsy = 191 , 95% CL = 144 - 253
Biomass in last year = 140 , 2.5th perc = 113 , 97.5 perc = 166
B/Bmsy in last year = 0.733 , 2.5th perc = 0.591 , 97.5 perc = 0.869
Fishing mortality in last year = 0.284 , 2.5th perc = 0.239 , 97.5 perc = 0.352
F/Fmsy = 0.829 , 2.5th perc = 0.699 , 97.5 perc = 1.03

Stock status and exploitation in 2014
Biomass = 128 , B/Bmsy = 0.67 , fishing mortality F = 0.265 , F/Fmsy = 0.776
Comment: OK (RF 27.09.16)


A: had-iceg 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 had-iceg
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1979
2006
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

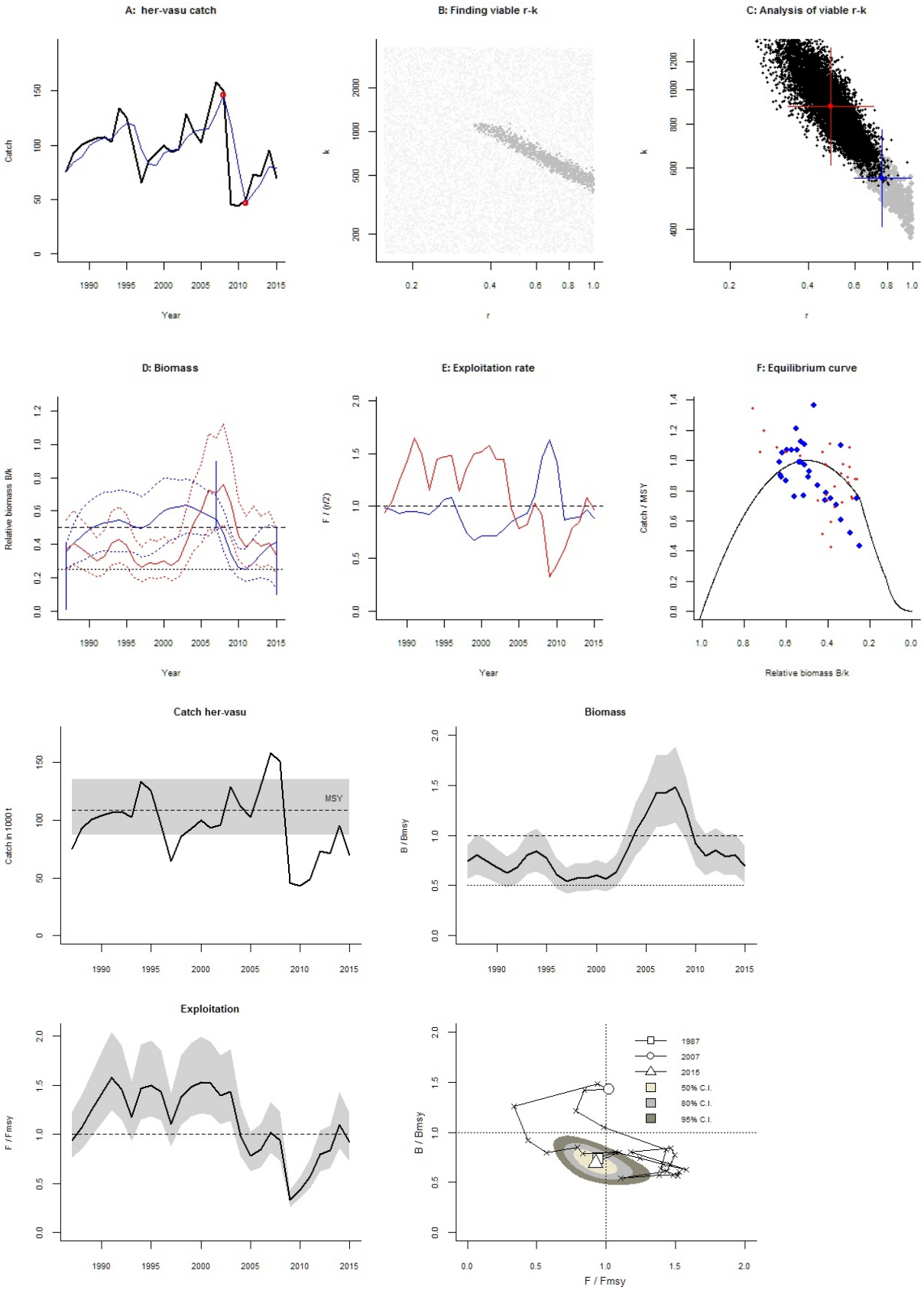
Species: *Clupea harengus* , stock: her-vasu
Herring in Division Va (Iceland grounds) (summer-spawning herring)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/her-vasu.pdf
Region: Northeast Atlantic , Iceland Sea
Catch data used from years 1987 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.5 - 0.9 in year 2007 expert
Prior final relative biomass = 0.1 - 0.5 expert
Prior range for r = 0.16 - 1 expert, , prior range for k = 147 - 3748
Prior range of q = 0.665 - 3.36

Results of CMSY analysis with altogether 1177 viable trajectories for 1021 r-k pairs
r = 0.765 , 95% CL = 0.596 - 0.982 , k = 560 , 95% CL = 407 - 770
MSY = 107 , 95% CL = 93.6 - 123
Relative biomass last year = 0.415 k, 2.5th = 0.139 , 97.5th = 0.496
Exploitation F/(r/2) in last year = 0.886

Results from Bayesian Schaefer model using catch & CPUE
r = 0.485 , 95% CL = 0.331 - 0.711 , k = 895 , 95% CL = 609 - 1317
MSY = 109 , 95% CL = 87.2 - 135
Relative biomass in last year = 0.347 k, 2.5th perc = 0.265 , 97.5th perc = 0.443
Exploitation F/(r/2) in last year = 0.924
q = 1.16 , lcl = 0.862 , ucl = 1.56

Results for Management (based on BSM analysis)
Fmsy = 0.243 , 95% CL = 0.166 - 0.355 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.243 , 95% CL = 0.166 - 0.355 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 109 , 95% CL = 87.2 - 135
Bmsy = 448 , 95% CL = 304 - 658
Biomass in last year = 311 , 2.5th perc = 237 , 97.5 perc = 396
B/Bmsy in last year = 0.694 , 2.5th perc = 0.529 , 97.5 perc = 0.886
Fishing mortality in last year = 0.224 , 2.5th perc = 0.176 , 97.5 perc = 0.294
F/Fmsy = 0.924 , 2.5th perc = 0.725 , 97.5 perc = 1.21

Stock status and exploitation in 2014
Biomass = 358 , B/Bmsy = 0.8 , fishing mortality F = 0.265 , F/Fmsy = 1.09
Comment: OK (RF 27.09.16)


A: her-vasu 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 her-vasu
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1987
2007
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

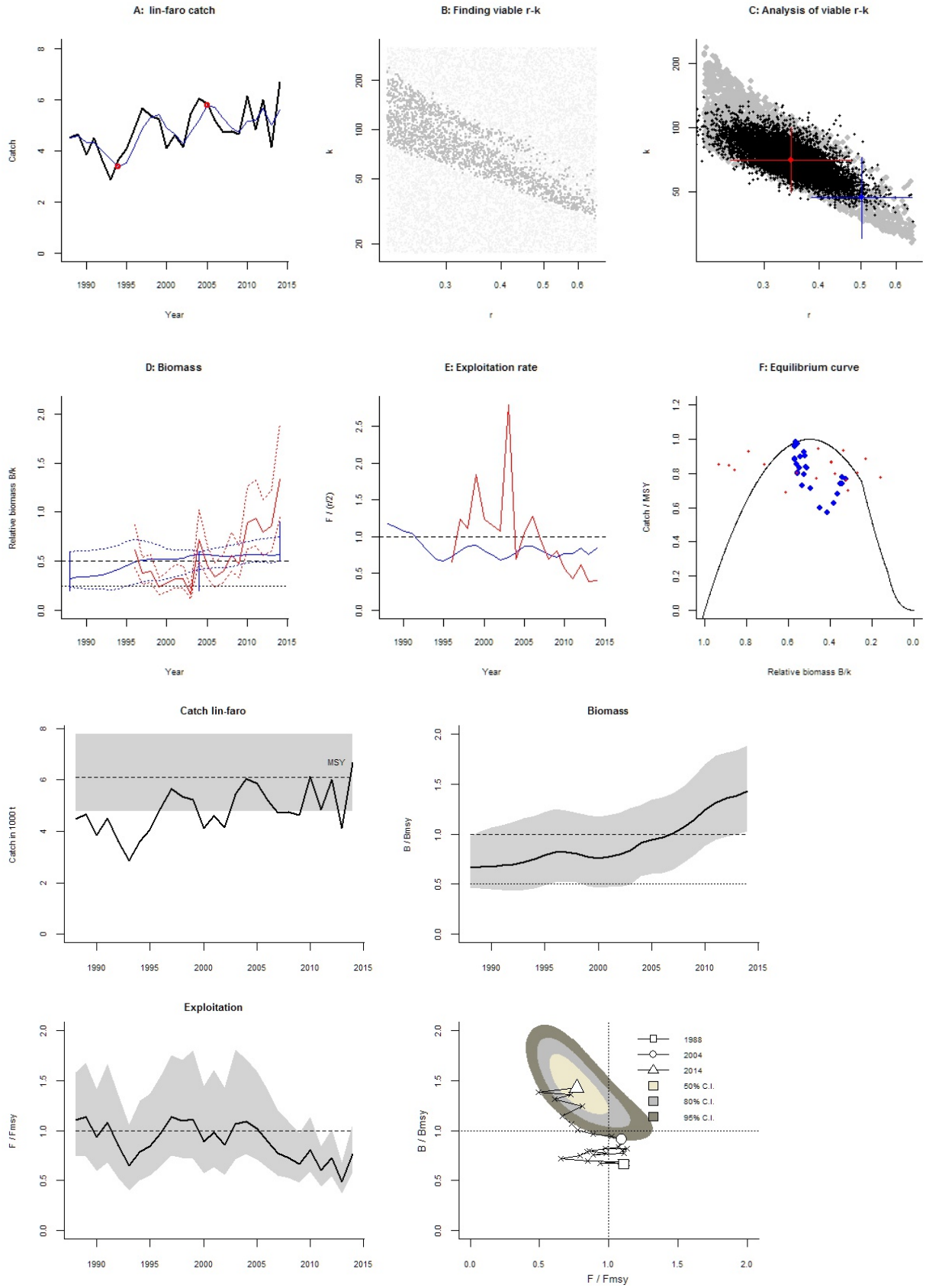
Species: *Molva molva* , stock: lin-faro
Ling in Division Vb (Faroes Grounds)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/lin-faro.pdf
Region: Northeast Atlantic , Faroes
Catch data used from years 1988 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2004 expert
Prior final relative biomass = 0.5 - 0.9 expert
Prior range for r = 0.22 - 0.66 expert, , prior range for k = 17.5 - 315
Prior range of q = 2e-04 - 0.000694

Results of CMSY analysis with altogether 3746 viable trajectories for 1950 r-k pairs
r = 0.502 , 95% CL = 0.386 - 0.651 , k = 46.8 , 95% CL = 30.1 - 72.7
MSY = 5.87 , 95% CL = 4.13 - 8.34
Relative biomass last year = 0.568 k, 2.5th = 0.503 , 97.5th = 0.749
Exploitation F/(r/2) in last year = 0.842

Results from Bayesian Schaefer model using catch & CPUE
r = 0.346 , 95% CL = 0.252 - 0.475 , k = 70.4 , 95% CL = 49.6 - 100
MSY = 6.1 , 95% CL = 4.77 - 7.79
Relative biomass in last year = 0.713 k, 2.5th perc = 0.514 , 97.5th perc = 0.943
Exploitation F/(r/2) in last year = 0.769
q = 0.000354 , lcl = 0.00027 , ucl = 0.000465

Results for Management (based on BSM analysis)
Fmsy = 0.173 , 95% CL = 0.126 - 0.238 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.173 , 95% CL = 0.126 - 0.238 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 6.1 , 95% CL = 4.77 - 7.79
Bmsy = 35.2 , 95% CL = 24.8 - 50
Biomass in last year = 50.2 , 2.5th perc = 36.2 , 97.5 perc = 66.4
B/Bmsy in last year = 1.43 , 2.5th perc = 1.03 , 97.5 perc = 1.89
Fishing mortality in last year = 0.133 , 2.5th perc = 0.101 , 97.5 perc = 0.185
F/Fmsy = 0.769 , 2.5th perc = 0.581 , 97.5 perc = 1.07

Stock status and exploitation in 2014
Biomass = 50.2 , B/Bmsy = 1.43 , fishing mortality F = 0.133 , F/Fmsy = 0.769
Comment: OK (RF 27.9.16)


A: Iin-faro 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 Iin-faro
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1988
2004
2014
50% C.I.
80% C.I.
95% C.I.

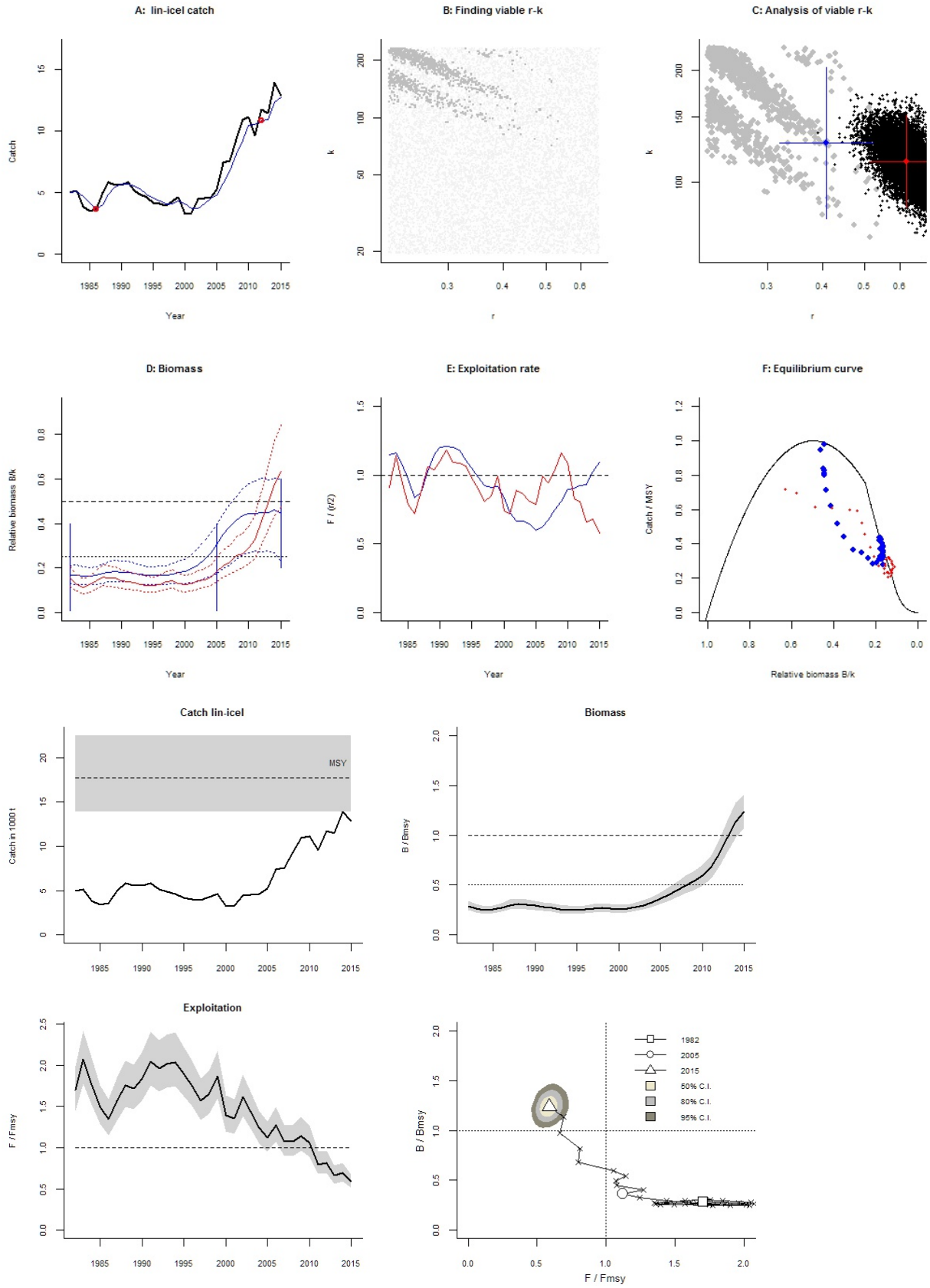
Species: *Molva molva* , stock: lin-icel
Ling in Division 5.a (Iceland grounds)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/lin-icel.pdf
Region: Northeast Atlantic , Iceland Sea
Catch data used from years 1982 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2005 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.22 - 0.66 expert, , prior range for k = 19.3 - 232
Prior range of q = 0.418 - 1.45

Results of CMSY analysis with altogether 1066 viable trajectories for 1066 r-k pairs
r = 0.409 , 95% CL = 0.32 - 0.522 , k = 128 , 95% CL = 80.1 - 204
MSY = 13.1 , 95% CL = 7.65 - 22.3
Relative biomass last year = 0.445 k, 2.5th = 0.228 , 97.5th = 0.595
Exploitation F/(r/2) in last year = 1.1

Results from Bayesian Schaefer model using catch & CPUE
r = 0.621 , 95% CL = 0.512 - 0.753 , k = 114 , 95% CL = 85.5 - 152
MSY = 17.7 , 95% CL = 13.9 - 22.5
Relative biomass in last year = 0.618 k, 2.5th perc = 0.538 , 97.5th perc = 0.703
Exploitation F/(r/2) in last year = 0.588
q = 0.57 , lcl = 0.461 , ucl = 0.705

Results for Management (based on BSM analysis)
Fmsy = 0.311 , 95% CL = 0.256 - 0.377 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.311 , 95% CL = 0.256 - 0.377 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 17.7 , 95% CL = 13.9 - 22.5
Bmsy = 57 , 95% CL = 42.8 - 76
Biomass in last year = 70.5 , 2.5th perc = 61.3 , 97.5 perc = 80.1
B/Bmsy in last year = 1.24 , 2.5th perc = 1.08 , 97.5 perc = 1.41
Fishing mortality in last year = 0.182 , 2.5th perc = 0.16 , 97.5 perc = 0.21
F/Fmsy = 0.588 , 2.5th perc = 0.517 , 97.5 perc = 0.675

Stock status and exploitation in 2014
Biomass = 64.8 , B/Bmsy = 1.14 , fishing mortality F = 0.215 , F/Fmsy = 0.692
Comment: OK (RF 27.09.16)


A: lin-icel 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-icel
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1982
2005
2015
50% C.I.
80% C.I.
95% C.I.

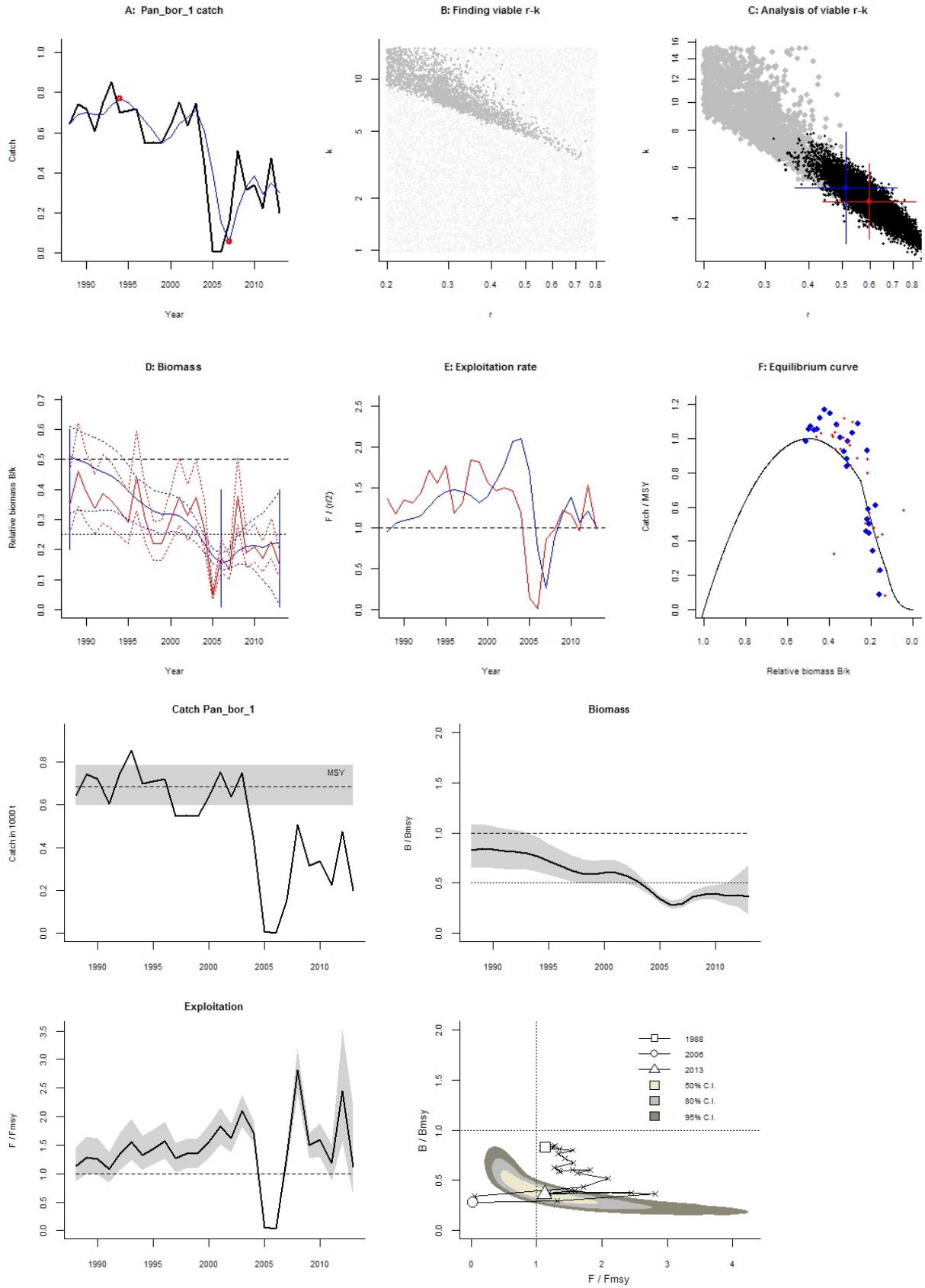
Species: *Pandalus borealis* , stock: Pan_bor_1
Northern shrimp in Arnarfjordur
Source: Report of WKLIFE IV, ICES CM 2014/ACOM:54
Region: Northeast Atlantic , Iceland Sea
Catch data used from years 1988 - 2013 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2006 default
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 0.96 - 15.4
Prior range of q = 0.702 - 2.81

Results of CMSY analysis with altogether 3258 viable trajectories for 2392 r-k pairs
r = 0.513 , 95% CL = 0.366 - 0.718 , k = 5.12 , 95% CL = 3.3 - 7.92
MSY = 0.656 , 95% CL = 0.498 - 0.865
Relative biomass last year = 0.224 k, 2.5th = 0.014 , 97.5th = 0.394
Exploitation F/(r/2) in last year = 1.02

Results from Bayesian Schaefer model using catch & CPUE
r = 0.599 , 95% CL = 0.441 - 0.814 , k = 4.58 , 95% CL = 3.41 - 6.15
MSY = 0.686 , 95% CL = 0.598 - 0.787
Relative biomass in last year = 0.181 k, 2.5th perc = 0.094 , 97.5th perc = 0.341
Exploitation F/(r/2) in last year = 0.812
q = 1.09 , lcl = 0.834 , ucl = 1.42

Results for Management (based on BSM analysis)
Fmsy = 0.299 , 95% CL = 0.22 - 0.407 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.216 , 95% CL = 0.159 - 0.294 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.686 , 95% CL = 0.598 - 0.787
Bmsy = 2.29 , 95% CL = 1.7 - 3.08
Biomass in last year = 0.827 , 2.5th perc = 0.43 , 97.5 perc = 1.56
B/Bmsy in last year = 0.361 , 2.5th perc = 0.188 , 97.5 perc = 0.681
Fishing mortality in last year = 0.243 , 2.5th perc = 0.129 , 97.5 perc = 0.467
F/Fmsy = 1.12 , 2.5th perc = 0.596 , 97.5 perc = 2.16

Stock status and exploitation in 2014
Biomass = , B/Bmsy = , fishing mortality F = , F/Fmsy =
Comment: OK (RF 27.09.16)


A: Pan_bor_1 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 Pan_bor_1
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1988
2006
2013
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

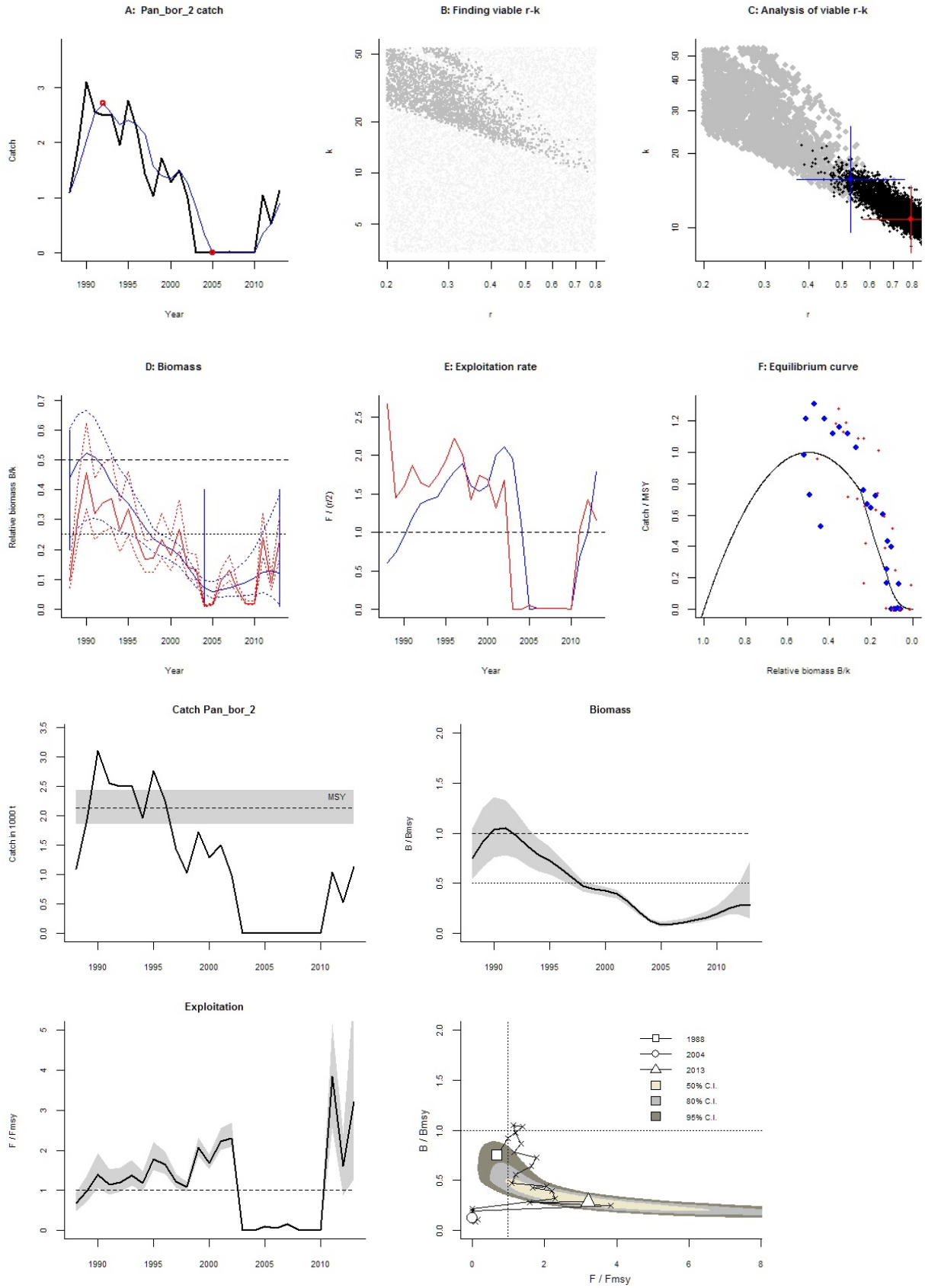
Species: *Pandalus borealis* , stock: Pan_bor_2
Northern shrimp in Isafjardardjup
Source: Report of WKLIFE IV, ICES CM 2014/ACOM:54
Region: Northeast Atlantic , Iceland Sea
Catch data used from years 1988 - 2013 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2004 default
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 3.4 - 54.4
Prior range of q = 0.632 - 2.53

Results of CMSY analysis with altogether 3446 viable trajectories for 2832 r-k pairs
r = 0.529 , 95% CL = 0.37 - 0.755 , k = 15.7 , 95% CL = 9.59 - 25.9
MSY = 2.08 , 95% CL = 1.43 - 3.02
Relative biomass last year = 0.121 k, 2.5th = 0.015 , 97.5th = 0.385
Exploitation F/(r/2) in last year = 1.79

Results from Bayesian Schaefer model using catch & CPUE
r = 0.788 , 95% CL = 0.572 - 1.09 , k = 10.8 , 95% CL = 7.91 - 14.7
MSY = 2.13 , 95% CL = 1.86 - 2.44
Relative biomass in last year = 0.144 k, 2.5th perc = 0.0758 , 97.5th perc = 0.359
Exploitation F/(r/2) in last year = 1.84
q = 0.794 , lcl = 0.607 , ucl = 1.04

Results for Management (based on BSM analysis)
Fmsy = 0.394 , 95% CL = 0.286 - 0.543 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.226 , 95% CL = 0.164 - 0.312 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 2.13 , 95% CL = 1.86 - 2.44
Bmsy = 5.4 , 95% CL = 3.96 - 7.37
Biomass in last year = 1.55 , 2.5th perc = 0.819 , 97.5 perc = 3.87
B/Bmsy in last year = 0.287 , 2.5th perc = 0.152 , 97.5 perc = 0.718
Fishing mortality in last year = 0.727 , 2.5th perc = 0.291 , 97.5 perc = 1.38
F/Fmsy = 3.21 , 2.5th perc = 1.29 , 97.5 perc = 6.08

Stock status and exploitation in 2014
Biomass = , B/Bmsy = , fishing mortality F = , F/Fmsy =
Comment: OK (RF 27.09.16)


A: Pan_bor_2 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 Pan_bor_2
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1988
2004
2013
50% C.I.
80% C.I.
95% C.I.

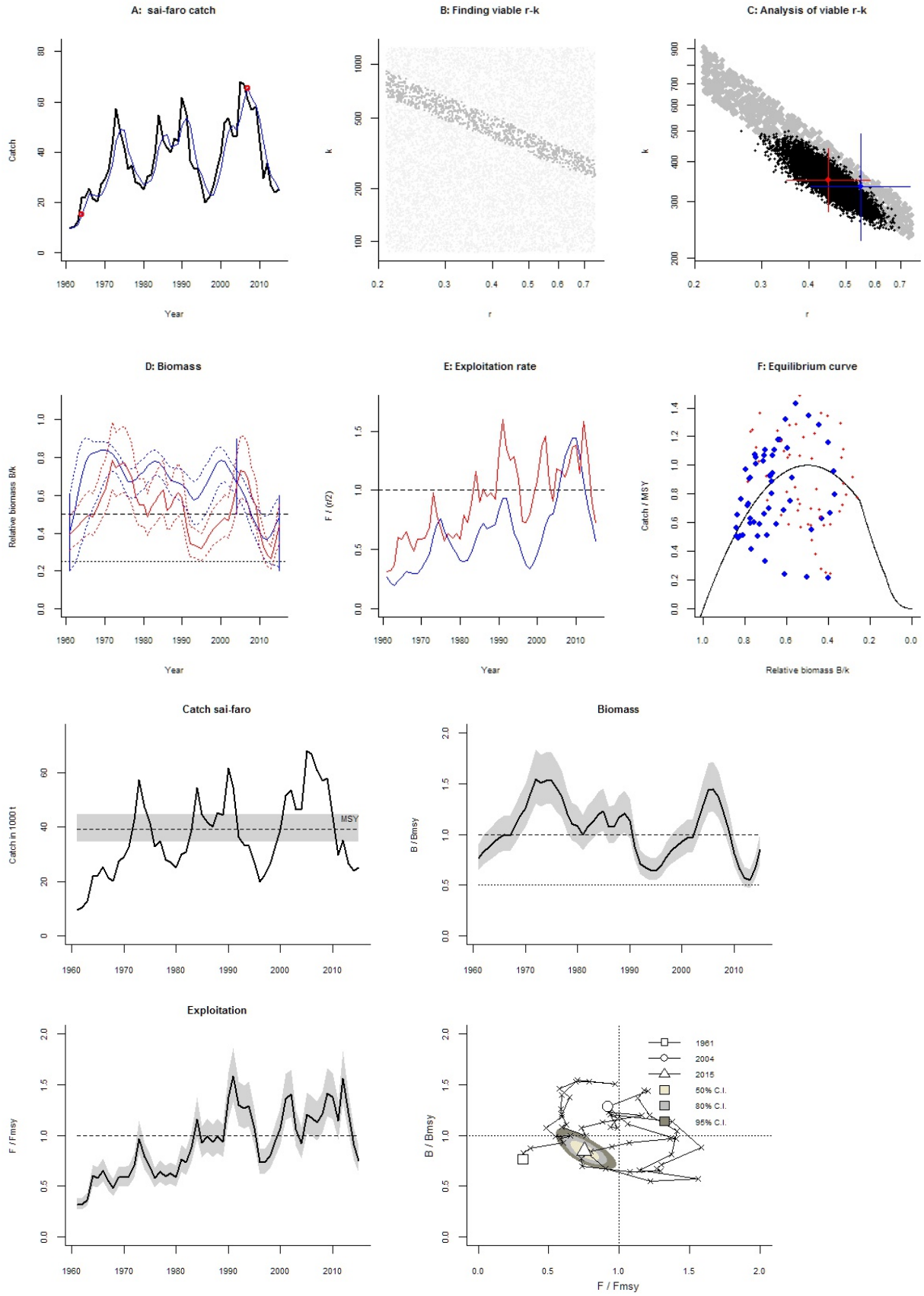
Species: *Pollachius virens* , stock: sai-faro
Saithe in Division Vb (Faroe Saithe)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/sai-faro.pdf
Region: Northeast Atlantic , Faroes
Catch data used from years 1961 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.5 - 0.9 in year 2004 expert
Prior final relative biomass = 0.2 - 0.6 , default
Prior range for r = 0.21 - 0.75 expert, , prior range for k = 87 - 1242
Prior range of q = 0.36 - 1.36

Results of CMSY analysis with altogether 7727 viable trajectories for 1010 r-k pairs
r = 0.547 , 95% CL = 0.405 - 0.74 , k = 334 , 95% CL = 227 - 490
MSY = 45.7 , 95% CL = 38.9 - 53.7
Relative biomass last year = 0.48 k, 2.5th = 0.222 , 97.5th = 0.596
Exploitation F/(r/2) in last year = 0.574

Results from Bayesian Schaefer model using catch & CPUE
r = 0.45 , 95% CL = 0.349 - 0.579 , k = 350 , 95% CL = 279 - 439
MSY = 39.4 , 95% CL = 34.8 - 44.6
Relative biomass in last year = 0.424 k, 2.5th perc = 0.356 , 97.5th perc = 0.506
Exploitation F/(r/2) in last year = 0.752
q = 0.501 , lcl = 0.397 , ucl = 0.631

Results for Management (based on BSM analysis)
Fmsy = 0.225 , 95% CL = 0.175 - 0.29 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.225 , 95% CL = 0.175 - 0.29 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 39.4 , 95% CL = 34.8 - 44.6
Bmsy = 175 , 95% CL = 140 - 219
Biomass in last year = 148 , 2.5th perc = 125 , 97.5 perc = 177
B/Bmsy in last year = 0.848 , 2.5th perc = 0.712 , 97.5 perc = 1.01
Fishing mortality in last year = 0.169 , 2.5th perc = 0.142 , 97.5 perc = 0.201
F/Fmsy = 0.752 , 2.5th perc = 0.631 , 97.5 perc = 0.896

Stock status and exploitation in 2014
Biomass = 118 , B/Bmsy = 0.671 , fishing mortality F = 0.203 , F/Fmsy = 0.903
Comment: OK (RF 27.9.16)


A: sai-faro 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 sai-faro
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1961
2004
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

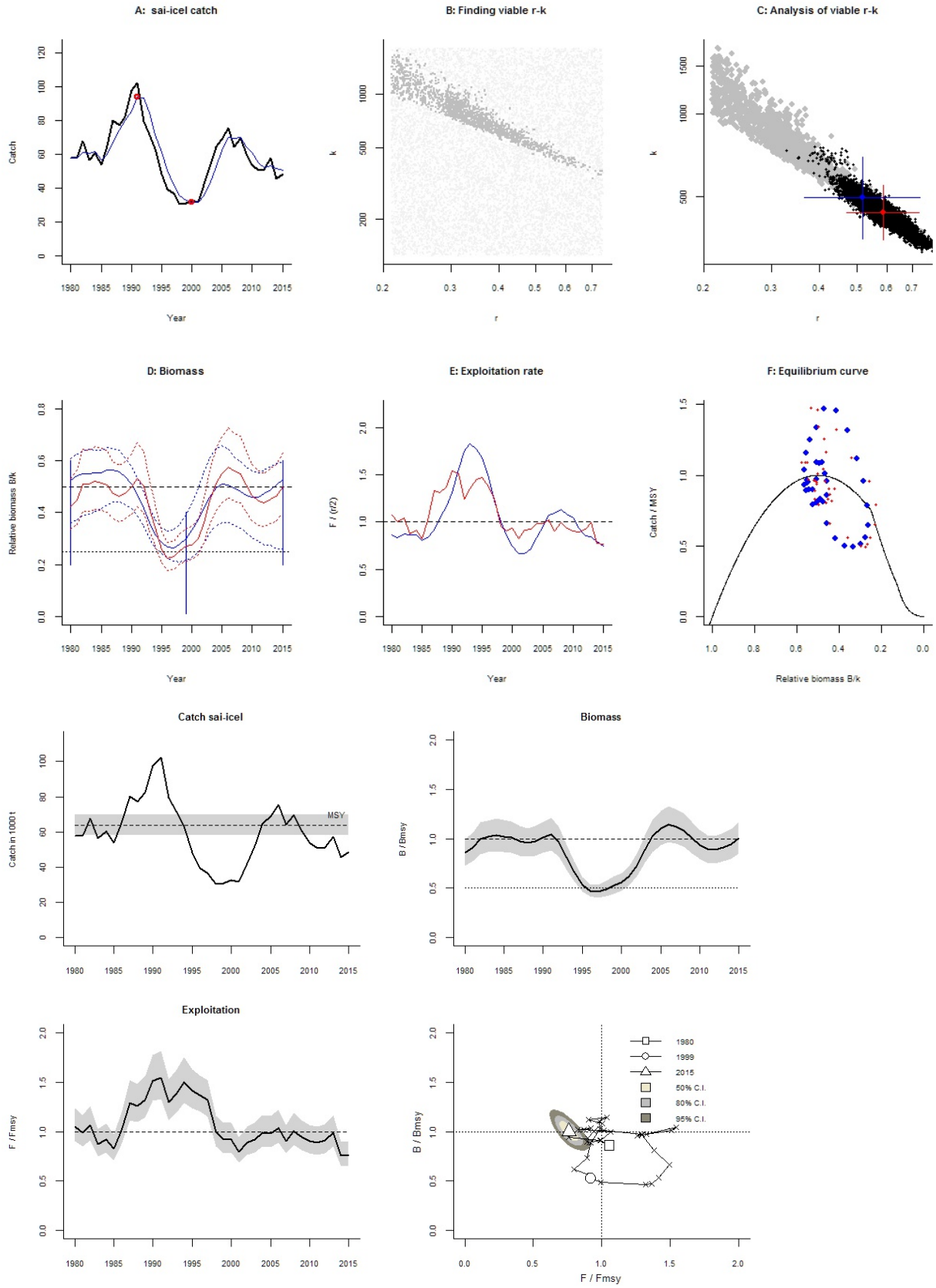
Species: *Pollachius virens* , stock: sai-icel
Icelandic saithe (Division Va)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/sai-icel.pdf
Region: Northeast Atlantic , Iceland Sea
Catch data used from years 1980 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 1999 default
Prior final relative biomass = 0.2 - 0.6 , default
Prior range for r = 0.21 - 0.75 expert, , prior range for k = 125 - 1791
Prior range of q = 0.447 - 1.69

Results of CMSY analysis with altogether 2976 viable trajectories for 1554 r-k pairs
r = 0.518 , 95% CL = 0.366 - 0.733 , k = 494 , 95% CL = 350 - 698
MSY = 64 , 95% CL = 57.3 - 71.6
Relative biomass last year = 0.527 k, 2.5th = 0.261 , 97.5th = 0.598
Exploitation F/(r/2) in last year = 0.748

Results from Bayesian Schaefer model using catch & CPUE
r = 0.586 , 95% CL = 0.471 - 0.73 , k = 435 , 95% CL = 345 - 548
MSY = 63.8 , 95% CL = 58.3 - 69.7
Relative biomass in last year = 0.501 k, 2.5th perc = 0.425 , 97.5th perc = 0.581
Exploitation F/(r/2) in last year = 0.759
q = 0.619 , lcl = 0.509 , ucl = 0.754

Results for Management (based on BSM analysis)
Fmsy = 0.293 , 95% CL = 0.235 - 0.365 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.293 , 95% CL = 0.235 - 0.365 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 63.8 , 95% CL = 58.3 - 69.7
Bmsy = 218 , 95% CL = 173 - 274
Biomass in last year = 218 , 2.5th perc = 185 , 97.5 perc = 253
B/Bmsy in last year = 1 , 2.5th perc = 0.851 , 97.5 perc = 1.16
Fishing mortality in last year = 0.222 , 2.5th perc = 0.192 , 97.5 perc = 0.262
F/Fmsy = 0.759 , 2.5th perc = 0.654 , 97.5 perc = 0.893

Stock status and exploitation in 2014
Biomass = 205 , B/Bmsy = 0.941 , fishing mortality F = 0.222 , F/Fmsy = 0.759
Comment: OK (RF 27.09.16)


A: sai-icel 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 sai-icel
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1980
1999
2015
50% C.I.
80% C.I.
95% C.I.

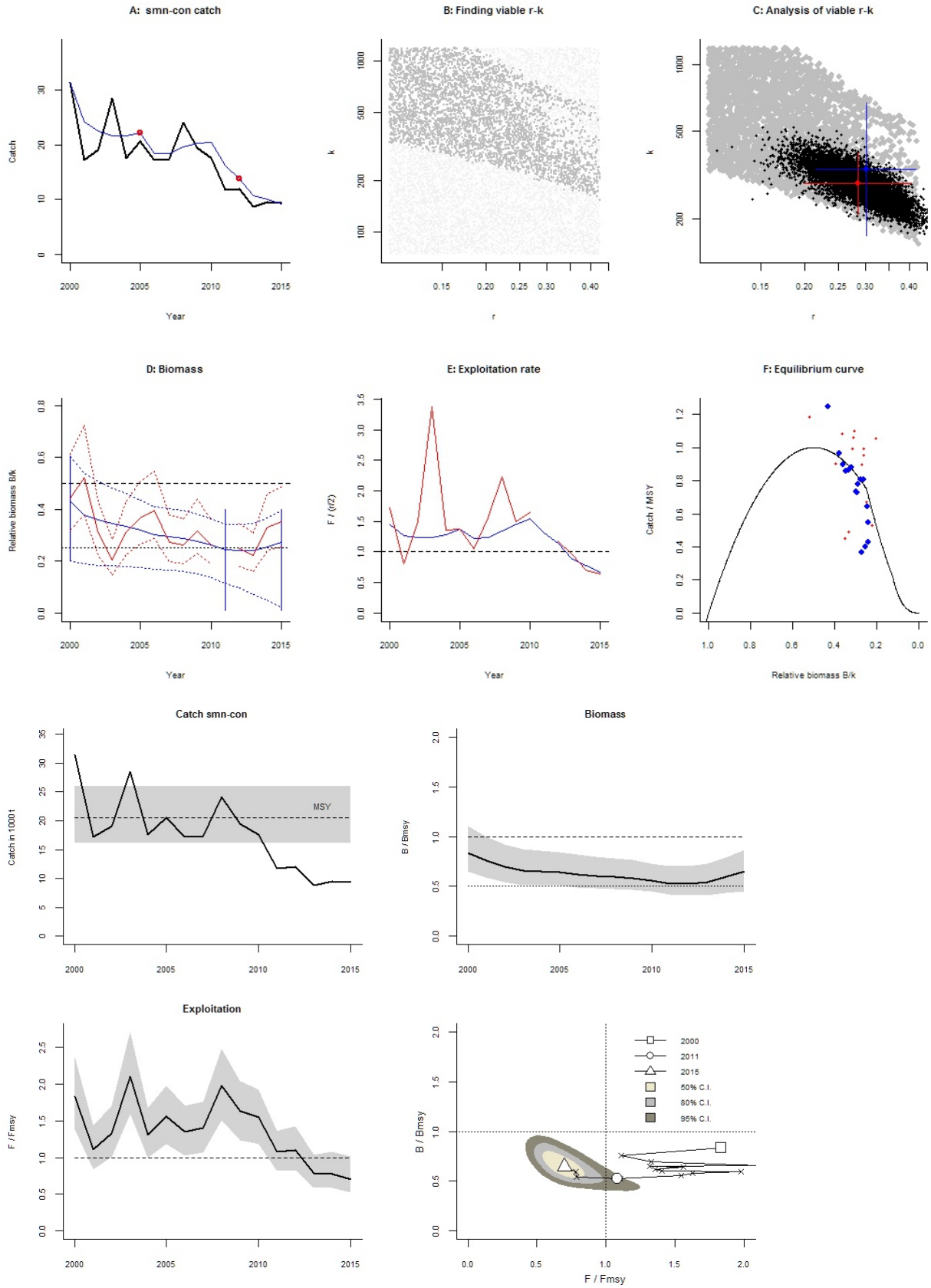
Species: *Sebastes mentella* , stock: smn-con
Beaked redfish in Subarea XIV and Division Va (Icelandic slope stock) (East of Greenland, Iceland grounds)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/smn-con.pdf
Region: Northeast Atlantic , Iceland Sea
Catch data used from years 2000 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2011 default
Prior final relative biomass = 0.01 - 0.4 , default
Prior range for r = 0.11 - 0.43 expert, , prior range for k = 73.7 - 1185
Prior range of q = 0.62 - 2.49

Results of CMSY analysis with altogether 9756 viable trajectories for 4025 r-k pairs
r = 0.3 , 95% CL = 0.216 - 0.418 , k = 336 , 95% CL = 168 - 671
MSY = 25.2 , 95% CL = 12.4 - 51.3
Relative biomass last year = 0.273 k, 2.5th = 0.021 , 97.5th = 0.396
Exploitation F/(r/2) in last year = 0.668

Results from Bayesian Schaefer model using catch & CPUE
r = 0.284 , 95% CL = 0.199 - 0.405 , k = 289 , 95% CL = 209 - 399
MSY = 20.5 , 95% CL = 16.2 - 26
Relative biomass in last year = 0.325 k, 2.5th perc = 0.224 , 97.5th perc = 0.431
Exploitation F/(r/2) in last year = 0.699
q = 1.09 , lcl = 0.827 , ucl = 1.43

Results for Management (based on BSM analysis)
Fmsy = 0.142 , 95% CL = 0.0997 - 0.203 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.142 , 95% CL = 0.0997 - 0.203 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 20.5 , 95% CL = 16.2 - 26
Bmsy = 144 , 95% CL = 104 - 200
Biomass in last year = 93.7 , 2.5th perc = 64.7 , 97.5 perc = 125
B/Bmsy in last year = 0.649 , 2.5th perc = 0.448 , 97.5 perc = 0.863
Fishing mortality in last year = 0.0993 , 2.5th perc = 0.0747 , 97.5 perc = 0.144
F/Fmsy = 0.699 , 2.5th perc = 0.526 , 97.5 perc = 1.01

Stock status and exploitation in 2014
Biomass = 85.7 , B/Bmsy = 0.593 , fishing mortality F = 0.111 , F/Fmsy = 0.781
Comment: OK (RF 27.09.16)


A: smn-con 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 smn-con
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
2000
2011
2015
50% C.I.
80% C.I.
95% C.I.

Species: *Sebastes mentella* , stock: smn-dp

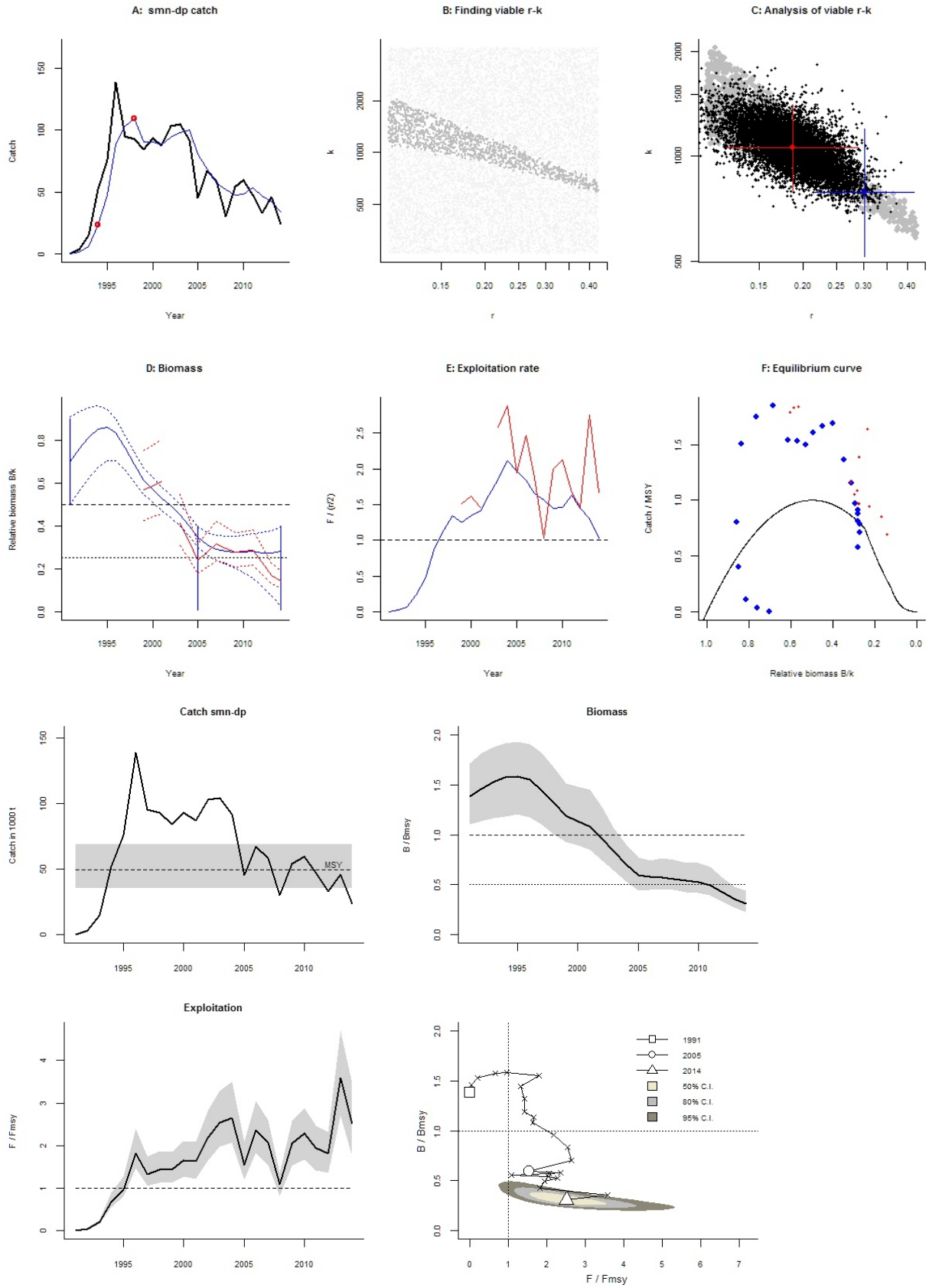
Beaked redfish in Subareas V, XII, and XIV (Iceland and Faroes grounds, north of Azores, east of Greenland) and NAFO Subareas 1+2 (deep pelagic stock > 500 m)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/smn-dp.pdf
Region: Northeast Atlantic , Iceland Sea
Catch data used from years 1991 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2005 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.11 - 0.43 expert, , prior range for k = 255 - 4106
Prior range of q = 0.000791 - 0.00317

Results of CMSY analysis with altogether 5793 viable trajectories for 1259 r-k pairs
r = 0.3 , 95% CL = 0.216 - 0.418 , k = 785 , 95% CL = 515 - 1197
MSY = 59 , 95% CL = 49.3 - 70.5
Relative biomass last year = 0.28 k, 2.5th = 0.025 , 97.5th = 0.393
Exploitation F/(r/2) in last year = 1.03

Results from Bayesian Schaefer model using catch & CPUE
r = 0.187 , 95% CL = 0.121 - 0.288 , k = 1057 , 95% CL = 796 - 1403
MSY = 49.3 , 95% CL = 35.3 - 68.9
Relative biomass in last year = 0.155 k, 2.5th perc = 0.113 , 97.5th perc = 0.22
Exploitation F/(r/2) in last year = 1.56
q = 0.00156 , lcl = 0.00121 , ucl = 0.00201

Results for Management (based on BSM analysis)
Fmsy = 0.0933 , 95% CL = 0.0603 - 0.144 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0577 , 95% CL = 0.0373 - 0.0893 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 49.3 , 95% CL = 35.3 - 68.9
Bmsy = 528 , 95% CL = 398 - 701
Biomass in last year = 164 , 2.5th perc = 119 , 97.5 perc = 232
B/Bmsy in last year = 0.309 , 2.5th perc = 0.225 , 97.5 perc = 0.44
Fishing mortality in last year = 0.145 , 2.5th perc = 0.102 , 97.5 perc = 0.2
F/Fmsy = 2.52 , 2.5th perc = 1.77 , 97.5 perc = 3.46

Stock status and exploitation in 2014
Biomass = 164 , B/Bmsy = 0.309 , fishing mortality F = 0.145 , F/Fmsy = 2.52
Comment: OK (RF 27.09.16)


A: smn-dp 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 smn-dp
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1991
2005
2014
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

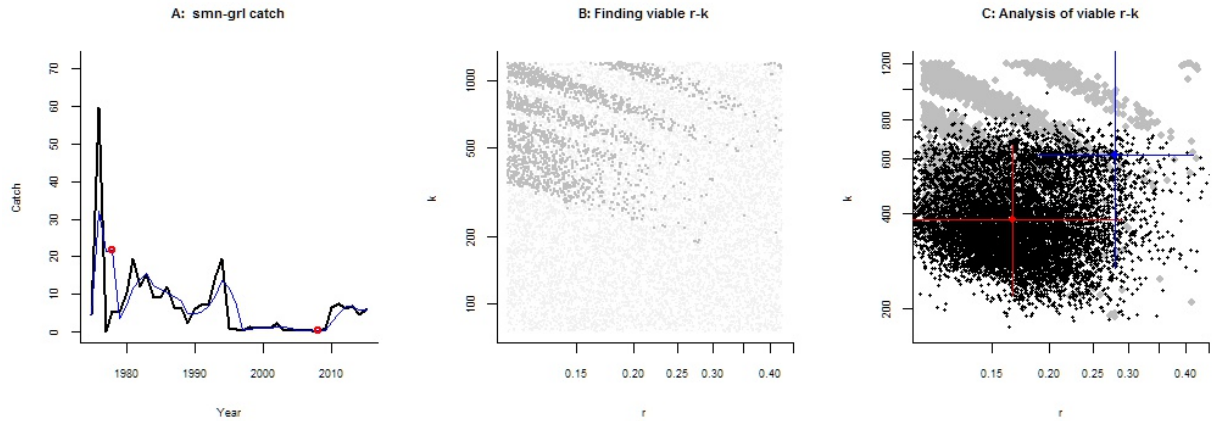
Species: *Sebastes mentella* , stock: smn-grl
Beaked redfish in Division XIVb (Demersal) (Southeast Greenland)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/smn-grl.pdf
Region: Northeast Atlantic , Greenland Sea
Catch data used from years 1975 - 2015 , abundance = CPUE
Prior 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 - 0.2 expert
Prior range for r = 0.11 - 0.43 expert, , prior range for k = 75.2 - 1209
Prior range of q = 0.00551 - 0.0221

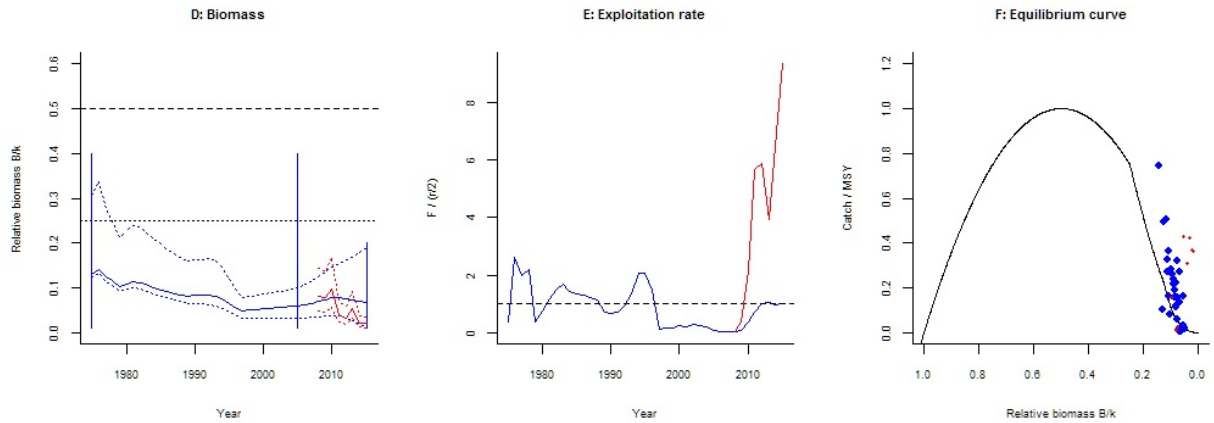
Results of CMSY analysis with altogether 1780 viable trajectories for 1766 r-k pairs
r = 0.279 , 95% CL = 0.188 - 0.416 , k = 616 , 95% CL = 268 - 1414
MSY = 43 , 95% CL = 15.6 - 118
Relative biomass last year = 0.0666 k, 2.5th = 0.0127 , 97.5th = 0.19
Exploitation F/(r/2) in last year = 1.01

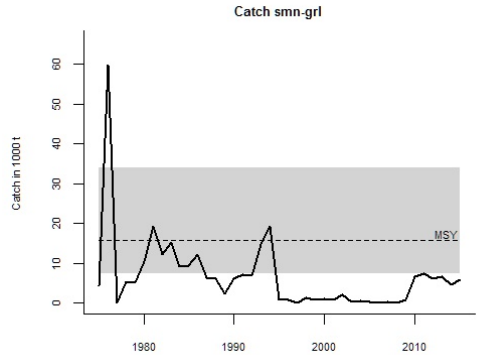
Results from Bayesian Schaefer model using catch & CPUE
r = 0.166 , 95% CL = 0.0951 - 0.29 , k = 383 , 95% CL = 221 - 663
MSY = 15.9 , 95% CL = 7.45 - 33.9
Relative biomass in last year = 0.021 k, 2.5th perc = 0.0111 , 97.5th perc = 0.0388
Exploitation F/(r/2) in last year = 8.95
q = 0.00786 , lcl = 0.00615 , ucl = 0.01

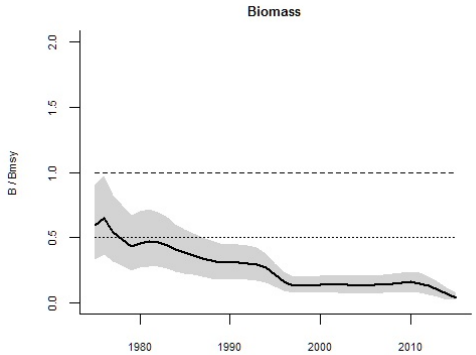
Results for Management (based on BSM analysis)
Fmsy = 0.083 , 95% CL = 0.0476 - 0.145 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.00698 , 95% CL = 0.004 - 0.0122 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 15.9 , 95% CL = 7.45 - 33.9
Bmsy = 191 , 95% CL = 111 - 331
Biomass in last year = 8.04 , 2.5th perc = 4.23 , 97.5 perc = 14.9
B/Bmsy in last year = 0.042 , 2.5th perc = 0.0221 , 97.5 perc = 0.0776
Fishing mortality in last year = 0.743 , 2.5th perc = 0.402 , 97.5 perc = 1.41
F/Fmsy = 106 , 2.5th perc = 57.7 , 97.5 perc = 202

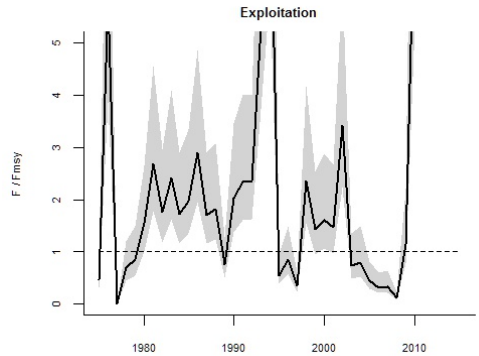
Stock status and exploitation in 2014
Biomass = 13.8 , B/Bmsy = 0.0722 , fishing mortality F = 0.334 , F/Fmsy = 27.8
Comment: OK (RF 27.09.16)

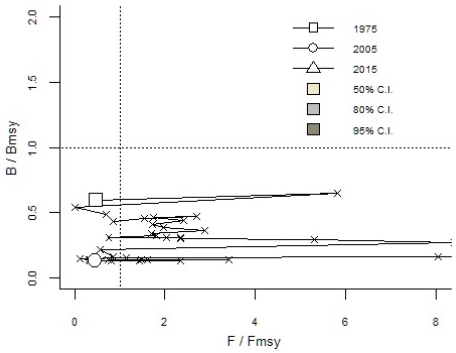

A: smn-grl catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r


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


Catch smn-grl
Catch in 1000 t
MSY


Biomass
B / Bmsy


Exploitation
F / Fmsy


1975
2005
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

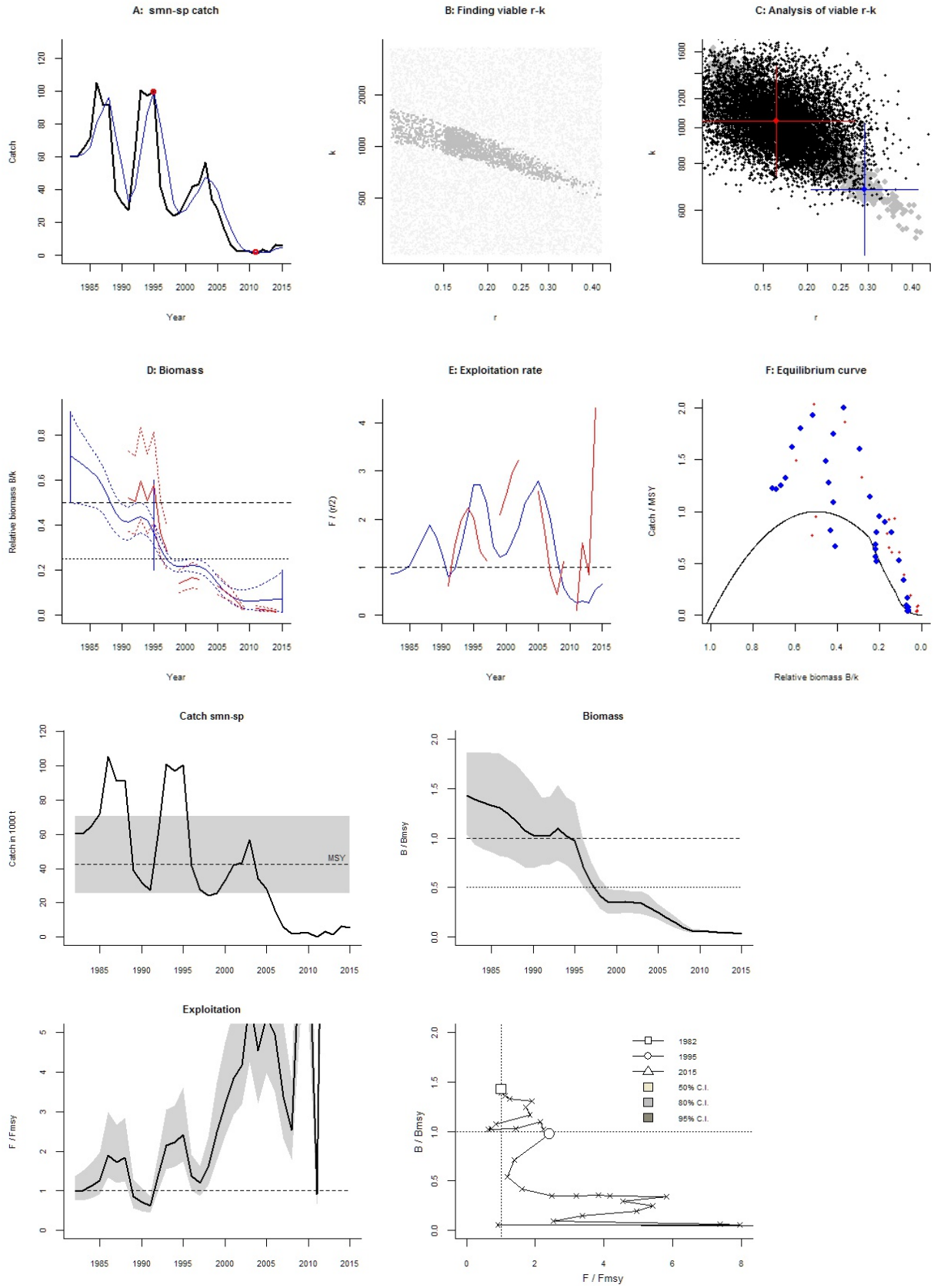
Species: *Sebastes mentella* , stock: smn-sp
Beaked redfish in Subareas V, XII, and XIV (Iceland and Faroes grounds, north of Azores, east of Greenland) and NAFO Subareas 1+2 (shallow pelagic stock < 500 m)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/smn-sp.pdf
Region: Northeast Atlantic , Iceland Sea
Catch data used from years 1982 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 1995 expert
Prior final relative biomass = 0.01 - 0.2 expert
Prior range for r = 0.11 - 0.43 expert, , prior range for k = 233 - 3746
Prior range of q = 0.00179 - 0.00717

Results of CMSY analysis with altogether 2403 viable trajectories for 1685 r-k pairs
r = 0.292 , 95% CL = 0.205 - 0.414 , k = 681 , 95% CL = 454 - 1023
MSY = 49.6 , 95% CL = 41.9 - 58.8
Relative biomass last year = 0.0701 k, 2.5th = 0.0126 , 97.5th = 0.19
Exploitation F/(r/2) in last year = 0.649

Results from Bayesian Schaefer model using catch & CPUE
r = 0.164 , 95% CL = 0.0972 - 0.275 , k = 1043 , 95% CL = 742 - 1465
MSY = 42.6 , 95% CL = 25.8 - 70.5
Relative biomass in last year = 0.0158 k, 2.5th perc = 0.0112 , 97.5th perc = 0.0255
Exploitation F/(r/2) in last year = 4.17
q = 0.00412 , lcl = 0.00316 , ucl = 0.00536

Results for Management (based on BSM analysis)
Fmsy = 0.0818 , 95% CL = 0.0486 - 0.137 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.00515 , 95% CL = 0.00306 - 0.00866 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 42.6 , 95% CL = 25.8 - 70.5
Bmsy = 521 , 95% CL = 371 - 733
Biomass in last year = 16.4 , 2.5th perc = 11.7 , 97.5 perc = 26.6
B/Bmsy in last year = 0.0315 , 2.5th perc = 0.0224 , 97.5 perc = 0.051
Fishing mortality in last year = 0.341 , 2.5th perc = 0.21 , 97.5 perc = 0.479
F/Fmsy = 66.2 , 2.5th perc = 40.8 , 97.5 perc = 93

Stock status and exploitation in 2014
Biomass = 19.8 , B/Bmsy = 0.0381 , fishing mortality F = 0.324 , F/Fmsy = 52
Comment: OK (RF 27.09.16) Acoustic survey data used for abundance.


A: smn-sp 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 smn-sp
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1982
1995
2015
50% C.I.
80% C.I.
95% C.I.

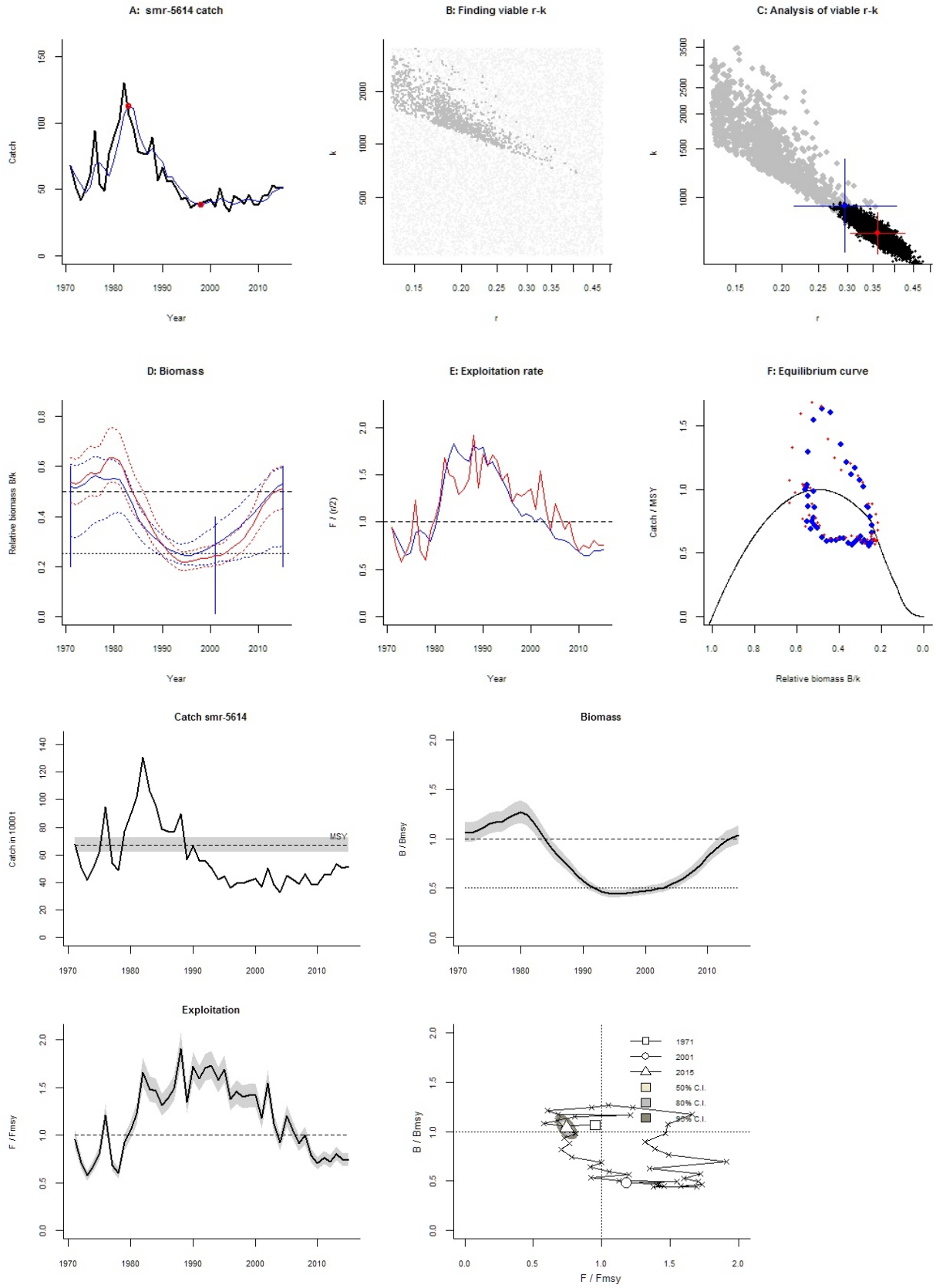
Species: *Sebastes norvegicus* , stock: smr-5614
Golden redfish in Subareas V, VI, XII, and XIV (Iceland and Faroes grounds, West of Scotland, North of Azores, East of Greenland)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/smr-5614.pdf
Region: Northeast Atlantic , Greenland Sea
Catch data used from years 1971 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2001 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.13 - 0.48 expert, , prior range for k = 235 - 3475
Prior range of q = 0.803 - 3.09

Results of CMSY analysis with altogether 2008 viable trajectories for 1285 r-k pairs
r = 0.295 , 95% CL = 0.215 - 0.405 , k = 937 , 95% CL = 637 - 1377
MSY = 69.1 , 95% CL = 53.7 - 89
Relative biomass last year = 0.532 k, 2.5th = 0.283 , 97.5th = 0.597
Exploitation F/(r/2) in last year = 0.705

Results from Bayesian Schaefer model using catch & CPUE
r = 0.36 , 95% CL = 0.304 - 0.426 , k = 744 , 95% CL = 629 - 881
MSY = 67 , 95% CL = 62.1 - 72.4
Relative biomass in last year = 0.518 k, 2.5th perc = 0.475 , 97.5th perc = 0.568
Exploitation F/(r/2) in last year = 0.742
q = 0.932 , lcl = 0.796 , ucl = 1.09

Results for Management (based on BSM analysis)
Fmsy = 0.18 , 95% CL = 0.152 - 0.213 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.18 , 95% CL = 0.152 - 0.213 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 67 , 95% CL = 62.1 - 72.4
Bmsy = 372 , 95% CL = 314 - 441
Biomass in last year = 386 , 2.5th perc = 353 , 97.5 perc = 423
B/Bmsy in last year = 1.04 , 2.5th perc = 0.95 , 97.5 perc = 1.14
Fishing mortality in last year = 0.134 , 2.5th perc = 0.122 , 97.5 perc = 0.146
F/Fmsy = 0.742 , 2.5th perc = 0.678 , 97.5 perc = 0.811

Stock status and exploitation in 2014
Biomass = 376 , B/Bmsy = 1.01 , fishing mortality F = 0.135 , F/Fmsy = 0.749
Comment: OK (RF 27.09.16)


A: smr-5614 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 smr-5614
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1971
2001
2015
50% C.I.
80% C.I.
90% C.I.
B / Bmsy
F / Fmsy

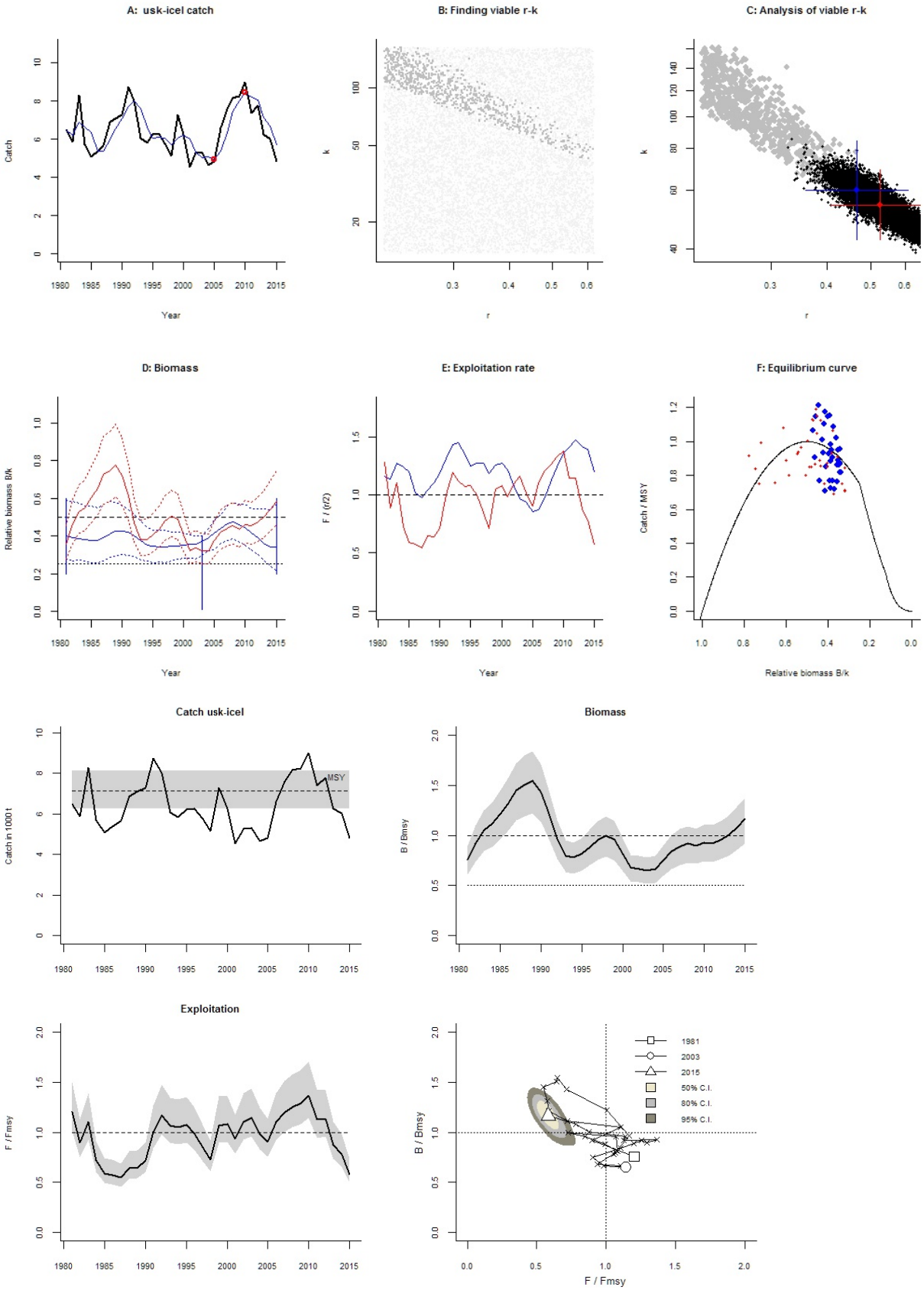
Species: *Brosme brosme* , stock: usk-icel
Tusk in Division Va and Subarea XIV
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/usk-icel.pdf
Region: Northeast Atlantic , Iceland Sea
Catch data used from years 1981 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2003 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.21 - 0.62 expert, , prior range for k = 13.7 - 161
Prior range of q = 0.129 - 0.442

Results of CMSY analysis with altogether 1003 viable trajectories for 796 r-k pairs
r = 0.466 , 95% CL = 0.358 - 0.608 , k = 59.9 , 95% CL = 42.5 - 84.5
MSY = 6.99 , 95% CL = 5.87 - 8.33
Relative biomass last year = 0.34 k, 2.5th = 0.21 , 97.5th = 0.57
Exploitation F/(r/2) in last year = 1.2

Results from Bayesian Schaefer model using catch & CPUE
r = 0.525 , 95% CL = 0.408 - 0.677 , k = 54.2 , 95% CL = 42.4 - 69.3
MSY = 7.12 , 95% CL = 6.25 - 8.11
Relative biomass in last year = 0.581 k, 2.5th perc = 0.461 , 97.5th perc = 0.681
Exploitation F/(r/2) in last year = 0.583
q = 0.206 , lcl = 0.164 , ucl = 0.258

Results for Management (based on BSM analysis)
Fmsy = 0.263 , 95% CL = 0.204 - 0.338 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.263 , 95% CL = 0.204 - 0.338 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 7.12 , 95% CL = 6.25 - 8.11
Bmsy = 27.1 , 95% CL = 21.2 - 34.6
Biomass in last year = 31.5 , 2.5th perc = 25 , 97.5 perc = 36.9
B/Bmsy in last year = 1.16 , 2.5th perc = 0.922 , 97.5 perc = 1.36
Fishing mortality in last year = 0.153 , 2.5th perc = 0.131 , 97.5 perc = 0.193
F/Fmsy = 0.583 , 2.5th perc = 0.497 , 97.5 perc = 0.734

Stock status and exploitation in 2014
Biomass = 29.4 , B/Bmsy = 1.08 , fishing mortality F = 0.205 , F/Fmsy = 0.781
Comment: OK (RF 27.09.16)


A: usk-icel 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-icel
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1981
2003
2015
50% C.I.
80% C.I.
95% C.I.

Greater North Sea (analyzed with CMSY_O_7m.R)

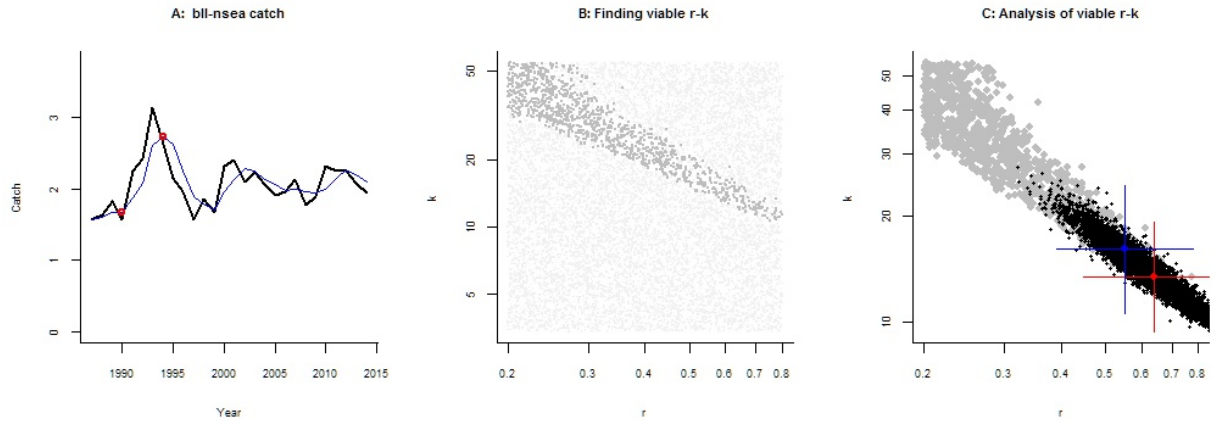
Species: *Scophthalmus rhombus* , stock: bll-nsea
Brill in Subarea IV, Divisions IIIa and VIId,e
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/bll-nsea.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1987 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2005 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 3.41 - 54.6
Prior range of q = 0.000134 - 0.000536

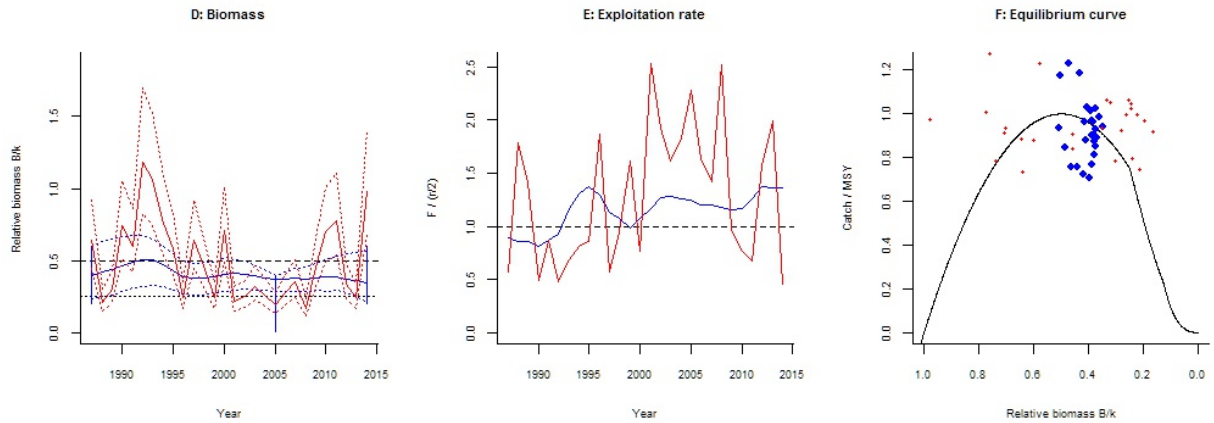
Results of CMSY analysis with altogether 1673 viable trajectories for 1110 r-k pairs
r = 0.553 , 95% CL = 0.392 - 0.78 , k = 16.1 , 95% CL = 10.6 - 24.4
MSY = 2.22 , 95% CL = 1.84 - 2.68
Relative biomass last year = 0.346 k, 2.5th = 0.212 , 97.5th = 0.561
Exploitation F/(r/2) in last year = 1.36

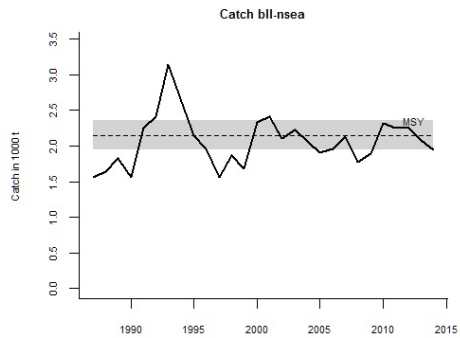
Results from Bayesian Schaefer model using catch & CPUE
r = 0.639 , 95% CL = 0.448 - 0.91 , k = 13.4 , 95% CL = 9.37 - 19.2
MSY = 2.14 , 95% CL = 1.94 - 2.36
Relative biomass in last year = 0.431 k, 2.5th perc = 0.246 , 97.5th perc = 0.616
Exploitation F/(r/2) in last year = 1.05
q = 0.000232 , lcl = 0.000174 , ucl = 0.000308

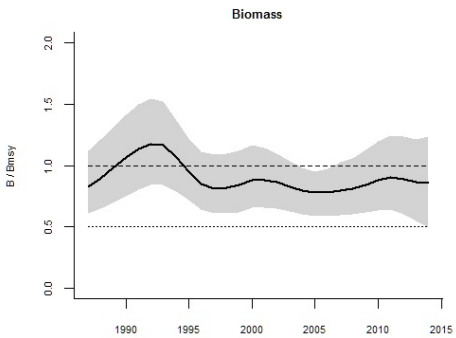
Results for Management (based on BSM analysis)
Fmsy = 0.319 , 95% CL = 0.224 - 0.455 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.319 , 95% CL = 0.224 - 0.455 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 2.14 , 95% CL = 1.94 - 2.36
Bmsy = 6.71 , 95% CL = 4.69 - 9.6
Biomass in last year = 5.78 , 2.5th perc = 3.3 , 97.5 perc = 8.26
B/Bmsy in last year = 0.861 , 2.5th perc = 0.493 , 97.5 perc = 1.23
Fishing mortality in last year = 0.336 , 2.5th perc = 0.235 , 97.5 perc = 0.588
F/Fmsy = 1.05 , 2.5th perc = 0.736 , 97.5 perc = 1.84

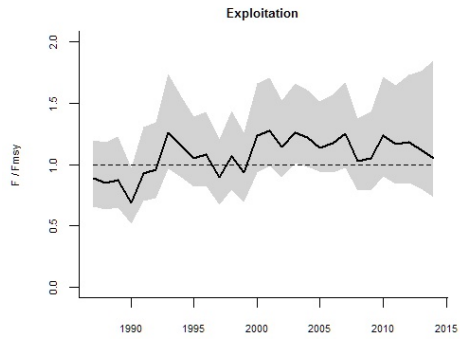
Stock status and exploitation in 2014
Biomass = 5.78 , B/Bmsy = 0.861 , fishing mortality F = 0.336 , F/Fmsy = 1.05
Comment: OK (RF 23.09.16)

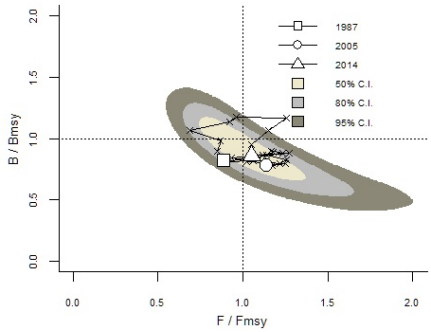

A: bll-nsea catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r


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


Catch bll-nsea
Catch in 1000 t
MSY


Biomass
B / Bmsy


Exploitation
F / Fmsy


1987
2005
2014
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

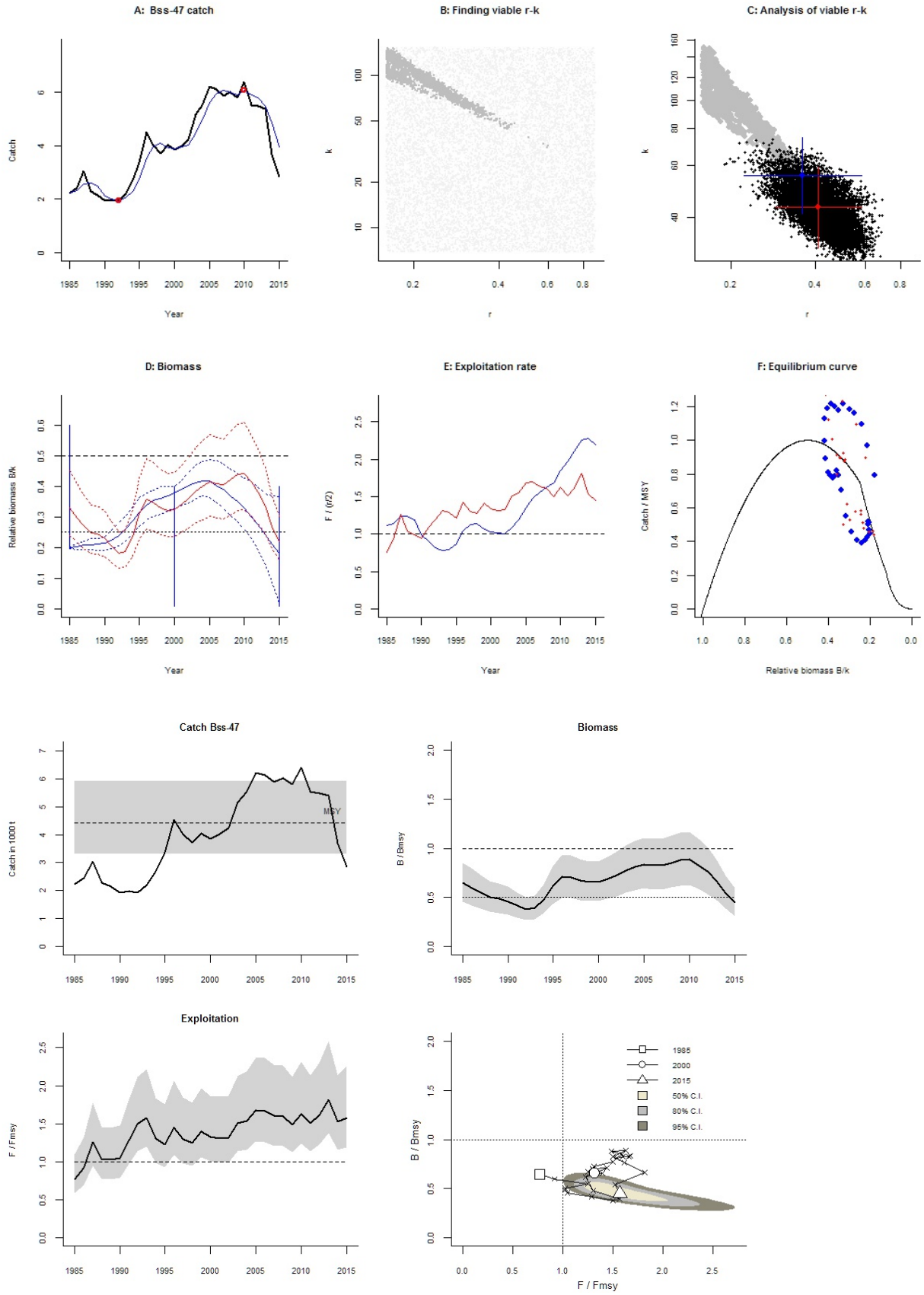
Species: *Dicentrarchus labrax* , stock: Bss-47
Seabass in Divisions IVb and c, VIIa, and VIId–h (Central and South North Sea, Irish Sea, English Channel, Bristol Channel, Celtic Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/bss-47.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1985 - 2015 , 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 - 0.4 expert
Prior range for r = 0.16 - 0.88 expert, , prior range for k = 6.9 - 152
Prior range of q = 0.637 - 2.99

Results of CMSY analysis with altogether 1923 viable trajectories for 1913 r-k pairs
r = 0.361 , 95% CL = 0.222 - 0.584 , k = 55.4 , 95% CL = 41 - 74.8
MSY = 5 , 95% CL = 4.59 - 5.44
Relative biomass last year = 0.181 k, 2.5th = 0.0193 , 97.5th = 0.368
Exploitation F/(r/2) in last year = 2.2

Results from Bayesian Schaefer model using catch & CPUE
r = 0.41 , 95% CL = 0.289 - 0.582 , k = 43.2 , 95% CL = 31.5 - 59.2
MSY = 4.43 , 95% CL = 3.31 - 5.92
Relative biomass in last year = 0.226 k, 2.5th perc = 0.157 , 97.5th perc = 0.3
Exploitation F/(r/2) in last year = 1.42
q = 0.951 , lcl = 0.687 , ucl = 1.32

Results for Management (based on BSM analysis)
Fmsy = 0.205 , 95% CL = 0.145 - 0.291 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.185 , 95% CL = 0.131 - 0.263 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 4.43 , 95% CL = 3.31 - 5.92
Bmsy = 21.6 , 95% CL = 15.7 - 29.6
Biomass in last year = 9.74 , 2.5th perc = 6.78 , 97.5 perc = 12.9
B/Bmsy in last year = 0.451 , 2.5th perc = 0.314 , 97.5 perc = 0.599
Fishing mortality in last year = 0.292 , 2.5th perc = 0.22 , 97.5 perc = 0.419
F/Fmsy = 1.57 , 2.5th perc = 1.19 , 97.5 perc = 2.26

Stock status and exploitation in 2014
Biomass = 11.8 , B/Bmsy = 0.545 , fishing mortality F = 0.313 , F/Fmsy = 1.52
Comment: OK (RF 23.09.16)


A: Bss-47 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 Bss-47
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1985
2000
2015
50% C.I.
80% C.I.
95% C.I.

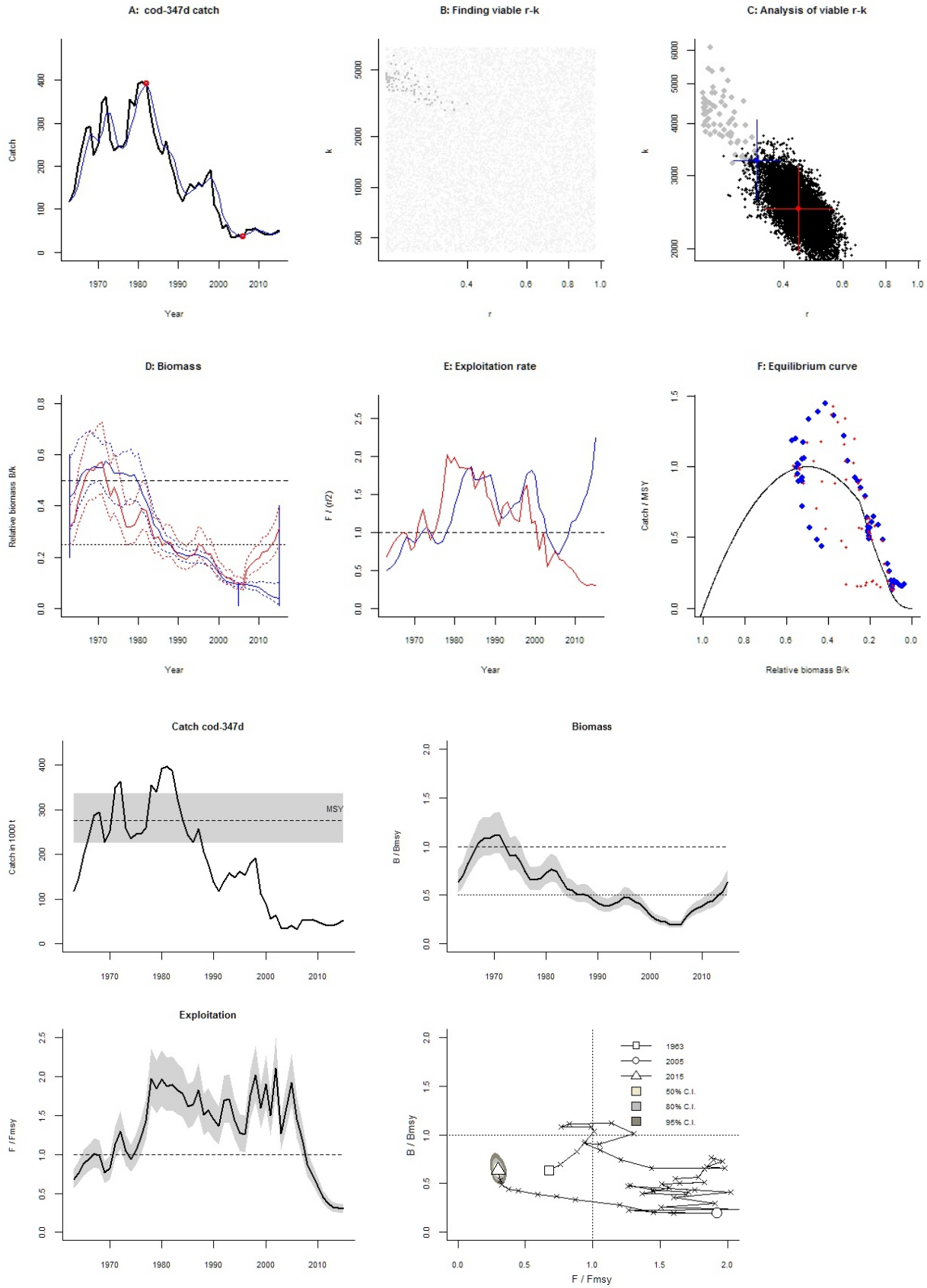
Species: *Gadus morhua* , stock: cod-347d
Cod in Subarea IV (North Sea), Divison VIId and IIIa West
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/cod-347d.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1963 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.01 - 0.1 in year 2005 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.23 - 0.96 expert, , prior range for k = 408 - 6808
Prior range of q = 0.172 - 0.703

Results of CMSY analysis with altogether 72 viable trajectories for 72 r-k pairs
r = 0.333 , 95% CL = 0.283 - 0.392 , k = 3259 , 95% CL = 2604 - 4079
MSY = 271 , 95% CL = 220 - 334
Relative biomass last year = 0.0383 k, 2.5th = 0.0125 , 97.5th = 0.102
Exploitation F/(r/2) in last year = 2.24

Results from Bayesian Schaefer model using catch & CPUE
r = 0.442 , 95% CL = 0.35 - 0.559 , k = 2488 , 95% CL = 1957 - 3162
MSY = 275 , 95% CL = 226 - 335
Relative biomass in last year = 0.319 k, 2.5th perc = 0.265 , 97.5th perc = 0.385
Exploitation F/(r/2) in last year = 0.298
q = 0.193 , lcl = 0.158 , ucl = 0.235

Results for Management (based on BSM analysis)
Fmsy = 0.221 , 95% CL = 0.175 - 0.279 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.221 , 95% CL = 0.175 - 0.279 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 275 , 95% CL = 226 - 335
Bmsy = 1244 , 95% CL = 979 - 1581
Biomass in last year = 793 , 2.5th perc = 660 , 97.5 perc = 958
B/Bmsy in last year = 0.638 , 2.5th perc = 0.531 , 97.5 perc = 0.77
Fishing mortality in last year = 0.066 , 2.5th perc = 0.0546 , 97.5 perc = 0.0792
F/Fmsy = 0.298 , 2.5th perc = 0.247 , 97.5 perc = 0.358

Stock status and exploitation in 2014
Biomass = 667 , B/Bmsy = 0.536 , fishing mortality F = 0.0689 , F/Fmsy = 0.311
Comment: OK (RF 11.07.16). Final F much too low; probably discards are underestimated (RF 23.09.2016)


A: cod-347d 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 cod-347d
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1963
2005
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

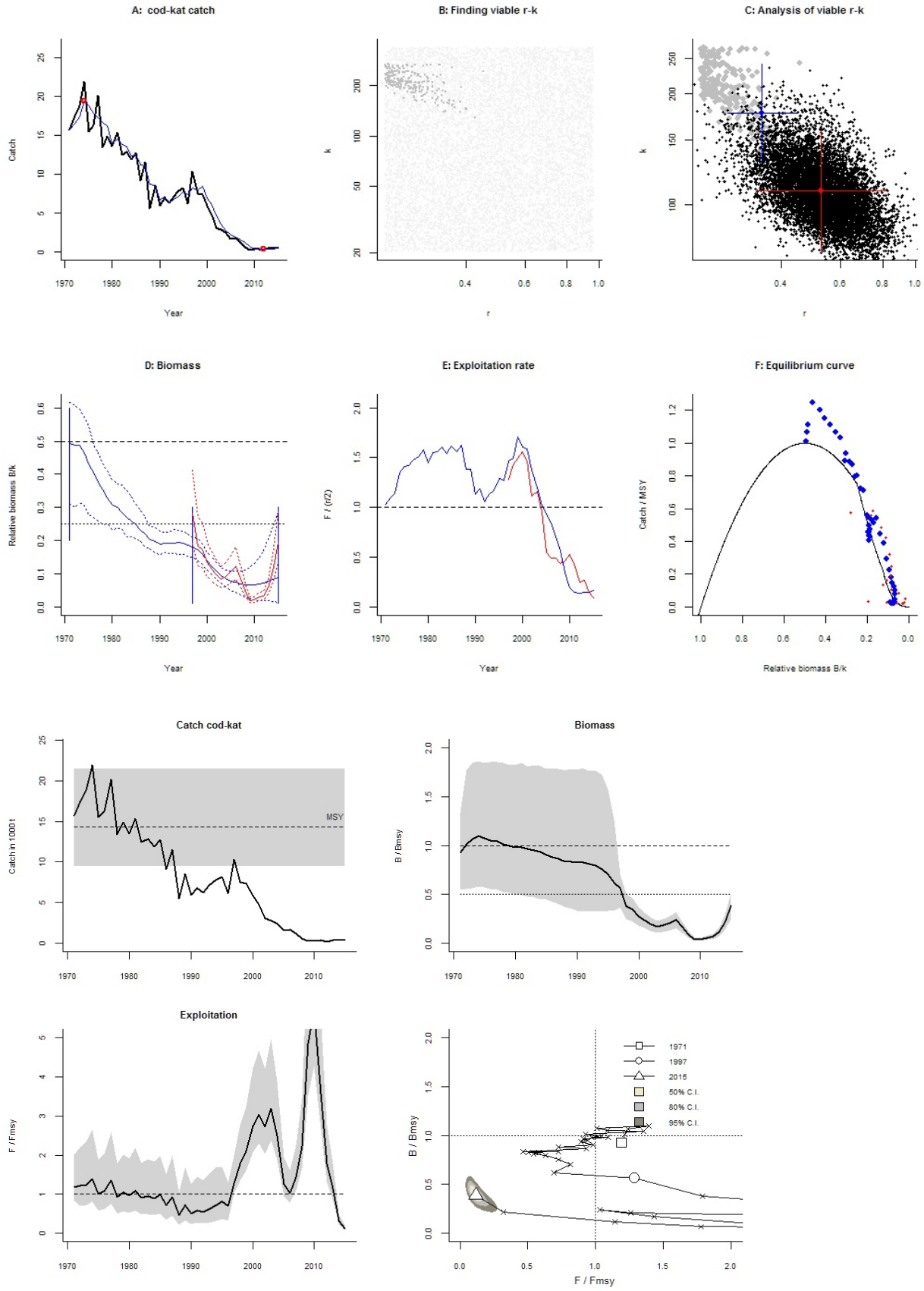
Species: *Gadus morhua* , stock: cod-kat
Cod in Division IIIa East (Kattegat)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/cod-kat.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1971 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.3 in year 1997 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.23 - 0.96 expert, , prior range for k = 20.2 - 337
Prior range of q = 5.09e-05 - 0.000208

Results of CMSY analysis with altogether 222 viable trajectories for 218 r-k pairs
r = 0.35 , 95% CL = 0.276 - 0.444 , k = 178 , 95% CL = 131 - 241
MSY = 15.6 , 95% CL = 11.1 - 21.8
Relative biomass last year = 0.0883 k, 2.5th = 0.0144 , 97.5th = 0.287
Exploitation F/(r/2) in last year = 0.17

Results from Bayesian Schaefer model using catch & CPUE
r = 0.525 , 95% CL = 0.336 - 0.82 , k = 109 , 95% CL = 74.3 - 159
MSY = 14.3 , 95% CL = 9.51 - 21.4
Relative biomass in last year = 0.194 k, 2.5th perc = 0.123 , 97.5th perc = 0.259
Exploitation F/(r/2) in last year = 0.0916
q = 8.45e-05 , lcl = 6.54e-05 , ucl = 0.000109

Results for Management (based on BSM analysis)
Fmsy = 0.263 , 95% CL = 0.168 - 0.41 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.204 , 95% CL = 0.131 - 0.318 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 14.3 , 95% CL = 9.51 - 21.4
Bmsy = 54.3 , 95% CL = 37.2 - 79.5
Biomass in last year = 21.1 , 2.5th perc = 13.4 , 97.5 perc = 28.1
B/Bmsy in last year = 0.389 , 2.5th perc = 0.246 , 97.5 perc = 0.517
Fishing mortality in last year = 0.0241 , 2.5th perc = 0.0181 , 97.5 perc = 0.038
F/Fmsy = 0.118 , 2.5th perc = 0.0886 , 97.5 perc = 0.186

Stock status and exploitation in 2014
Biomass = 12 , B/Bmsy = 0.221 , fishing mortality F = 0.0372 , F/Fmsy = 0.32
Comment: OK (RF 23.09.16) r updated


A: cod-kat 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 cod-kat
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1971
1997
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

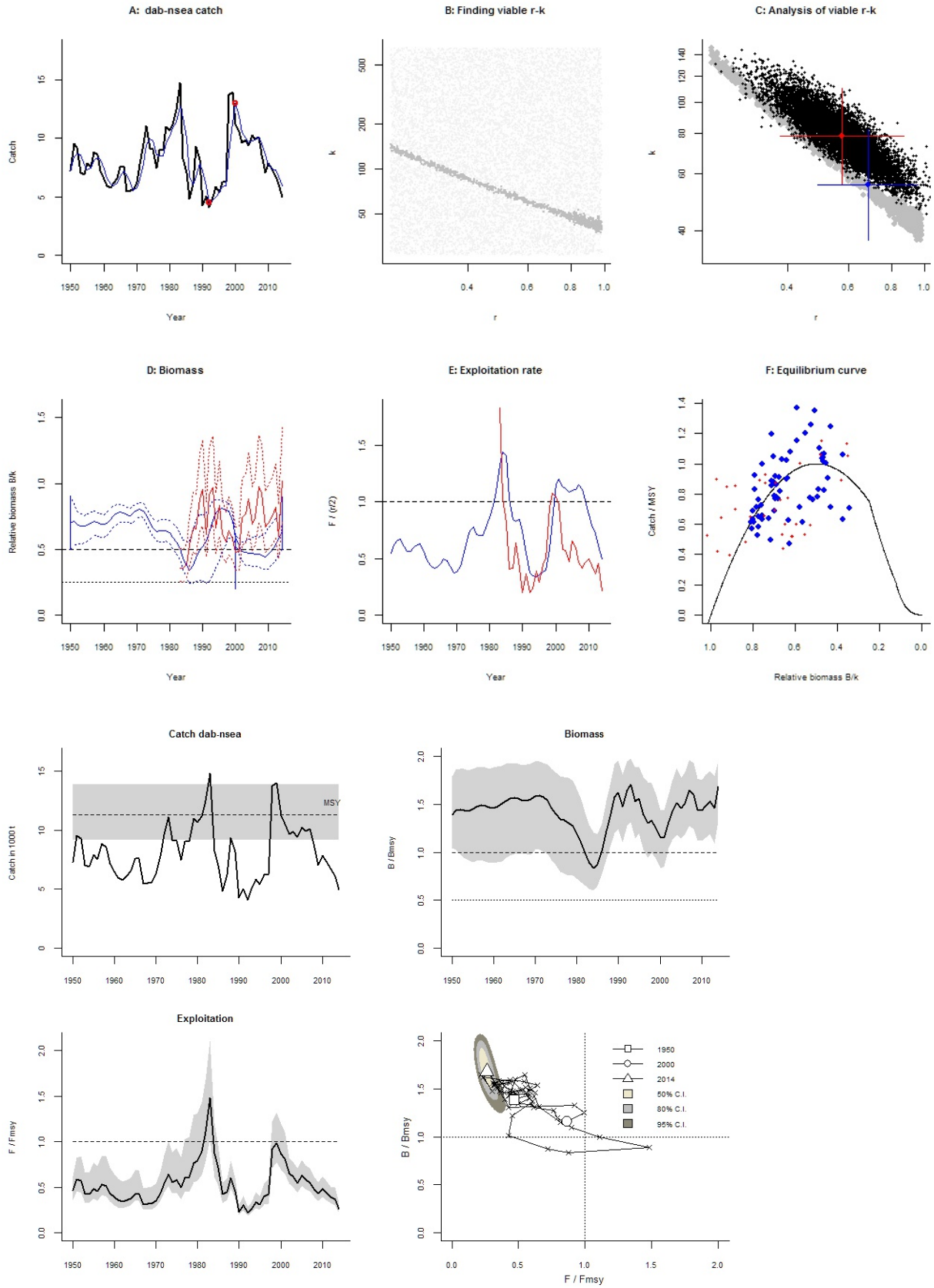
Species: *Limanda limanda* , stock: dab-nsea
Dab in Subarea IV and Division IIIa
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/dab-nsea.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1950 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 default
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2000 expert
Prior final relative biomass = 0.5 - 0.9 expert
Prior range for r = 0.24 - 0.98 expert, , prior range for k = 26.5 - 649
Prior range of q = 0.000256 - 0.00104

Results of CMSY analysis with altogether 1084 viable trajectories for 789 r-k pairs
r = 0.684 , 95% CL = 0.49 - 0.954 , k = 55.5 , 95% CL = 37.6 - 82
MSY = 9.49 , 95% CL = 8.48 - 10.6
Relative biomass last year = 0.63 k, 2.5th = 0.507 , 97.5th = 0.784
Exploitation F/(r/2) in last year = 0.496

Results from Bayesian Schaefer model using catch & CPUE
r = 0.575 , 95% CL = 0.38 - 0.87 , k = 78.3 , 95% CL = 55.9 - 110
MSY = 11.3 , 95% CL = 9.15 - 13.9
Relative biomass in last year = 0.84 k, 2.5th perc = 0.66 , 97.5th perc = 0.977
Exploitation F/(r/2) in last year = 0.262
q = 0.000433 , lcl = 0.000322 , ucl = 0.000582

Results for Management (based on BSM analysis)
Fmsy = 0.287 , 95% CL = 0.19 - 0.435 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.287 , 95% CL = 0.19 - 0.435 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 11.3 , 95% CL = 9.15 - 13.9
Bmsy = 39.2 , 95% CL = 27.9 - 54.9
Biomass in last year = 65.8 , 2.5th perc = 51.7 , 97.5 perc = 76.6
B/Bmsy in last year = 1.68 , 2.5th perc = 1.32 , 97.5 perc = 1.95
Fishing mortality in last year = 0.0753 , 2.5th perc = 0.0647 , 97.5 perc = 0.0958
F/Fmsy = 0.262 , 2.5th perc = 0.225 , 97.5 perc = 0.333

Stock status and exploitation in 2014
Biomass = 65.8 , B/Bmsy = 1.68 , fishing mortality F = 0.0753 , F/Fmsy = 0.262
Comment: OK (RF 23.09.16) r updated


A: dab-nsea 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 dab-nsea
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.

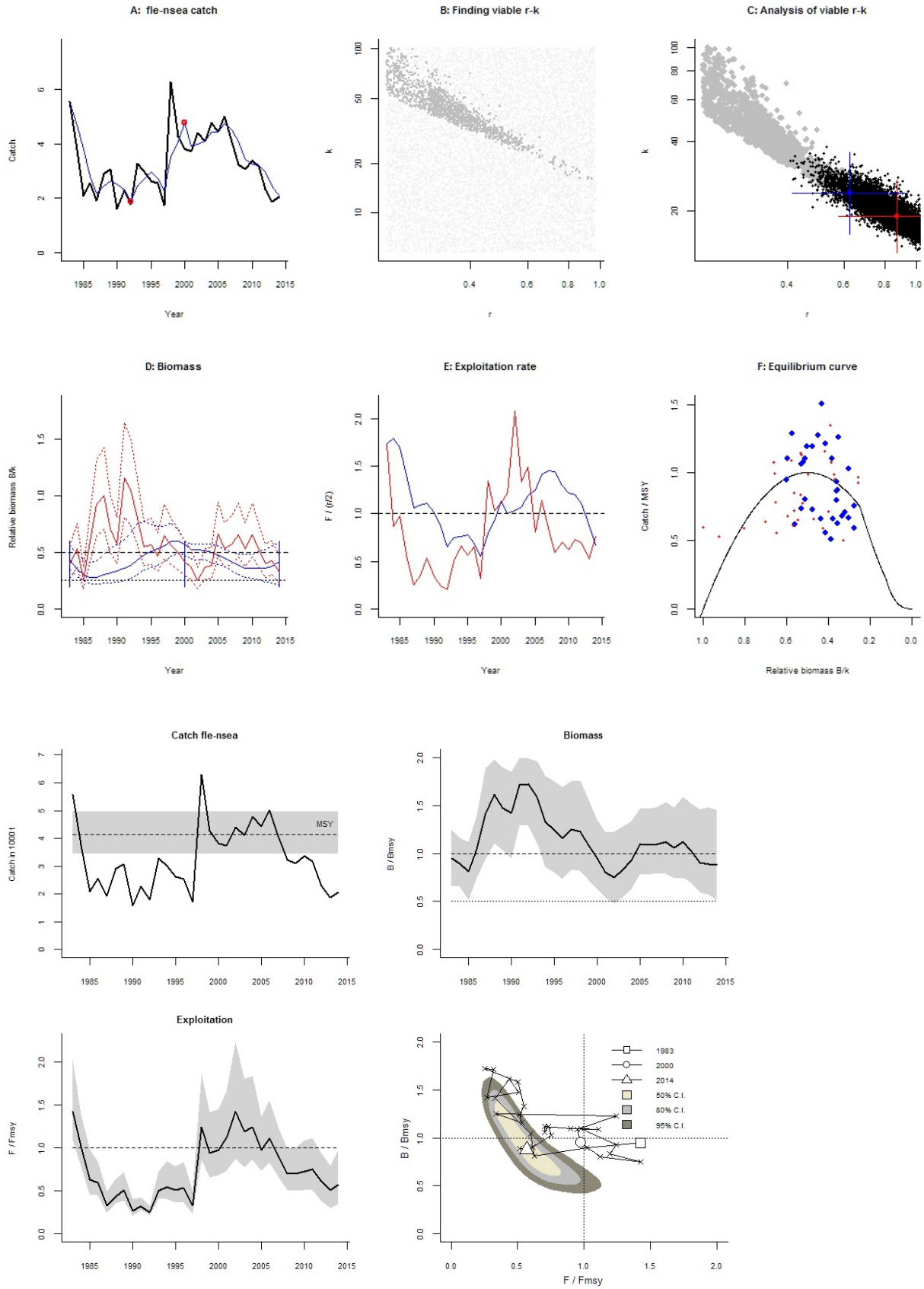
Species: *Platichthys flesus* , stock: fle-nsea
Flounder in Division IIIa and Subarea IV
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/fle-nsea.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1983 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2000 expert
Prior final relative biomass = 0.2 - 0.6 , default
Prior range for r = 0.22 - 0.97 expert, , prior range for k = 5.75 - 101
Prior range of q = 0.000282 - 0.00119

Results of CMSY analysis with altogether 2570 viable trajectories for 1359 r-k pairs
r = 0.622 , 95% CL = 0.414 - 0.935 , k = 23.9 , 95% CL = 16 - 35.6
MSY = 3.72 , 95% CL = 3.23 - 4.28
Relative biomass last year = 0.416 k, 2.5th = 0.213 , 97.5th = 0.591
Exploitation F/(r/2) in last year = 0.673

Results from Bayesian Schaefer model using catch & CPUE
r = 0.87 , 95% CL = 0.575 - 1.32 , k = 19 , 95% CL = 13.3 - 27.1
MSY = 4.13 , 95% CL = 3.44 - 4.97
Relative biomass in last year = 0.44 k, 2.5th perc = 0.256 , 97.5th perc = 0.724
Exploitation F/(r/2) in last year = 0.567
q = 0.000389 , lcl = 0.000299 , ucl = 0.000508

Results for Management (based on BSM analysis)
Fmsy = 0.435 , 95% CL = 0.288 - 0.658 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.435 , 95% CL = 0.288 - 0.658 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 4.13 , 95% CL = 3.44 - 4.97
Bmsy = 9.5 , 95% CL = 6.66 - 13.6
Biomass in last year = 8.36 , 2.5th perc = 4.86 , 97.5 perc = 13.8
B/Bmsy in last year = 0.88 , 2.5th perc = 0.511 , 97.5 perc = 1.45
Fishing mortality in last year = 0.247 , 2.5th perc = 0.15 , 97.5 perc = 0.425
F/Fmsy = 0.567 , 2.5th perc = 0.345 , 97.5 perc = 0.976

Stock status and exploitation in 2014
Biomass = 8.36 , B/Bmsy = 0.88 , fishing mortality F = 0.247 , F/Fmsy = 0.567
Comment: OK (RF 23.09.16)


A: fle-nsea 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 fle-nsea
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1983
2000
2014
50% C.I.
80% C.I.
95% C.I.

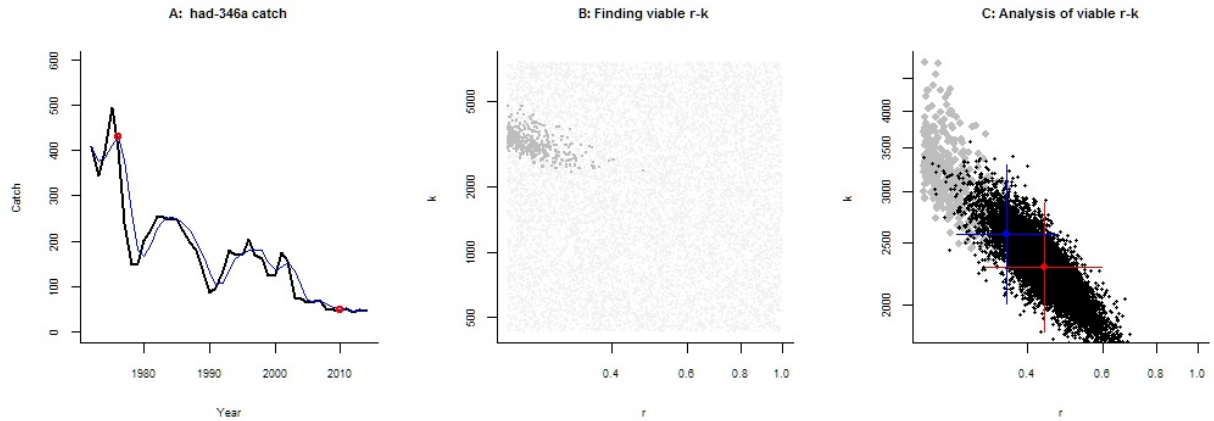
Species: *Melanogrammus aeglefinus* , stock: had-346a
Haddock in Sub-area IV (North Sea) and Division IIIa West and VIa
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/had-346a.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1972 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2009 default
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.23 - 1 expert, , prior range for k = 431 - 7498
Prior range of q = 1.24 - 5.16

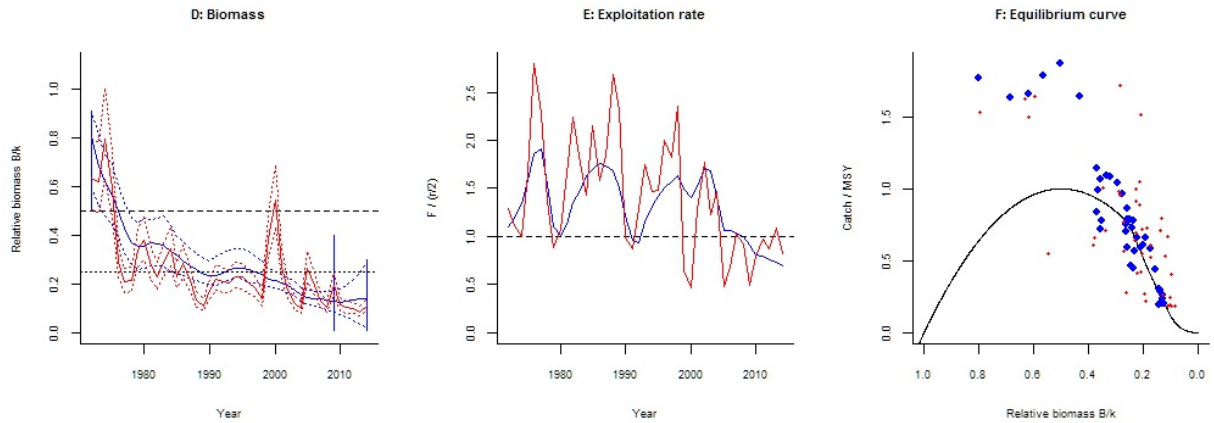
Results of CMSY analysis with altogether 395 viable trajectories for 378 r-k pairs
r = 0.359 , 95% CL = 0.274 - 0.47 , k = 2573 , 95% CL = 2011 - 3293
MSY = 231 , 95% CL = 188 - 283
Relative biomass last year = 0.142 k, 2.5th = 0.0174 , 97.5th = 0.29
Exploitation F/(r/2) in last year = 0.696

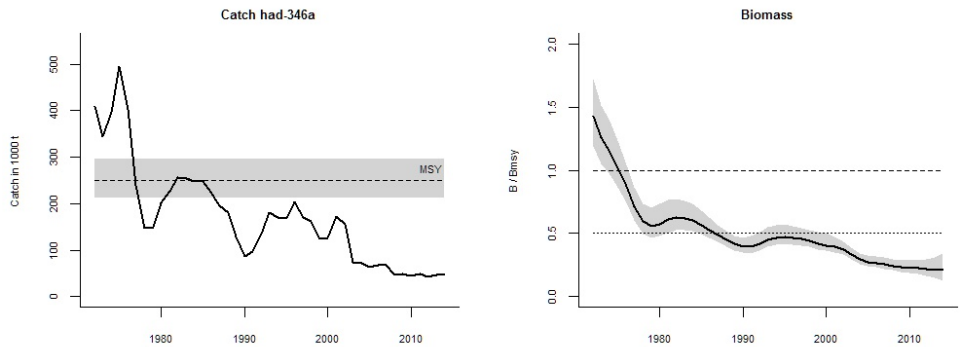
Results from Bayesian Schaefer model using catch & CPUE
r = 0.438 , 95% CL = 0.321 - 0.596 , k = 2291 , 95% CL = 1819 - 2885
MSY = 251 , 95% CL = 212 - 296
Relative biomass in last year = 0.105 k, 2.5th perc = 0.0632 , 97.5th perc = 0.173
Exploitation F/(r/2) in last year = 0.883
q = 1.8 , lcl = 1.39 , ucl = 2.33

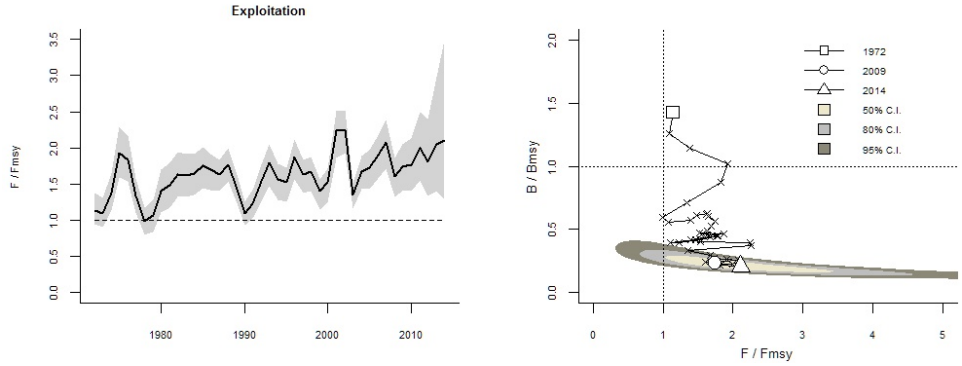
Results for Management (based on BSM analysis)
Fmsy = 0.219 , 95% CL = 0.161 - 0.298 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0916 , 95% CL = 0.0672 - 0.125 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 251 , 95% CL = 212 - 296
Bmsy = 1145 , 95% CL = 909 - 1443
Biomass in last year = 240 , 2.5th perc = 145 , 97.5 perc = 396
B/Bmsy in last year = 0.209 , 2.5th perc = 0.126 , 97.5 perc = 0.345
Fishing mortality in last year = 0.193 , 2.5th perc = 0.117 , 97.5 perc = 0.32
F/Fmsy = 2.11 , 2.5th perc = 1.28 , 97.5 perc = 3.49

Stock status and exploitation in 2014
Biomass = 240 , B/Bmsy = 0.209 , fishing mortality F = 0.193 , F/Fmsy = 2.11
Comment: OK (RF 23.09.16)


A: had-346a 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 had-346a
Catch in 1000 t
MSY
Biomass
B / Bmsy


Exploitation
F / Fmsy
1972
2009
2014
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

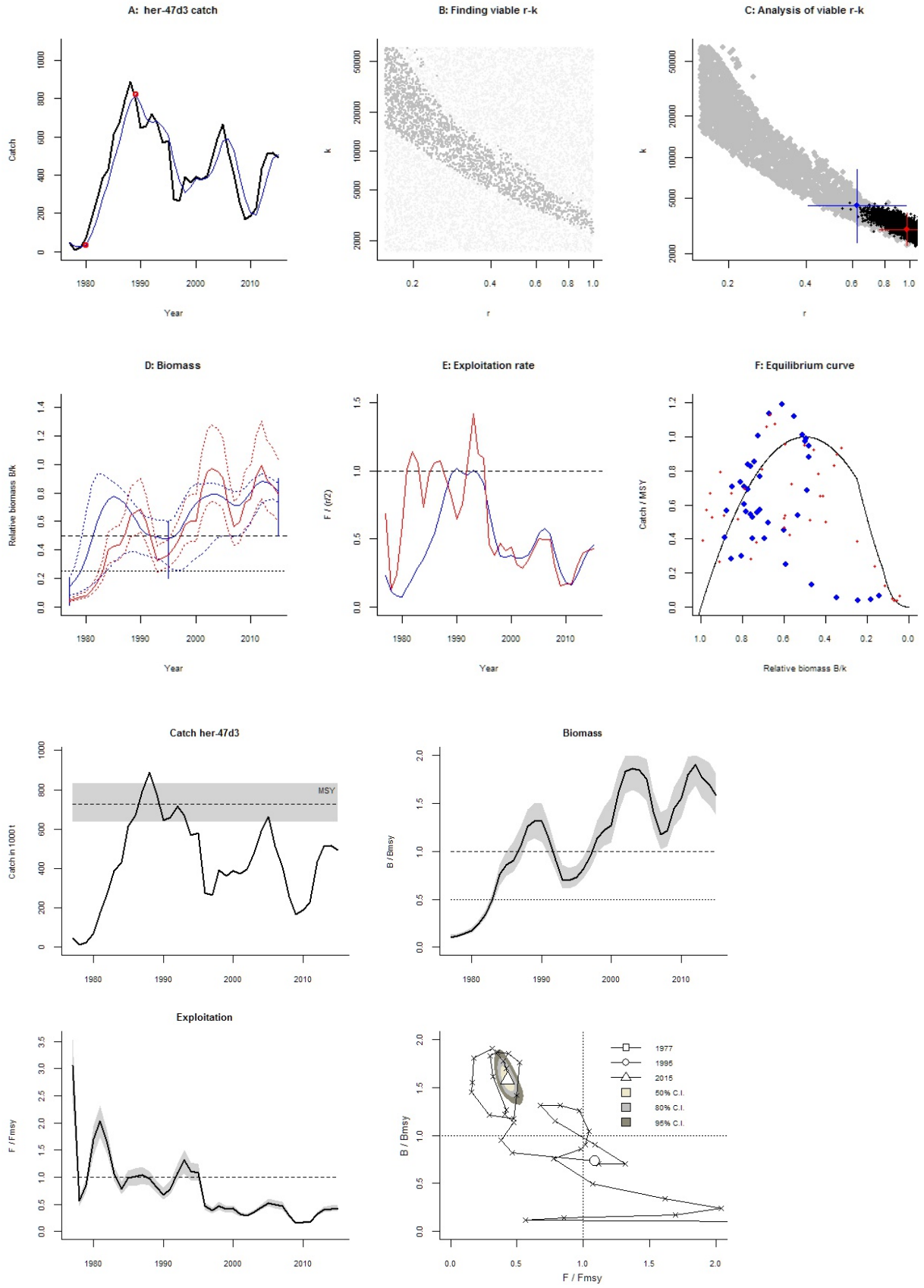
Species: *Clupea harengus* , stock: her-47d3
Herring in Subarea IV and Divisions IIIa and VIId
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/her-47d3.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1977 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.2 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 1995 expert
Prior final relative biomass = 0.5 - 0.9 expert
Prior range for r = 0.16 - 1 expert, , prior range for k = 1652 - 63273
Prior range of q = 0.566 - 2.86

Results of CMSY analysis with altogether 6411 viable trajectories for 2181 r-k pairs
r = 0.625 , 95% CL = 0.404 - 0.968 , k = 4418 , 95% CL = 2403 - 8123
MSY = 690 , 95% CL = 493 - 967
Relative biomass last year = 0.809 k, 2.5th = 0.731 , 97.5th = 0.869
Exploitation F/(r/2) in last year = 0.454

Results from Bayesian Schaefer model using catch & CPUE
r = 0.979 , 95% CL = 0.761 - 1.26 , k = 2975 , 95% CL = 2268 - 3903
MSY = 729 , 95% CL = 637 - 833
Relative biomass in last year = 0.791 k, 2.5th perc = 0.689 , 97.5th perc = 0.903
Exploitation F/(r/2) in last year = 0.429
q = 0.768 , lcl = 0.591 , ucl = 0.997

Results for Management (based on BSM analysis)
Fmsy = 0.49 , 95% CL = 0.381 - 0.63 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.49 , 95% CL = 0.381 - 0.63 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 729 , 95% CL = 637 - 833
Bmsy = 1488 , 95% CL = 1134 - 1951
Biomass in last year = 2353 , 2.5th perc = 2050 , 97.5 perc = 2688
B/Bmsy in last year = 1.58 , 2.5th perc = 1.38 , 97.5 perc = 1.81
Fishing mortality in last year = 0.21 , 2.5th perc = 0.184 , 97.5 perc = 0.241
F/Fmsy = 0.429 , 2.5th perc = 0.375 , 97.5 perc = 0.492

Stock status and exploitation in 2014
Biomass = 2523 , B/Bmsy = 1.7 , fishing mortality F = 0.205 , F/Fmsy = 0.419
Comment: OK (RF 23.09.16)


A: her-47d3 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 her-47d3
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1977
1995
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

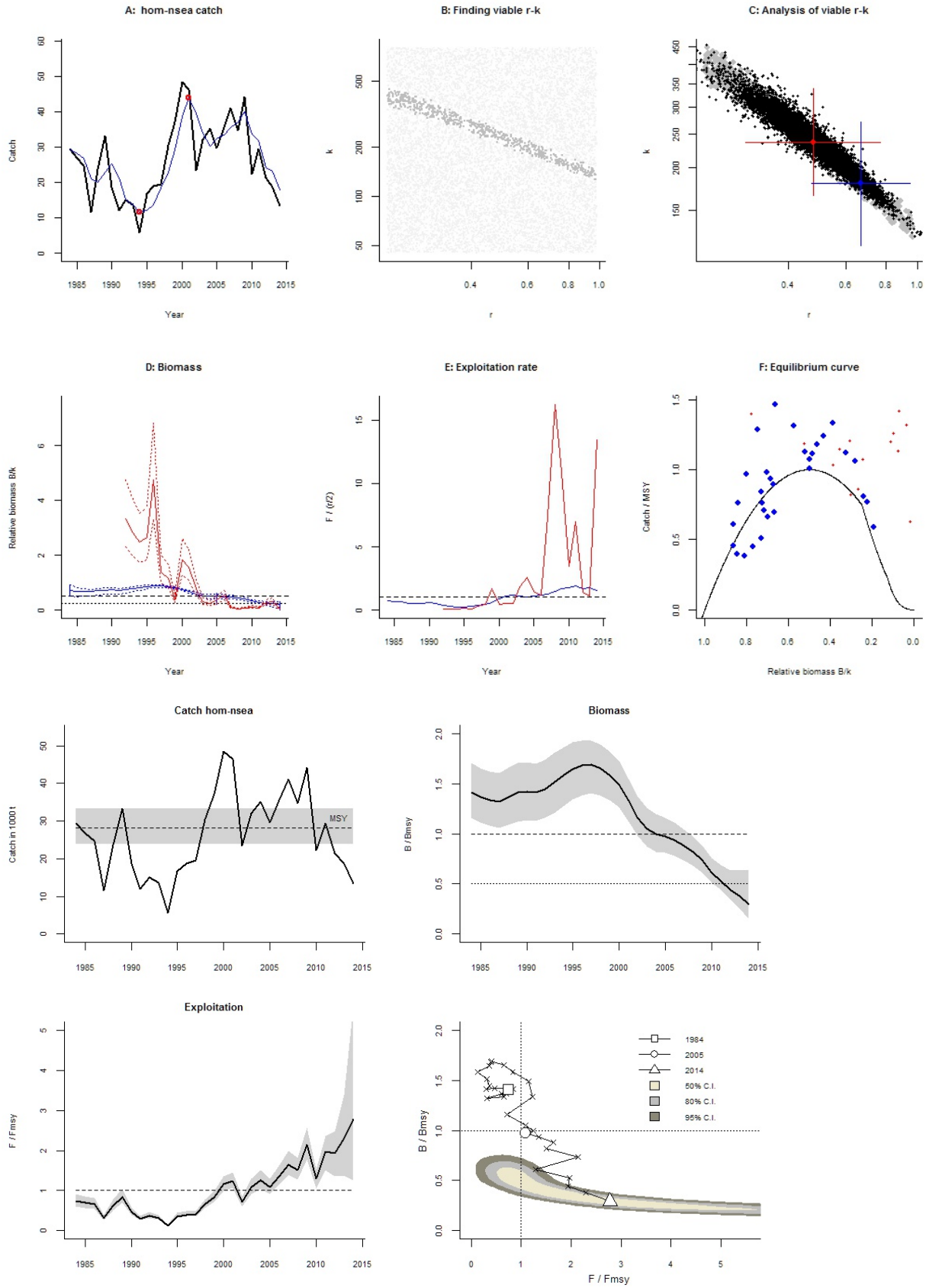
Species: *Trachurus trachurus* , stock: hom-nsea
Horse mackerel in Divisions IIIa, IVb,c, and VIId (Skagerrak and Kattegat, Southern and Central North Sea, Eastern English Channel)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/hom-nsea.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1984 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2005 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.22 - 0.98 expert, , prior range for k = 45 - 800
Prior range of q = 0.0446 - 0.188

Results of CMSY analysis with altogether 3345 viable trajectories for 624 r-k pairs
r = 0.67 , 95% CL = 0.472 - 0.953 , k = 180 , 95% CL = 119 - 271
MSY = 30.1 , 95% CL = 26.7 - 33.9
Relative biomass last year = 0.193 k, 2.5th = 0.0222 , 97.5th = 0.295
Exploitation F/(r/2) in last year = 1.53

Results from Bayesian Schaefer model using catch & CPUE
r = 0.476 , 95% CL = 0.295 - 0.769 , k = 237 , 95% CL = 166 - 339
MSY = 28.2 , 95% CL = 23.8 - 33.3
Relative biomass in last year = 0.146 k, 2.5th perc = 0.0727 , 97.5th perc = 0.322
Exploitation F/(r/2) in last year = 1.63
q = 0.0876 , lcl = 0.0648 , ucl = 0.118

Results for Management (based on BSM analysis)
Fmsy = 0.238 , 95% CL = 0.147 - 0.385 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.139 , 95% CL = 0.0861 - 0.225 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 28.2 , 95% CL = 23.8 - 33.3
Bmsy = 118 , 95% CL = 82.8 - 169
Biomass in last year = 34.6 , 2.5th perc = 17.2 , 97.5 perc = 76.4
B/Bmsy in last year = 0.292 , 2.5th perc = 0.145 , 97.5 perc = 0.645
Fishing mortality in last year = 0.387 , 2.5th perc = 0.175 , 97.5 perc = 0.778
F/Fmsy = 2.78 , 2.5th perc = 1.26 , 97.5 perc = 5.59

Stock status and exploitation in 2014
Biomass = 34.6 , B/Bmsy = 0.292 , fishing mortality F = 0.387 , F/Fmsy = 2.78
Comment: OK (RF 23.09.16)


A: hom-nsea 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-nsea
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1984
2005
2014
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

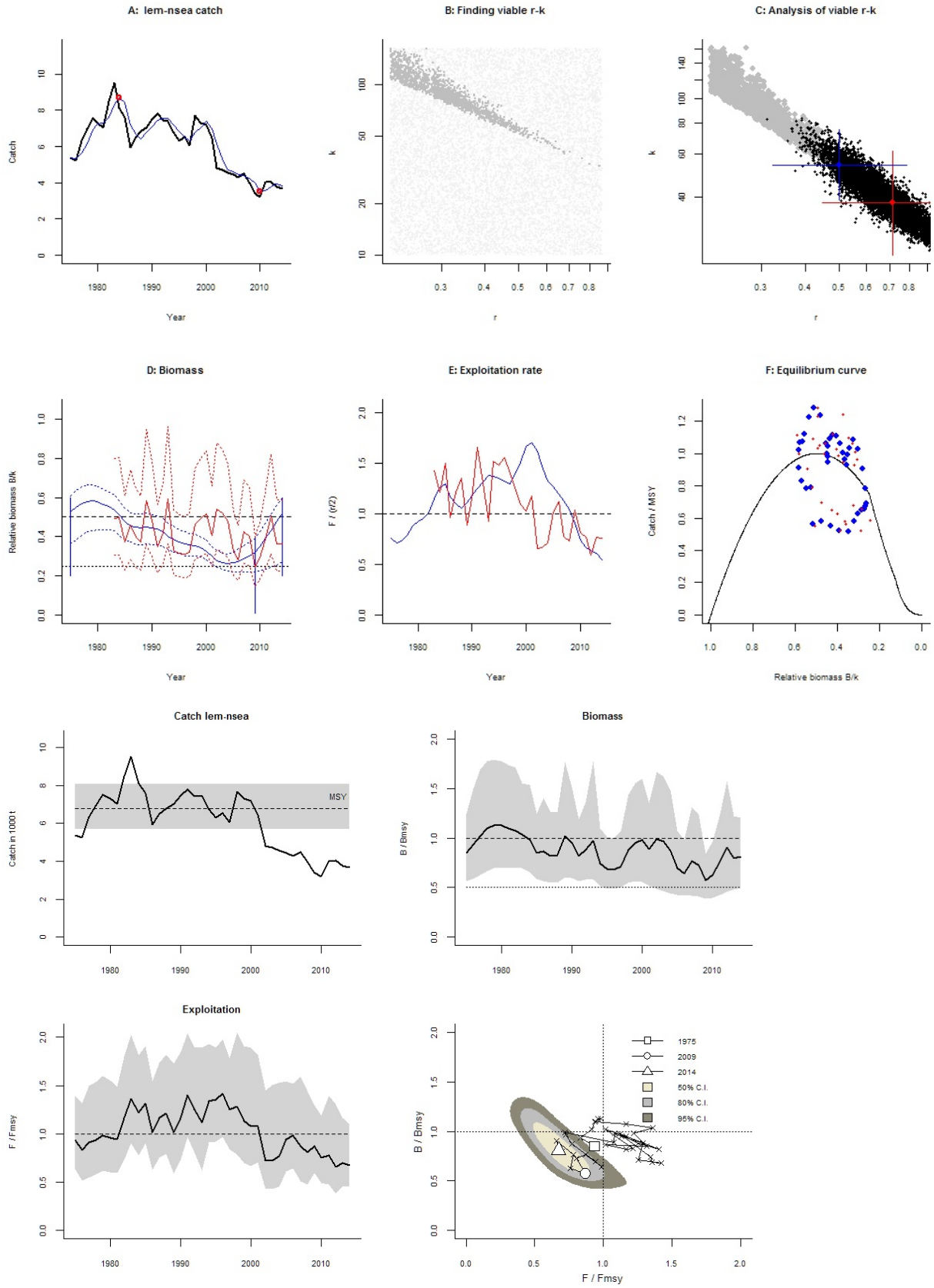
Species: *Microstomus kitt* , stock: lem-nsea
Lemon sole in Subarea IV (North Sea) and Divisions IIIa (Skagerrak–Kattegat) and VIId (Eastern Channel)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/lem-nsea.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1975 - 2014 , 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 = 0.2 - 0.6 , default
Prior range for r = 0.21 - 0.87 expert, , prior range for k = 10 - 163
Prior range of q = 8.85e-05 - 0.000356

Results of CMSY analysis with altogether 2388 viable trajectories for 1551 r-k pairs
r = 0.502 , 95% CL = 0.322 - 0.782 , k = 54.2 , 95% CL = 39.1 - 75
MSY = 6.79 , 95% CL = 6.11 - 7.56
Relative biomass last year = 0.517 k, 2.5th = 0.274 , 97.5th = 0.596
Exploitation F/(r/2) in last year = 0.545

Results from Bayesian Schaefer model using catch & CPUE
r = 0.714 , 95% CL = 0.447 - 1.14 , k = 37.9 , 95% CL = 23.4 - 61.6
MSY = 6.77 , 95% CL = 5.68 - 8.08
Relative biomass in last year = 0.405 k, 2.5th perc = 0.248 , 97.5th perc = 0.604
Exploitation F/(r/2) in last year = 0.673
q = 0.000113 , lcl = 8.6e-05 , ucl = 0.000149

Results for Management (based on BSM analysis)
Fmsy = 0.357 , 95% CL = 0.224 - 0.57 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.357 , 95% CL = 0.224 - 0.57 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 6.77 , 95% CL = 5.68 - 8.08
Bmsy = 19 , 95% CL = 11.7 - 30.8
Biomass in last year = 15.4 , 2.5th perc = 9.4 , 97.5 perc = 22.9
B/Bmsy in last year = 0.809 , 2.5th perc = 0.496 , 97.5 perc = 1.21
Fishing mortality in last year = 0.24 , 2.5th perc = 0.161 , 97.5 perc = 0.392
F/Fmsy = 0.673 , 2.5th perc = 0.451 , 97.5 perc = 1.1

Stock status and exploitation in 2014
Biomass = 15.4 , B/Bmsy = 0.809 , fishing mortality F = 0.24 , F/Fmsy = 0.673
Comment: OK (RF 23.09.16)


A: lem-nsea 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 lem-nsea
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1975
2009
2014
50% C.I.
80% C.I.
95% C.I.

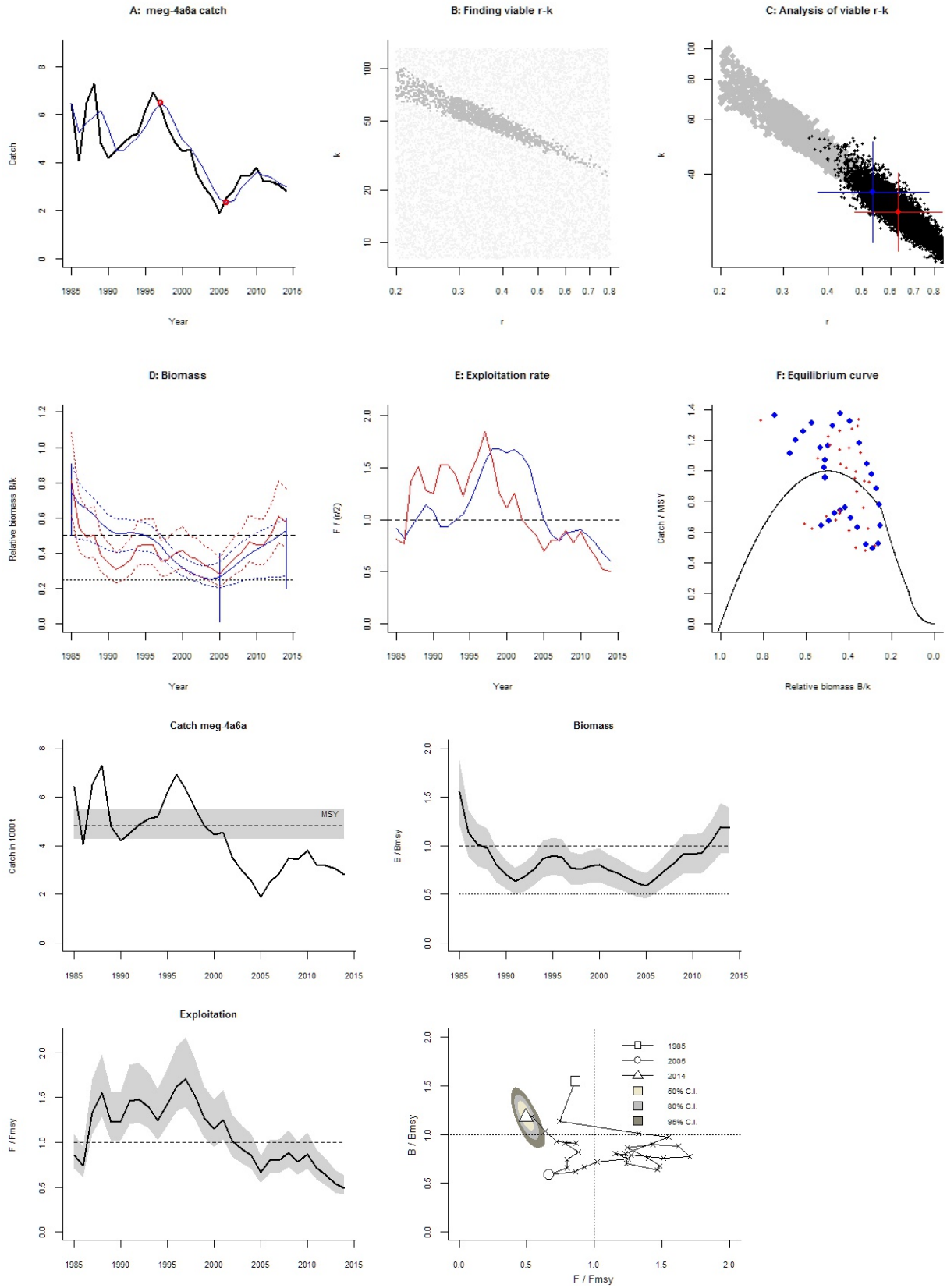
Species: *Lepidorhombus* spp. , stock: meg-4a6a
Megrim in Divisions IVa and VIa (Northern North Sea, West of Scotland)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/meg-4a6a.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1985 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2005 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 8.09 - 129
Prior range of q = 8.6e-05 - 0.000344

Results of CMSY analysis with altogether 4403 viable trajectories for 1548 r-k pairs
r = 0.537 , 95% CL = 0.374 - 0.77 , k = 35.1 , 95% CL = 24.3 - 50.6
MSY = 4.71 , 95% CL = 4.22 - 5.25
Relative biomass last year = 0.53 k, 2.5th = 0.273 , 97.5th = 0.598
Exploitation F/(r/2) in last year = 0.605

Results from Bayesian Schaefer model using catch & CPUE
r = 0.633 , 95% CL = 0.477 - 0.839 , k = 30.5 , 95% CL = 23 - 40.5
MSY = 4.83 , 95% CL = 4.25 - 5.49
Relative biomass in last year = 0.59 k, 2.5th perc = 0.461 , 97.5th perc = 0.695
Exploitation F/(r/2) in last year = 0.493
q = 0.000105 , lcl = 8.23e-05 , ucl = 0.000134

Results for Management (based on BSM analysis)
Fmsy = 0.316 , 95% CL = 0.239 - 0.42 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.316 , 95% CL = 0.239 - 0.42 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 4.83 , 95% CL = 4.25 - 5.49
Bmsy = 15.3 , 95% CL = 11.5 - 20.3
Biomass in last year = 18 , 2.5th perc = 14.1 , 97.5 perc = 21.2
B/Bmsy in last year = 1.18 , 2.5th perc = 0.923 , 97.5 perc = 1.39
Fishing mortality in last year = 0.156 , 2.5th perc = 0.132 , 97.5 perc = 0.199
F/Fmsy = 0.493 , 2.5th perc = 0.418 , 97.5 perc = 0.63

Stock status and exploitation in 2014
Biomass = 18 , B/Bmsy = 1.18 , fishing mortality F = 0.156 , F/Fmsy = 0.493
Comment: OK (RF 23.09.16)


A: meg-4a6a 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 meg-4a6a
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1985
2005
2014
50% C.I.
80% C.I.
95% C.I.

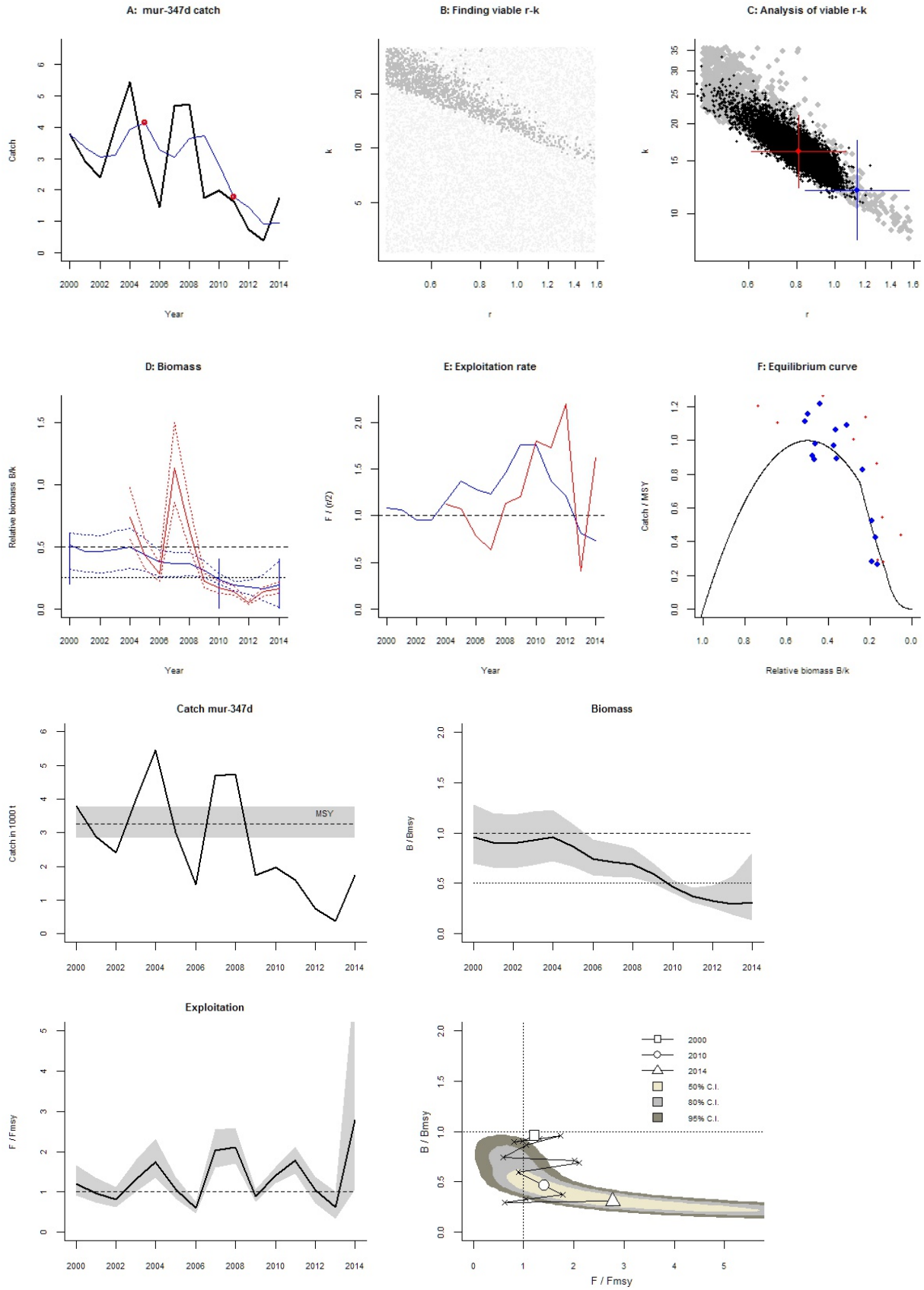
Species: *Mullus surmuletus* , stock: mur-347d
Striped red mullet - in Subarea IV (North Sea) and Divisions VIId (Eastern English Channel) and IIIa (Skagerrak–Kattegat)
Source: http://ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/mur-347d.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 2000 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2010 default
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.46 - 1.6 expert, , prior range for k = 2.62 - 36.1
Prior range of q = 0.182 - 0.675

Results of CMSY analysis with altogether 2445 viable trajectories for 1580 r-k pairs
r = 1.14 , 95% CL = 0.84 - 1.55 , k = 12 , 95% CL = 8.17 - 17.5
MSY = 3.41 , 95% CL = 2.84 - 4.09
Relative biomass last year = 0.19 k, 2.5th = 0.0175 , 97.5th = 0.39
Exploitation F/(r/2) in last year = 0.733

Results from Bayesian Schaefer model using catch & CPUE
r = 0.811 , 95% CL = 0.613 - 1.07 , k = 16.1 , 95% CL = 12.2 - 21.3
MSY = 3.27 , 95% CL = 2.84 - 3.77
Relative biomass in last year = 0.154 k, 2.5th perc = 0.0677 , 97.5th perc = 0.401
Exploitation F/(r/2) in last year = 1.72
q = 0.347 , lcl = 0.269 , ucl = 0.448

Results for Management (based on BSM analysis)
Fmsy = 0.406 , 95% CL = 0.307 - 0.537 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.25 , 95% CL = 0.189 - 0.331 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 3.27 , 95% CL = 2.84 - 3.77
Bmsy = 8.06 , 95% CL = 6.11 - 10.6
Biomass in last year = 2.49 , 2.5th perc = 1.09 , 97.5 perc = 6.46
B/Bmsy in last year = 0.309 , 2.5th perc = 0.135 , 97.5 perc = 0.801
Fishing mortality in last year = 0.696 , 2.5th perc = 0.268 , 97.5 perc = 1.59
F/Fmsy = 2.78 , 2.5th perc = 1.07 , 97.5 perc = 6.34

Stock status and exploitation in 2014
Biomass = 2.49 , B/Bmsy = 0.309 , fishing mortality F = 0.696 , F/Fmsy = 2.78
Comment: OK (RF 23.09.16)

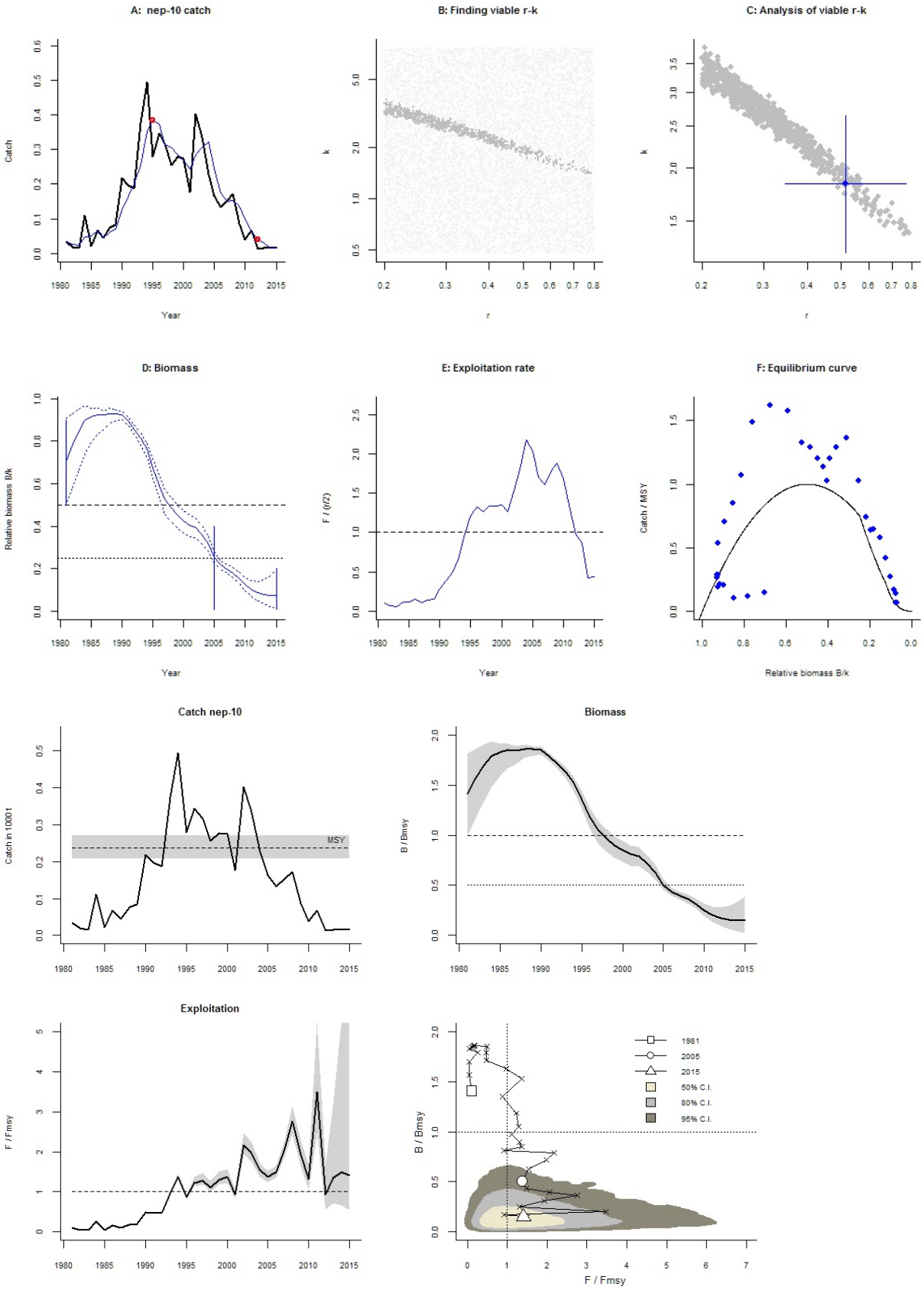

A: mur-347d catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch mur-347d
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
2000
2010
2014
50% C.I.
80% C.I.
95% C.I.

Species: *Nephrops norvegicus* , stock: nep-10
Norway lobster (Nephrops norvegicus) in Division 4.a, Functional Unit 10 (northern North Sea, Noup)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/nep-10.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1981 - 2015 , abundance = None
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2005 expert
Prior final relative biomass = 0.01 - 0.2 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 0.479 - 7.66

Results of CMSY analysis with altogether 2568 viable trajectories for 770 r-k pairs
r = 0.517 , 95% CL = 0.347 - 0.77 , k = 1.83 , 95% CL = 1.27 - 2.64
MSY = 0.237 , 95% CL = 0.208 - 0.27
Relative biomass last year = 0.0751 k, 2.5th = 0.014 , 97.5th = 0.195
Exploitation F/(r/2) in last year = 0.431

Results for Management (based on CMSY analysis)
Fmsy = 0.258 , 95% CL = 0.173 - 0.385 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0776 , 95% CL = 0.0521 - 0.116 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.237 , 95% CL = 0.208 - 0.27
Bmsy = 0.916 , 95% CL = 0.635 - 1.32
Biomass in last year = 0.138 , 2.5th perc = 0.0256 , 97.5 perc = 0.357
B/Bmsy in last year = 0.15 , 2.5th perc = 0.028 , 97.5 perc = 0.39
Fishing mortality in last year = 0.109 , 2.5th perc = 0.042 , 97.5 perc = 0.586
F/Fmsy = 1.41 , 2.5th perc = 0.541 , 97.5 perc = 7.55

Stock status and exploitation in 2014
Biomass = 0.133 , B/Bmsy = 0.146 , fishing mortality F = 0.112 , F/Fmsy = 1.49
Comment: OK (RF 23.09.16)


A: nep-10 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 nep-10
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1981
2005
2015
50% C.I.
80% C.I.
95% C.I.

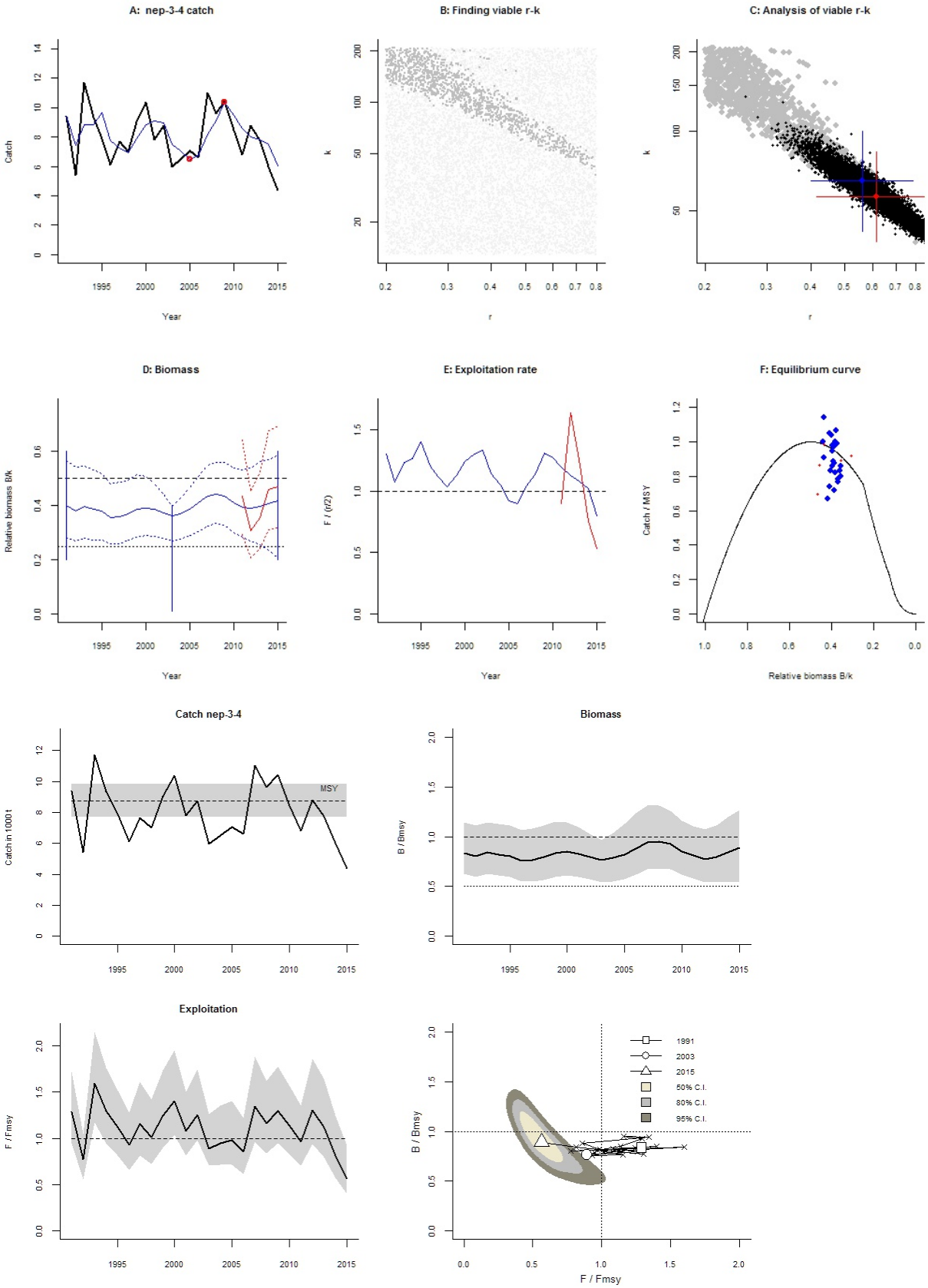
Species: *Nephrops norvegicus* , stock: nep-3-4
Norway lobster in Division IIIa (Skagerrak and Kattegat)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/nep-3-4.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1991 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2003 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 13 - 207
Prior range of q = 0.0841 - 0.337

Results of CMSY analysis with altogether 1954 viable trajectories for 1242 r-k pairs
r = 0.561 , 95% CL = 0.401 - 0.785 , k = 64.6 , 95% CL = 41.7 - 100
MSY = 9.07 , 95% CL = 7.27 - 11.3
Relative biomass last year = 0.419 k, 2.5th = 0.208 , 97.5th = 0.588
Exploitation F/(r/2) in last year = 0.797

Results from Bayesian Schaefer model using catch & CPUE
r = 0.618 , 95% CL = 0.416 - 0.918 , k = 56.4 , 95% CL = 38.2 - 83.4
MSY = 8.72 , 95% CL = 7.71 - 9.86
Relative biomass in last year = 0.446 k, 2.5th perc = 0.272 , 97.5th perc = 0.633
Exploitation F/(r/2) in last year = 0.564
q = 0.146 , lcl = 0.108 , ucl = 0.195

Results for Management (based on BSM analysis)
Fmsy = 0.309 , 95% CL = 0.208 - 0.459 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.309 , 95% CL = 0.208 - 0.459 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 8.72 , 95% CL = 7.71 - 9.86
Bmsy = 28.2 , 95% CL = 19.1 - 41.7
Biomass in last year = 25.2 , 2.5th perc = 15.4 , 97.5 perc = 35.7
B/Bmsy in last year = 0.892 , 2.5th perc = 0.544 , 97.5 perc = 1.27
Fishing mortality in last year = 0.174 , 2.5th perc = 0.123 , 97.5 perc = 0.286
F/Fmsy = 0.564 , 2.5th perc = 0.398 , 97.5 perc = 0.925

Stock status and exploitation in 2014
Biomass = 23.9 , B/Bmsy = 0.846 , fishing mortality F = 0.252 , F/Fmsy = 0.814
Comment: OK (RF 23.09.16)


A: nep-3-4 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 nep-3-4
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.

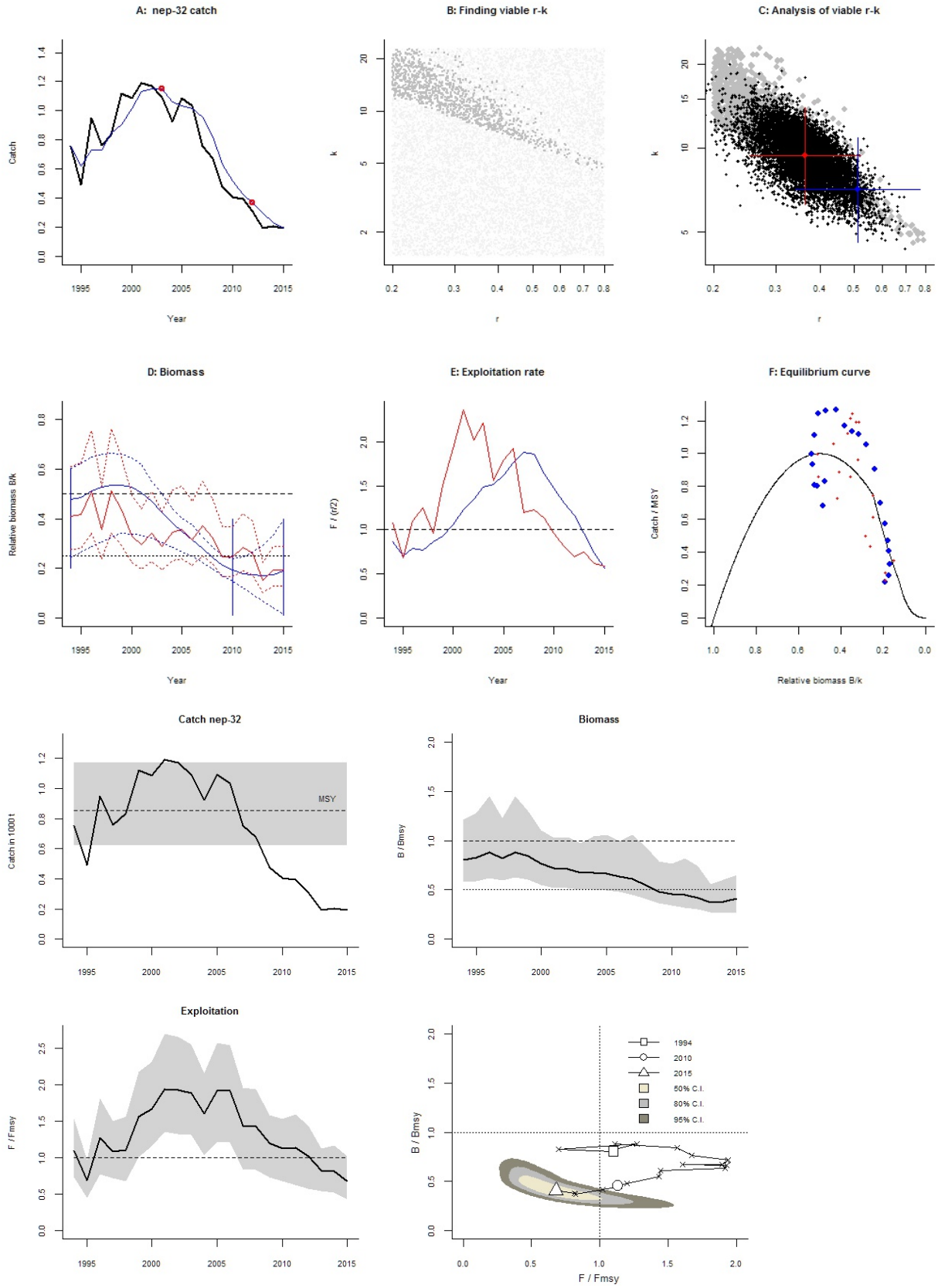
Species: *Nephrops norvegicus* , stock: nep-32
Norway lobster in Division IVa, FU 32 (Northern North Sea, Norwegian Deep)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/nep-32.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1994 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2010 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 1.44 - 23
Prior range of q = 0.0586 - 0.235

Results of CMSY analysis with altogether 1883 viable trajectories for 1109 r-k pairs
r = 0.513 , 95% CL = 0.342 - 0.77 , k = 7.09 , 95% CL = 4.61 - 10.9
MSY = 0.91 , 95% CL = 0.699 - 1.18
Relative biomass last year = 0.19 k, 2.5th = 0.014 , 97.5th = 0.394
Exploitation F/(r/2) in last year = 0.566

Results from Bayesian Schaefer model using catch & CPUE
r = 0.363 , 95% CL = 0.252 - 0.523 , k = 9.38 , 95% CL = 6.3 - 14
MSY = 0.852 , 95% CL = 0.621 - 1.17
Relative biomass in last year = 0.204 k, 2.5th perc = 0.135 , 97.5th perc = 0.324
Exploitation F/(r/2) in last year = 0.553
q = 0.105 , lcl = 0.0803 , ucl = 0.138

Results for Management (based on BSM analysis)
Fmsy = 0.182 , 95% CL = 0.126 - 0.262 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.148 , 95% CL = 0.103 - 0.213 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.852 , 95% CL = 0.621 - 1.17
Bmsy = 4.69 , 95% CL = 3.15 - 6.99
Biomass in last year = 1.91 , 2.5th perc = 1.27 , 97.5 perc = 3.04
B/Bmsy in last year = 0.408 , 2.5th perc = 0.271 , 97.5 perc = 0.648
Fishing mortality in last year = 0.1 , 2.5th perc = 0.0631 , 97.5 perc = 0.151
F/Fmsy = 0.678 , 2.5th perc = 0.426 , 97.5 perc = 1.02

Stock status and exploitation in 2014
Biomass = 1.8 , B/Bmsy = 0.384 , fishing mortality F = 0.114 , F/Fmsy = 0.817
Comment: OK (RF 23.09.16)

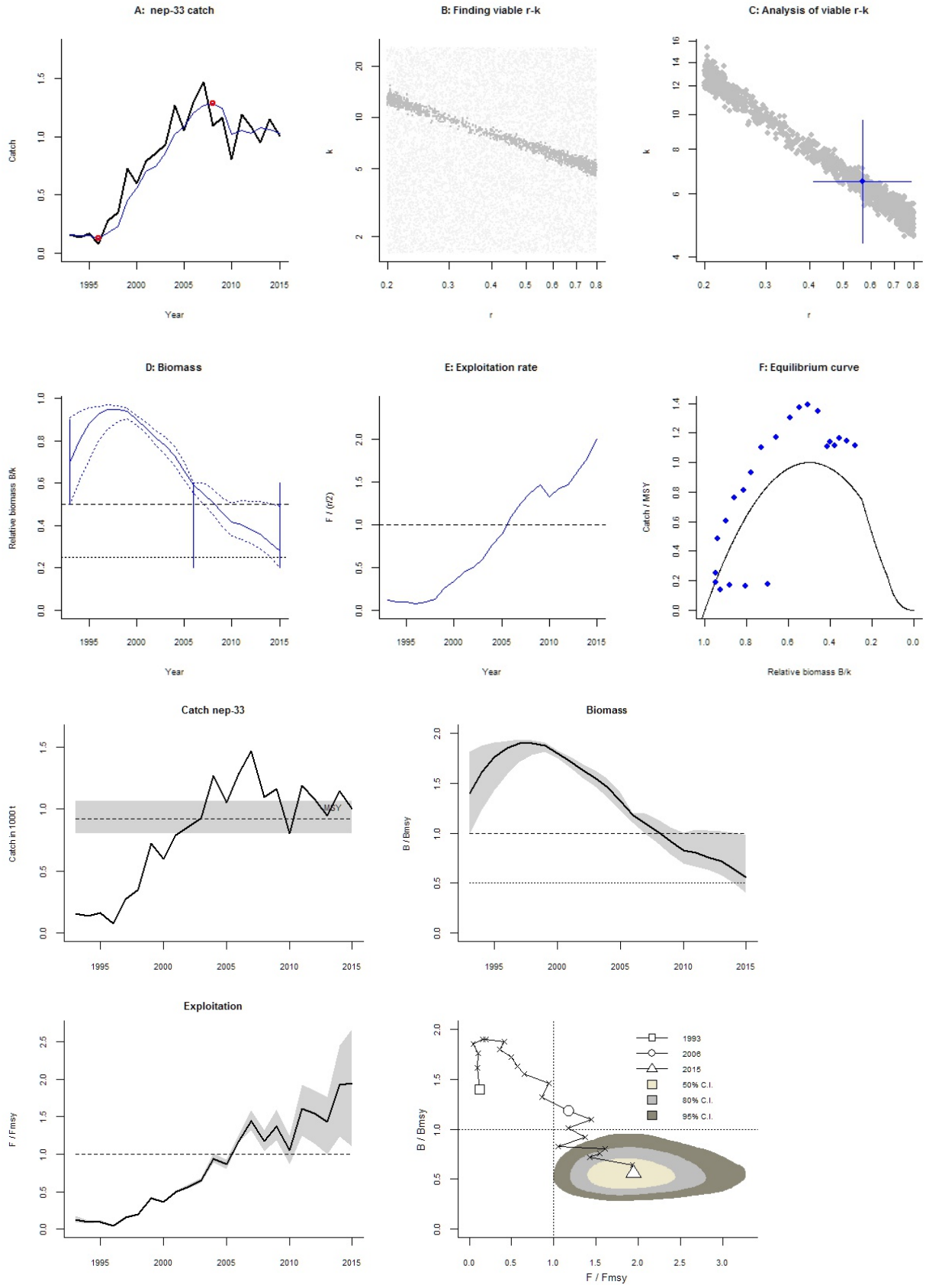

A: nep-32 catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch nep-32
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1994
2010
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

Species: *Nephrops norvegicus* , stock: nep-33
Norway lobster (Nephrops norvegicus) in Division 4.b, Functional Unit 33 (central North Sea, Horn's Reef)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/nep-33.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1993 - 2015 , abundance = None
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.2 - 0.6 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 = 1.6 - 25.7

Results of CMSY analysis with altogether 1783 viable trajectories for 1229 r-k pairs
r = 0.568 , 95% CL = 0.411 - 0.785 , k = 6.5 , 95% CL = 4.38 - 9.65
MSY = 0.924 , 95% CL = 0.803 - 1.06
Relative biomass last year = 0.279 k, 2.5th = 0.203 , 97.5th = 0.49
Exploitation F/(r/2) in last year = 2

Results for Management (based on CMSY analysis)
Fmsy = 0.284 , 95% CL = 0.206 - 0.393 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.284 , 95% CL = 0.206 - 0.393 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.924 , 95% CL = 0.803 - 1.06
Bmsy = 3.25 , 95% CL = 2.19 - 4.82
Biomass in last year = 1.82 , 2.5th perc = 1.32 , 97.5 perc = 3.19
B/Bmsy in last year = 0.558 , 2.5th perc = 0.407 , 97.5 perc = 0.98
Fishing mortality in last year = 0.553 , 2.5th perc = 0.315 , 97.5 perc = 0.758
F/Fmsy = 1.94 , 2.5th perc = 1.11 , 97.5 perc = 2.67

Stock status and exploitation in 2014
Biomass = 2.09 , B/Bmsy = 0.642 , fishing mortality F = 0.549 , F/Fmsy = 1.93
Comment: OK (RF 23.09.16)

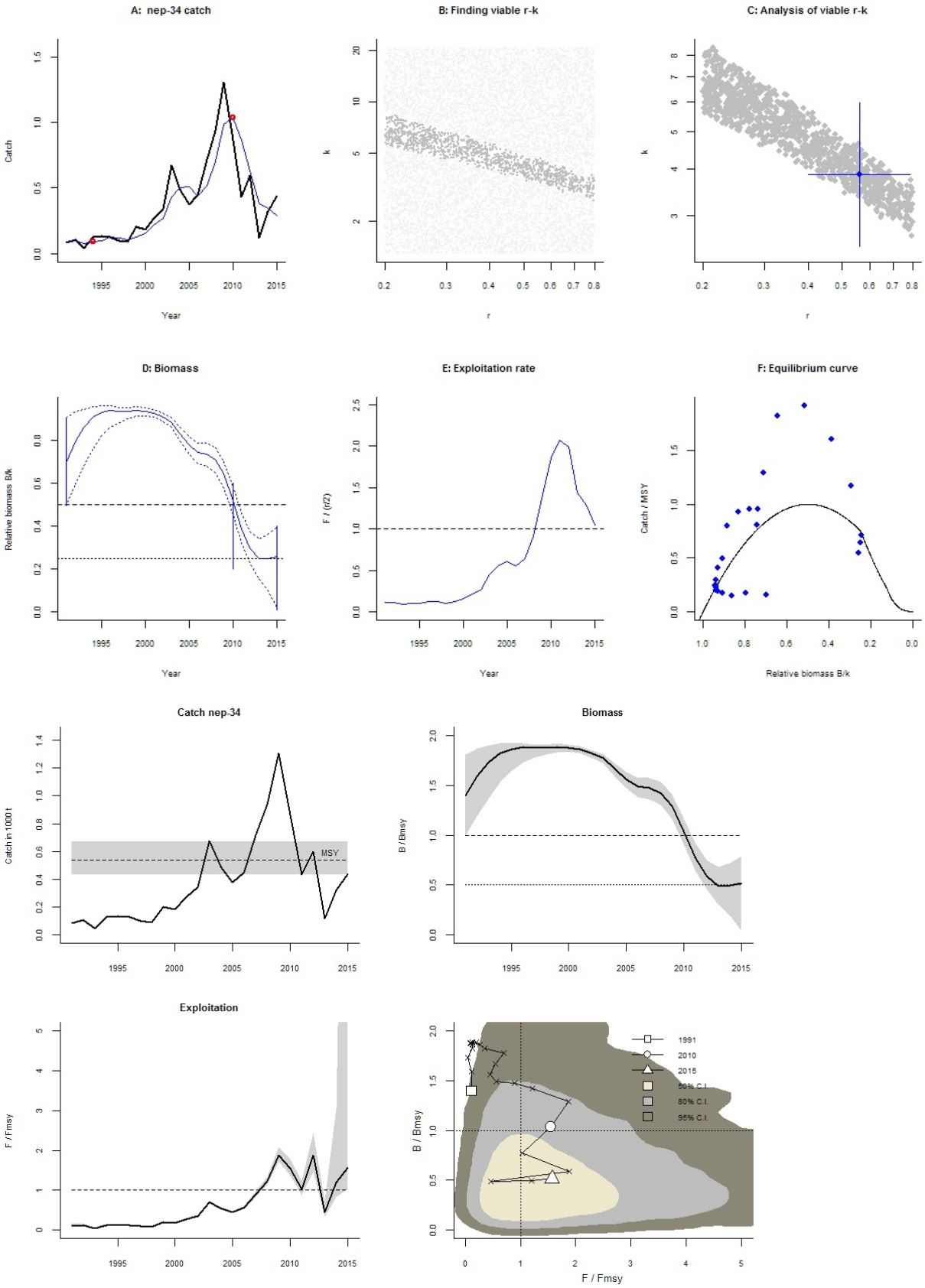

A: nep-33 catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch nep-33
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1993
2006
2015
50% C.I.
80% C.I.
95% C.I.

Species: *Nephrops norvegicus* , stock: nep-34
Norway lobster in Division 4.b, Functional Unit 34 (central North Sea, Devil's Hole)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/nep-34.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1991 - 2015 , abundance = None
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2010 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 1.29 - 20.7

Results of CMSY analysis with altogether 8452 viable trajectories for 1113 r-k pairs
r = 0.561 , 95% CL = 0.401 - 0.785 , k = 3.85 , 95% CL = 2.49 - 5.96
MSY = 0.541 , 95% CL = 0.435 - 0.672
Relative biomass last year = 0.258 k, 2.5th = 0.0221 , 97.5th = 0.394
Exploitation F/(r/2) in last year = 1.05

Results for Management (based on CMSY analysis)
Fmsy = 0.281 , 95% CL = 0.201 - 0.392 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.281 , 95% CL = 0.201 - 0.392 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.541 , 95% CL = 0.435 - 0.672
Bmsy = 1.93 , 95% CL = 1.24 - 2.98
Biomass in last year = 0.994 , 2.5th perc = 0.0852 , 97.5 perc = 1.52
B/Bmsy in last year = 0.516 , 2.5th perc = 0.0442 , 97.5 perc = 0.789
Fishing mortality in last year = 0.442 , 2.5th perc = 0.289 , 97.5 perc = 5.16
F/Fmsy = 1.57 , 2.5th perc = 1.03 , 97.5 perc = 18.4

Stock status and exploitation in 2014
Biomass = 0.957 , B/Bmsy = 0.497 , fishing mortality F = 0.334 , F/Fmsy = 1.2
Comment: OK (RF 23.09.16)

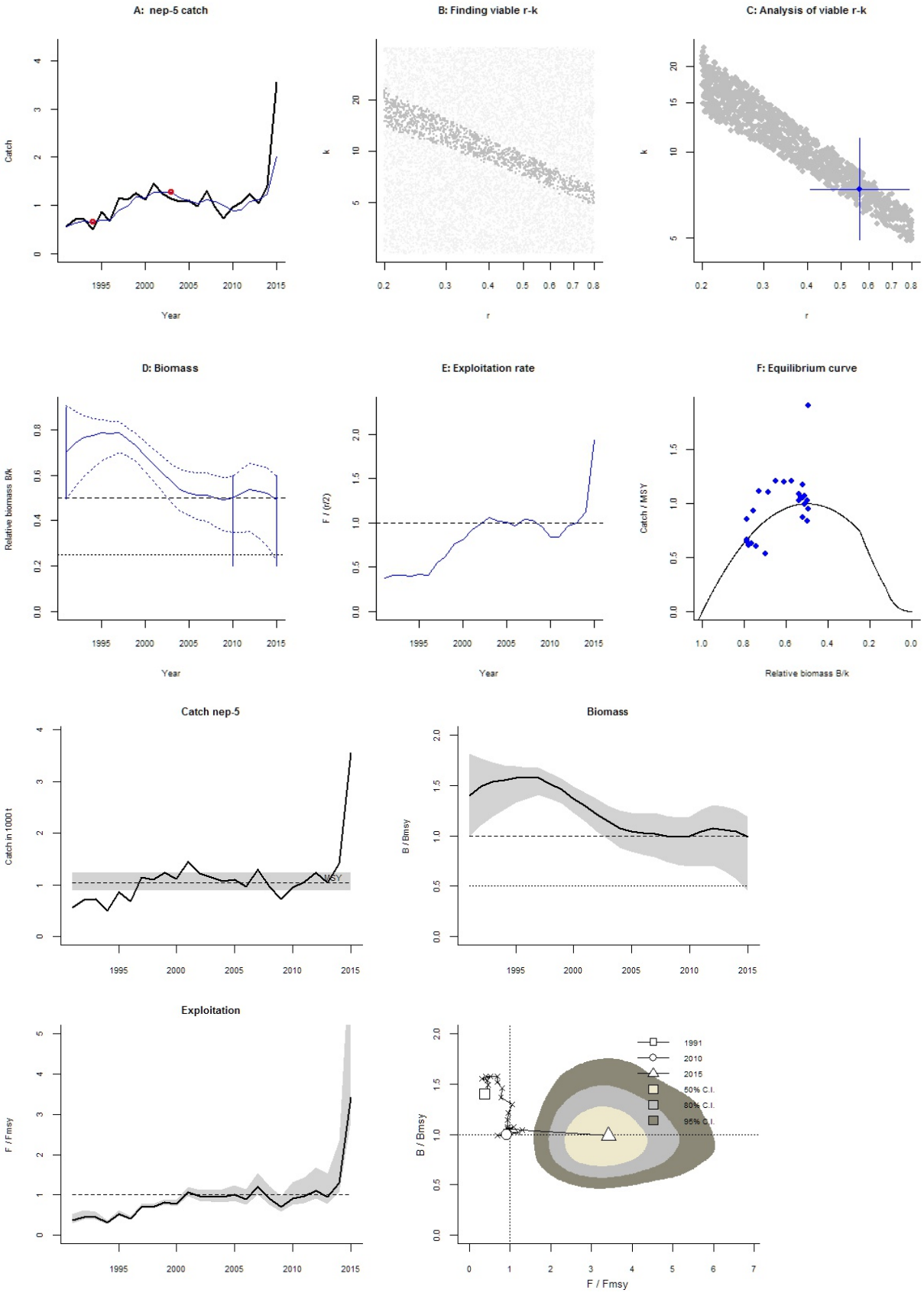

A: nep-34 catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch nep-34
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1991
2010
2015
50% C.I.
80% C.I.
95% C.I.

Species: *Nephrops norvegicus* , stock: nep-5
Norway lobster in divisions 4.b and 4.c, Functional Unit 5 (central and southern North Sea, Botney Cut-Silver Pit)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/nep-5.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1991 - 2015 , abundance = None
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2010 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 2.51 - 40.1

Results of CMSY analysis with altogether 9619 viable trajectories for 1218 r-k pairs
r = 0.566 , 95% CL = 0.407 - 0.785 , k = 7.43 , 95% CL = 4.93 - 11.2
MSY = 1.05 , 95% CL = 0.893 - 1.24
Relative biomass last year = 0.493 k, 2.5th = 0.226 , 97.5th = 0.595
Exploitation F/(r/2) in last year = 1.93

Results for Management (based on CMSY analysis)
Fmsy = 0.283 , 95% CL = 0.204 - 0.392 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.283 , 95% CL = 0.204 - 0.392 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1.05 , 95% CL = 0.893 - 1.24
Bmsy = 3.72 , 95% CL = 2.46 - 5.61
Biomass in last year = 3.67 , 2.5th perc = 1.68 , 97.5 perc = 4.42
B/Bmsy in last year = 0.987 , 2.5th perc = 0.451 , 97.5 perc = 1.19
Fishing mortality in last year = 0.968 , 2.5th perc = 0.804 , 97.5 perc = 2.12
F/Fmsy = 3.42 , 2.5th perc = 2.84 , 97.5 perc = 7.49

Stock status and exploitation in 2014
Biomass = 3.87 , B/Bmsy = 1.04 , fishing mortality F = 0.366 , F/Fmsy = 1.29
Comment: OK (RF 23.09.16)


A: nep-5 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 nep-5
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1991
2010
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

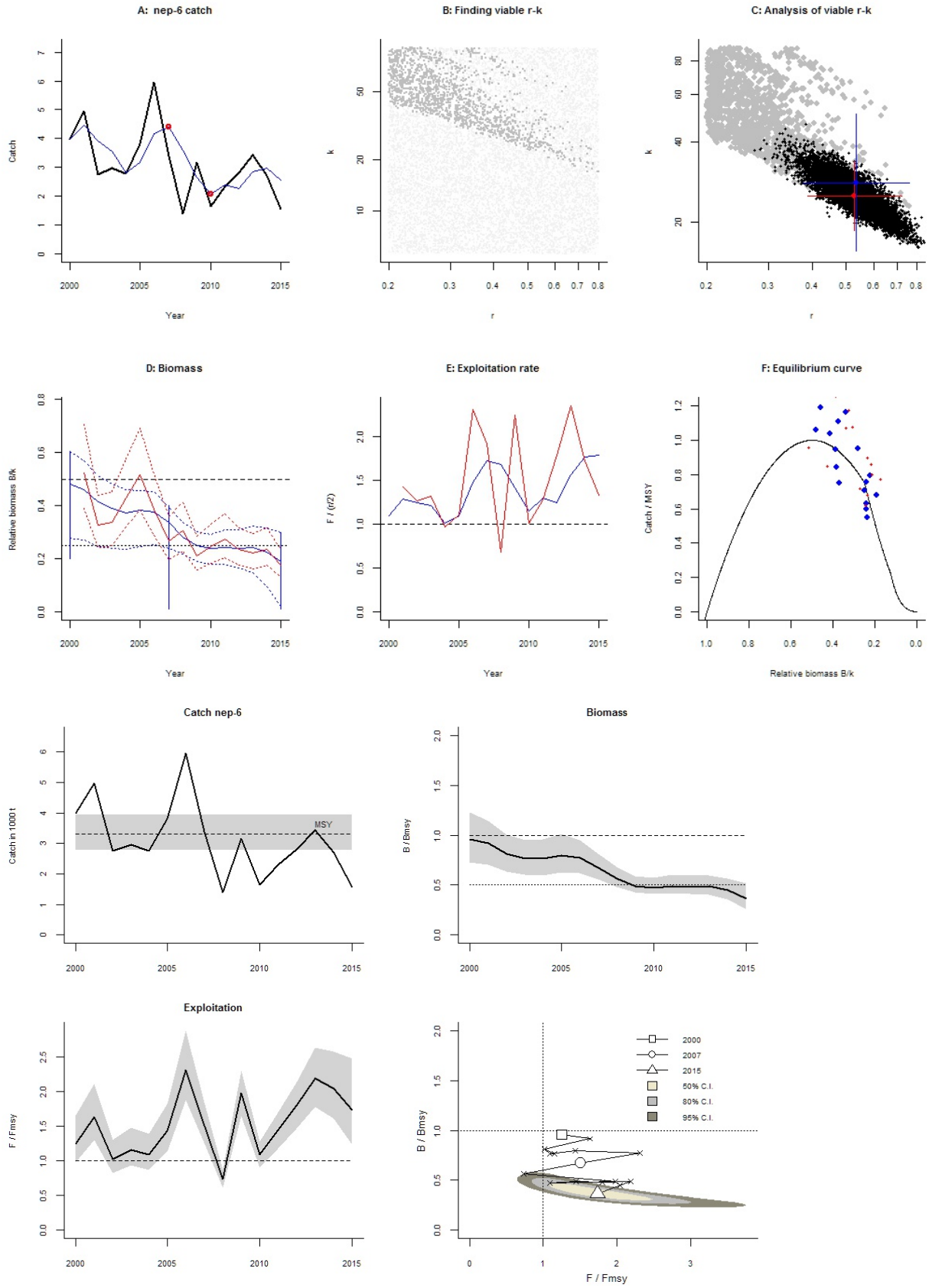
Species: *Nephrops norvegicus* , stock: nep-6
Norway lobster in Division IVa, FU 7 (Northern North Sea, Fladen Ground)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/nep-6.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 2000 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2007 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 5.59 - 89.5
Prior range of q = 0.0768 - 0.307

Results of CMSY analysis with altogether 2465 viable trajectories for 1533 r-k pairs
r = 0.535 , 95% CL = 0.376 - 0.762 , k = 28.1 , 95% CL = 15.6 - 50.8
MSY = 3.76 , 95% CL = 2.19 - 6.48
Relative biomass last year = 0.19 k, 2.5th = 0.0224 , 97.5th = 0.298
Exploitation F/(r/2) in last year = 1.79

Results from Bayesian Schaefer model using catch & CPUE
r = 0.53 , 95% CL = 0.388 - 0.723 , k = 25.1 , 95% CL = 18.6 - 33.8
MSY = 3.32 , 95% CL = 2.79 - 3.96
Relative biomass in last year = 0.184 k, 2.5th perc = 0.129 , 97.5th perc = 0.259
Exploitation F/(r/2) in last year = 1.28
q = 0.128 , lcl = 0.0992 , ucl = 0.166

Results for Management (based on BSM analysis)
Fmsy = 0.265 , 95% CL = 0.194 - 0.361 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.195 , 95% CL = 0.143 - 0.266 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 3.32 , 95% CL = 2.79 - 3.96
Bmsy = 12.5 , 95% CL = 9.32 - 16.9
Biomass in last year = 4.61 , 2.5th perc = 3.23 , 97.5 perc = 6.49
B/Bmsy in last year = 0.367 , 2.5th perc = 0.258 , 97.5 perc = 0.517
Fishing mortality in last year = 0.338 , 2.5th perc = 0.24 , 97.5 perc = 0.483
F/Fmsy = 1.74 , 2.5th perc = 1.24 , 97.5 perc = 2.48

Stock status and exploitation in 2014
Biomass = 5.6 , B/Bmsy = 0.446 , fishing mortality F = 0.483 , F/Fmsy = 2.04
Comment: OK (RF 23.09.16)


A: nep-6 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 nep-6
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
2000
2007
2015
50% C.I.
80% C.I.
95% C.I.

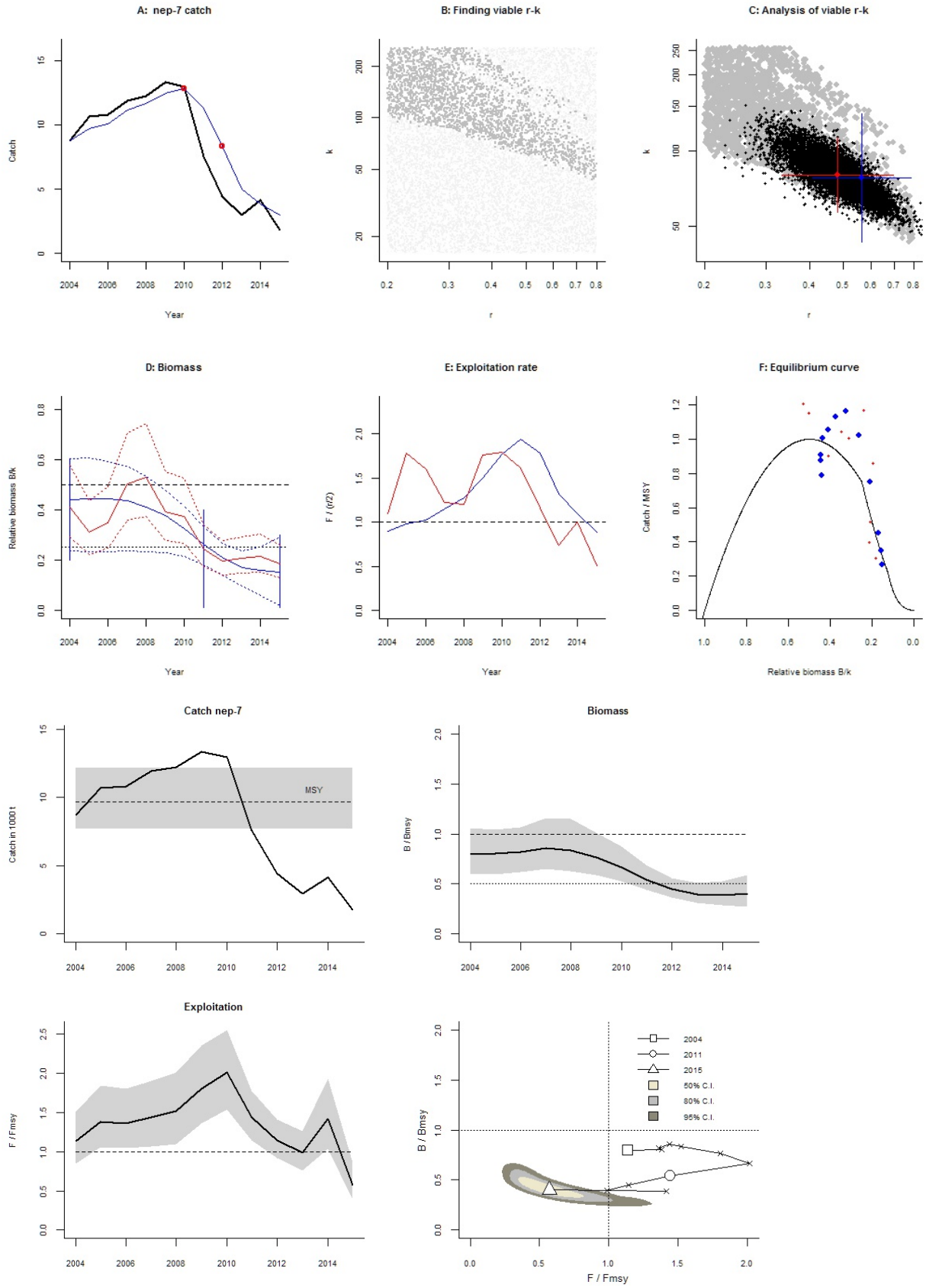
Species: *Nephrops norvegicus* , stock: nep-7
Norway lobster in Division IVa, FU 7 (Northern North Sea, Fladen Ground)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/nep-7.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 2004 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2011 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 16.1 - 257
Prior range of q = 0.0896 - 0.359

Results of CMSY analysis with altogether 5156 viable trajectories for 2611 r-k pairs
r = 0.566 , 95% CL = 0.407 - 0.785 , k = 78.3 , 95% CL = 43.4 - 141
MSY = 11.1 , 95% CL = 6.64 - 18.4
Relative biomass last year = 0.15 k, 2.5th = 0.0168 , 97.5th = 0.294
Exploitation F/(r/2) in last year = 0.89

Results from Bayesian Schaefer model using catch & CPUE
r = 0.481 , 95% CL = 0.332 - 0.696 , k = 80.3 , 95% CL = 57.1 - 113
MSY = 9.66 , 95% CL = 7.67 - 12.2
Relative biomass in last year = 0.201 k, 2.5th perc = 0.134 , 97.5th perc = 0.295
Exploitation F/(r/2) in last year = 0.459
q = 0.173 , lcl = 0.132 , ucl = 0.228

Results for Management (based on BSM analysis)
Fmsy = 0.24 , 95% CL = 0.166 - 0.348 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.194 , 95% CL = 0.134 - 0.28 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 9.66 , 95% CL = 7.67 - 12.2
Bmsy = 40.2 , 95% CL = 28.5 - 56.5
Biomass in last year = 16.2 , 2.5th perc = 10.8 , 97.5 perc = 23.7
B/Bmsy in last year = 0.403 , 2.5th perc = 0.269 , 97.5 perc = 0.59
Fishing mortality in last year = 0.11 , 2.5th perc = 0.0754 , 97.5 perc = 0.166
F/Fmsy = 0.571 , 2.5th perc = 0.39 , 97.5 perc = 0.855

Stock status and exploitation in 2014
Biomass = 15.6 , B/Bmsy = 0.39 , fishing mortality F = 0.265 , F/Fmsy = 1.42
Comment: OK (RF 23.09.16)


A: nep-7 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 nep-7
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
2004
2011
2015
50% C.I.
80% C.I.
95% C.I.

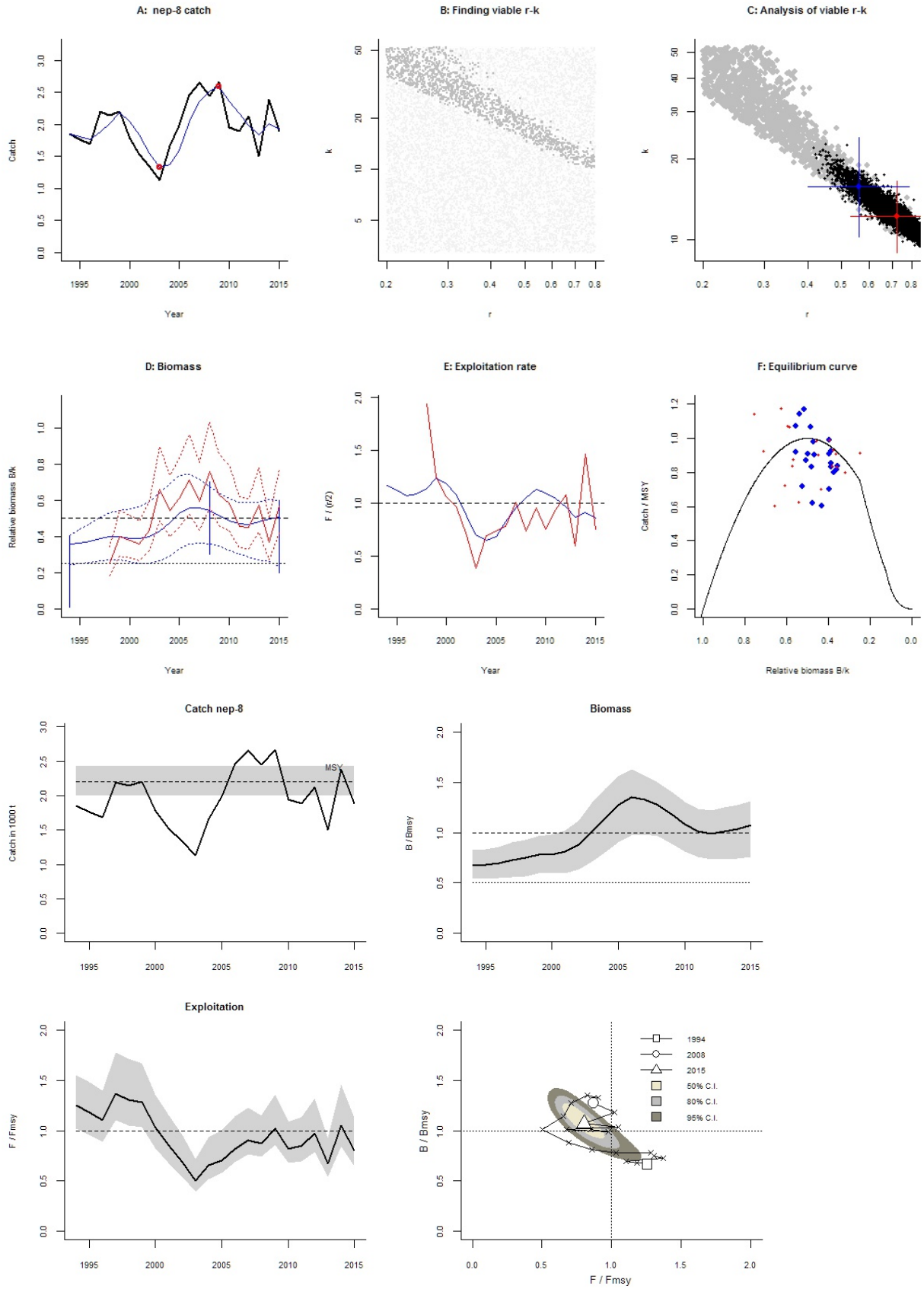
Species: *Nephrops norvegicus* , stock: nep-8
Norway lobster in Division IVb, FU 8 (Central North Sea, Firth of Forth)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/nep-8.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1994 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.3 - 0.7 in year 2008 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 3.23 - 51.8
Prior range of q = 0.0577 - 0.231

Results of CMSY analysis with altogether 3192 viable trajectories for 1437 r-k pairs
r = 0.561 , 95% CL = 0.401 - 0.785 , k = 15.7 , 95% CL = 10.3 - 24.1
MSY = 2.21 , 95% CL = 1.82 - 2.68
Relative biomass last year = 0.506 k, 2.5th = 0.236 , 97.5th = 0.597
Exploitation F/(r/2) in last year = 0.862

Results from Bayesian Schaefer model using catch & CPUE
r = 0.723 , 95% CL = 0.533 - 0.98 , k = 12.2 , 95% CL = 8.98 - 16.6
MSY = 2.21 , 95% CL = 2 - 2.43
Relative biomass in last year = 0.536 k, 2.5th perc = 0.38 , 97.5th perc = 0.656
Exploitation F/(r/2) in last year = 0.801
q = 0.0955 , lcl = 0.0727 , ucl = 0.125

Results for Management (based on BSM analysis)
Fmsy = 0.362 , 95% CL = 0.267 - 0.49 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.362 , 95% CL = 0.267 - 0.49 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 2.21 , 95% CL = 2 - 2.43
Bmsy = 6.1 , 95% CL = 4.49 - 8.29
Biomass in last year = 6.54 , 2.5th perc = 4.64 , 97.5 perc = 8.01
B/Bmsy in last year = 1.07 , 2.5th perc = 0.761 , 97.5 perc = 1.31
Fishing mortality in last year = 0.289 , 2.5th perc = 0.236 , 97.5 perc = 0.408
F/Fmsy = 0.801 , 2.5th perc = 0.653 , 97.5 perc = 1.13

Stock status and exploitation in 2014
Biomass = 6.29 , B/Bmsy = 1.03 , fishing mortality F = 0.379 , F/Fmsy = 1.05
Comment: OK (RF 23.09.16) Abundance data before 2003 read off graph; early landings not reliable; start year set to 1993.


A: nep-8 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 nep-8
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1994
2008
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

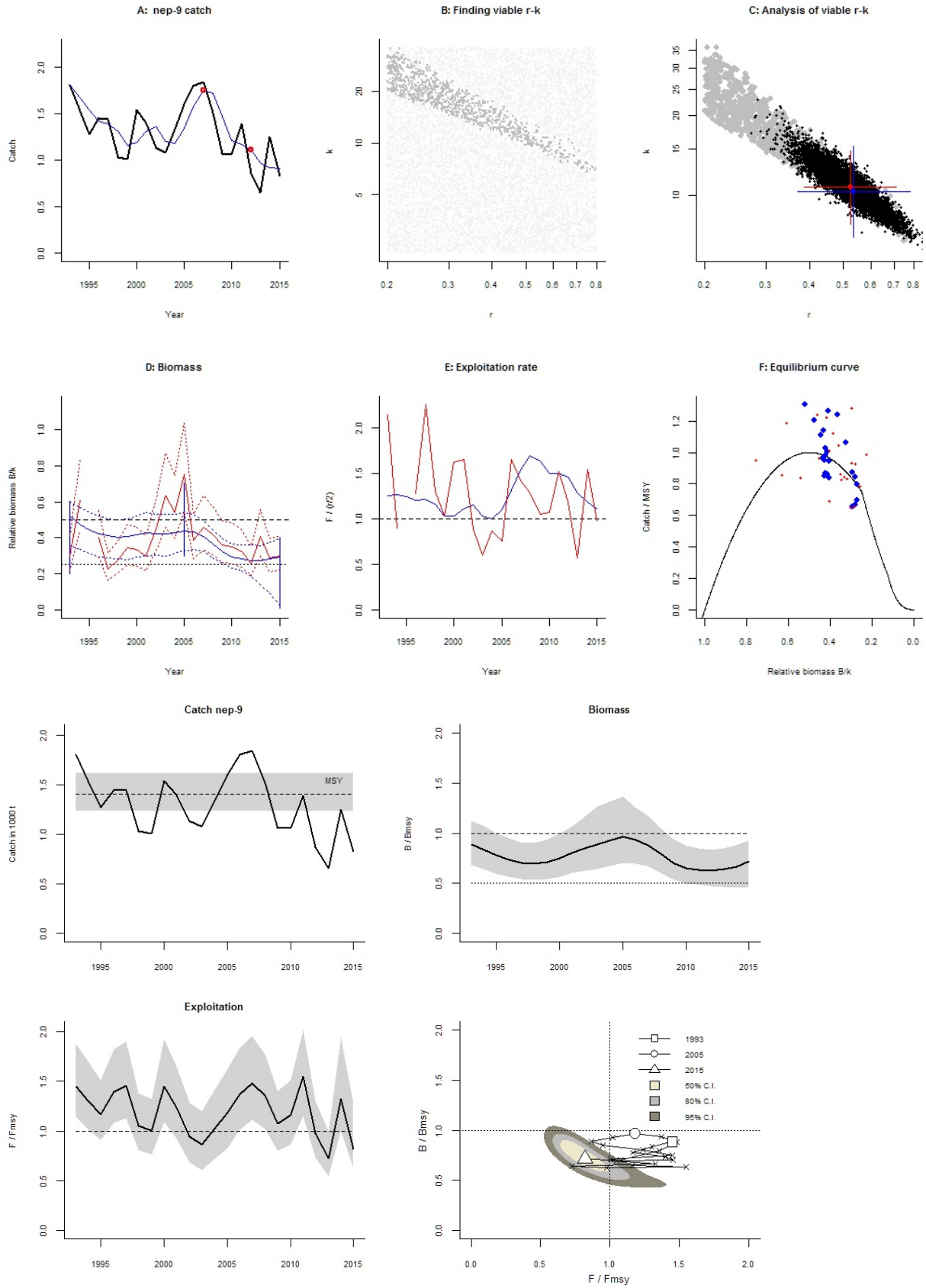
Species: *Nephrops norvegicus* , stock: nep-9
Norway lobster in Division IVb, FU 9 (Central North Sea, Moray Firth)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/nep-9.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1993 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.3 - 0.7 in year 2005 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 2.26 - 36.2
Prior range of q = 0.0593 - 0.237

Results of CMSY analysis with altogether 1871 viable trajectories for 965 r-k pairs
r = 0.537 , 95% CL = 0.37 - 0.778 , k = 10.4 , 95% CL = 6.97 - 15.4
MSY = 1.39 , 95% CL = 1.18 - 1.64
Relative biomass last year = 0.296 k, 2.5th = 0.025 , 97.5th = 0.397
Exploitation F/(r/2) in last year = 1.11

Results from Bayesian Schaefer model using catch & CPUE
r = 0.525 , 95% CL = 0.387 - 0.712 , k = 10.8 , 95% CL = 7.84 - 14.8
MSY = 1.41 , 95% CL = 1.23 - 1.62
Relative biomass in last year = 0.359 k, 2.5th perc = 0.229 , 97.5th perc = 0.465
Exploitation F/(r/2) in last year = 0.82
q = 0.107 , lcl = 0.0815 , ucl = 0.14

Results for Management (based on BSM analysis)
Fmsy = 0.262 , 95% CL = 0.193 - 0.356 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.262 , 95% CL = 0.193 - 0.356 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1.41 , 95% CL = 1.23 - 1.62
Bmsy = 5.38 , 95% CL = 3.92 - 7.39
Biomass in last year = 3.86 , 2.5th perc = 2.46 , 97.5 perc = 5.01
B/Bmsy in last year = 0.717 , 2.5th perc = 0.458 , 97.5 perc = 0.931
Fishing mortality in last year = 0.215 , 2.5th perc = 0.166 , 97.5 perc = 0.337
F/Fmsy = 0.82 , 2.5th perc = 0.631 , 97.5 perc = 1.28

Stock status and exploitation in 2014
Biomass = 3.6 , B/Bmsy = 0.668 , fishing mortality F = 0.348 , F/Fmsy = 1.33
Comment: OK (RF 23.09.16)


A: nep-9 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 nep-9
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1993
2005
2015
50% C.I.
80% C.I.
95% C.I.

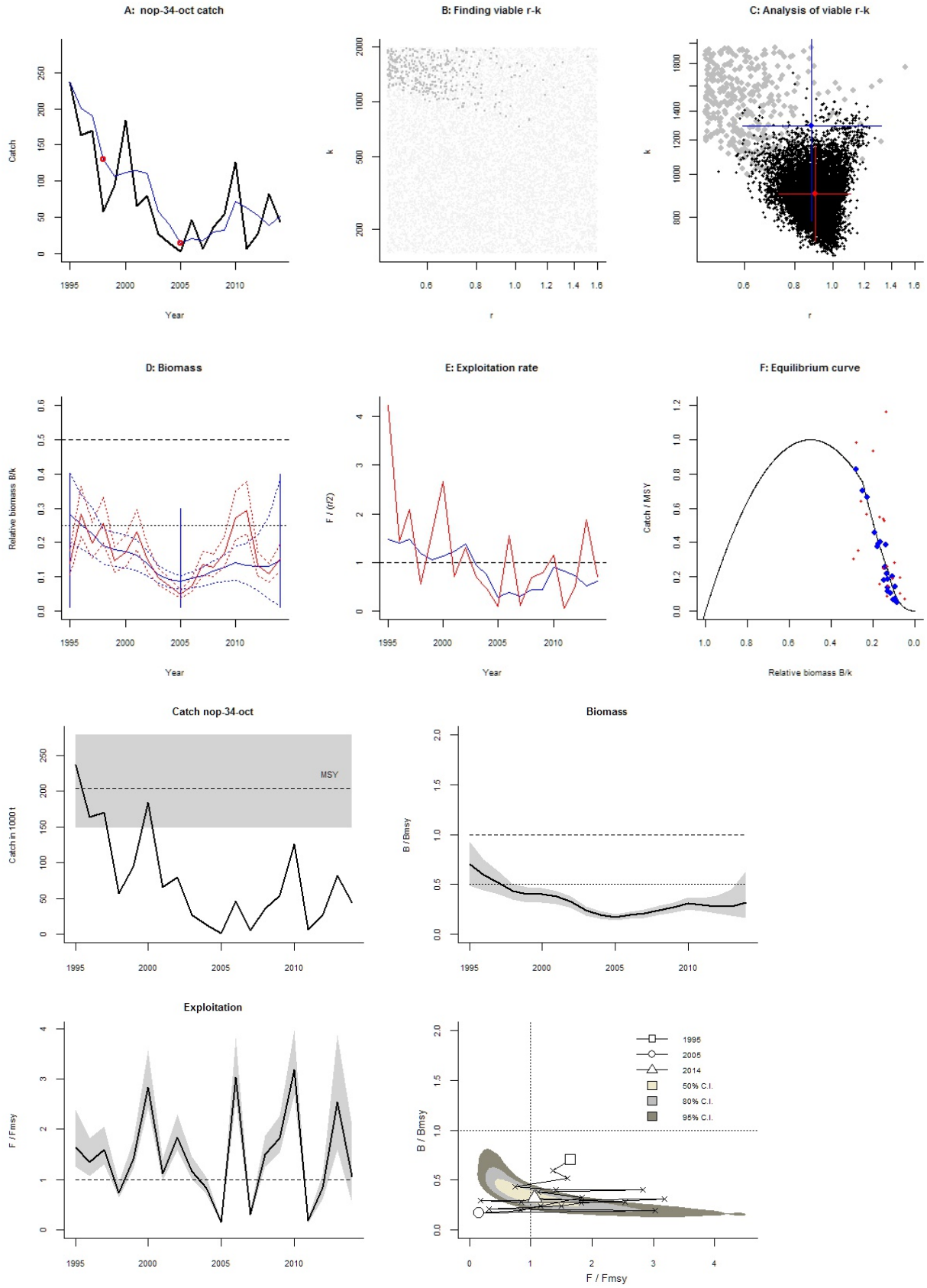
Species: *Trisopterus esmarkii* , stock: nop-34-oct
Norway Pout in Subarea IV (North S.) and IIIa (Skagerrak - Kattegat)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/nop-34-oct.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1995 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.3 in year 2005 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.48 - 1.6 expert, , prior range for k = 148 - 1973
Prior range of q = 0.962 - 3.51

Results of CMSY analysis with altogether 372 viable trajectories for 367 r-k pairs
r = 0.885 , 95% CL = 0.593 - 1.32 , k = 1293 , 95% CL = 782 - 2136
MSY = 286 , 95% CL = 160 - 509
Relative biomass last year = 0.146 k, 2.5th = 0.0143 , 97.5th = 0.387
Exploitation F/(r/2) in last year = 0.611

Results from Bayesian Schaefer model using catch & CPUE
r = 0.901 , 95% CL = 0.732 - 1.11 , k = 906 , 95% CL = 702 - 1168
MSY = 204 , 95% CL = 149 - 279
Relative biomass in last year = 0.16 k, 2.5th perc = 0.0822 , 97.5th perc = 0.317
Exploitation F/(r/2) in last year = 0.679
q = 1.41 , lcl = 1.16 , ucl = 1.73

Results for Management (based on BSM analysis)
Fmsy = 0.45 , 95% CL = 0.366 - 0.554 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.288 , 95% CL = 0.234 - 0.354 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 204 , 95% CL = 149 - 279
Bmsy = 453 , 95% CL = 351 - 584
Biomass in last year = 145 , 2.5th perc = 74.4 , 97.5 perc = 287
B/Bmsy in last year = 0.32 , 2.5th perc = 0.164 , 97.5 perc = 0.635
Fishing mortality in last year = 0.306 , 2.5th perc = 0.154 , 97.5 perc = 0.594
F/Fmsy = 1.06 , 2.5th perc = 0.534 , 97.5 perc = 2.06

Stock status and exploitation in 2014
Biomass = 145 , B/Bmsy = 0.32 , fishing mortality F = 0.306 , F/Fmsy = 1.06
Comment: OK (RF 23.09.16)


A: nop-34-oct 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 nop-34-oct
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1995
2005
2014
50% C.I.
80% C.I.
95% C.I.

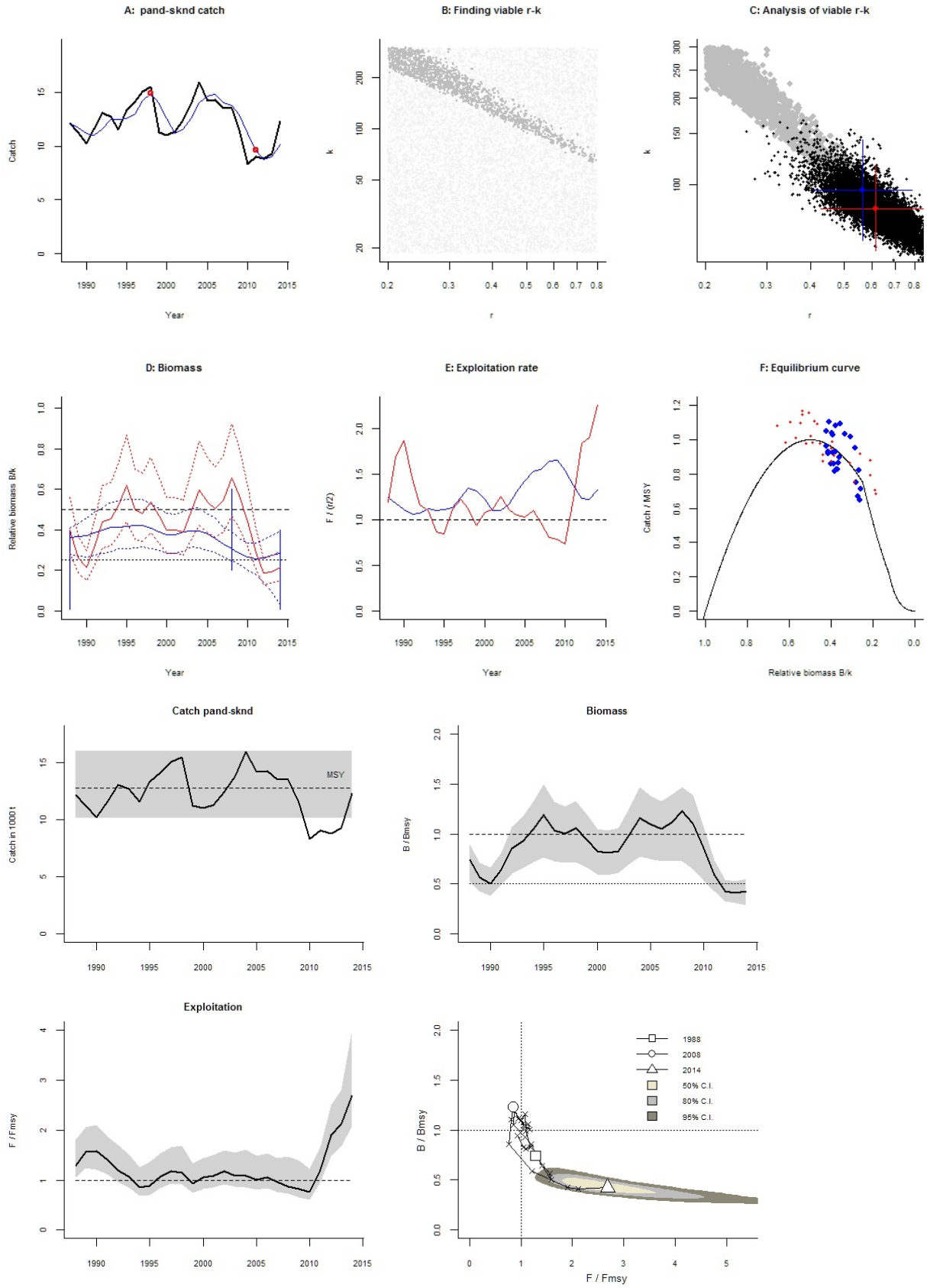
Species: *Pandalus borealis* , stock: pand-sknd
Northern shrimp in Divisions 3a and 4a East (Skagerrak, Northern North Sea in the Norwegian Deep)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/pand-sknd_2015update.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1988 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2008 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 18.6 - 298
Prior range of q = 0.253 - 1.01

Results of CMSY analysis with altogether 2191 viable trajectories for 1565 r-k pairs
r = 0.566 , 95% CL = 0.407 - 0.785 , k = 95.8 , 95% CL = 64 - 143
MSY = 13.5 , 95% CL = 11.7 - 15.7
Relative biomass last year = 0.283 k, 2.5th = 0.0313 , 97.5th = 0.397
Exploitation F/(r/2) in last year = 1.33

Results from Bayesian Schaefer model using catch & CPUE
r = 0.618 , 95% CL = 0.43 - 0.89 , k = 82.6 , 95% CL = 58.9 - 116
MSY = 12.8 , 95% CL = 10.2 - 16
Relative biomass in last year = 0.212 k, 2.5th perc = 0.142 , 97.5th perc = 0.275
Exploitation F/(r/2) in last year = 2.28
q = 0.408 , lcl = 0.311 , ucl = 0.534

Results for Management (based on BSM analysis)
Fmsy = 0.309 , 95% CL = 0.215 - 0.445 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.262 , 95% CL = 0.182 - 0.377 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 12.8 , 95% CL = 10.2 - 16
Bmsy = 41.3 , 95% CL = 29.4 - 58
Biomass in last year = 17.5 , 2.5th perc = 11.8 , 97.5 perc = 22.7
B/Bmsy in last year = 0.424 , 2.5th perc = 0.284 , 97.5 perc = 0.55
Fishing mortality in last year = 0.704 , 2.5th perc = 0.543 , 97.5 perc = 1.05
F/Fmsy = 2.69 , 2.5th perc = 2.07 , 97.5 perc = 4.01

Stock status and exploitation in 2014
Biomass = 17.5 , B/Bmsy = 0.424 , fishing mortality F = 0.704 , F/Fmsy = 2.69
Comment: OK (RF 23.09.16)


A: pand-sknd 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 pand-sknd
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.

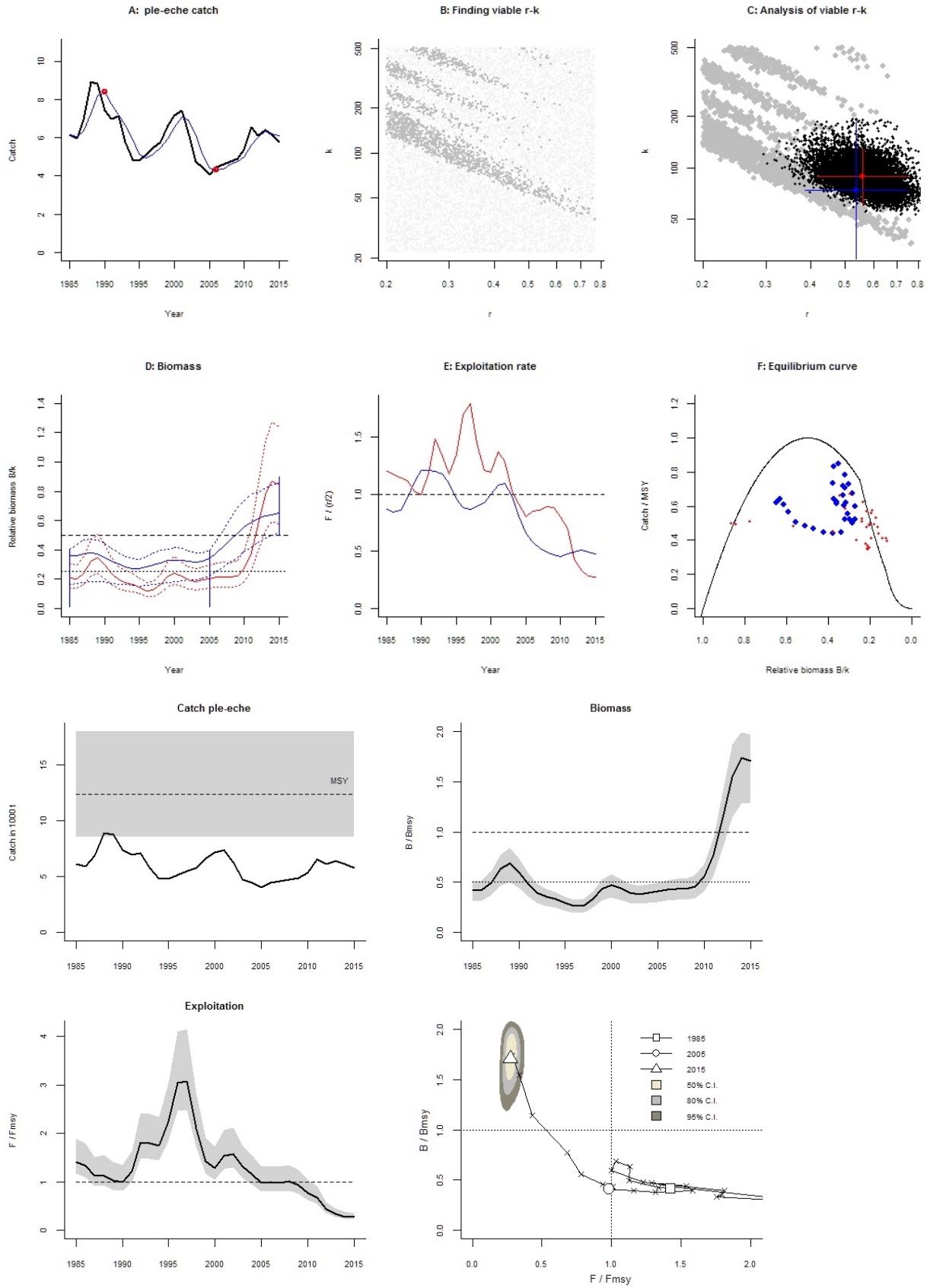
Species: *Pleuronectes platessa* , stock: ple-eche
Plaice in Division VIId (Eastern Channel)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/ple-eche.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1985 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2005 default
Prior final relative biomass = 0.5 - 0.9 , default
Prior range for r = 0.2 - 0.77 expert, , prior range for k = 21.8 - 503
Prior range of q = 0.521 - 2.05

Results of CMSY analysis with altogether 2013 viable trajectories for 1777 r-k pairs
r = 0.537 , 95% CL = 0.385 - 0.747 , k = 73.6 , 95% CL = 29.5 - 184
MSY = 9.87 , 95% CL = 3.03 - 32.2
Relative biomass last year = 0.651 k, 2.5th = 0.516 , 97.5th = 0.854
Exploitation F/(r/2) in last year = 0.475

Results from Bayesian Schaefer model using catch & CPUE
r = 0.56 , 95% CL = 0.418 - 0.75 , k = 88.7 , 95% CL = 60.6 - 130
MSY = 12.4 , 95% CL = 8.55 - 18
Relative biomass in last year = 0.853 k, 2.5th perc = 0.644 , 97.5th perc = 0.984
Exploitation F/(r/2) in last year = 0.273
q = 0.725 , lcl = 0.558 , ucl = 0.941

Results for Management (based on BSM analysis)
Fmsy = 0.28 , 95% CL = 0.209 - 0.375 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.28 , 95% CL = 0.209 - 0.375 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 12.4 , 95% CL = 8.55 - 18
Bmsy = 44.4 , 95% CL = 30.3 - 64.9
Biomass in last year = 75.7 , 2.5th perc = 57.2 , 97.5 perc = 87.3
B/Bmsy in last year = 1.71 , 2.5th perc = 1.29 , 97.5 perc = 1.97
Fishing mortality in last year = 0.0764 , 2.5th perc = 0.0663 , 97.5 perc = 0.101
F/Fmsy = 0.273 , 2.5th perc = 0.237 , 97.5 perc = 0.362

Stock status and exploitation in 2014
Biomass = 77.1 , B/Bmsy = 1.74 , fishing mortality F = 0.0796 , F/Fmsy = 0.284
Comment: OK (RF 23.09.16) r updated


A: ple-eche 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 ple-eche
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1985
2005
2015
50% C.I.
80% C.I.
95% C.I.

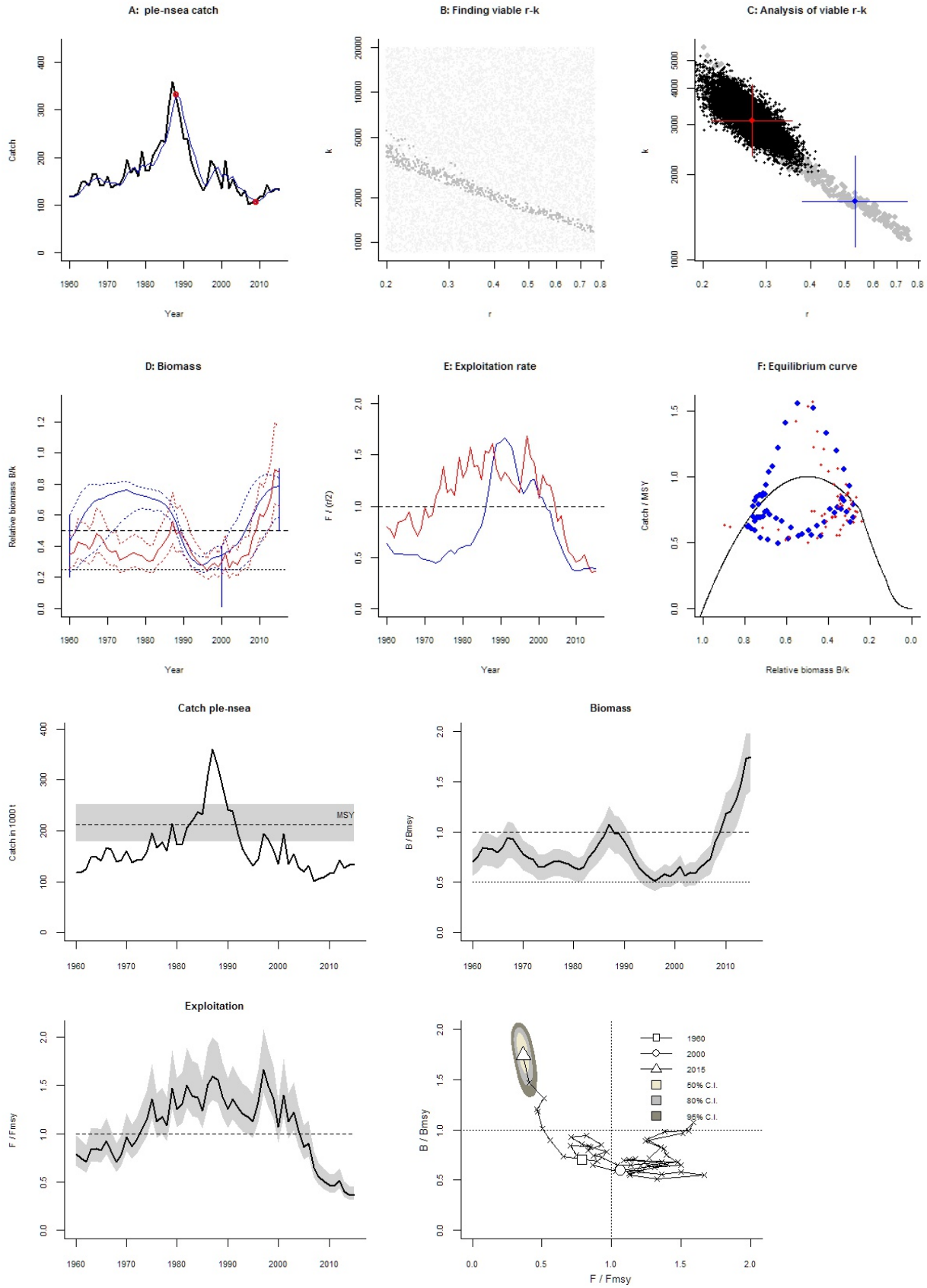
Species: *Pleuronectes platessa* , stock: ple-nsea
Plaice Subarea IV (North Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/ple-nsea.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1960 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert
Prior final relative biomass = 0.5 - 0.9 expert
Prior range for r = 0.2 - 0.77 expert, , prior range for k = 860 - 19862
Prior range of q = 0.146 - 0.573

Results of CMSY analysis with altogether 1377 viable trajectories for 486 r-k pairs
r = 0.533 , 95% CL = 0.38 - 0.747 , k = 1602 , 95% CL = 1111 - 2310
MSY = 213 , 95% CL = 191 - 239
Relative biomass last year = 0.786 k, 2.5th = 0.592 , 97.5th = 0.842
Exploitation F/(r/2) in last year = 0.392

Results from Bayesian Schaefer model using catch & CPUE
r = 0.274 , 95% CL = 0.211 - 0.356 , k = 3088 , 95% CL = 2314 - 4120
MSY = 212 , 95% CL = 178 - 252
Relative biomass in last year = 0.871 k, 2.5th perc = 0.701 , 97.5th perc = 0.987
Exploitation F/(r/2) in last year = 0.365
q = 0.28 , lcl = 0.22 , ucl = 0.356

Results for Management (based on BSM analysis)
Fmsy = 0.137 , 95% CL = 0.106 - 0.178 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.137 , 95% CL = 0.106 - 0.178 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 212 , 95% CL = 178 - 252
Bmsy = 1544 , 95% CL = 1157 - 2060
Biomass in last year = 2689 , 2.5th perc = 2163 , 97.5 perc = 3049
B/Bmsy in last year = 1.74 , 2.5th perc = 1.4 , 97.5 perc = 1.97
Fishing mortality in last year = 0.05 , 2.5th perc = 0.0441 , 97.5 perc = 0.0622
F/Fmsy = 0.365 , 2.5th perc = 0.322 , 97.5 perc = 0.454

Stock status and exploitation in 2014
Biomass = 2671 , B/Bmsy = 1.73 , fishing mortality F = 0.05 , F/Fmsy = 0.365
Comment: OK (RF 23.09.16)

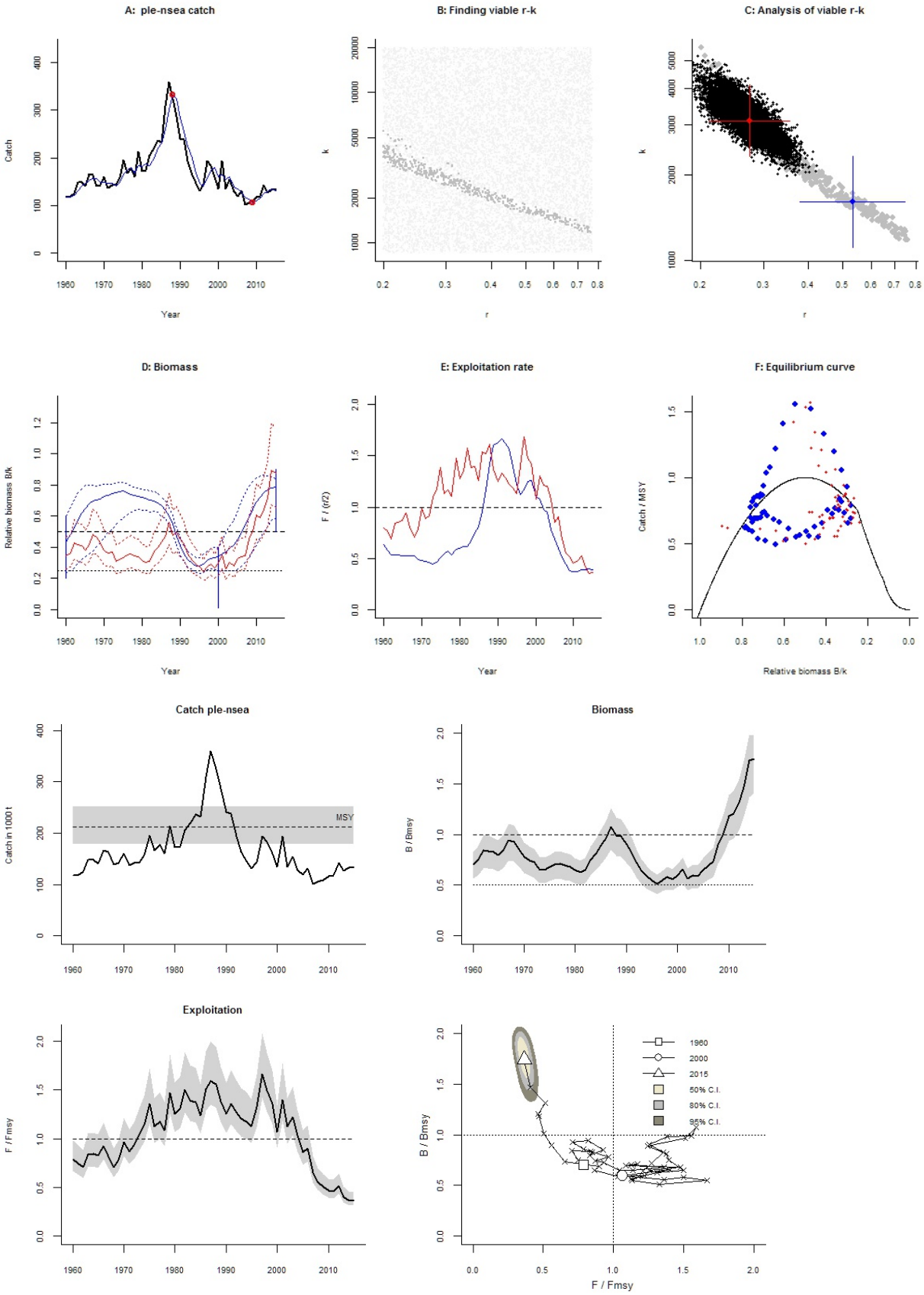

A: ple-nsea catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch ple-nsea
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1960
2000
2015
50% C.I.
80% C.I.
95% C.I.

Species: *Pollachius pollachius* , stock: pol-nsea
Pollack in Subarea 4 (North Sea) and Division 3.a (North Sea, Skagerrak and Kattegat)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/pol-nsea.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1977 - 2015 , 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 - 0.4 expert
Prior range for r = 0.5 - 1 expert, , prior range for k = 6 - 48

Results of CMSY analysis with altogether 14 viable trajectories for 14 r-k pairs
r = 0.613 , 95% CL = 0.57 - 0.659 , k = 27.6 , 95% CL = 24.5 - 31
MSY = 4.23 , 95% CL = 3.79 - 4.71
Relative biomass last year = 0.196 k, 2.5th = 0.112 , 97.5th = 0.315
Exploitation F/(r/2) in last year = 1.02

Results for Management (based on CMSY analysis)
Fmsy = 0.306 , 95% CL = 0.285 - 0.329 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.24 , 95% CL = 0.223 - 0.258 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 4.23 , 95% CL = 3.79 - 4.71
Bmsy = 13.8 , 95% CL = 12.3 - 15.5
Biomass in last year = 5.4 , 2.5th perc = 3.09 , 97.5 perc = 8.7
B/Bmsy in last year = 0.392 , 2.5th perc = 0.224 , 97.5 perc = 0.63
Fishing mortality in last year = 0.366 , 2.5th perc = 0.228 , 97.5 perc = 0.641
F/Fmsy = 1.53 , 2.5th perc = 0.949 , 97.5 perc = 2.67

Stock status and exploitation in 2014
Biomass = 5.81 , B/Bmsy = 0.421 , fishing mortality F = 0.275 , F/Fmsy = 1.07
Comment: OK (RF 23.09.16)


A: ple-nsea 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 ple-nsea
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1960
2000
2015
50% C.I.
80% C.I.
95% C.I.

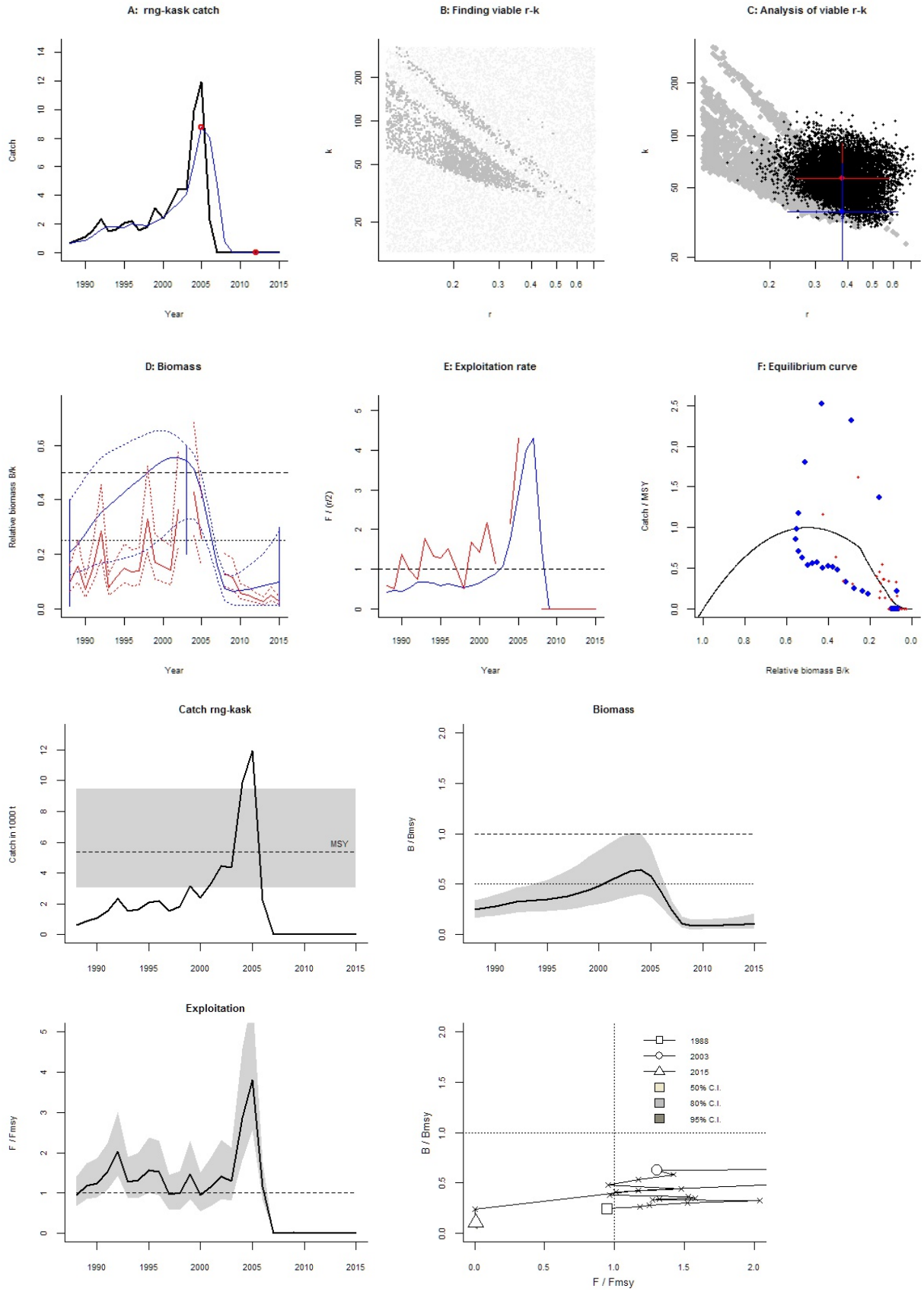
Species: *Coryphaenoides rupestris* , stock: rng-kask
Roundnose grenadier in Division 3.a (Skagerrak and Kattegat)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/rng-kask.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1988 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2003 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.11 - 0.71 expert, , prior range for k = 12.3 - 318
Prior range of q = 0.00789 - 0.0401

Results of CMSY analysis with altogether 3506 viable trajectories for 2333 r-k pairs
r = 0.381 , 95% CL = 0.233 - 0.624 , k = 36.4 , 95% CL = 19.2 - 69.3
MSY = 3.47 , 95% CL = 2.13 - 5.65
Relative biomass last year = 0.0984 k, 2.5th = 0.0139 , 97.5th = 0.286
Exploitation F/(r/2) in last year = 0.00146

Results from Bayesian Schaefer model using catch & CPUE
r = 0.381 , 95% CL = 0.251 - 0.579 , k = 56.6 , 95% CL = 35.5 - 90.2
MSY = 5.4 , 95% CL = 3.07 - 9.48
Relative biomass in last year = 0.0546 k, 2.5th perc = 0.0284 , 97.5th perc = 0.105
Exploitation F/(r/2) in last year = 0.0017
q = 0.0124 , lcl = 0.00898 , ucl = 0.0171

Results for Management (based on BSM analysis)
Fmsy = 0.191 , 95% CL = 0.126 - 0.289 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0417 , 95% CL = 0.0274 - 0.0633 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 5.4 , 95% CL = 3.07 - 9.48
Bmsy = 28.3 , 95% CL = 17.8 - 45.1
Biomass in last year = 3.09 , 2.5th perc = 1.61 , 97.5 perc = 5.97
B/Bmsy in last year = 0.109 , 2.5th perc = 0.0567 , 97.5 perc = 0.211
Fishing mortality in last year = 0.000323 , 2.5th perc = 0.000168 , 97.5 perc = 0.000623
F/Fmsy = 0.00776 , 2.5th perc = 0.00402 , 97.5 perc = 0.015

Stock status and exploitation in 2014
Biomass = 2.92 , B/Bmsy = 0.103 , fishing mortality F = 0.000342 , F/Fmsy = 0.0087
Comment: OK (RF 23.09.16)


A: rng-kask 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-kask
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1988
2003
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

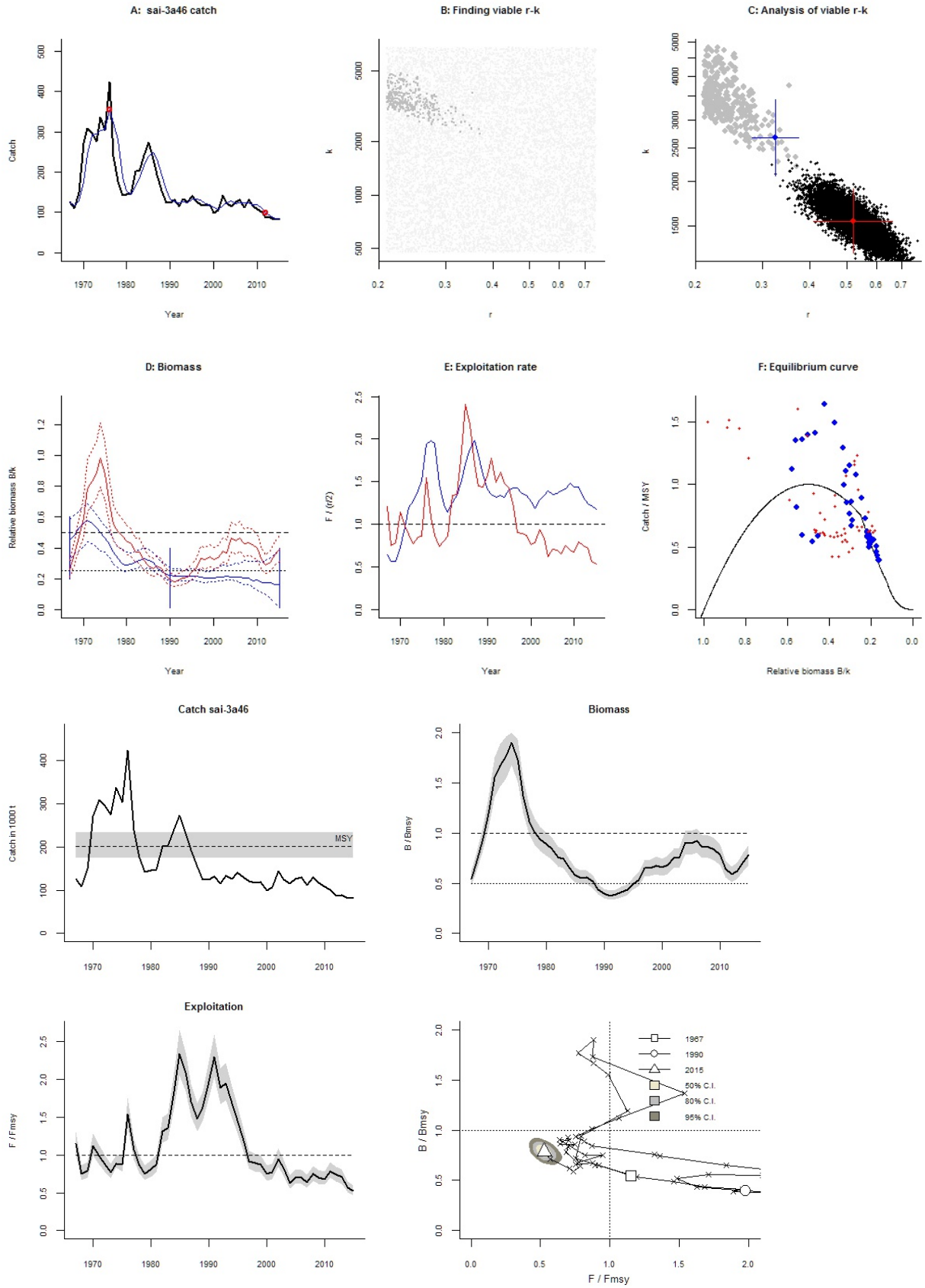
Species: *Pollachius virens* , stock: sai-3a46
Saithe in Subarea IV (North Sea) Division IIIa West and Subarea VI
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/sai-3a46.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1967 - 2015 , abundance = CPUE
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 - 0.4 expert
Prior range for r = 0.21 - 0.75 expert, , prior range for k = 473 - 6762
Prior range of q = 0.411 - 1.55

Results of CMSY analysis with altogether 343 viable trajectories for 327 r-k pairs
r = 0.325 , 95% CL = 0.282 - 0.374 , k = 2671 , 95% CL = 2076 - 3435
MSY = 217 , 95% CL = 175 - 269
Relative biomass last year = 0.165 k, 2.5th = 0.0145 , 97.5th = 0.393
Exploitation F/(r/2) in last year = 1.18

Results from Bayesian Schaefer model using catch & CPUE
r = 0.521 , 95% CL = 0.409 - 0.663 , k = 1548 , 95% CL = 1256 - 1908
MSY = 202 , 95% CL = 174 - 234
Relative biomass in last year = 0.392 k, 2.5th perc = 0.343 , 97.5th perc = 0.441
Exploitation F/(r/2) in last year = 0.526
q = 0.379 , lcl = 0.311 , ucl = 0.464

Results for Management (based on BSM analysis)
Fmsy = 0.26 , 95% CL = 0.205 - 0.332 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.26 , 95% CL = 0.205 - 0.332 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 202 , 95% CL = 174 - 234
Bmsy = 774 , 95% CL = 628 - 954
Biomass in last year = 607 , 2.5th perc = 530 , 97.5 perc = 682
B/Bmsy in last year = 0.785 , 2.5th perc = 0.685 , 97.5 perc = 0.882
Fishing mortality in last year = 0.137 , 2.5th perc = 0.122 , 97.5 perc = 0.157
F/Fmsy = 0.526 , 2.5th perc = 0.469 , 97.5 perc = 0.603

Stock status and exploitation in 2014
Biomass = 551 , B/Bmsy = 0.712 , fishing mortality F = 0.148 , F/Fmsy = 0.57
Comment: OK (RF 23.09.16)


A: sai-3a46 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 sai-3a46
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1967
1990
2015
50% C.I.
80% C.I.
95% C.I.

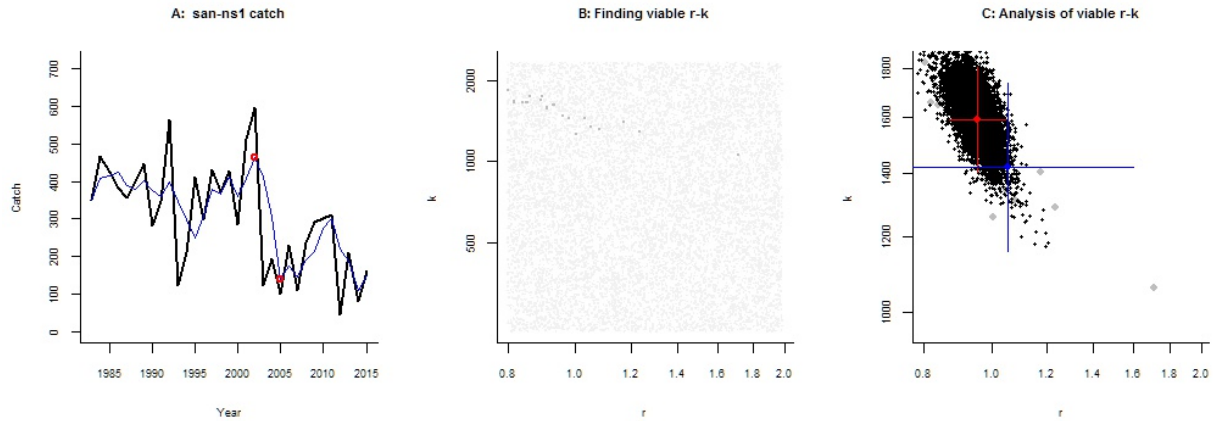
Species: *Ammodytes tobianus* , stock: san-ns1
Sandeel in the Dogger Bank area (SA 1)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/san-ns1.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1983 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2004 default
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.8 - 2 expert, , prior range for k = 235 - 2323
Prior range of q = 0.609 - 1.92

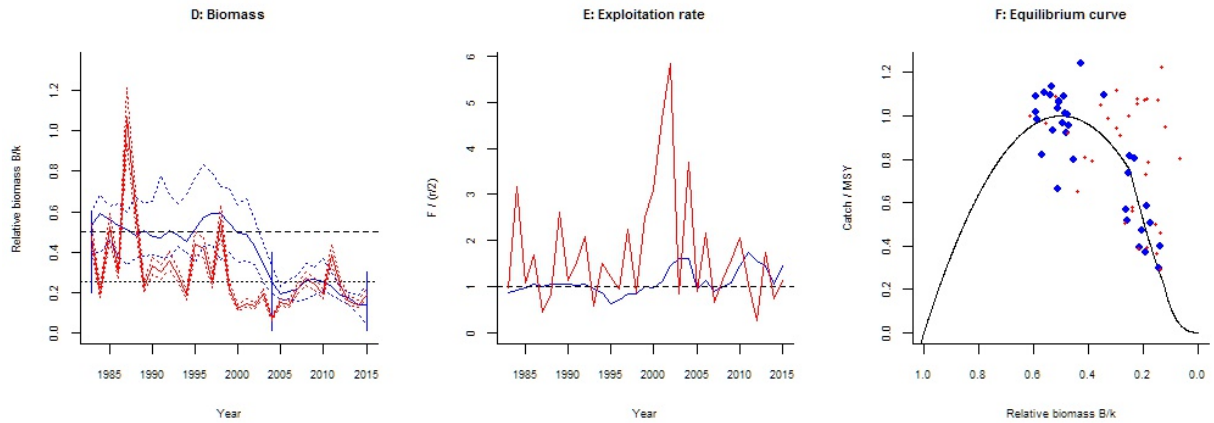
Results of CMSY analysis with altogether 19 viable trajectories for 19 r-k pairs
r = 1.06 , 95% CL = 0.698 - 1.6 , k = 1418 , 95% CL = 1157 - 1739
MSY = 375 , 95% CL = 300 - 467
Relative biomass last year = 0.138 k, 2.5th = 0.044 , 97.5th = 0.232
Exploitation F/(r/2) in last year = 1.45

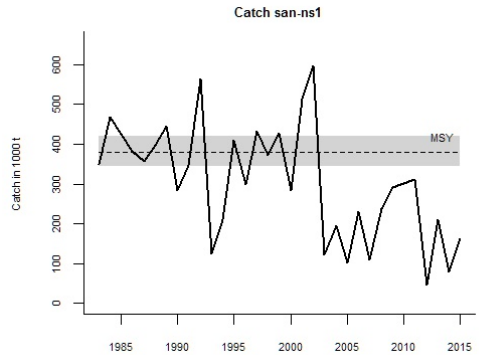
Results from Bayesian Schaefer model using catch & CPUE
r = 0.954 , 95% CL = 0.869 - 1.05 , k = 1592 , 95% CL = 1404 - 1806
MSY = 380 , 95% CL = 344 - 420
Relative biomass in last year = 0.199 k, 2.5th perc = 0.111 , 97.5th perc = 0.33
Exploitation F/(r/2) in last year = 1.07
q = 0.638 , lcl = 0.53 , ucl = 0.769

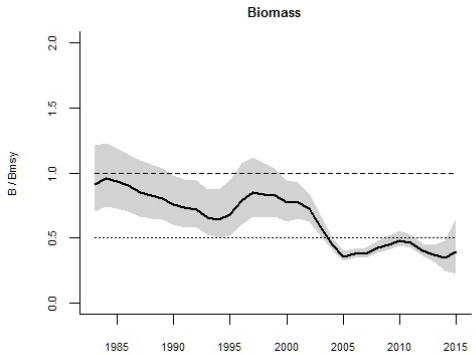
Results for Management (based on BSM analysis)
Fmsy = 0.477 , 95% CL = 0.435 - 0.524 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.38 , 95% CL = 0.346 - 0.417 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 380 , 95% CL = 344 - 420
Bmsy = 796 , 95% CL = 702 - 903
Biomass in last year = 317 , 2.5th perc = 177 , 97.5 perc = 526
B/Bmsy in last year = 0.399 , 2.5th perc = 0.223 , 97.5 perc = 0.661
Fishing mortality in last year = 0.511 , 2.5th perc = 0.308 , 97.5 perc = 0.915
F/Fmsy = 1.34 , 2.5th perc = 0.81 , 97.5 perc = 2.41

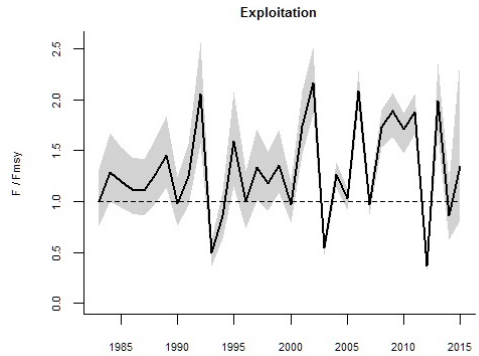
Stock status and exploitation in 2014
Biomass = 277 , B/Bmsy = 0.348 , fishing mortality F = 0.286 , F/Fmsy = 0.862
Comment: OK (RF 23.09.16)

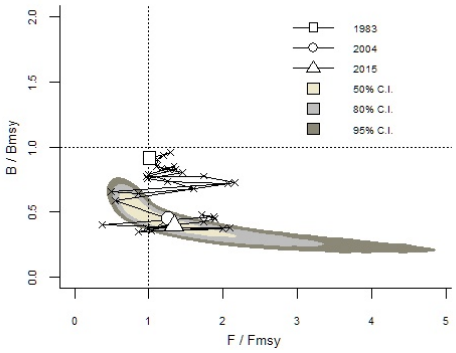

A: san-ns1 catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r


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


Catch san-ns1
Catch in 1000 t
MSY


Biomass
B / Bmsy


Exploitation
F / Fmsy


1983
2004
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

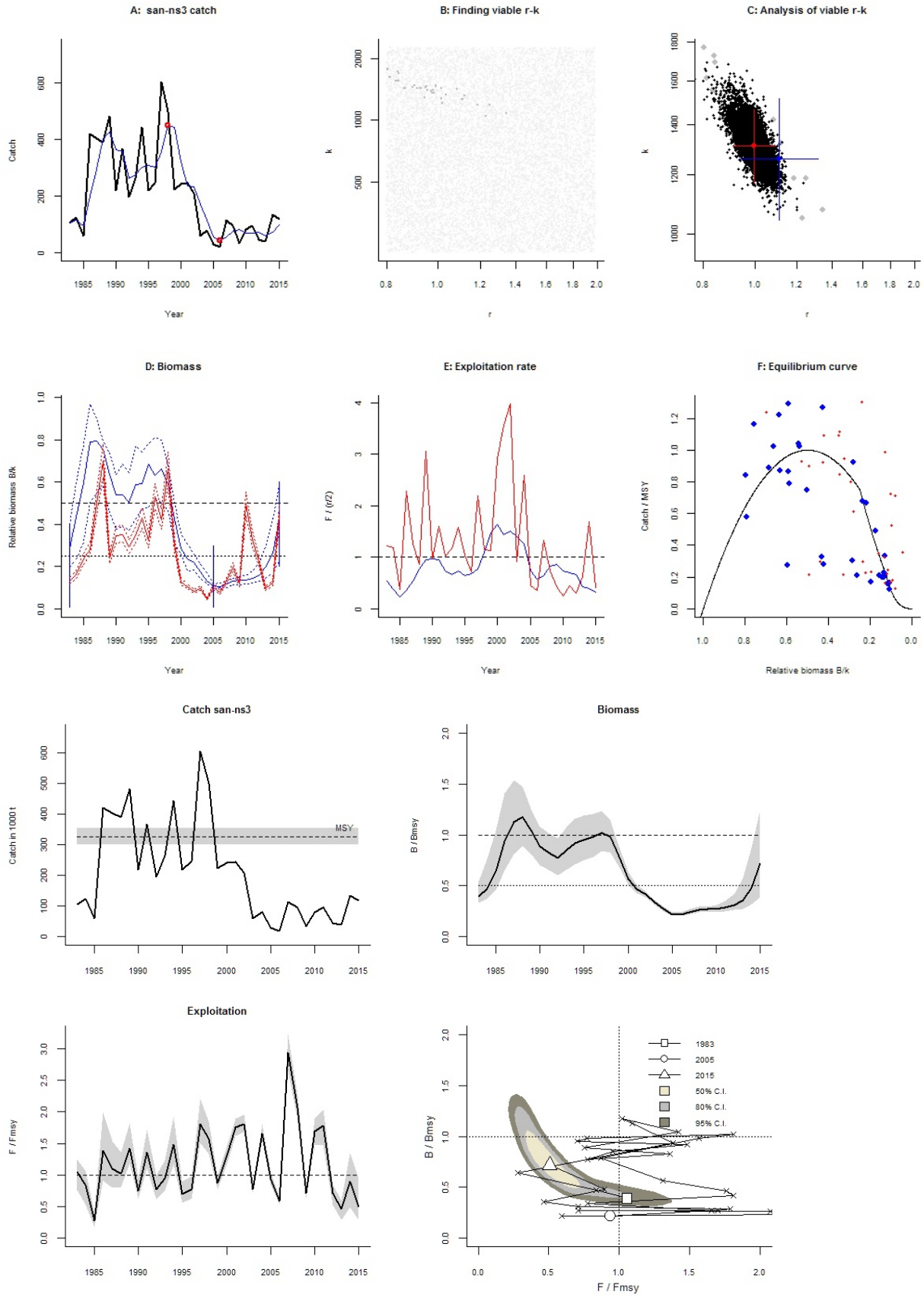
Species: *Ammodytes tobianus* , stock: san-ns3
Sandeel in the Central Eastern North Sea (SA 3)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/san-ns3.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1983 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.3 in year 2005 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.8 - 2 expert, , prior range for k = 227 - 2251
Prior range of q = 0.394 - 1.24

Results of CMSY analysis with altogether 32 viable trajectories for 32 r-k pairs
r = 1.11 , 95% CL = 0.935 - 1.32 , k = 1257 , 95% CL = 1043 - 1514
MSY = 349 , 95% CL = 307 - 397
Relative biomass last year = 0.425 k, 2.5th = 0.222 , 97.5th = 0.583
Exploitation F/(r/2) in last year = 0.327

Results from Bayesian Schaefer model using catch & CPUE
r = 0.998 , 95% CL = 0.91 - 1.09 , k = 1309 , 95% CL = 1170 - 1464
MSY = 326 , 95% CL = 302 - 353
Relative biomass in last year = 0.358 k, 2.5th perc = 0.192 , 97.5th perc = 0.62
Exploitation F/(r/2) in last year = 0.507
q = 0.427 , lcl = 0.355 , ucl = 0.514

Results for Management (based on BSM analysis)
Fmsy = 0.499 , 95% CL = 0.455 - 0.547 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.499 , 95% CL = 0.455 - 0.547 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 326 , 95% CL = 302 - 353
Bmsy = 654 , 95% CL = 585 - 732
Biomass in last year = 469 , 2.5th perc = 251 , 97.5 perc = 811
B/Bmsy in last year = 0.716 , 2.5th perc = 0.384 , 97.5 perc = 1.24
Fishing mortality in last year = 0.253 , 2.5th perc = 0.146 , 97.5 perc = 0.472
F/Fmsy = 0.507 , 2.5th perc = 0.293 , 97.5 perc = 0.946

Stock status and exploitation in 2014
Biomass = 313 , B/Bmsy = 0.478 , fishing mortality F = 0.427 , F/Fmsy = 0.895
Comment: OK (RF 23.09.16)


A: san-ns3 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 san-ns3
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1983
2005
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

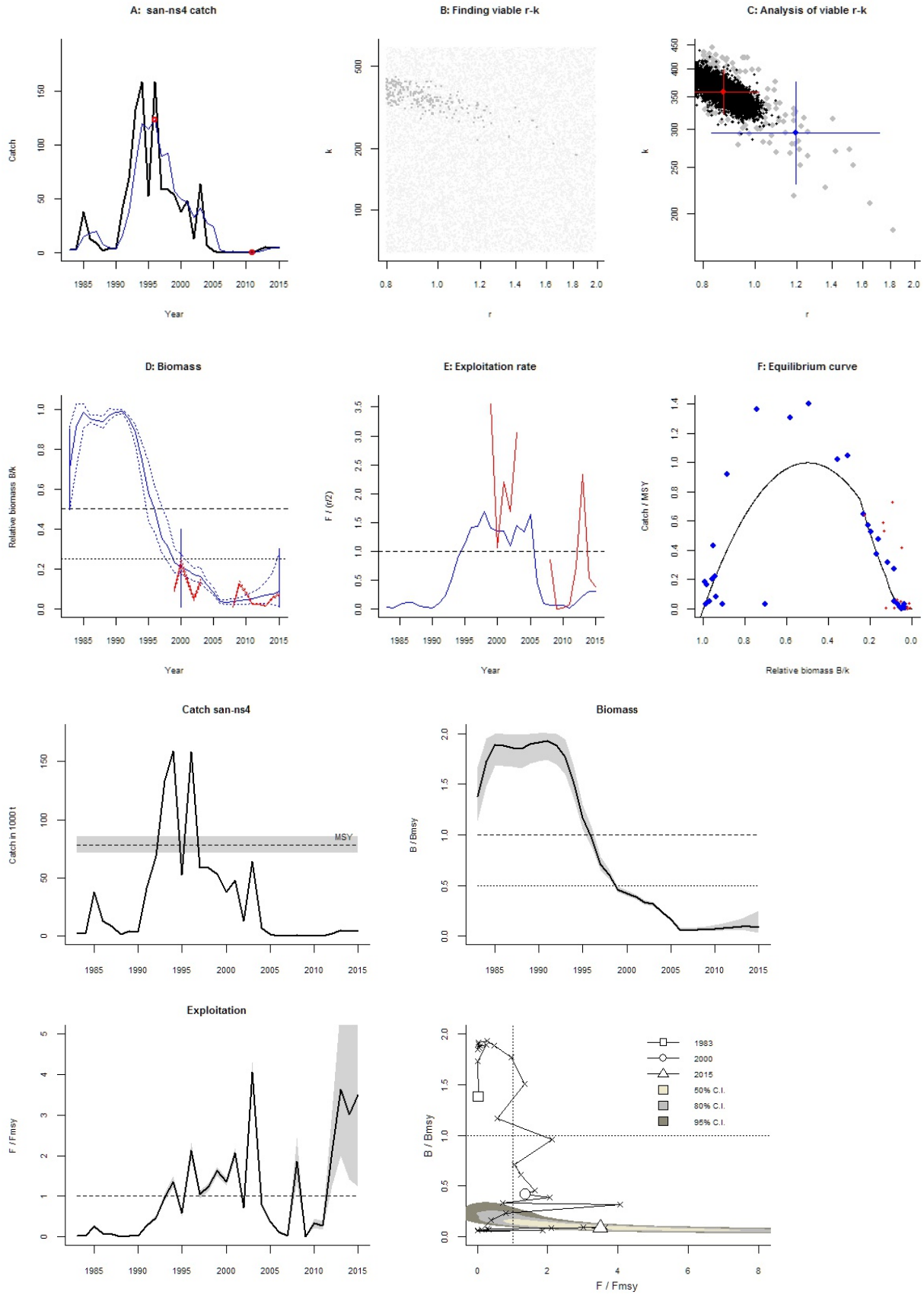
Species: *Ammodytes tobianus* , stock: san-ns4
Sandeel in Divisions 4a and 4b, SA 4 (North and Central North Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/san-ns4.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1983 - 2015 , abundance = 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 = 0.01 - 0.3 expert
Prior range for r = 0.8 - 2 expert, , prior range for k = 62.3 - 616
Prior range of q = 2.25e-05 - 7.07e-05

Results of CMSY analysis with altogether 214 viable trajectories for 210 r-k pairs
r = 1.19 , 95% CL = 0.83 - 1.72 , k = 295 , 95% CL = 231 - 376
MSY = 88 , 95% CL = 71.7 - 108
Relative biomass last year = 0.0872 k, 2.5th = 0.0142 , 97.5th = 0.285
Exploitation F/(r/2) in last year = 0.305

Results from Bayesian Schaefer model using catch & CPUE
r = 0.874 , 95% CL = 0.75 - 1.02 , k = 358 , 95% CL = 322 - 398
MSY = 78.2 , 95% CL = 71.5 - 85.6
Relative biomass in last year = 0.0448 k, 2.5th perc = 0.0174 , 97.5th perc = 0.127
Exploitation F/(r/2) in last year = 0.626
q = 3.52e-05 , lcl = 2.73e-05 , ucl = 4.55e-05

Results for Management (based on BSM analysis)
Fmsy = 0.437 , 95% CL = 0.375 - 0.51 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0782 , 95% CL = 0.0671 - 0.0912 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 78.2 , 95% CL = 71.5 - 85.6
Bmsy = 179 , 95% CL = 161 - 199
Biomass in last year = 16 , 2.5th perc = 6.23 , 97.5 perc = 45.4
B/Bmsy in last year = 0.0895 , 2.5th perc = 0.0348 , 97.5 perc = 0.253
Fishing mortality in last year = 0.274 , 2.5th perc = 0.0967 , 97.5 perc = 0.704
F/Fmsy = 3.5 , 2.5th perc = 1.24 , 97.5 perc = 9

Stock status and exploitation in 2014
Biomass = 17.3 , B/Bmsy = 0.0967 , fishing mortality F = 0.255 , F/Fmsy = 3.02
Comment: OK (RF 23.09.16) r updated

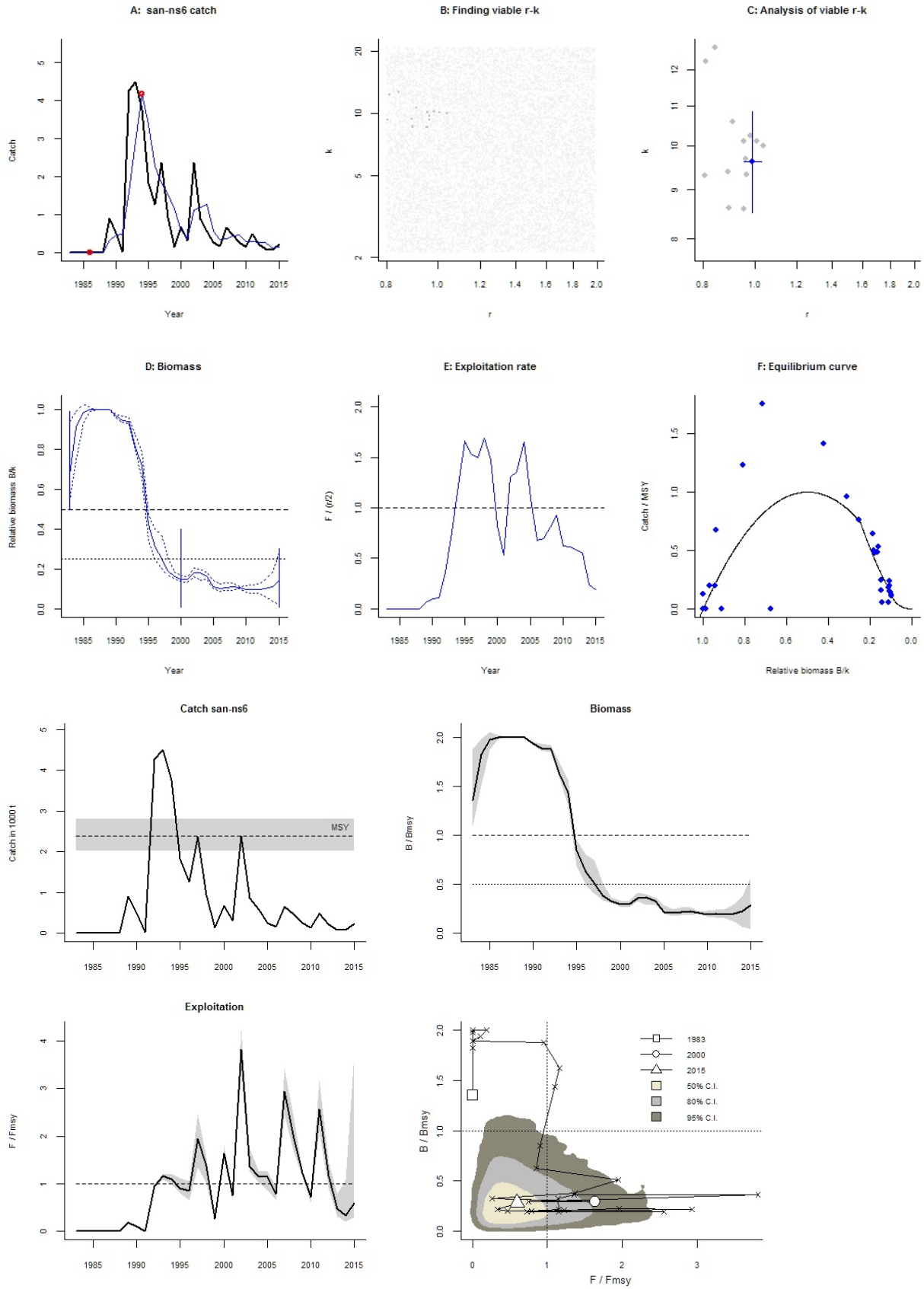

A: san-ns4 catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch san-ns4
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1983
2000
2015
50% C.I.
80% C.I.
95% C.I.

Species: *Ammodytes tobianus* , stock: san-ns6
Sandeel in Division 3a East, SA 6 (Kattegat)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/san-ns6.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1983 - 2015 , abundance = None
Prior initial relative biomass = 0.5 - 0.99 expert
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 = 0.8 - 2 expert, , prior range for k = 2.11 - 20.9

Results of CMSY analysis with altogether 13 viable trajectories for 13 r-k pairs
r = 0.99 , 95% CL = 0.953 - 1.03 , k = 9.61 , 95% CL = 8.52 - 10.9
MSY = 2.38 , 95% CL = 2.02 - 2.8
Relative biomass last year = 0.142 k, 2.5th = 0.0228 , 97.5th = 0.285
Exploitation F/(r/2) in last year = 0.196

Results for Management (based on CMSY analysis)
Fmsy = 0.495 , 95% CL = 0.477 - 0.514 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.281 , 95% CL = 0.271 - 0.292 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 2.38 , 95% CL = 2.02 - 2.8
Bmsy = 4.81 , 95% CL = 4.26 - 5.43
Biomass in last year = 1.36 , 2.5th perc = 0.219 , 97.5 perc = 2.74
B/Bmsy in last year = 0.284 , 2.5th perc = 0.0455 , 97.5 perc = 0.569
Fishing mortality in last year = 0.168 , 2.5th perc = 0.0837 , 97.5 perc = 1.05
F/Fmsy = 0.597 , 2.5th perc = 0.298 , 97.5 perc = 3.72

Stock status and exploitation in 2014
Biomass = 1.06 , B/Bmsy = 0.221 , fishing mortality F = 0.0743 , F/Fmsy = 0.34
Comment: OK (RF 23.09.16)

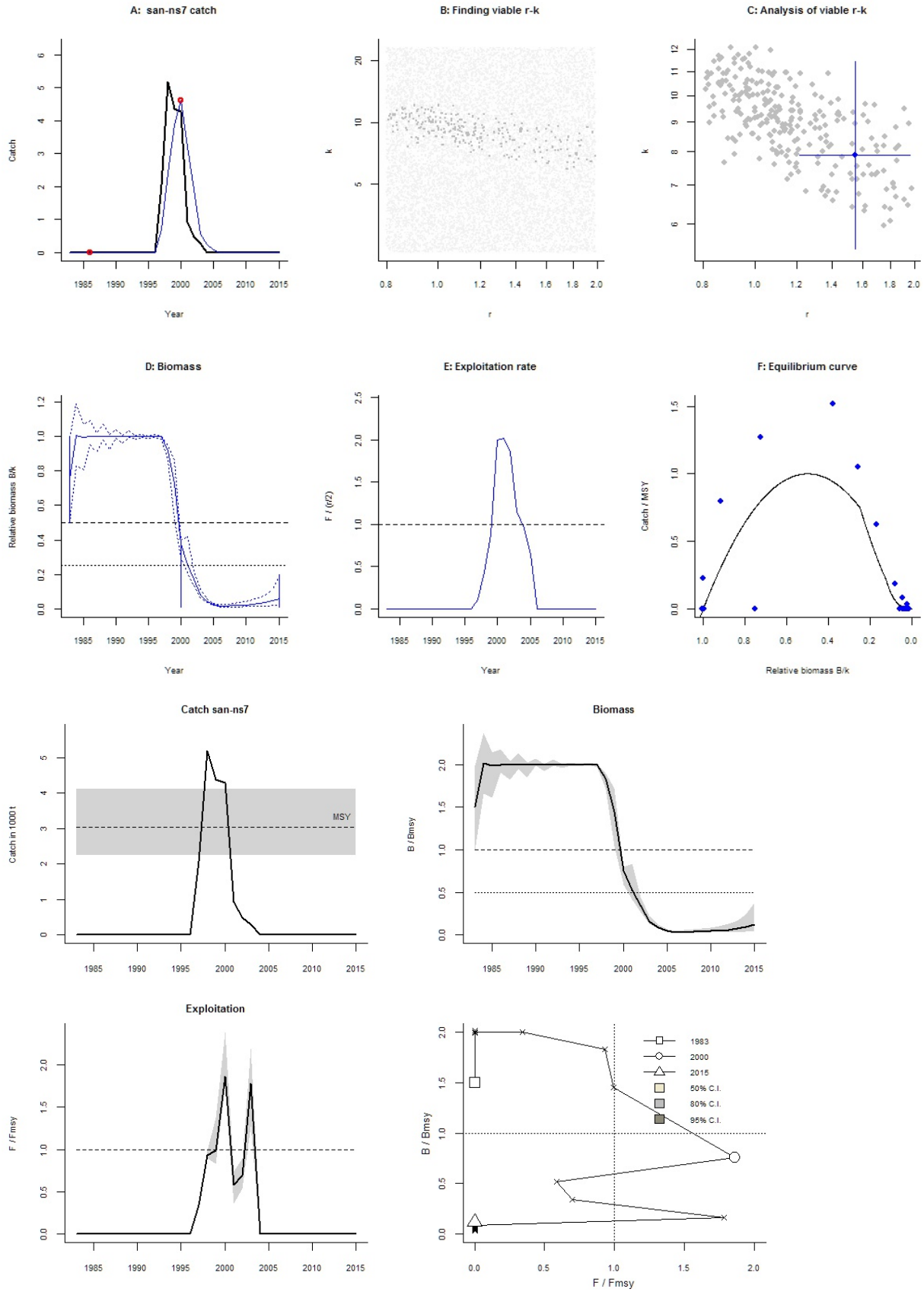

A: san-ns6 catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch san-ns6
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1983
2000
2015
50% C.I.
80% C.I.
95% C.I.

Species: *Ammodytes tobianus* , stock: san-ns7
Sandeel in Division 4a, SA 7 (Northern North Sea, Shetland)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/san-ns7.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1983 - 2015 , abundance = None
Prior initial relative biomass = 0.5 - 0.99 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert
Prior final relative biomass = 0.01 - 0.2 expert
Prior range for r = 0.8 - 2 expert, , prior range for k = 2.33 - 23.1

Results of CMSY analysis with altogether 248 viable trajectories for 247 r-k pairs
r = 1.54 , 95% CL = 1.22 - 1.96 , k = 7.88 , 95% CL = 5.43 - 11.4
MSY = 3.04 , 95% CL = 2.26 - 4.11
Relative biomass last year = 0.0597 k, 2.5th = 0.0206 , 97.5th = 0.189
Exploitation F/(r/2) in last year = 0

Results for Management (based on CMSY analysis)
Fmsy = 0.772 , 95% CL = 0.608 - 0.982 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.185 , 95% CL = 0.145 - 0.235 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 3.04 , 95% CL = 2.26 - 4.11
Bmsy = 3.94 , 95% CL = 2.71 - 5.72
Biomass in last year = 0.471 , 2.5th perc = 0.162 , 97.5 perc = 1.49
B/Bmsy in last year = 0.119 , 2.5th perc = 0.0412 , 97.5 perc = 0.378
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 = 0.364 , B/Bmsy = 0.0925 , fishing mortality F = 0 , F/Fmsy = 0
Comment: OK (RF 23.09.16) Catch data read from graph partially.


A: san-ns7 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 san-ns7
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1983
2000
2015
50% C.I.
80% C.I.
95% C.I.

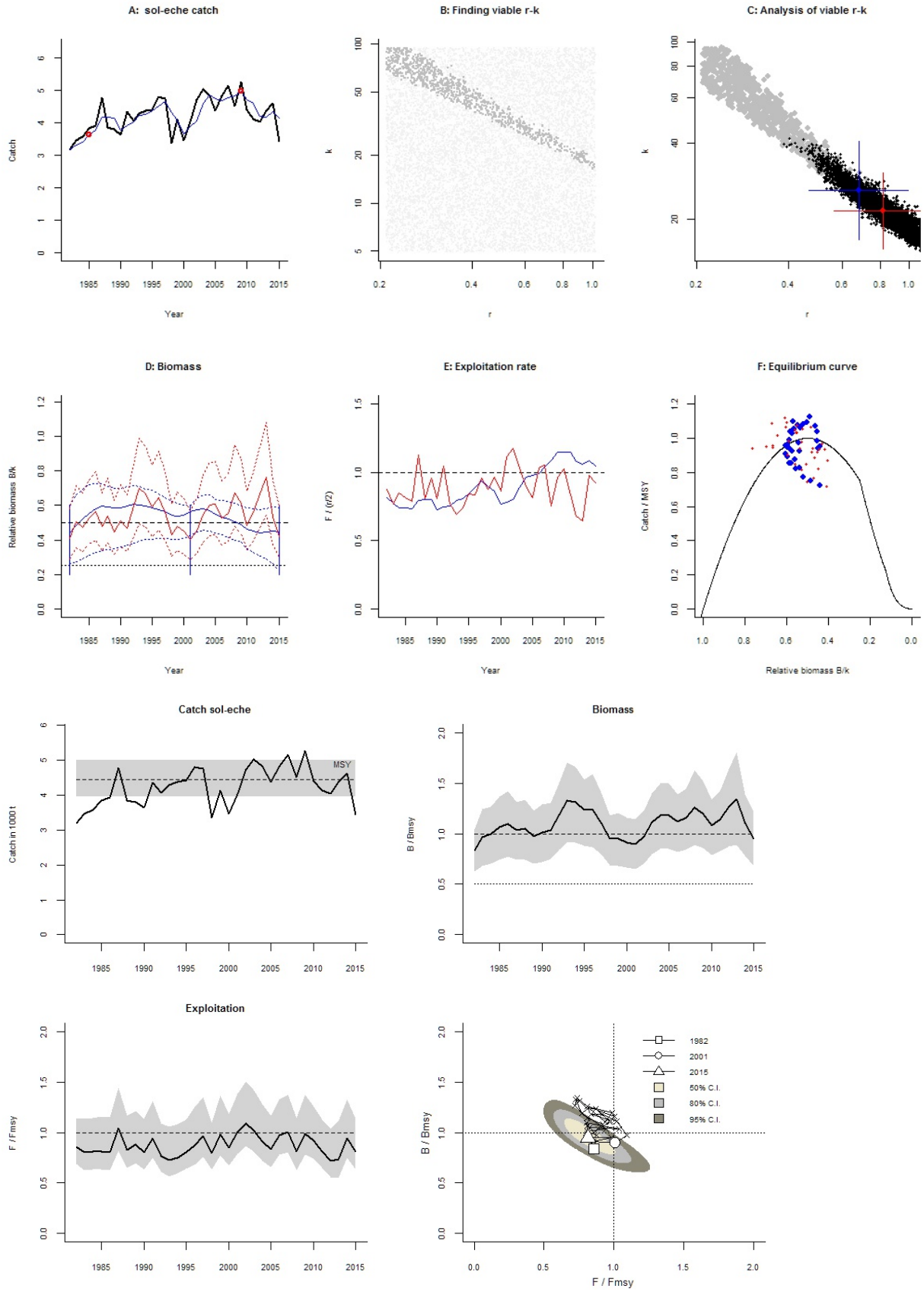
Species: *Solea solea* , stock: sol-eche
Sole in Division VIId (Eastern Channel)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/sol-eche.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1982 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2001 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.21 - 1 expert, , prior range for k = 4.89 - 94.9
Prior range of q = 0.538 - 2.37

Results of CMSY analysis with altogether 3483 viable trajectories for 944 r-k pairs
r = 0.68 , 95% CL = 0.468 - 0.99 , k = 26 , 95% CL = 16.7 - 40.4
MSY = 4.42 , 95% CL = 3.89 - 5.03
Relative biomass last year = 0.449 k, 2.5th = 0.222 , 97.5th = 0.588
Exploitation F/(r/2) in last year = 1.05

Results from Bayesian Schaefer model using catch & CPUE
r = 0.822 , 95% CL = 0.564 - 1.2 , k = 21.7 , 95% CL = 15.3 - 30.6
MSY = 4.45 , 95% CL = 3.95 - 5.01
Relative biomass in last year = 0.475 k, 2.5th perc = 0.34 , 97.5th perc = 0.608
Exploitation F/(r/2) in last year = 0.814
q = 0.872 , lcl = 0.645 , ucl = 1.18

Results for Management (based on BSM analysis)
Fmsy = 0.411 , 95% CL = 0.282 - 0.599 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.411 , 95% CL = 0.282 - 0.599 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 4.45 , 95% CL = 3.95 - 5.01
Bmsy = 10.8 , 95% CL = 7.66 - 15.3
Biomass in last year = 10.3 , 2.5th perc = 7.35 , 97.5 perc = 13.2
B/Bmsy in last year = 0.95 , 2.5th perc = 0.679 , 97.5 perc = 1.22
Fishing mortality in last year = 0.335 , 2.5th perc = 0.261 , 97.5 perc = 0.468
F/Fmsy = 0.814 , 2.5th perc = 0.636 , 97.5 perc = 1.14

Stock status and exploitation in 2014
Biomass = 12 , B/Bmsy = 1.11 , fishing mortality F = 0.386 , F/Fmsy = 0.939
Comment: OK (RF 23.09.16)


A: sol-eche 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 sol-eche
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1982
2001
2015
50% C.I.
80% C.I.
95% C.I.

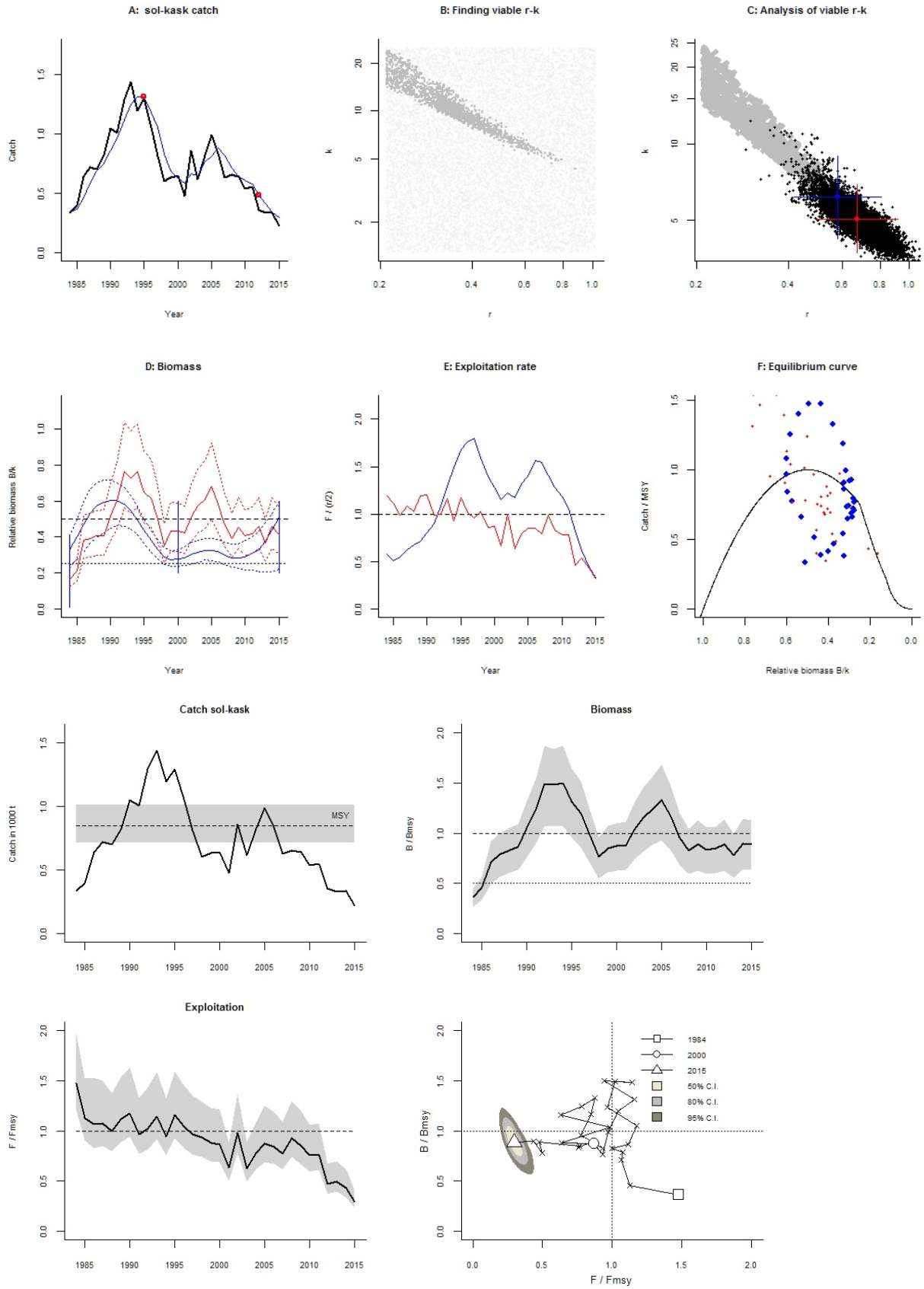
Species: *Solea solea* , stock: sol-kask
Sole in Division IIIa and Subdivisions 22-24 (Skagerrak, Kattegat, and the Belts)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/sol-kask.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1984 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2000 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.21 - 1 expert, , prior range for k = 1.29 - 25
Prior range of q = 0.795 - 3.5

Results of CMSY analysis with altogether 2973 viable trajectories for 1998 r-k pairs
r = 0.58 , 95% CL = 0.416 - 0.808 , k = 6.15 , 95% CL = 4.23 - 8.95
MSY = 0.891 , 95% CL = 0.797 - 0.996
Relative biomass last year = 0.51 k, 2.5th = 0.223 , 97.5th = 0.596
Exploitation F/(r/2) in last year = 0.327

Results from Bayesian Schaefer model using catch & CPUE
r = 0.672 , 95% CL = 0.492 - 0.918 , k = 5.06 , 95% CL = 3.73 - 6.86
MSY = 0.85 , 95% CL = 0.713 - 1.01
Relative biomass in last year = 0.443 k, 2.5th perc = 0.318 , 97.5th perc = 0.563
Exploitation F/(r/2) in last year = 0.297
q = 1.06 , lcl = 0.794 , ucl = 1.41

Results for Management (based on BSM analysis)
Fmsy = 0.336 , 95% CL = 0.246 - 0.459 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.336 , 95% CL = 0.246 - 0.459 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.85 , 95% CL = 0.713 - 1.01
Bmsy = 2.53 , 95% CL = 1.87 - 3.43
Biomass in last year = 2.24 , 2.5th perc = 1.61 , 97.5 perc = 2.85
B/Bmsy in last year = 0.886 , 2.5th perc = 0.636 , 97.5 perc = 1.13
Fishing mortality in last year = 0.0999 , 2.5th perc = 0.0786 , 97.5 perc = 0.139
F/Fmsy = 0.297 , 2.5th perc = 0.234 , 97.5 perc = 0.414

Stock status and exploitation in 2014
Biomass = 2.28 , B/Bmsy = 0.9 , fishing mortality F = 0.147 , F/Fmsy = 0.438
Comment: OK (RF 23.09.16)


A: sol-kask 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 sol-kask
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1984
2000
2015
50% C.I.
80% C.I.
95% C.I.

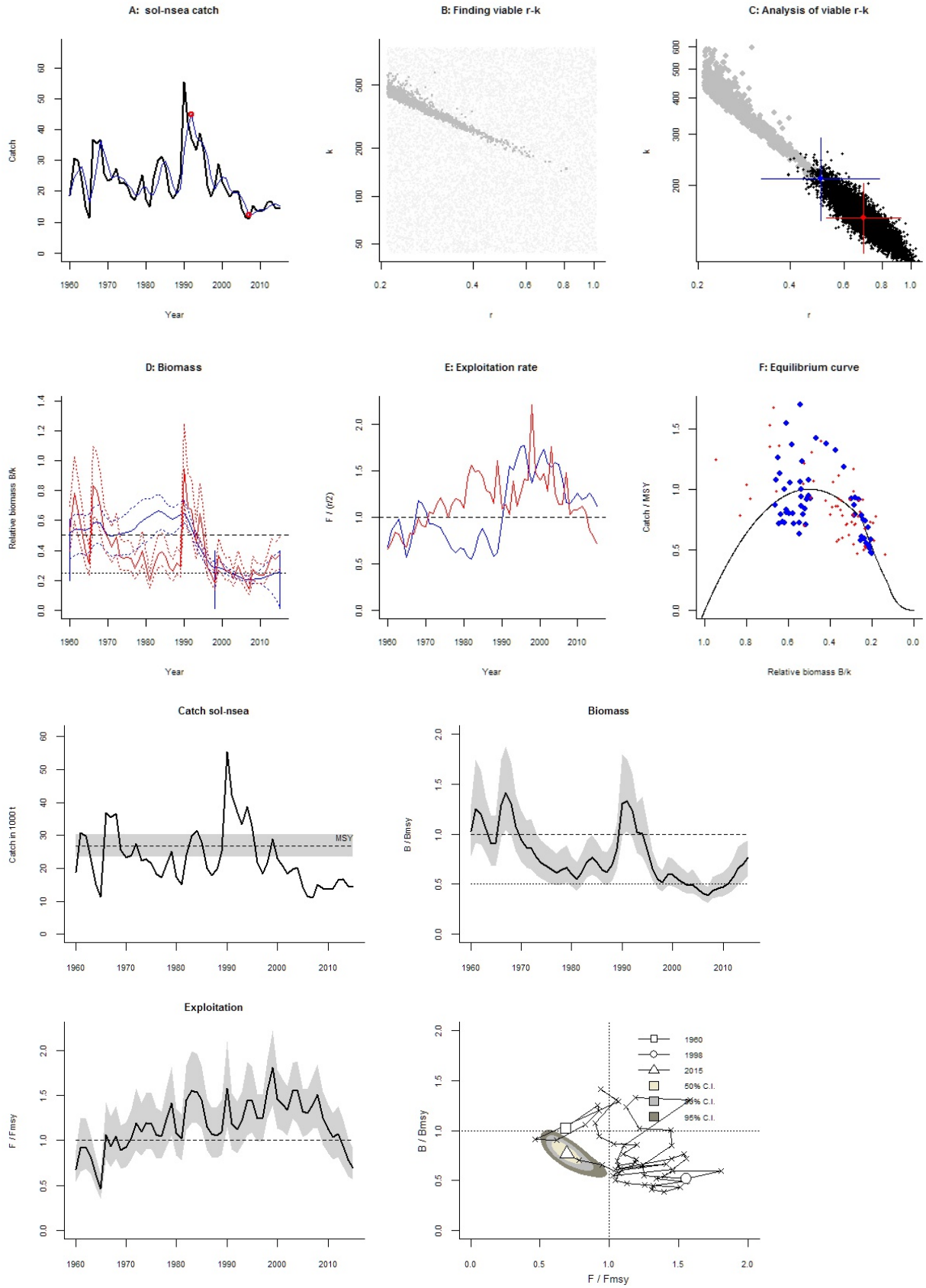
Species: *Solea solea* , stock: sol-nsea
Sole in Subarea IV (North Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/sol-nsea.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1960 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 1998 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.21 - 1 expert, , prior range for k = 44 - 855
Prior range of q = 0.626 - 2.76

Results of CMSY analysis with altogether 1740 viable trajectories for 1279 r-k pairs
r = 0.504 , 95% CL = 0.323 - 0.787 , k = 210 , 95% CL = 151 - 292
MSY = 26.5 , 95% CL = 24.1 - 29.1
Relative biomass last year = 0.256 k, 2.5th = 0.0256 , 97.5th = 0.396
Exploitation F/(r/2) in last year = 1.12

Results from Bayesian Schaefer model using catch & CPUE
r = 0.696 , 95% CL = 0.526 - 0.922 , k = 154 , 95% CL = 117 - 203
MSY = 26.8 , 95% CL = 23.6 - 30.4
Relative biomass in last year = 0.384 k, 2.5th perc = 0.29 , 97.5th perc = 0.467
Exploitation F/(r/2) in last year = 0.694
q = 0.859 , lcl = 0.67 , ucl = 1.1

Results for Management (based on BSM analysis)
Fmsy = 0.348 , 95% CL = 0.263 - 0.461 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.348 , 95% CL = 0.263 - 0.461 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 26.8 , 95% CL = 23.6 - 30.4
Bmsy = 76.9 , 95% CL = 58.4 - 101
Biomass in last year = 59.1 , 2.5th perc = 44.6 , 97.5 perc = 71.9
B/Bmsy in last year = 0.768 , 2.5th perc = 0.579 , 97.5 perc = 0.934
Fishing mortality in last year = 0.242 , 2.5th perc = 0.199 , 97.5 perc = 0.321
F/Fmsy = 0.694 , 2.5th perc = 0.571 , 97.5 perc = 0.921

Stock status and exploitation in 2014
Biomass = 54 , B/Bmsy = 0.702 , fishing mortality F = 0.272 , F/Fmsy = 0.782
Comment: OK (RF 23.09.16)


A: sol-nsea 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 sol-nsea
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1960
1998
2015
50% C.I.
95% C.I.

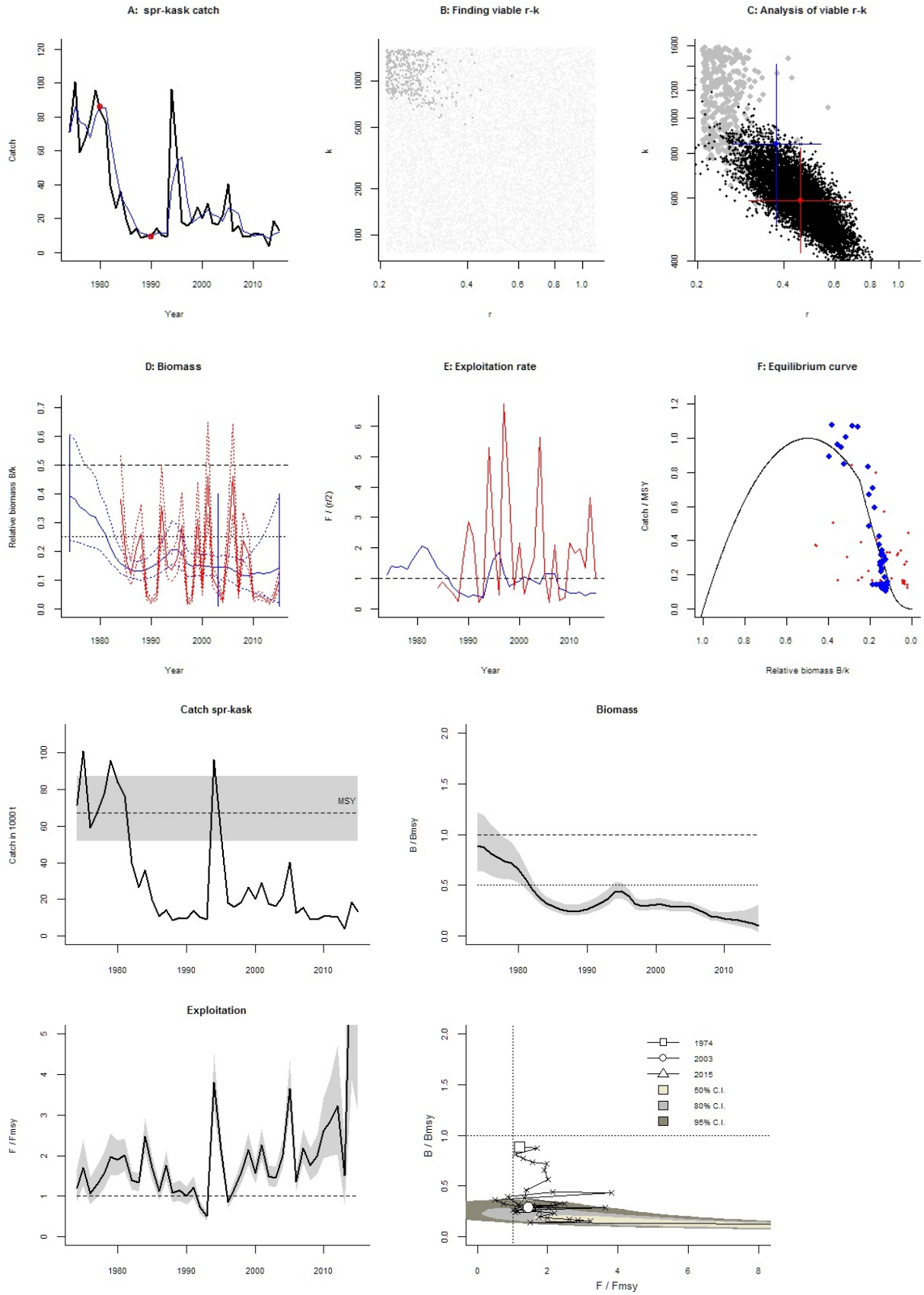
Species: *Sprattus sprattus* , stock: spr-kask
Sprat in Division IIIa (Skagerrak and Kattegat)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/spr-kask.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1974 - 2015 , abundance = CPUE
Prior initial 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 - 0.4 expert
Prior range for r = 0.21 - 1.1 expert, , prior range for k = 77.4 - 1637
Prior range of q = 8.63e-06 - 3.97e-05

Results of CMSY analysis with altogether 378 viable trajectories for 371 r-k pairs
r = 0.377 , 95% CL = 0.266 - 0.535 , k = 849 , 95% CL = 508 - 1418
MSY = 80 , 95% CL = 42.4 - 151
Relative biomass last year = 0.141 k, 2.5th = 0.0179 , 97.5th = 0.394
Exploitation F/(r/2) in last year = 0.526

Results from Bayesian Schaefer model using catch & CPUE
r = 0.456 , 95% CL = 0.3 - 0.692 , k = 590 , 95% CL = 421 - 827
MSY = 67.3 , 95% CL = 51.8 - 87.3
Relative biomass in last year = 0.0519 k, 2.5th perc = 0.0221 , 97.5th perc = 0.154
Exploitation F/(r/2) in last year = 1.9
q = 1.35e-05 , lcl = 9.92e-06 , ucl = 1.82e-05

Results for Management (based on BSM analysis)
Fmsy = 0.228 , 95% CL = 0.15 - 0.346 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0474 , 95% CL = 0.0312 - 0.0719 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 67.3 , 95% CL = 51.8 - 87.3
Bmsy = 295 , 95% CL = 211 - 413
Biomass in last year = 30.7 , 2.5th perc = 13 , 97.5 perc = 91.1
B/Bmsy in last year = 0.104 , 2.5th perc = 0.0441 , 97.5 perc = 0.309
Fishing mortality in last year = 0.433 , 2.5th perc = 0.146 , 97.5 perc = 1.02
F/Fmsy = 9.14 , 2.5th perc = 3.08 , 97.5 perc = 21.5

Stock status and exploitation in 2014
Biomass = 37.5 , B/Bmsy = 0.127 , fishing mortality F = 0.495 , F/Fmsy = 8.54
Comment: OK (RF 23.09.16)


A: spr-kask 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 spr-kask
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1974
2003
2015
50% C.I.
80% C.I.
95% C.I.

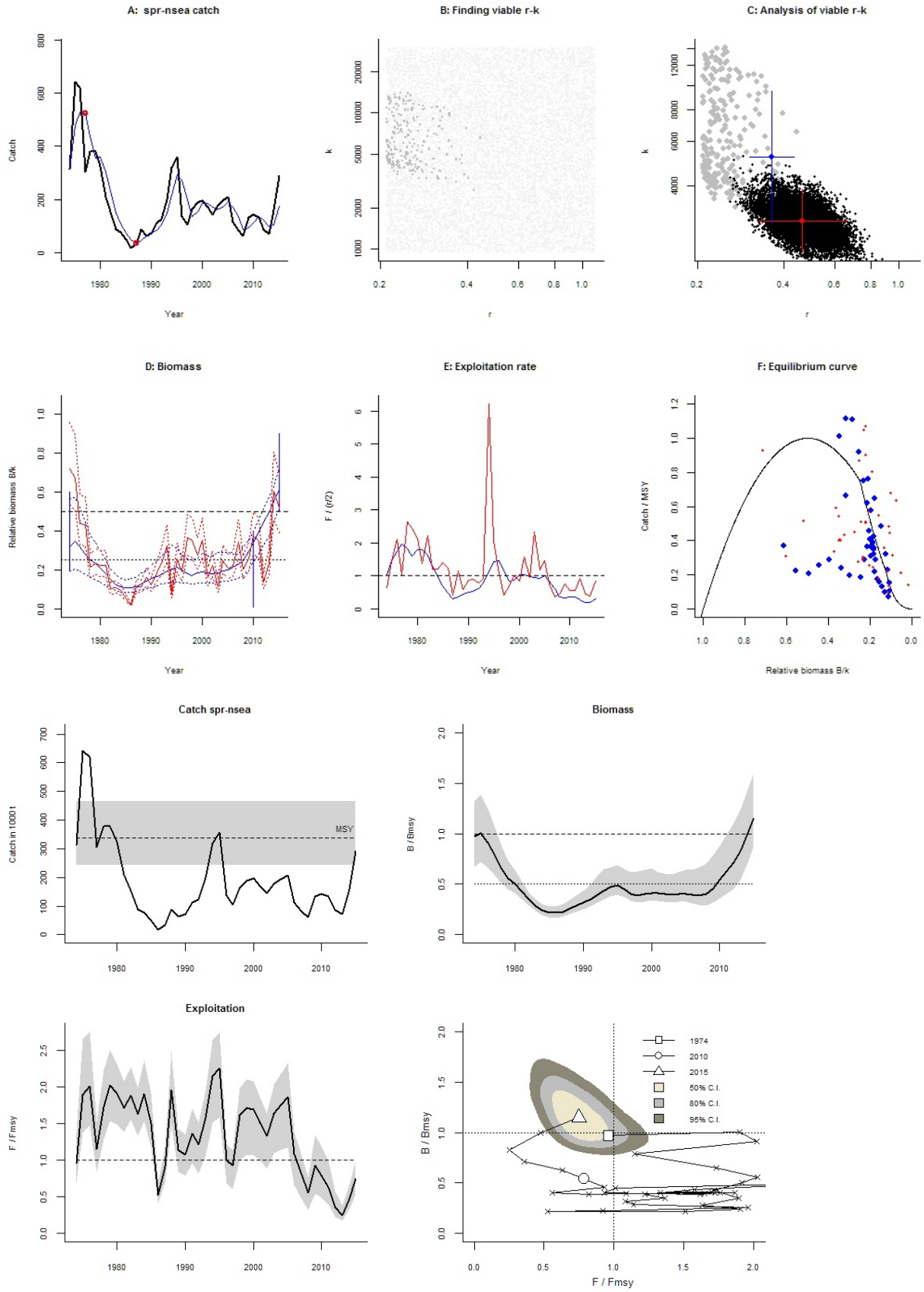
Species: *Sprattus sprattus* , stock: spr-nsea
Sprat in Subarea IV (North Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/spr-nsea.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1974 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2010 expert
Prior final relative biomass = 0.5 - 0.9 expert
Prior range for r = 0.21 - 1.1 expert, , prior range for k = 947 - 30025
Prior range of q = 0.197 - 0.906

Results of CMSY analysis with altogether 234 viable trajectories for 232 r-k pairs
r = 0.363 , 95% CL = 0.304 - 0.434 , k = 5197 , 95% CL = 2841 - 9507
MSY = 472 , 95% CL = 205 - 1088
Relative biomass last year = 0.615 k, 2.5th = 0.518 , 97.5th = 0.723
Exploitation F/(r/2) in last year = 0.298

Results from Bayesian Schaefer model using catch & CPUE
r = 0.463 , 95% CL = 0.326 - 0.658 , k = 2908 , 95% CL = 2184 - 3873
MSY = 337 , 95% CL = 244 - 465
Relative biomass in last year = 0.575 k, 2.5th perc = 0.436 , 97.5th perc = 0.799
Exploitation F/(r/2) in last year = 0.75
q = 0.235 , lcl = 0.175 , ucl = 0.317

Results for Management (based on BSM analysis)
Fmsy = 0.232 , 95% CL = 0.163 - 0.329 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.232 , 95% CL = 0.163 - 0.329 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 337 , 95% CL = 244 - 465
Bmsy = 1454 , 95% CL = 1092 - 1937
Biomass in last year = 1672 , 2.5th perc = 1269 , 97.5 perc = 2323
B/Bmsy in last year = 1.15 , 2.5th perc = 0.872 , 97.5 perc = 1.6
Fishing mortality in last year = 0.174 , 2.5th perc = 0.125 , 97.5 perc = 0.229
F/Fmsy = 0.75 , 2.5th perc = 0.54 , 97.5 perc = 0.988

Stock status and exploitation in 2014
Biomass = 1447 , B/Bmsy = 0.995 , fishing mortality F = 0.109 , F/Fmsy = 0.473
Comment: OK (RF 23.09.16)


A: spr-nsea 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 spr-nsea
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1974
2010
2015
50% C.I.
80% C.I.
95% C.I.

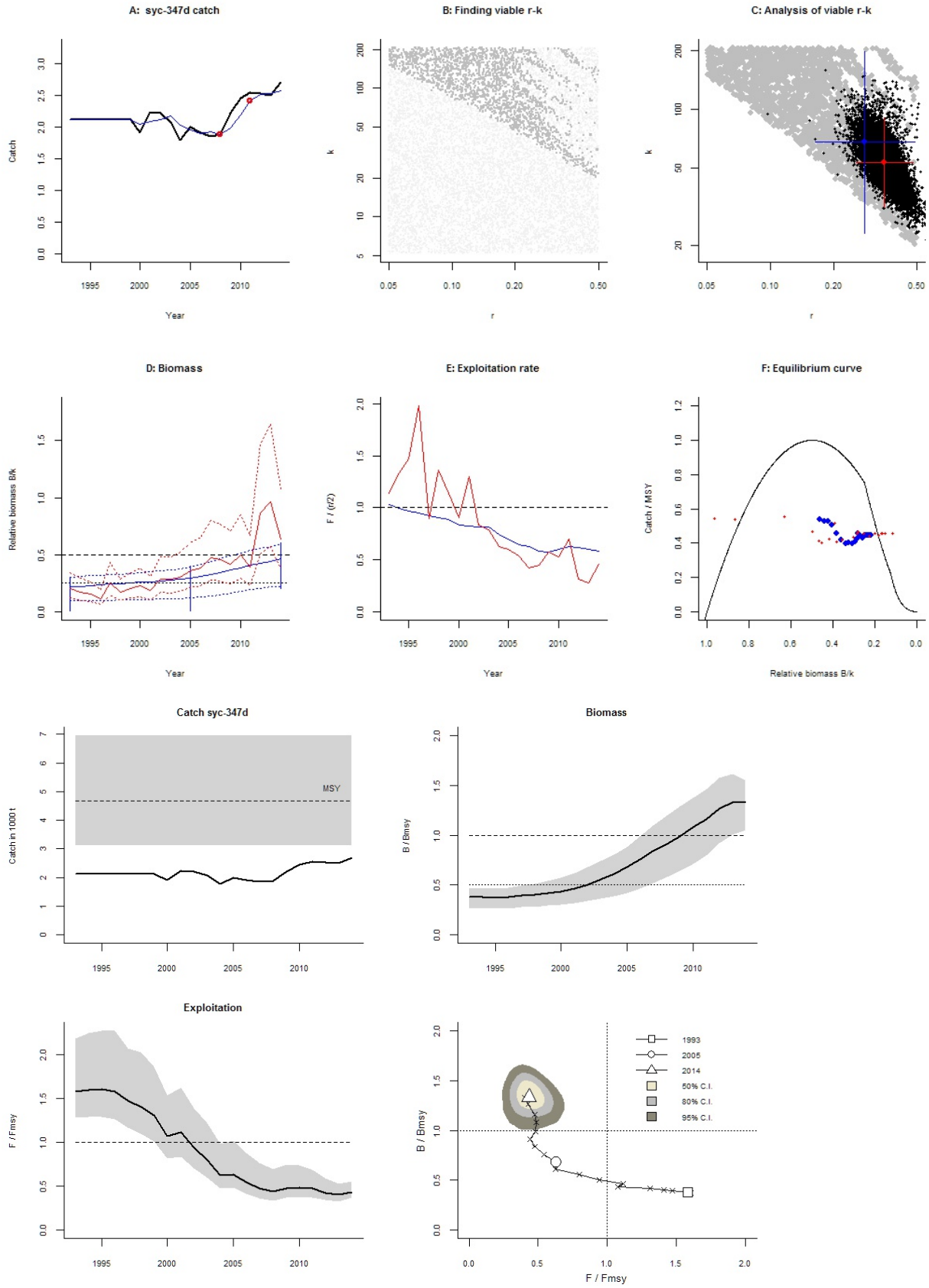
Species: *Scyliorhinus canicula* , stock: syc-347d
Lesser-spotted dogfish in Subarea IV and Divisions IIIa and VIId (North Sea, Skagerrak and Kattegat, and eastern English Channel)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/syc-347d.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1993 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.3 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2005 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.05 - 0.5 default , prior range for k = 5.15 - 206
Prior range of q = 3.18e-05 - 0.000201

Results of CMSY analysis with altogether 3954 viable trajectories for 2144 r-k pairs
r = 0.282 , 95% CL = 0.163 - 0.487 , k = 67.6 , 95% CL = 23.2 - 197
MSY = 4.77 , 95% CL = 1.71 - 13.3
Relative biomass last year = 0.462 k, 2.5th = 0.222 , 97.5th = 0.594
Exploitation F/(r/2) in last year = 0.584

Results from Bayesian Schaefer model using catch & CPUE
r = 0.35 , 95% CL = 0.257 - 0.477 , k = 53.3 , 95% CL = 31.4 - 90.6
MSY = 4.67 , 95% CL = 3.13 - 6.96
Relative biomass in last year = 0.666 k, 2.5th perc = 0.524 , 97.5th perc = 0.775
Exploitation F/(r/2) in last year = 0.435
q = 5.72e-05 , lcl = 3.95e-05 , ucl = 8.28e-05

Results for Management (based on BSM analysis)
Fmsy = 0.175 , 95% CL = 0.129 - 0.238 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.175 , 95% CL = 0.129 - 0.238 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 4.67 , 95% CL = 3.13 - 6.96
Bmsy = 26.6 , 95% CL = 15.7 - 45.3
Biomass in last year = 35.5 , 2.5th perc = 27.9 , 97.5 perc = 41.3
B/Bmsy in last year = 1.33 , 2.5th perc = 1.05 , 97.5 perc = 1.55
Fishing mortality in last year = 0.0762 , 2.5th perc = 0.0655 , 97.5 perc = 0.0968
F/Fmsy = 0.435 , 2.5th perc = 0.374 , 97.5 perc = 0.552

Stock status and exploitation in 2014
Biomass = 35.5 , B/Bmsy = 1.33 , fishing mortality F = 0.0762 , F/Fmsy = 0.435
Comment: OK (RF 23.09.16)


A: syc-347d 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 syc-347d
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1993
2005
2014
50% C.I.
80% C.I.
95% C.I.

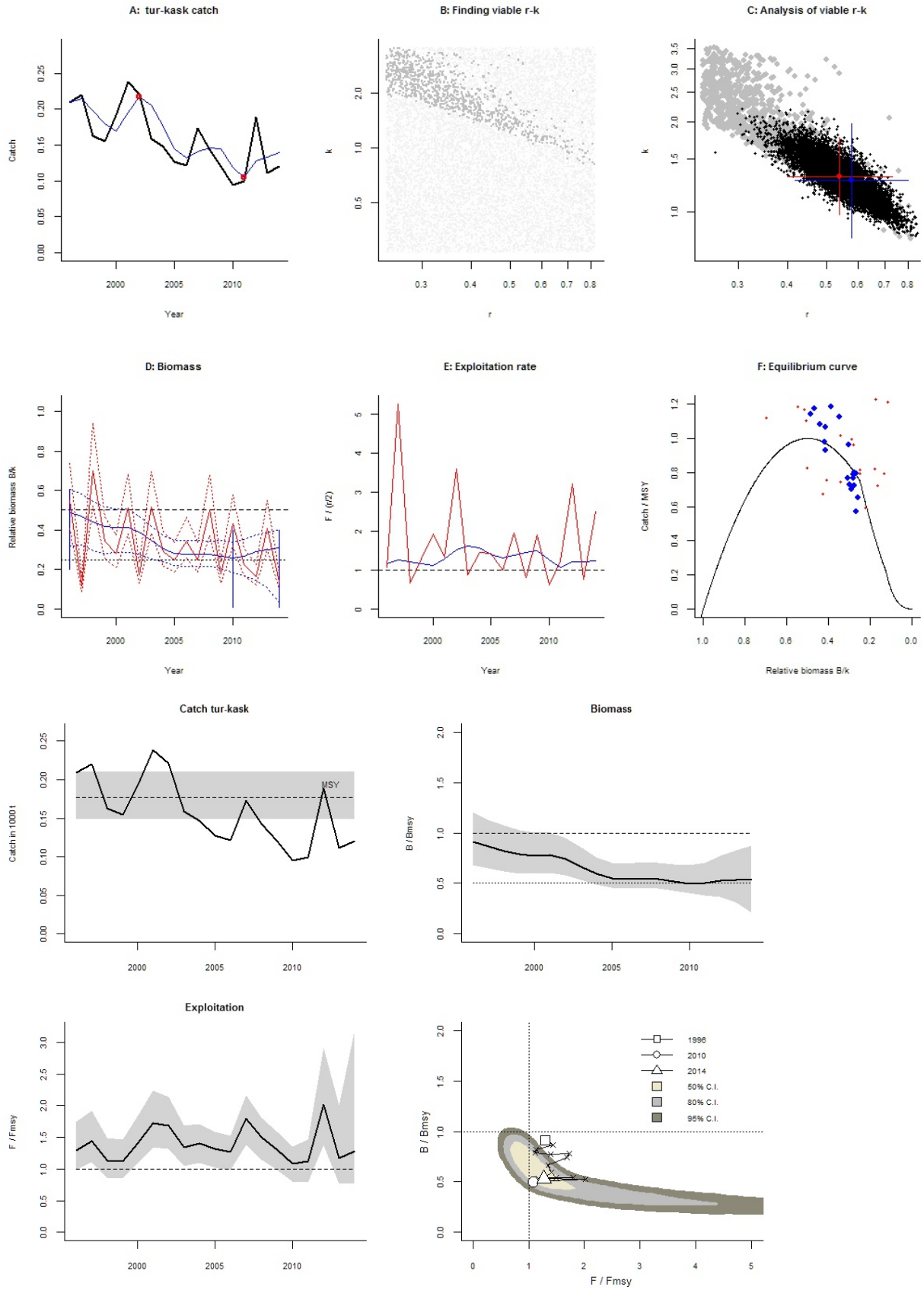
Species: *Scophthalmus maximus* , stock: tur-kask
Turbot in Division IIIa
Source: http://ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/Tur-kask.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1996 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2010 default
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.24 - 0.82 expert, , prior range for k = 0.265 - 3.54
Prior range of q = 0.0016 - 0.00585

Results of CMSY analysis with altogether 1655 viable trajectories for 995 r-k pairs
r = 0.577 , 95% CL = 0.416 - 0.8 , k = 1.27 , 95% CL = 0.817 - 1.97
MSY = 0.183 , 95% CL = 0.131 - 0.254
Relative biomass last year = 0.308 k, 2.5th = 0.0341 , 97.5th = 0.397
Exploitation F/(r/2) in last year = 1.24

Results from Bayesian Schaefer model using catch & CPUE
r = 0.54 , 95% CL = 0.399 - 0.73 , k = 1.31 , 95% CL = 0.973 - 1.76
MSY = 0.177 , 95% CL = 0.149 - 0.21
Relative biomass in last year = 0.266 k, 2.5th perc = 0.107 , 97.5th perc = 0.437
Exploitation F/(r/2) in last year = 1.28
q = 0.00273 , lcl = 0.0021 , ucl = 0.00354

Results for Management (based on BSM analysis)
Fmsy = 0.27 , 95% CL = 0.2 - 0.365 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.27 , 95% CL = 0.2 - 0.365 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.177 , 95% CL = 0.149 - 0.21
Bmsy = 0.655 , 95% CL = 0.487 - 0.881
Biomass in last year = 0.349 , 2.5th perc = 0.14 , 97.5 perc = 0.572
B/Bmsy in last year = 0.533 , 2.5th perc = 0.213 , 97.5 perc = 0.874
Fishing mortality in last year = 0.344 , 2.5th perc = 0.21 , 97.5 perc = 0.859
F/Fmsy = 1.28 , 2.5th perc = 0.777 , 97.5 perc = 3.19

Stock status and exploitation in 2014
Biomass = 0.349 , B/Bmsy = 0.533 , fishing mortality F = 0.344 , F/Fmsy = 1.28
Comment: OK (RF 23.09.16)


A: tur-kask 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 tur-kask
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1996
2010
2014
50% C.I.
80% C.I.
95% C.I.

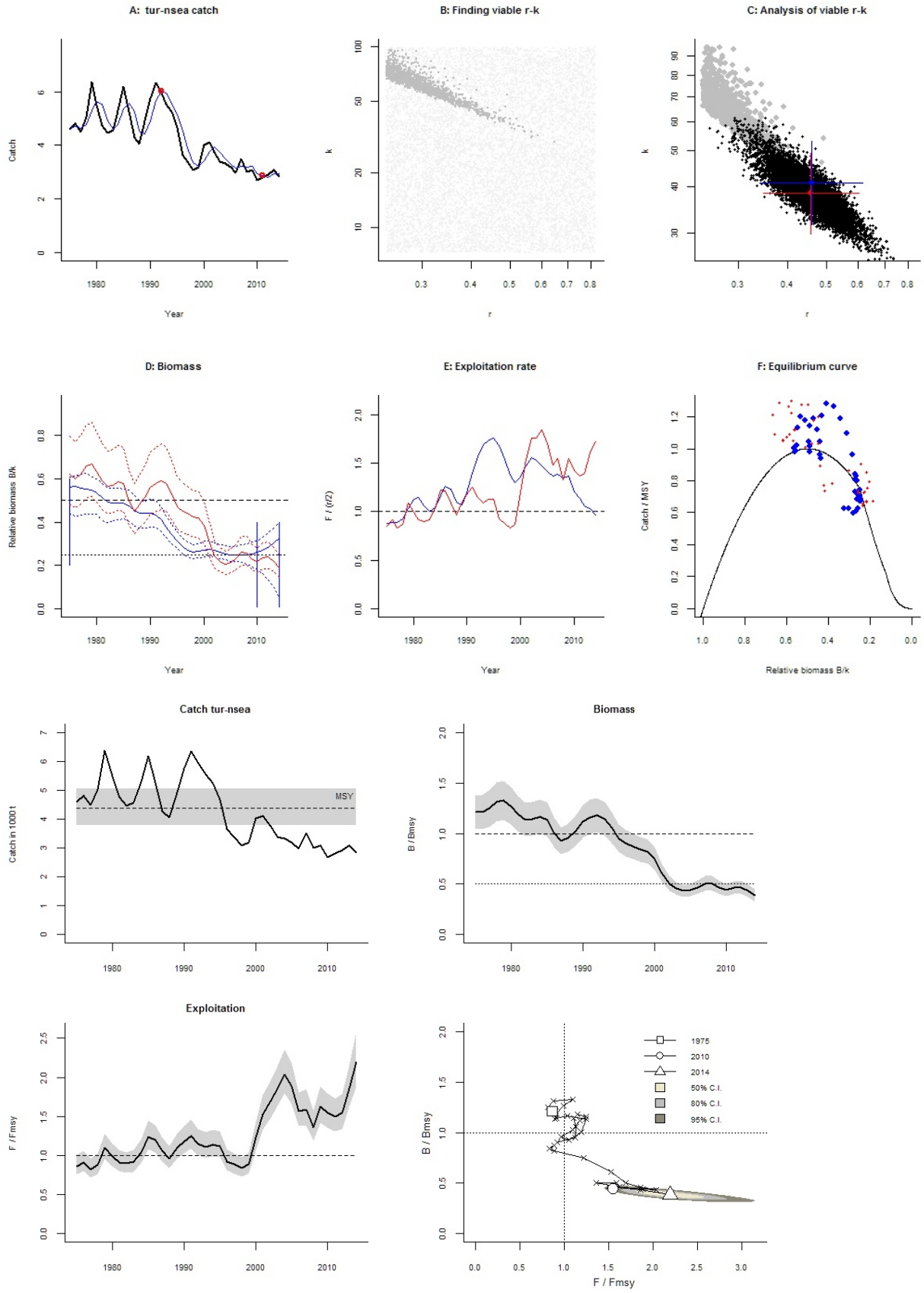
Species: *Scophthalmus maximus* , stock: tur-nsea
Turbot in Subarea IV
Source:
http://ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2015/WGNSSK/20%20WGNSSK%20report%20-%20Sec%2018%20Turbot%20in%20Subarea%20IV.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1975 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2010 default
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.24 - 0.82 expert, , prior range for k = 7.33 - 98.1
Prior range of q = 0.568 - 2.08

Results of CMSY analysis with altogether 1703 viable trajectories for 1384 r-k pairs
r = 0.458 , 95% CL = 0.34 - 0.617 , k = 41 , 95% CL = 31.6 - 53.1
MSY = 4.69 , 95% CL = 4.17 - 5.28
Relative biomass last year = 0.326 k, 2.5th = 0.0494 , 97.5th = 0.397
Exploitation F/(r/2) in last year = 0.961

Results from Bayesian Schaefer model using catch & CPUE
r = 0.457 , 95% CL = 0.347 - 0.602 , k = 38.3 , 95% CL = 29.7 - 49.3
MSY = 4.38 , 95% CL = 3.78 - 5.06
Relative biomass in last year = 0.192 k, 2.5th perc = 0.163 , 97.5th perc = 0.224
Exploitation F/(r/2) in last year = 1.68
q = 0.882 , lcl = 0.7 , ucl = 1.11

Results for Management (based on BSM analysis)
Fmsy = 0.228 , 95% CL = 0.173 - 0.301 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.176 , 95% CL = 0.133 - 0.232 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 4.38 , 95% CL = 3.78 - 5.06
Bmsy = 19.2 , 95% CL = 14.9 - 24.7
Biomass in last year = 7.36 , 2.5th perc = 6.24 , 97.5 perc = 8.6
B/Bmsy in last year = 0.384 , 2.5th perc = 0.326 , 97.5 perc = 0.449
Fishing mortality in last year = 0.385 , 2.5th perc = 0.33 , 97.5 perc = 0.454
F/Fmsy = 2.19 , 2.5th perc = 1.88 , 97.5 perc = 2.59

Stock status and exploitation in 2014
Biomass = 7.36 , B/Bmsy = 0.384 , fishing mortality F = 0.385 , F/Fmsy = 2.19
Comment: OK (RF 23.09.16)


A: tur-nsea 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 tur-nsea
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1975
2010
2014
50% C.I.
80% C.I.
95% C.I.

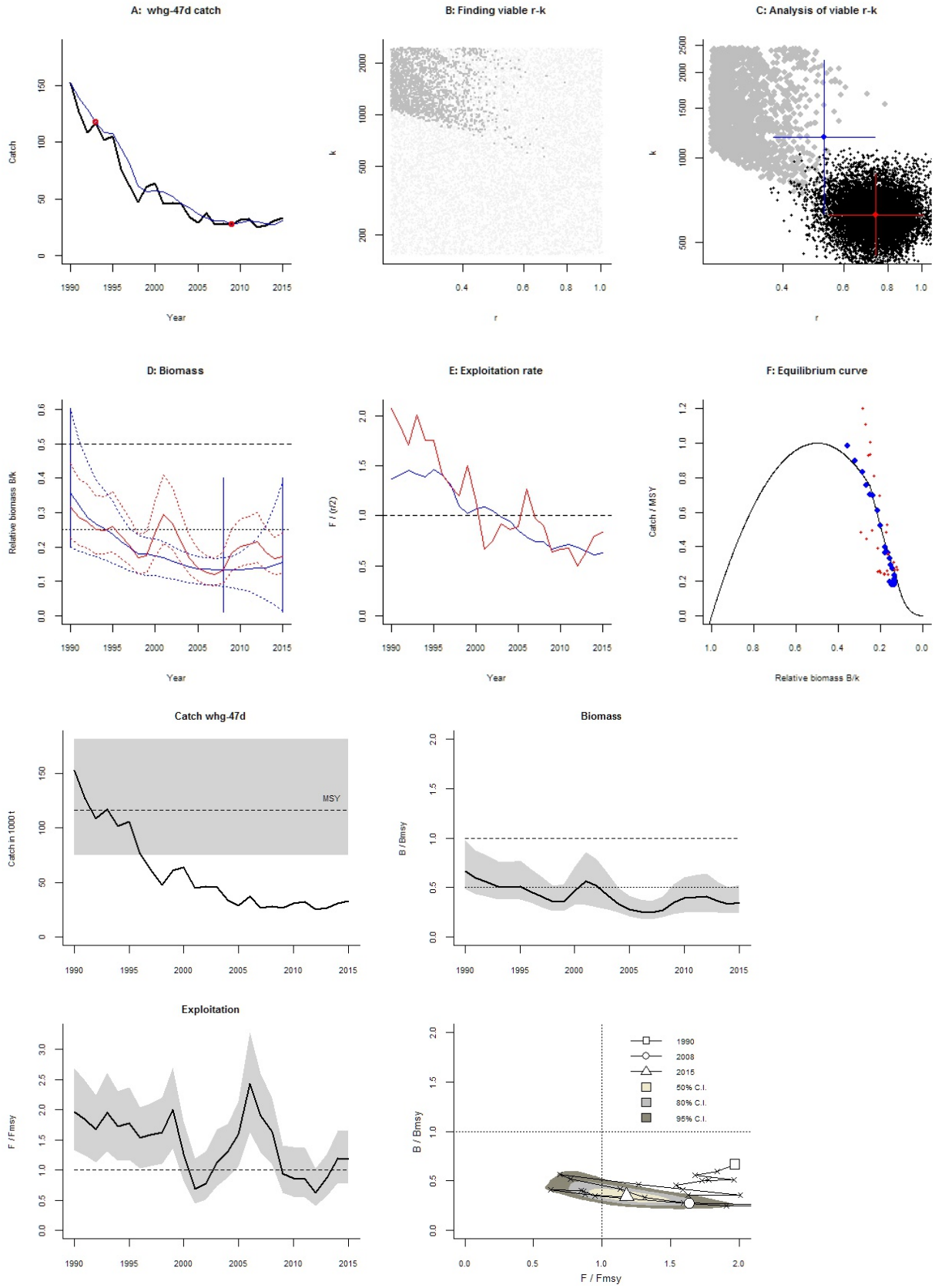
Species: *Merlangius merlangus* , stock: whg-47d
Whiting Subarea IV (North Sea) and Division VIId (Eastern Channel)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/whg-47d.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1990 - 2015 , abundance = CPUE
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 - 0.4 , default
Prior range for r = 0.25 - 1 expert, , prior range for k = 151 - 2442
Prior range of q = 2.37 - 9.53

Results of CMSY analysis with altogether 2057 viable trajectories for 1966 r-k pairs
r = 0.527 , 95% CL = 0.377 - 0.737 , k = 1179 , 95% CL = 630 - 2205
MSY = 155 , 95% CL = 72.5 - 333
Relative biomass last year = 0.156 k, 2.5th = 0.013 , 97.5th = 0.386
Exploitation F/(r/2) in last year = 0.624

Results from Bayesian Schaefer model using catch & CPUE
r = 0.742 , 95% CL = 0.541 - 1.02 , k = 628 , 95% CL = 451 - 875
MSY = 116 , 95% CL = 74.8 - 181
Relative biomass in last year = 0.174 k, 2.5th perc = 0.124 , 97.5th perc = 0.262
Exploitation F/(r/2) in last year = 0.819
q = 2.29 , lcl = 1.82 , ucl = 2.88

Results for Management (based on BSM analysis)
Fmsy = 0.371 , 95% CL = 0.27 - 0.509 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.258 , 95% CL = 0.188 - 0.354 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 116 , 95% CL = 74.8 - 181
Bmsy = 314 , 95% CL = 225 - 438
Biomass in last year = 109 , 2.5th perc = 77.9 , 97.5 perc = 165
B/Bmsy in last year = 0.348 , 2.5th perc = 0.248 , 97.5 perc = 0.524
Fishing mortality in last year = 0.304 , 2.5th perc = 0.202 , 97.5 perc = 0.426
F/Fmsy = 1.18 , 2.5th perc = 0.781 , 97.5 perc = 1.65

Stock status and exploitation in 2014
Biomass = 104 , B/Bmsy = 0.333 , fishing mortality F = 0.294 , F/Fmsy = 1.19
Comment: OK (RF 23.09.16)

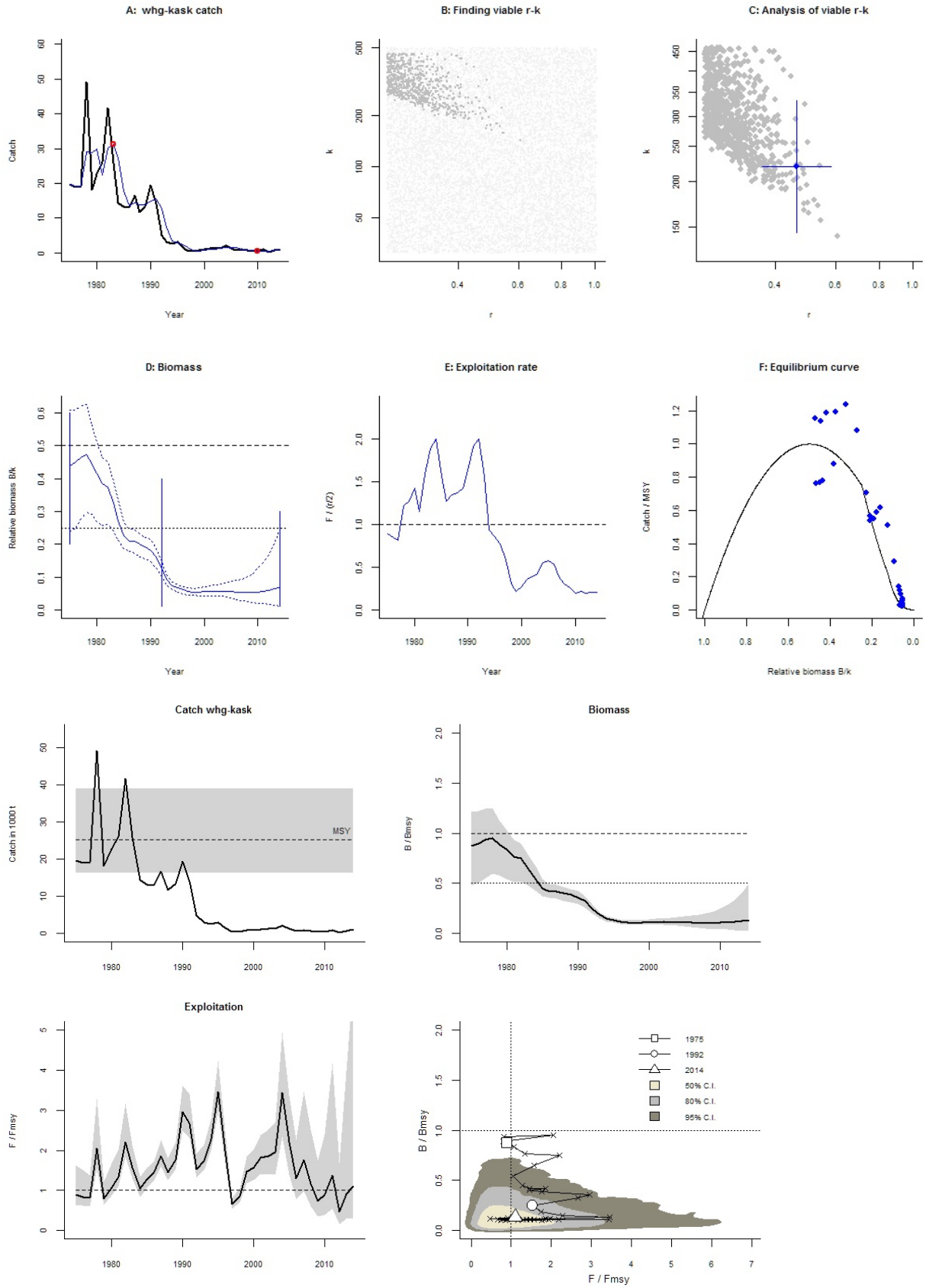

A: whg-47d catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch whg-47d
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1990
2008
2015
50% C.I.
80% C.I.
95% C.I.

Species: *Merlangius merlangus* , stock: whg-kask
Whiting in Division IIIa (Skagerrak and Kattegat)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/whg-kask.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1975 - 2014 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 1992 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.25 - 1 expert, , prior range for k = 30.9 - 500

Results of CMSY analysis with altogether 762 viable trajectories for 743 r-k pairs
r = 0.461 , 95% CL = 0.366 - 0.58 , k = 219 , 95% CL = 145 - 330
MSY = 25.3 , 95% CL = 16.4 - 38.9
Relative biomass last year = 0.0676 k, 2.5th = 0.012 , 97.5th = 0.246
Exploitation F/(r/2) in last year = 0.205

Results for Management (based on CMSY analysis)
Fmsy = 0.23 , 95% CL = 0.183 - 0.29 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0623 , 95% CL = 0.0495 - 0.0784 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 25.3 , 95% CL = 16.4 - 38.9
Bmsy = 110 , 95% CL = 72.7 - 165
Biomass in last year = 14.8 , 2.5th perc = 2.64 , 97.5 perc = 54
B/Bmsy in last year = 0.135 , 2.5th perc = 0.0241 , 97.5 perc = 0.492
Fishing mortality in last year = 0.0686 , 2.5th perc = 0.0189 , 97.5 perc = 0.385
F/Fmsy = 1.1 , 2.5th perc = 0.303 , 97.5 perc = 6.18

Stock status and exploitation in 2014
Biomass = 14.8 , B/Bmsy = 0.135 , fishing mortality F = 0.0686 , F/Fmsy = 1.1
Comment: OK (RF 23.09.16)


A: whg-kask 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 whg-kask
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1975
1992
2014
50% C.I.
80% C.I.
95% C.I.

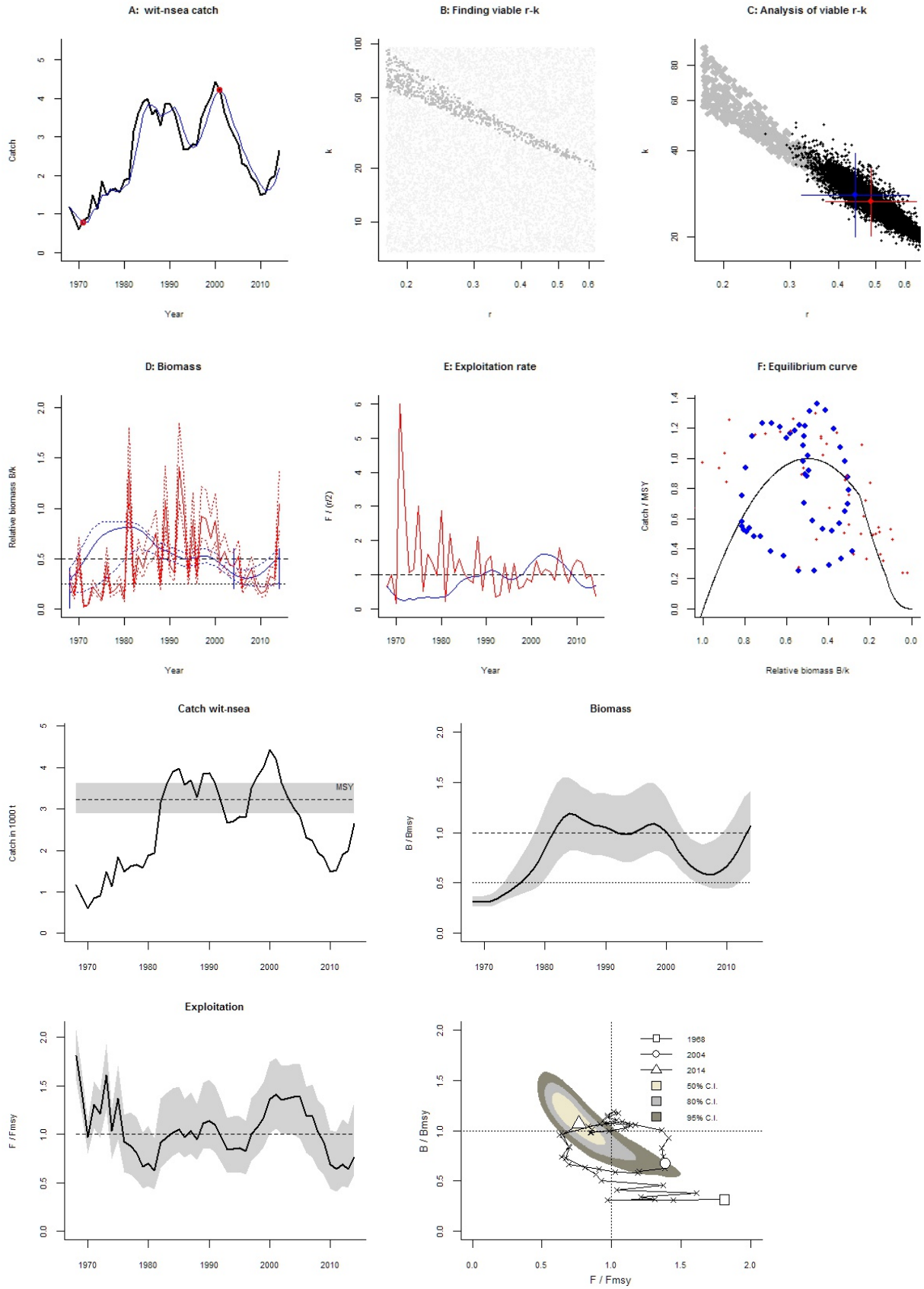
Species: *Glyptocephalus cynoglossus* , stock: wit-nsea
Witch in Subarea IV and Divisions IIIa and VIId (North Sea, Skagerrak and Kattegat, Eastern English Channel)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/wit-nsea.pdf
Region: Northeast Atlantic , Greater North Sea
Catch data used from years 1968 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2004 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.18 - 0.62 expert, , prior range for k = 6.76 - 95.3
Prior range of q = 6.37e-06 - 2.39e-05

Results of CMSY analysis with altogether 1958 viable trajectories for 690 r-k pairs
r = 0.443 , 95% CL = 0.32 - 0.613 , k = 28 , 95% CL = 20 - 39.2
MSY = 3.1 , 95% CL = 2.85 - 3.36
Relative biomass last year = 0.517 k, 2.5th = 0.26 , 97.5th = 0.596
Exploitation F/(r/2) in last year = 0.68

Results from Bayesian Schaefer model using catch & CPUE
r = 0.488 , 95% CL = 0.371 - 0.641 , k = 26.5 , 95% CL = 20.2 - 34.9
MSY = 3.23 , 95% CL = 2.88 - 3.63
Relative biomass in last year = 0.534 k, 2.5th perc = 0.308 , 97.5th perc = 0.708
Exploitation F/(r/2) in last year = 0.766
q = 1.04e-05 , lcl = 7.99e-06 , ucl = 1.36e-05

Results for Management (based on BSM analysis)
Fmsy = 0.244 , 95% CL = 0.186 - 0.32 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.244 , 95% CL = 0.186 - 0.32 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 3.23 , 95% CL = 2.88 - 3.63
Bmsy = 13.3 , 95% CL = 10.1 - 17.4
Biomass in last year = 14.2 , 2.5th perc = 8.16 , 97.5 perc = 18.8
B/Bmsy in last year = 1.07 , 2.5th perc = 0.615 , 97.5 perc = 1.42
Fishing mortality in last year = 0.187 , 2.5th perc = 0.141 , 97.5 perc = 0.324
F/Fmsy = 0.766 , 2.5th perc = 0.578 , 97.5 perc = 1.33

Stock status and exploitation in 2014
Biomass = 14.2 , B/Bmsy = 1.07 , fishing mortality F = 0.187 , F/Fmsy = 0.766
Comment: No update in 2016. OK (RF 23.09.16)


A: wit-nsea 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 wit-nsea
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1968
2004
2014
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

Baltic Sea (analyzed with CMSY_O_7m.R)

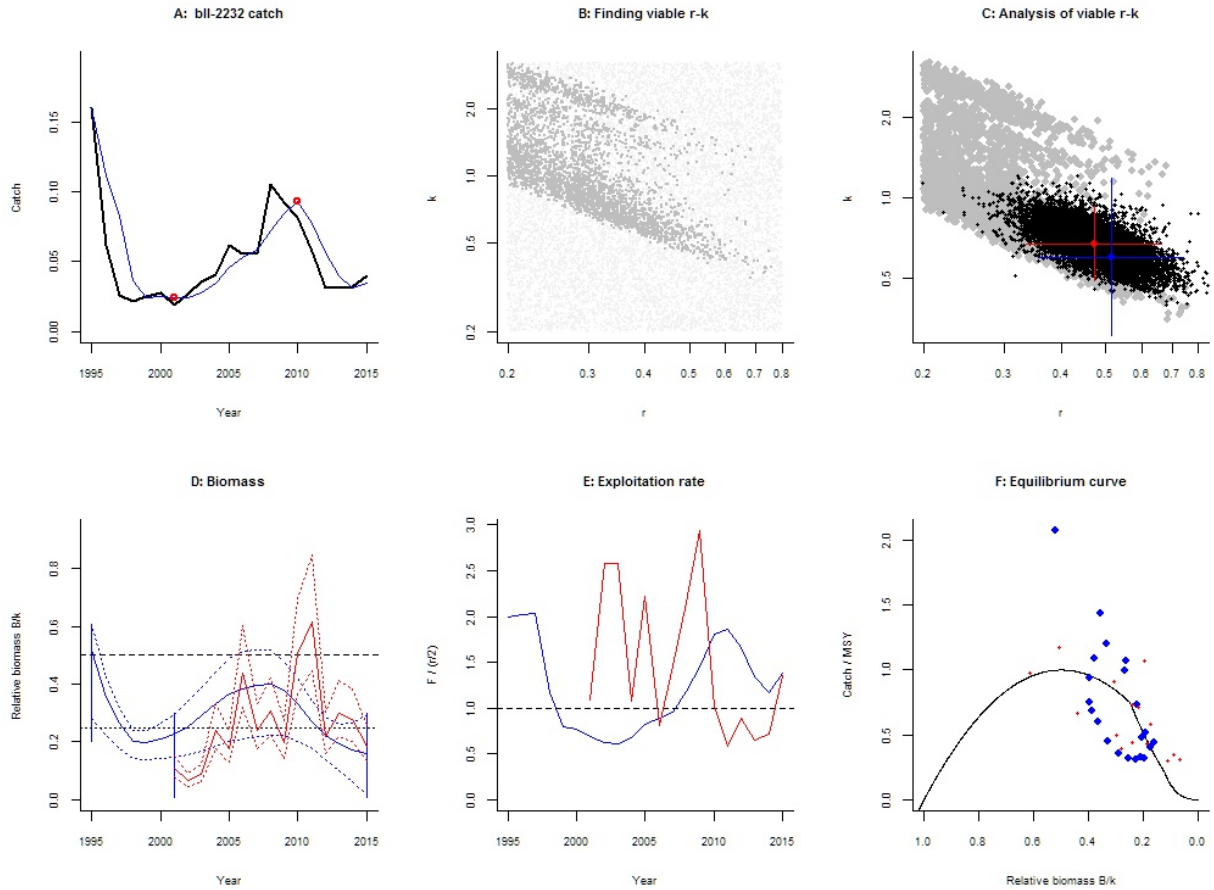
Species: *Scophthalmus rhombus* , stock: bll-2232
Brill in Subdivisions 22–32 (Baltic Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/bll-2232.pdf
Region: Northeast Atlantic , Baltic Sea
Catch data used from years 1995 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.01 - 0.3 in year 2001 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 0.2 - 3.2
Prior range of q = 0.00418 - 0.0167

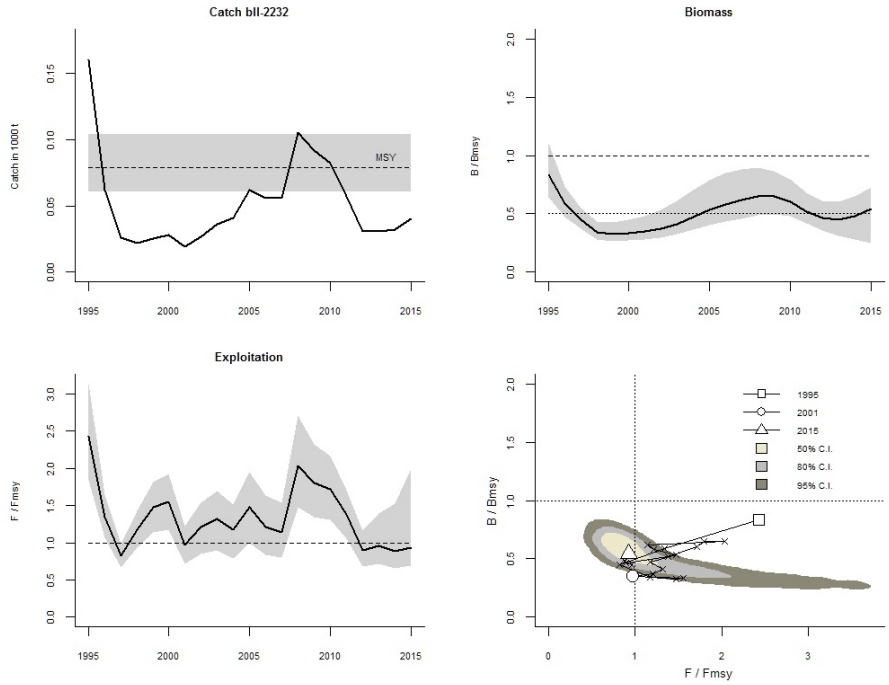
Results of CMSY analysis with altogether 3812 viable trajectories for 3190 r-k pairs
r = 0.517 , 95% CL = 0.359 - 0.743 , k = 0.597 , 95% CL = 0.304 - 1.17
MSY = 0.0772 , 95% CL = 0.0369 - 0.161
Relative biomass last year = 0.161 k, 2.5th = 0.0181 , 97.5th = 0.293
Exploitation F/(r/2) in last year = 1.38

Results from Bayesian Schaefer model using catch & CPUE
r = 0.472 , 95% CL = 0.335 - 0.664 , k = 0.671 , 95% CL = 0.488 - 0.921
MSY = 0.0792 , 95% CL = 0.0604 - 0.104
Relative biomass in last year = 0.272 k, 2.5th perc = 0.126 , 97.5th perc = 0.365
Exploitation F/(r/2) in last year = 0.931
q = 0.00677 , lcl = 0.00508 , ucl = 0.00904

Results for Management (based on BSM analysis)
Fmsy = 0.236 , 95% CL = 0.168 - 0.332 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.236 , 95% CL = 0.168 - 0.332 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.0792 , 95% CL = 0.0604 - 0.104
Bmsy = 0.335 , 95% CL = 0.244 - 0.461
Biomass in last year = 0.182 , 2.5th perc = 0.0848 , 97.5 perc = 0.245
B/Bmsy in last year = 0.543 , 2.5th perc = 0.253 , 97.5 perc = 0.729
Fishing mortality in last year = 0.22 , 2.5th perc = 0.164 , 97.5 perc = 0.472
F/Fmsy = 0.931 , 2.5th perc = 0.693 , 97.5 perc = 2

Stock status and exploitation in 2014
Biomass = 0.16 , B/Bmsy = 0.477 , fishing mortality F = 0.2 , F/Fmsy = 0.889
Comment: OK (RF 21.09.16)


A: bll-2232 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 bll-2232
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1995
2001
2015
50% C.I.
80% C.I.
95% C.I.

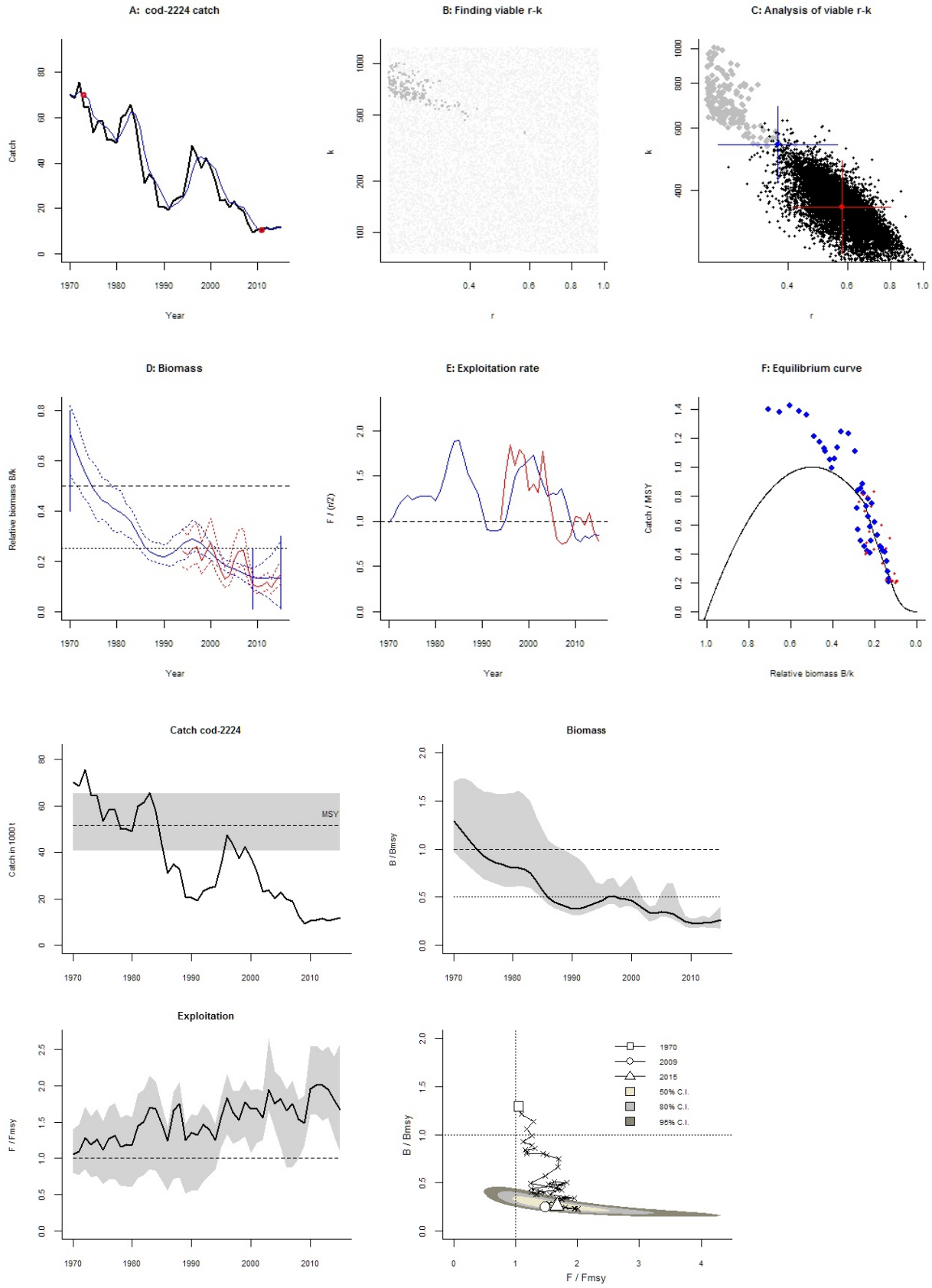
Species: *Gadus morhua* , stock: cod-2224
Cod in Sub-division 22 to 24
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/cod-2224.pdf
Region: Northeast Atlantic , Baltic Sea
Catch data used from years 1970 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.4 - 0.8 expert
Prior intermediate rel. biomass= 0.01 - 0.25 in year 2009 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.23 - 0.96 expert, , prior range for k = 74.4 - 1242
Prior range of q = 0.293 - 1.2

Results of CMSY analysis with altogether 208 viable trajectories for 202 r-k pairs
r = 0.373 , 95% CL = 0.248 - 0.559 , k = 539 , 95% CL = 421 - 690
MSY = 50.2 , 95% CL = 41.9 - 60.2
Relative biomass last year = 0.134 k, 2.5th = 0.0147 , 97.5th = 0.282
Exploitation F/(r/2) in last year = 0.846

Results from Bayesian Schaefer model using catch & CPUE
r = 0.576 , 95% CL = 0.413 - 0.802 , k = 359 , 95% CL = 265 - 485
MSY = 51.6 , 95% CL = 40.8 - 65.4
Relative biomass in last year = 0.132 k, 2.5th perc = 0.0854 , 97.5th perc = 0.203
Exploitation F/(r/2) in last year = 0.881
q = 0.369 , lcl = 0.28 , ucl = 0.484

Results for Management (based on BSM analysis)
Fmsy = 0.288 , 95% CL = 0.206 - 0.401 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.152 , 95% CL = 0.109 - 0.211 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 51.6 , 95% CL = 40.8 - 65.4
Bmsy = 179 , 95% CL = 133 - 242
Biomass in last year = 47.3 , 2.5th perc = 30.7 , 97.5 perc = 72.7
B/Bmsy in last year = 0.263 , 2.5th perc = 0.171 , 97.5 perc = 0.405
Fishing mortality in last year = 0.254 , 2.5th perc = 0.165 , 97.5 perc = 0.391
F/Fmsy = 1.67 , 2.5th perc = 1.09 , 97.5 perc = 2.58

Stock status and exploitation in 2014
Biomass = 44.5 , B/Bmsy = 0.248 , fishing mortality F = 0.257 , F/Fmsy = 1.8
Comment: OK (RF 21.09.16)


A: cod-2224 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 cod-2224
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1970
2009
2015
50% C.I.
80% C.I.
95% C.I.

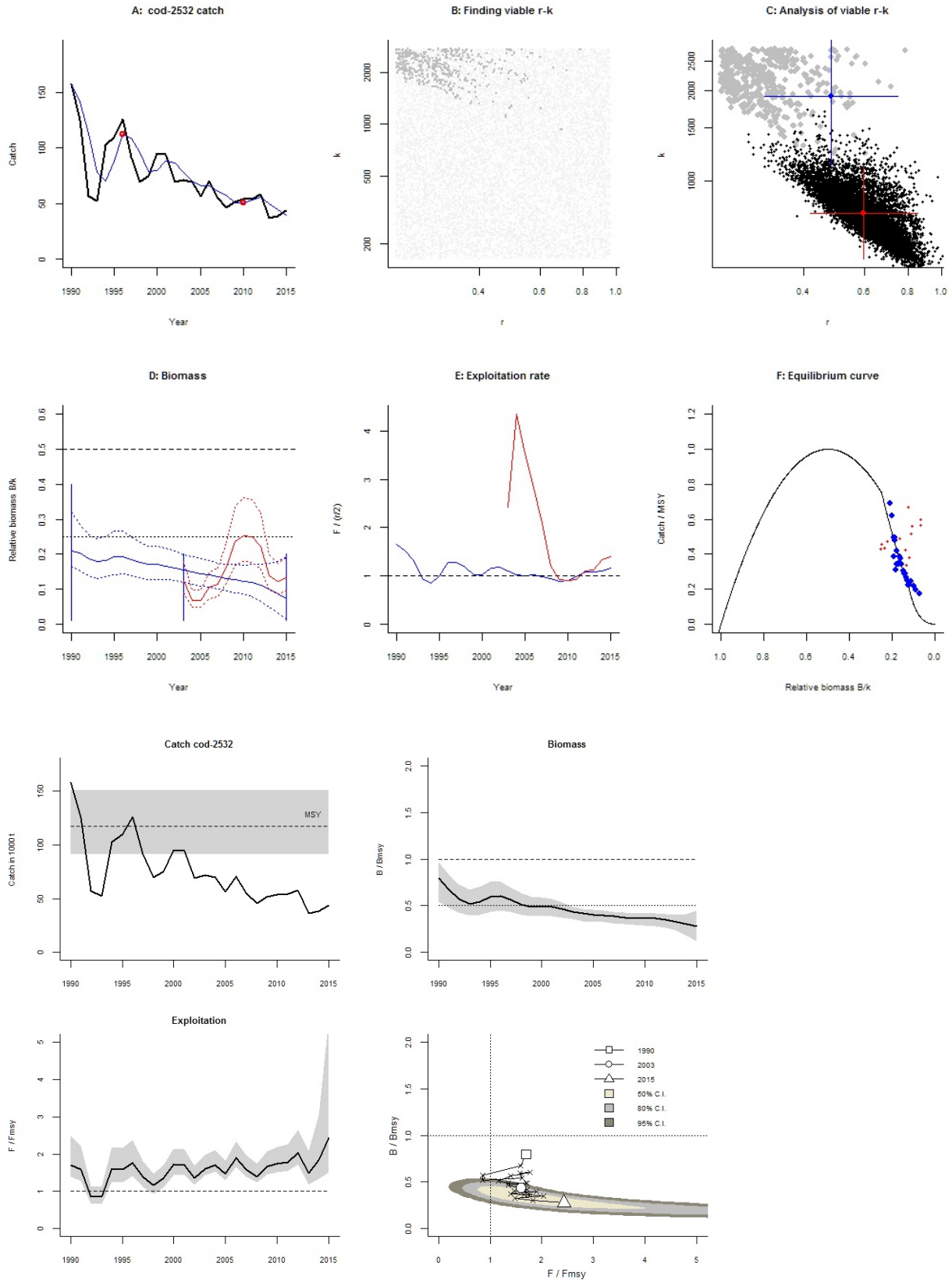
Species: *Gadus morhua* , stock: cod-2532
Cod in Subdivisions 25–32
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/cod-2532.pdf
Region: Northeast Atlantic , Baltic Sea
Catch data used from years 1990 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.2 in year 2003 expert
Prior final relative biomass = 0.01 - 0.2 expert
Prior range for r = 0.23 - 0.96 expert, , prior range for k = 164 - 2743
Prior range of q = 0.000973 - 0.00398

Results of CMSY analysis with altogether 497 viable trajectories for 495 r-k pairs
r = 0.48 , 95% CL = 0.308 - 0.747 , k = 1910 , 95% CL = 1131 - 3225
MSY = 229 , 95% CL = 129 - 405
Relative biomass last year = 0.0739 k, 2.5th = 0.0129 , 97.5th = 0.192
Exploitation F/(r/2) in last year = 1.17

Results from Bayesian Schaefer model using catch & CPUE
r = 0.597 , 95% CL = 0.417 - 0.853 , k = 785 , 95% CL = 553 - 1115
MSY = 117 , 95% CL = 91.1 - 151
Relative biomass in last year = 0.139 k, 2.5th perc = 0.0599 , 97.5th perc = 0.224
Exploitation F/(r/2) in last year = 1.35
q = 0.00138 , lcl = 0.00103 , ucl = 0.00184

Results for Management (based on BSM analysis)
Fmsy = 0.298 , 95% CL = 0.209 - 0.426 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.165 , 95% CL = 0.116 - 0.236 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 117 , 95% CL = 91.1 - 151
Bmsy = 393 , 95% CL = 277 - 557
Biomass in last year = 109 , 2.5th perc = 47 , 97.5 perc = 176
B/Bmsy in last year = 0.277 , 2.5th perc = 0.12 , 97.5 perc = 0.447
Fishing mortality in last year = 0.401 , 2.5th perc = 0.249 , 97.5 perc = 0.929
F/Fmsy = 2.43 , 2.5th perc = 1.5 , 97.5 perc = 5.62

Stock status and exploitation in 2014
Biomass = 118 , B/Bmsy = 0.3 , fishing mortality F = 0.327 , F/Fmsy = 1.83
Comment: OK (RF 21.09.16)


A: cod-2532 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 cod-2532
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1990
2003
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

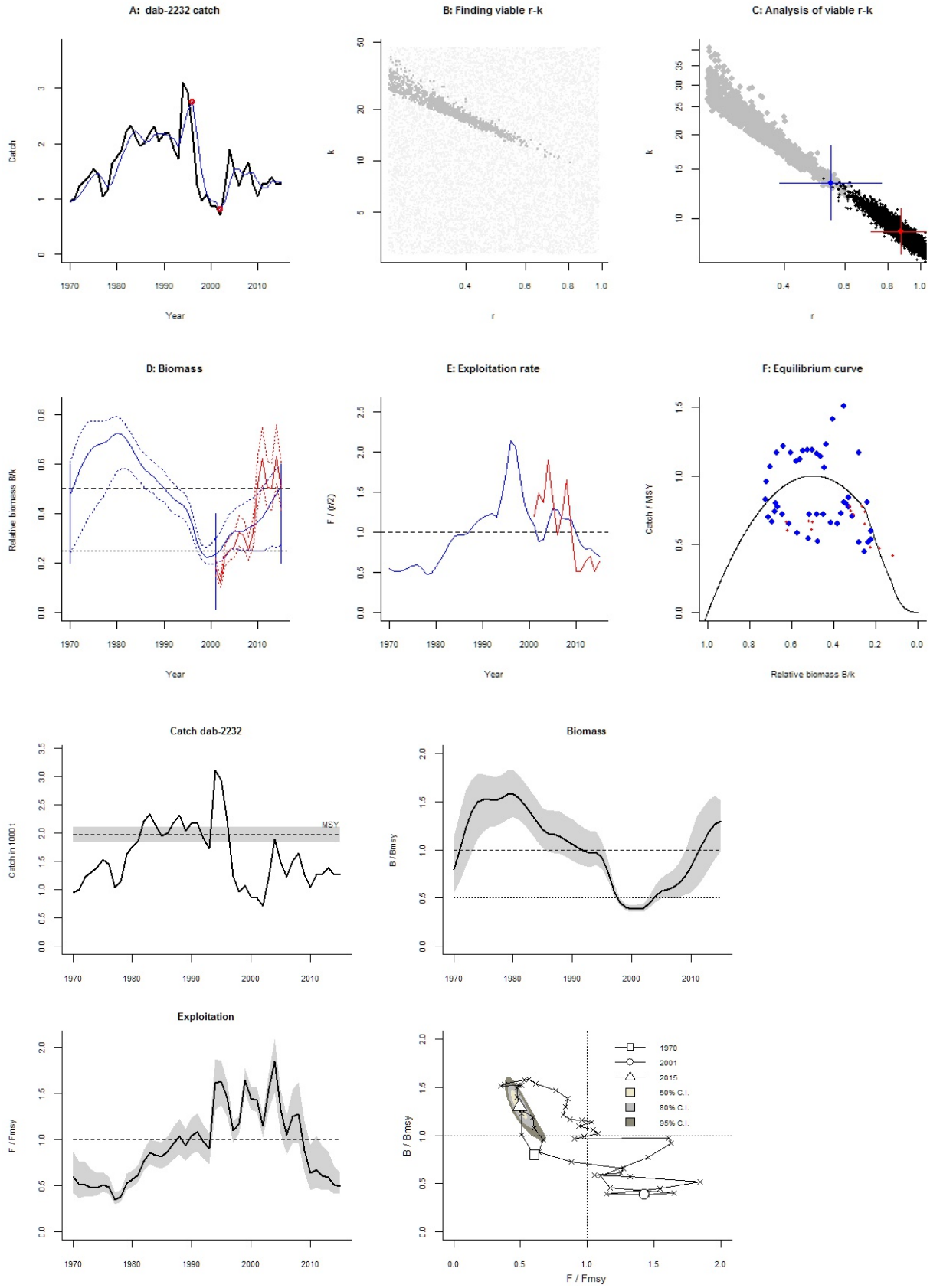
Species: *Limanda limanda* , stock: dab-2232
Dab in Subdivisions 22–32 (Baltic Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/dab-2232.pdf
Region: Northeast Atlantic , Baltic Sea
Catch data used from years 1970 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2001 default
Prior final relative biomass = 0.2 - 0.6 , default
Prior range for r = 0.24 - 0.98 expert, , prior range for k = 2.82 - 46
Prior range of q = 0.0206 - 0.0831

Results of CMSY analysis with altogether 2993 viable trajectories for 1315 r-k pairs
r = 0.546 , 95% CL = 0.389 - 0.767 , k = 13.4 , 95% CL = 9.92 - 18.1
MSY = 1.83 , 95% CL = 1.69 - 1.98
Relative biomass last year = 0.514 k, 2.5th = 0.273 , 97.5th = 0.598
Exploitation F/(r/2) in last year = 0.694

Results from Bayesian Schaefer model using catch & CPUE
r = 0.873 , 95% CL = 0.718 - 1.06 , k = 9.05 , 95% CL = 7.51 - 10.9
MSY = 1.97 , 95% CL = 1.85 - 2.1
Relative biomass in last year = 0.649 k, 2.5th perc = 0.495 , 97.5th perc = 0.755
Exploitation F/(r/2) in last year = 0.494
q = 0.0218 , lcl = 0.0172 , ucl = 0.0277

Results for Management (based on BSM analysis)
Fmsy = 0.437 , 95% CL = 0.359 - 0.531 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.437 , 95% CL = 0.359 - 0.531 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1.97 , 95% CL = 1.85 - 2.1
Bmsy = 4.52 , 95% CL = 3.75 - 5.45
Biomass in last year = 5.87 , 2.5th perc = 4.48 , 97.5 perc = 6.83
B/Bmsy in last year = 1.3 , 2.5th perc = 0.99 , 97.5 perc = 1.51
Fishing mortality in last year = 0.216 , 2.5th perc = 0.186 , 97.5 perc = 0.283
F/Fmsy = 0.494 , 2.5th perc = 0.425 , 97.5 perc = 0.648

Stock status and exploitation in 2014
Biomass = 5.72 , B/Bmsy = 1.27 , fishing mortality F = 0.222 , F/Fmsy = 0.508
Comment: OK (RF 21.09.16)


A: dab-2232 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 dab-2232
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1970
2001
2015
50% C.I.
80% C.I.
95% C.I.

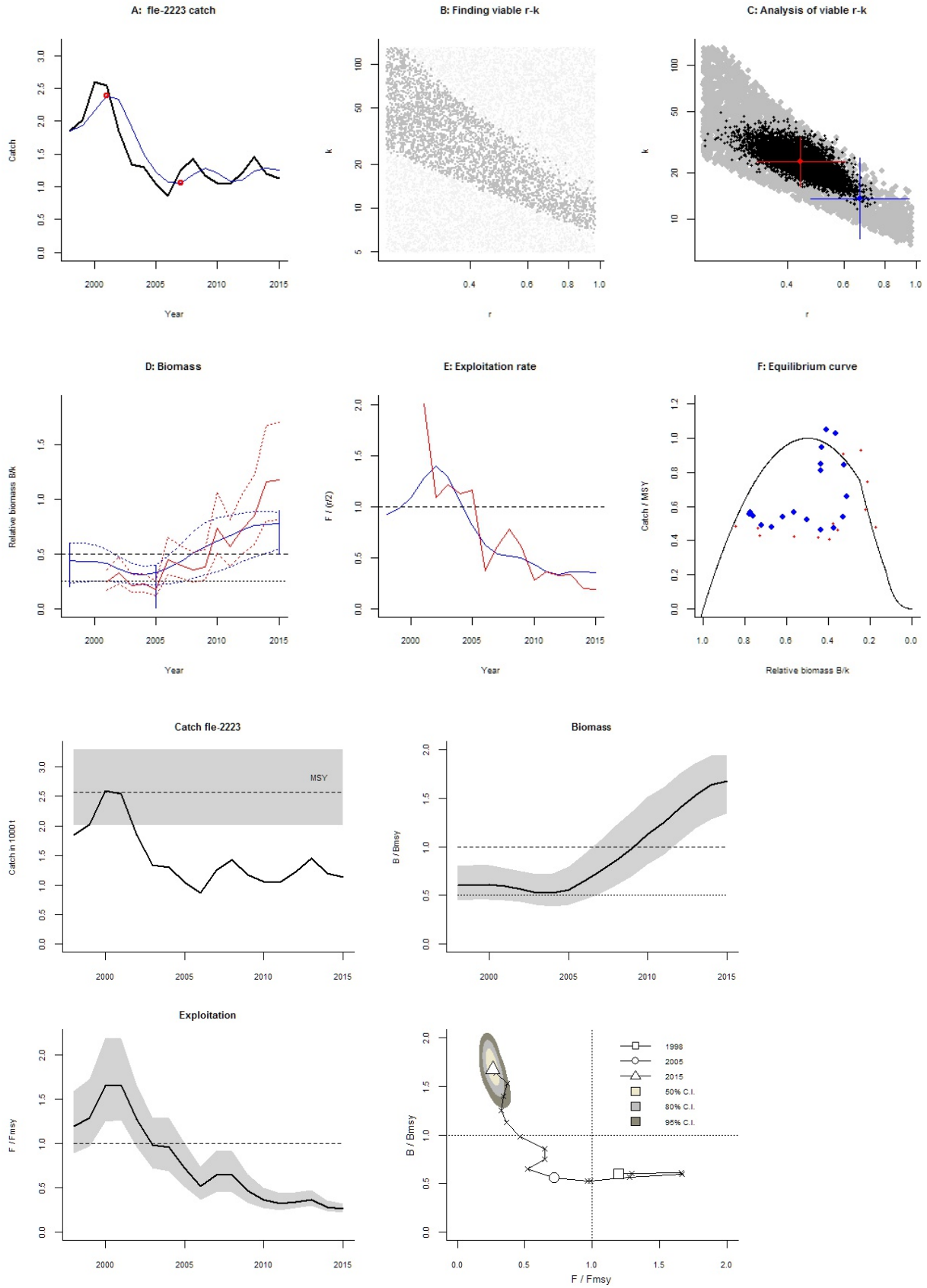
Species: *Platichthys flesus* , stock: fle-2223
Flounder in Subdivisions 22–23 (Belts and sound)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/fle-2223.pdf
Region: Northeast Atlantic , Baltic Sea
Catch data used from years 1998 - 2015 , abundance = CPUE
Prior initial relative 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 expert
Prior range for r = 0.22 - 0.97 expert, , prior range for k = 4.92 - 130
Prior range of q = 0.00148 - 0.00623

Results of CMSY analysis with altogether 6672 viable trajectories for 3292 r-k pairs
r = 0.67 , 95% CL = 0.472 - 0.953 , k = 13.6 , 95% CL = 7.39 - 24.9
MSY = 2.27 , 95% CL = 1.38 - 3.75
Relative biomass last year = 0.779 k, 2.5th = 0.547 , 97.5th = 0.884
Exploitation F/(r/2) in last year = 0.356

Results from Bayesian Schaefer model using catch & CPUE
r = 0.44 , 95% CL = 0.322 - 0.603 , k = 23.4 , 95% CL = 16.1 - 33.8
MSY = 2.57 , 95% CL = 2.01 - 3.3
Relative biomass in last year = 0.837 k, 2.5th perc = 0.672 , 97.5th perc = 0.968
Exploitation F/(r/2) in last year = 0.263
q = 0.00317 , lcl = 0.00233 , ucl = 0.00431

Results for Management (based on BSM analysis)
Fmsy = 0.22 , 95% CL = 0.161 - 0.301 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.22 , 95% CL = 0.161 - 0.301 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 2.57 , 95% CL = 2.01 - 3.3
Bmsy = 11.7 , 95% CL = 8.07 - 16.9
Biomass in last year = 19.5 , 2.5th perc = 15.7 , 97.5 perc = 22.6
B/Bmsy in last year = 1.67 , 2.5th perc = 1.34 , 97.5 perc = 1.94
Fishing mortality in last year = 0.0578 , 2.5th perc = 0.05 , 97.5 perc = 0.0721
F/Fmsy = 0.263 , 2.5th perc = 0.227 , 97.5 perc = 0.327

Stock status and exploitation in 2014
Biomass = 19.1 , B/Bmsy = 1.63 , fishing mortality F = 0.0626 , F/Fmsy = 0.284
Comment: OK (RF 21.09.16)


A: fle-2223 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 fle-2223
MSY
Catch in 1000 t
Biomass
B / Bmsy
Exploitation
F / Fmsy
1998
2005
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

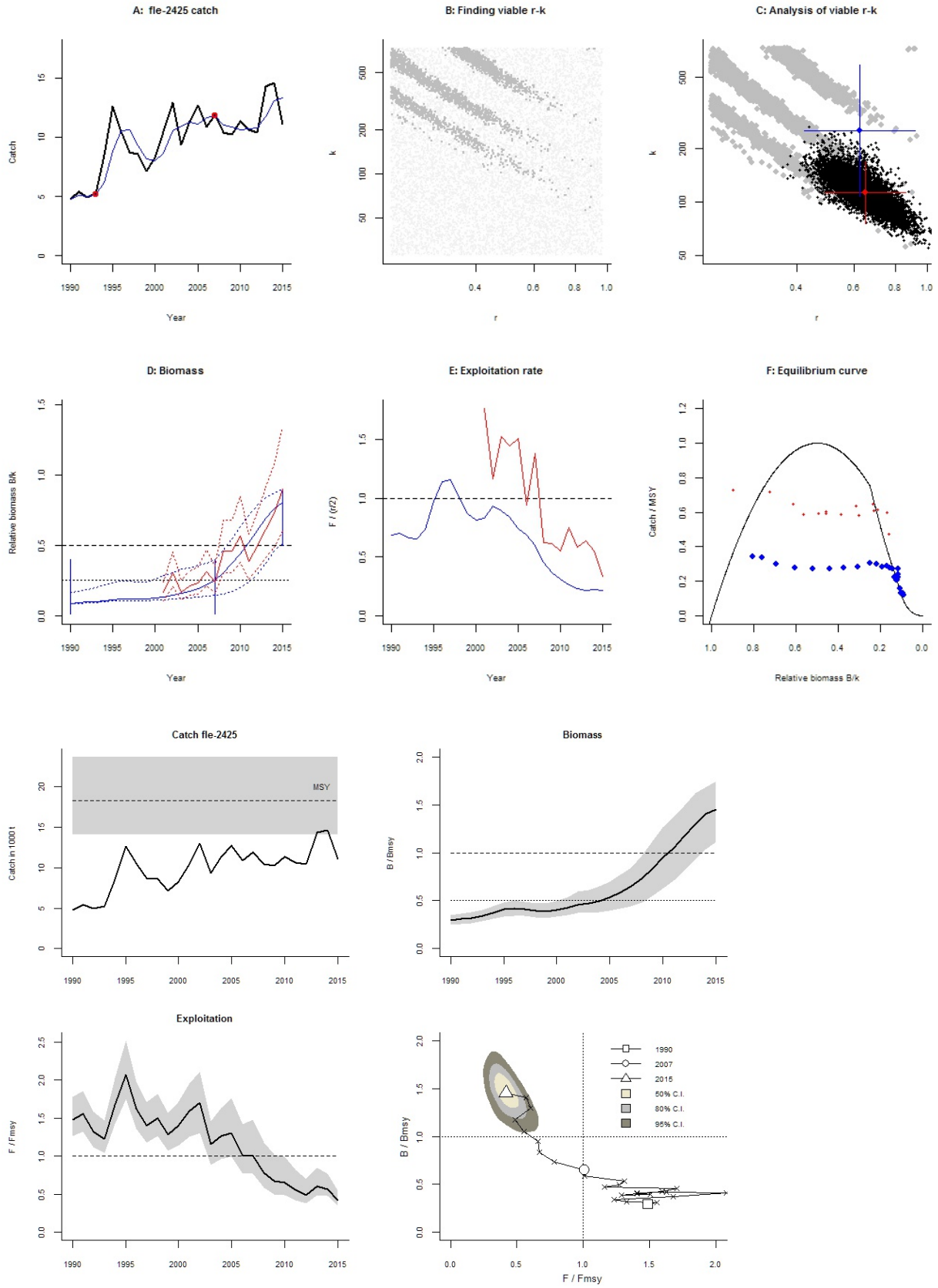
Species: *Platichthys flesus* , stock: fle-2425
Flounder in Subdivisions 24–25 (Southern Baltic Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/fle-2425.pdf
Region: Northeast Atlantic , Baltic Sea
Catch data used from years 1990 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2007 expert
Prior final relative biomass = 0.5 - 0.9 expert
Prior range for r = 0.22 - 0.97 expert, , prior range for k = 27.5 - 728
Prior range of q = 0.00115 - 0.00483

Results of CMSY analysis with altogether 2684 viable trajectories for 2684 r-k pairs
r = 0.622 , 95% CL = 0.422 - 0.916 , k = 252 , 95% CL = 108 - 590
MSY = 39.2 , 95% CL = 14.1 - 109
Relative biomass last year = 0.804 k, 2.5th = 0.515 , 97.5th = 0.897
Exploitation F/(r/2) in last year = 0.212

Results from Bayesian Schaefer model using catch & CPUE
r = 0.647 , 95% CL = 0.487 - 0.859 , k = 113 , 95% CL = 75.8 - 168
MSY = 18.3 , 95% CL = 14.1 - 23.7
Relative biomass in last year = 0.726 k, 2.5th perc = 0.555 , 97.5th perc = 0.87
Exploitation F/(r/2) in last year = 0.418
q = 0.00169 , lcl = 0.00126 , ucl = 0.00226

Results for Management (based on BSM analysis)
Fmsy = 0.323 , 95% CL = 0.243 - 0.43 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.323 , 95% CL = 0.243 - 0.43 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 18.3 , 95% CL = 14.1 - 23.7
Bmsy = 56.5 , 95% CL = 37.9 - 84.1
Biomass in last year = 82 , 2.5th perc = 62.7 , 97.5 perc = 98.3
B/Bmsy in last year = 1.45 , 2.5th perc = 1.11 , 97.5 perc = 1.74
Fishing mortality in last year = 0.135 , 2.5th perc = 0.113 , 97.5 perc = 0.177
F/Fmsy = 0.418 , 2.5th perc = 0.349 , 97.5 perc = 0.548

Stock status and exploitation in 2014
Biomass = 79.1 , B/Bmsy = 1.4 , fishing mortality F = 0.185 , F/Fmsy = 0.571
Comment: OK (RF 21.09.16)


A: fle-2425 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 fle-2425
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1990
2007
2015
50% C.I.
80% C.I.
95% C.I.

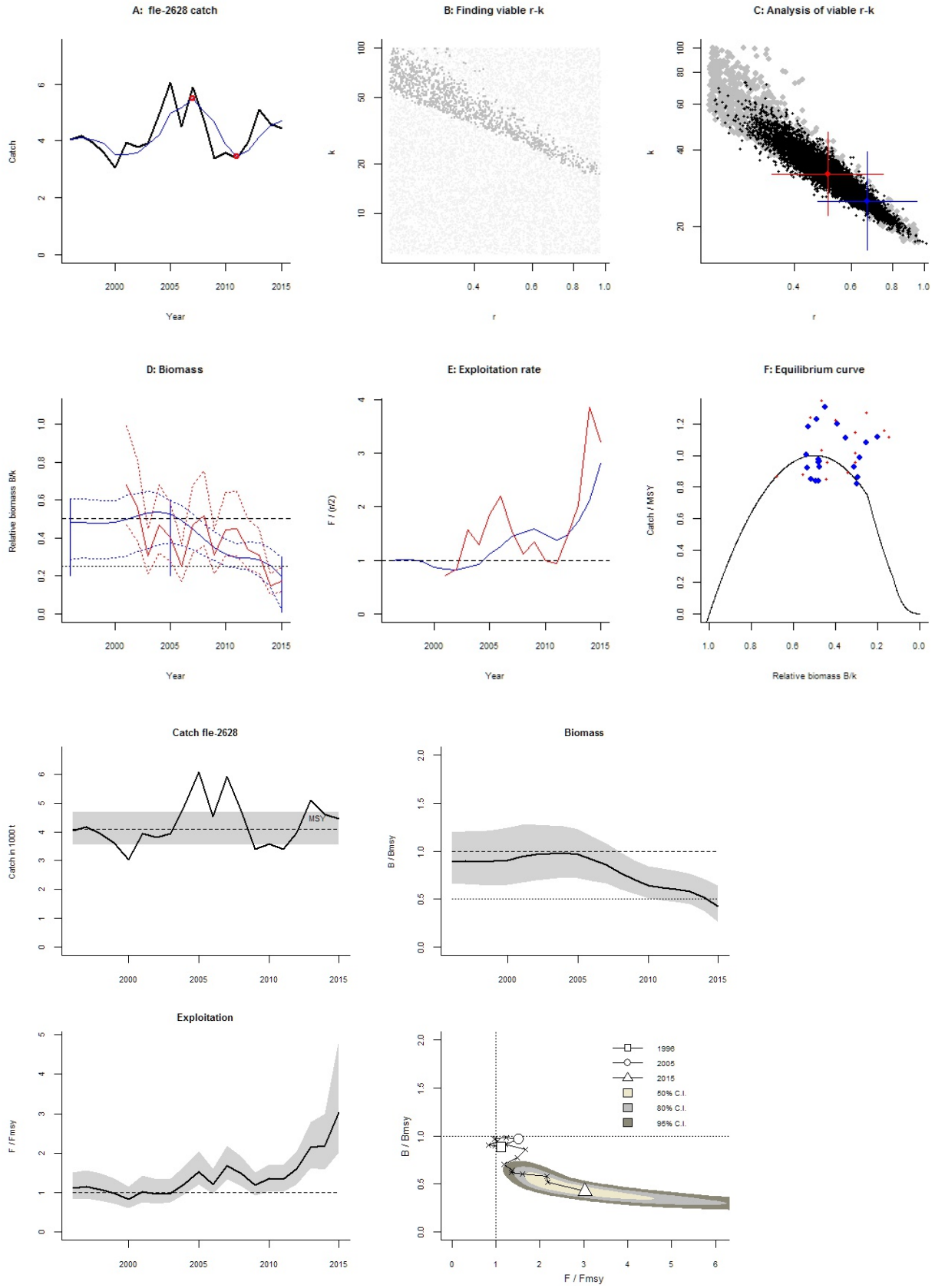
Species: *Platichthys flesus* , stock: fle-2628
Flounder in Subdivisions 26 and 28 (Eastern Gotland and Gulf of Gdansk)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/fle-2628.pdf
Region: Northeast Atlantic , Baltic Sea
Catch data used from years 1996 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2005 default
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.22 - 0.97 expert, , prior range for k = 5.67 - 99.9
Prior range of q = 0.00866 - 0.0364

Results of CMSY analysis with altogether 2247 viable trajectories for 1123 r-k pairs
r = 0.67 , 95% CL = 0.472 - 0.953 , k = 25.2 , 95% CL = 16.2 - 39.1
MSY = 4.22 , 95% CL = 3.55 - 5.02
Relative biomass last year = 0.199 k, 2.5th = 0.0236 , 97.5th = 0.296
Exploitation F/(r/2) in last year = 2.81

Results from Bayesian Schaefer model using catch & CPUE
r = 0.507 , 95% CL = 0.343 - 0.75 , k = 32.2 , 95% CL = 22.2 - 46.7
MSY = 4.08 , 95% CL = 3.55 - 4.68
Relative biomass in last year = 0.212 k, 2.5th perc = 0.132 , 97.5th perc = 0.32
Exploitation F/(r/2) in last year = 2.57
q = 0.0153 , lcl = 0.0119 , ucl = 0.0198

Results for Management (based on BSM analysis)
Fmsy = 0.254 , 95% CL = 0.171 - 0.375 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.215 , 95% CL = 0.145 - 0.318 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 4.08 , 95% CL = 3.55 - 4.68
Bmsy = 16.1 , 95% CL = 11.1 - 23.4
Biomass in last year = 6.82 , 2.5th perc = 4.24 , 97.5 perc = 10.3
B/Bmsy in last year = 0.424 , 2.5th perc = 0.263 , 97.5 perc = 0.64
Fishing mortality in last year = 0.651 , 2.5th perc = 0.432 , 97.5 perc = 1.05
F/Fmsy = 3.03 , 2.5th perc = 2.01 , 97.5 perc = 4.88

Stock status and exploitation in 2014
Biomass = 8.34 , B/Bmsy = 0.518 , fishing mortality F = 0.553 , F/Fmsy = 2.18
Comment: OK (RF 21.09.16)


A: fle-2628 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 fle-2628
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1996
2005
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

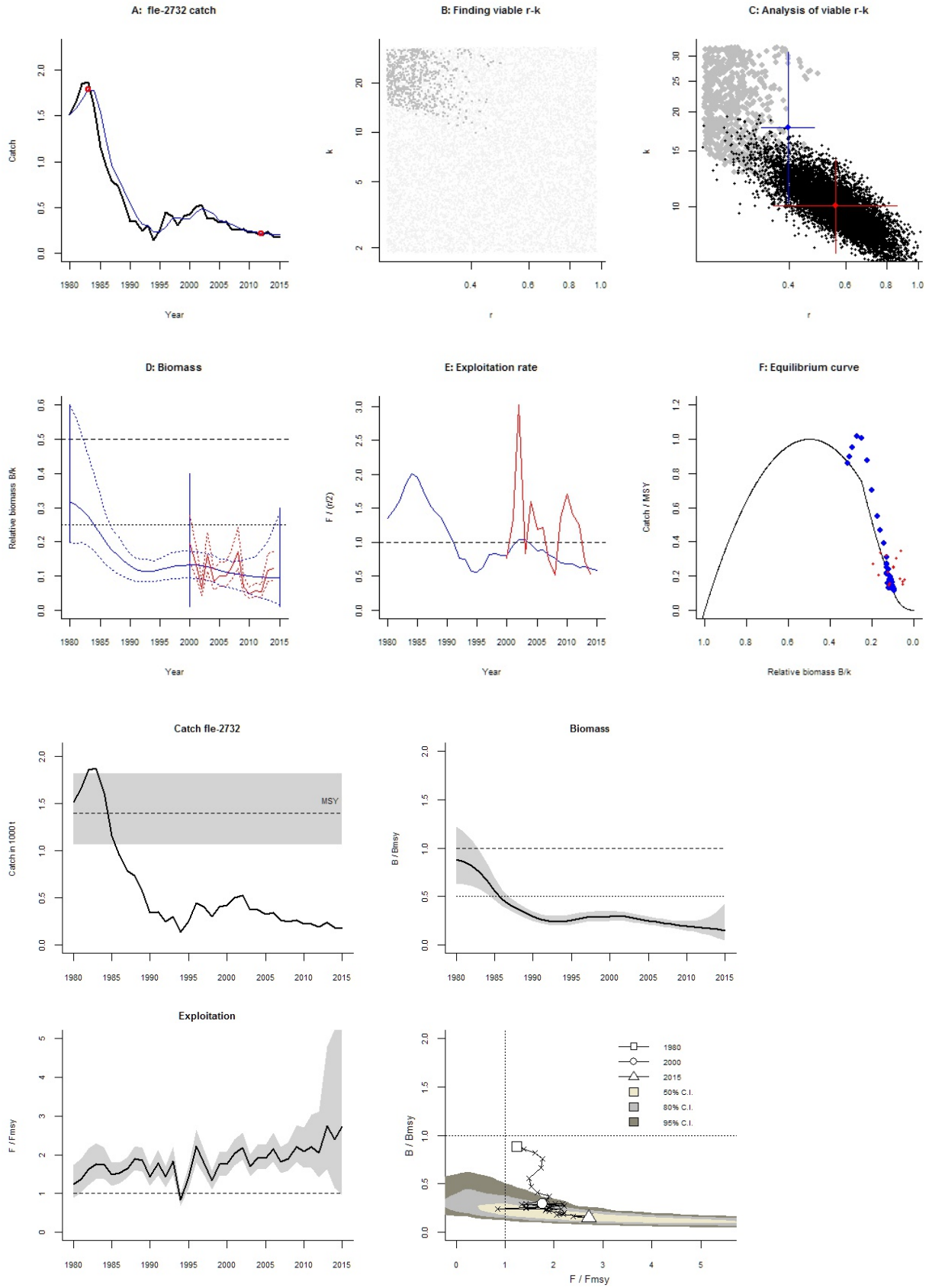
Species: *Platichthys flesus* , stock: fle-2732
Flounder in Subdivisions 27 and 29–32 (Northern Central and Northern Baltic Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/fle-2732.pdf
Region: Northeast Atlantic , Baltic Sea
Catch data used from years 1980 - 2015 , abundance = 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 = 0.01 - 0.3 expert
Prior range for r = 0.22 - 0.97 expert, , prior range for k = 1.85 - 32.6
Prior range of q = 0.000745 - 0.00313

Results of CMSY analysis with altogether 670 viable trajectories for 665 r-k pairs
r = 0.397 , 95% CL = 0.328 - 0.48 , k = 17.8 , 95% CL = 10.3 - 30.8
MSY = 1.77 , 95% CL = 0.877 - 3.56
Relative biomass last year = 0.0951 k, 2.5th = 0.0162 , 97.5th = 0.285
Exploitation F/(r/2) in last year = 0.591

Results from Bayesian Schaefer model using catch & CPUE
r = 0.555 , 95% CL = 0.359 - 0.859 , k = 10 , 95% CL = 7.14 - 14.1
MSY = 1.39 , 95% CL = 1.07 - 1.82
Relative biomass in last year = 0.0763 k, 2.5th perc = 0.0232 , 97.5th perc = 0.215
Exploitation F/(r/2) in last year = 0.828
q = 0.00103 , lcl = 0.000772 , ucl = 0.00137

Results for Management (based on BSM analysis)
Fmsy = 0.278 , 95% CL = 0.179 - 0.43 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0847 , 95% CL = 0.0547 - 0.131 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1.39 , 95% CL = 1.07 - 1.82
Bmsy = 5.02 , 95% CL = 3.57 - 7.06
Biomass in last year = 0.766 , 2.5th perc = 0.233 , 97.5 perc = 2.16
B/Bmsy in last year = 0.153 , 2.5th perc = 0.0465 , 97.5 perc = 0.429
Fishing mortality in last year = 0.23 , 2.5th perc = 0.0816 , 97.5 perc = 0.754
F/Fmsy = 2.71 , 2.5th perc = 0.964 , 97.5 perc = 8.9

Stock status and exploitation in 2014
Biomass = 0.831 , B/Bmsy = 0.165 , fishing mortality F = 0.22 , F/Fmsy = 2.4
Comment: OK (RF 21.09.16)


A: fle-2732 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 fle-2732
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1980
2000
2015
50% C.I.
80% C.I.
95% C.I.

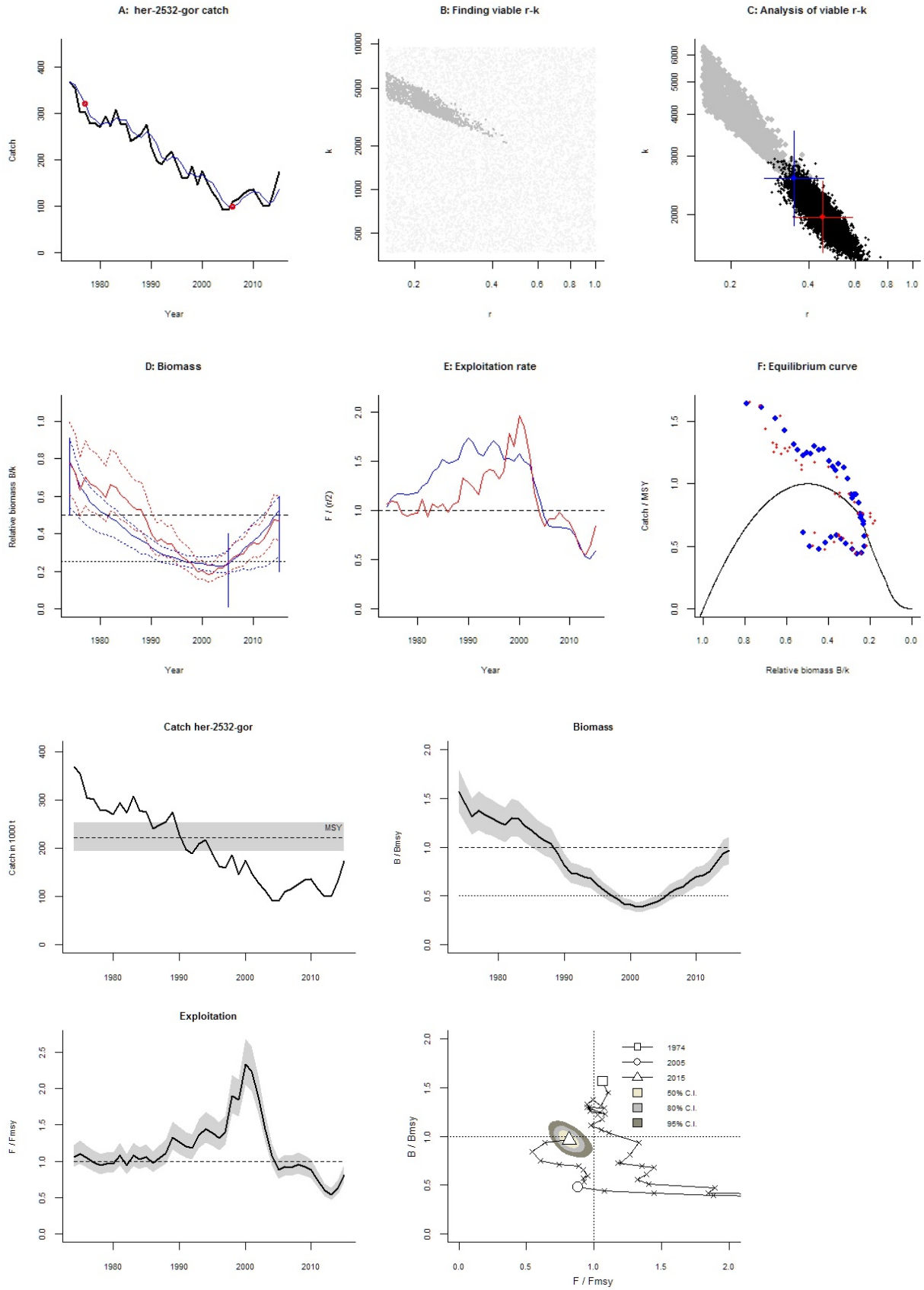
Species: *Clupea harengus* , stock: her-2532-gor
Herring in Subdivisions 25 - 29 (excluding Gulf of Riga) and 32
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/her-2532-gor.pdf
Region: Northeast Atlantic , Baltic Sea
Catch data used from years 1974 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2005 default
Prior final relative biomass = 0.2 - 0.6 , default
Prior range for r = 0.16 - 1 expert, , prior range for k = 370 - 9453
Prior range of q = 1.42 - 7.15

Results of CMSY analysis with altogether 3006 viable trajectories for 1498 r-k pairs
r = 0.35 , 95% CL = 0.269 - 0.454 , k = 2570 , 95% CL = 1851 - 3569
MSY = 225 , 95% CL = 197 - 256
Relative biomass last year = 0.523 k, 2.5th = 0.277 , 97.5th = 0.598
Exploitation F/(r/2) in last year = 0.579

Results from Bayesian Schaefer model using catch & CPUE
r = 0.452 , 95% CL = 0.346 - 0.589 , k = 1967 , 95% CL = 1540 - 2512
MSY = 222 , 95% CL = 195 - 253
Relative biomass in last year = 0.482 k, 2.5th perc = 0.413 , 97.5th perc = 0.553
Exploitation F/(r/2) in last year = 0.815
q = 1.1 , lcl = 0.871 , ucl = 1.39

Results for Management (based on BSM analysis)
Fmsy = 0.226 , 95% CL = 0.173 - 0.295 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.226 , 95% CL = 0.173 - 0.295 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 222 , 95% CL = 195 - 253
Bmsy = 983 , 95% CL = 770 - 1256
Biomass in last year = 947 , 2.5th perc = 812 , 97.5 perc = 1088
B/Bmsy in last year = 0.963 , 2.5th perc = 0.825 , 97.5 perc = 1.11
Fishing mortality in last year = 0.184 , 2.5th perc = 0.16 , 97.5 perc = 0.215
F/Fmsy = 0.815 , 2.5th perc = 0.709 , 97.5 perc = 0.951

Stock status and exploitation in 2014
Biomass = 921 , B/Bmsy = 0.937 , fishing mortality F = 0.144 , F/Fmsy = 0.638
Comment: OK (RF 21.09.16)


A: her-2532-gor 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 her-2532-gor
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1974
2005
2015
50% C.I.
80% C.I.
95% C.I.

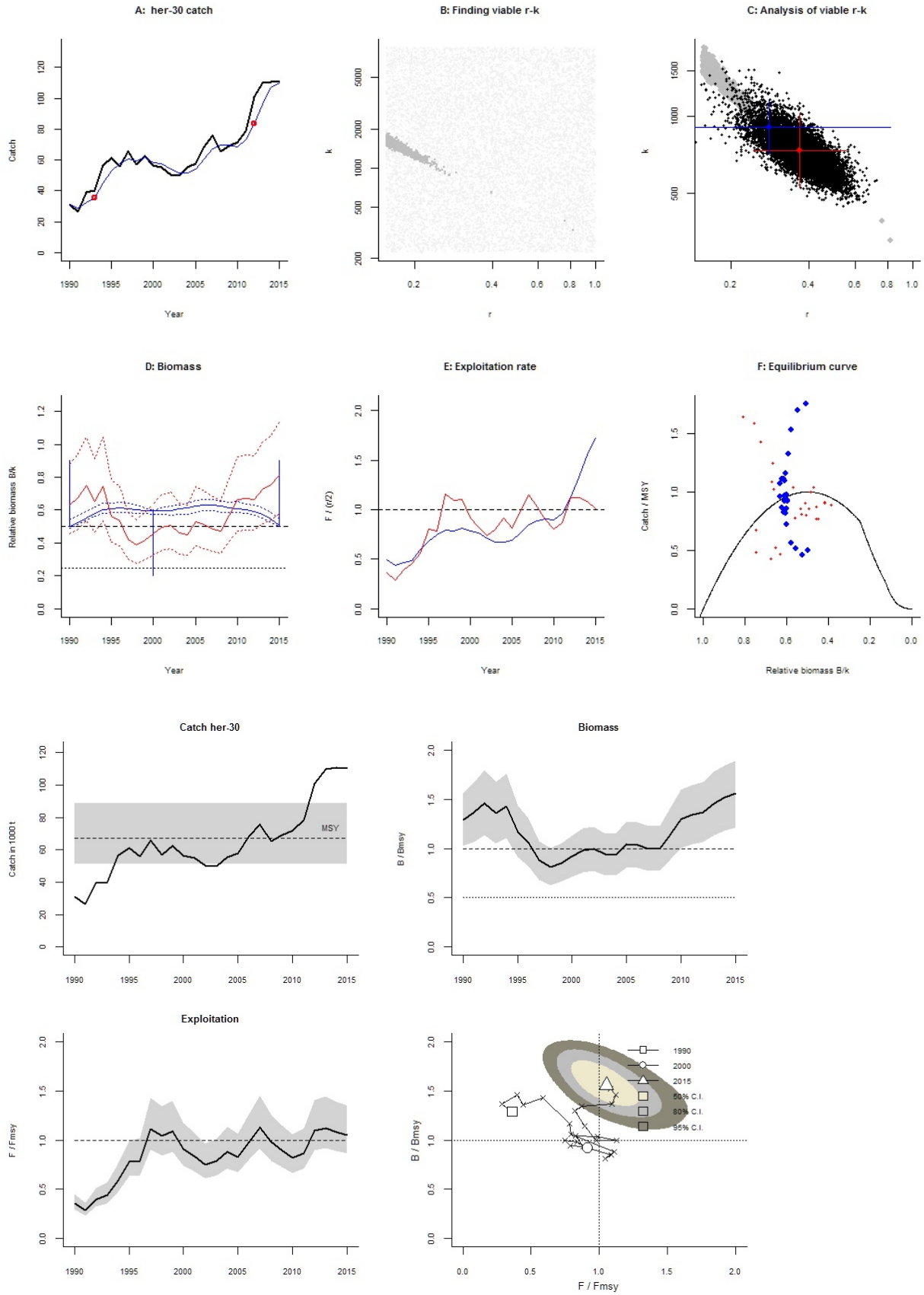
Species: *Clupea harengus* , stock: her-30
Herring in Subdivision 30 (Bothnian Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/her-30.pdf
Region: Northeast Atlantic , Baltic Sea
Catch data used from years 1990 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2000 expert
Prior final relative biomass = 0.5 - 0.9 expert
Prior range for r = 0.16 - 1 expert, , prior range for k = 221 - 8480
Prior range of q = 0.833 - 4.21

Results of CMSY analysis with altogether 715 viable trajectories for 681 r-k pairs
r = 0.279 , 95% CL = 0.0949 - 0.823 , k = 901 , 95% CL = 707 - 1149
MSY = 63 , 95% CL = 56.8 - 69.8
Relative biomass last year = 0.509 k, 2.5th = 0.5 , 97.5th = 0.548
Exploitation F/(r/2) in last year = 1.72

Results from Bayesian Schaefer model using catch & CPUE
r = 0.366 , 95% CL = 0.243 - 0.552 , k = 735 , 95% CL = 527 - 1025
MSY = 67.3 , 95% CL = 51.2 - 88.5
Relative biomass in last year = 0.779 k, 2.5th perc = 0.608 , 97.5th perc = 0.944
Exploitation F/(r/2) in last year = 1.05
q = 1.3 , lcl = 0.944 , ucl = 1.78

Results for Management (based on BSM analysis)
Fmsy = 0.183 , 95% CL = 0.121 - 0.276 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.183 , 95% CL = 0.121 - 0.276 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 67.3 , 95% CL = 51.2 - 88.5
Bmsy = 368 , 95% CL = 264 - 513
Biomass in last year = 573 , 2.5th perc = 447 , 97.5 perc = 694
B/Bmsy in last year = 1.56 , 2.5th perc = 1.22 , 97.5 perc = 1.89
Fishing mortality in last year = 0.193 , 2.5th perc = 0.159 , 97.5 perc = 0.247
F/Fmsy = 1.05 , 2.5th perc = 0.869 , 97.5 perc = 1.35

Stock status and exploitation in 2014
Biomass = 559 , B/Bmsy = 1.52 , fishing mortality F = 0.198 , F/Fmsy = 1.08
Comment: OK (RF 21.09.16)


A: her-30 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 her-30
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1990
2000
2015
50% C.I.
80% C.I.
95% C.I.

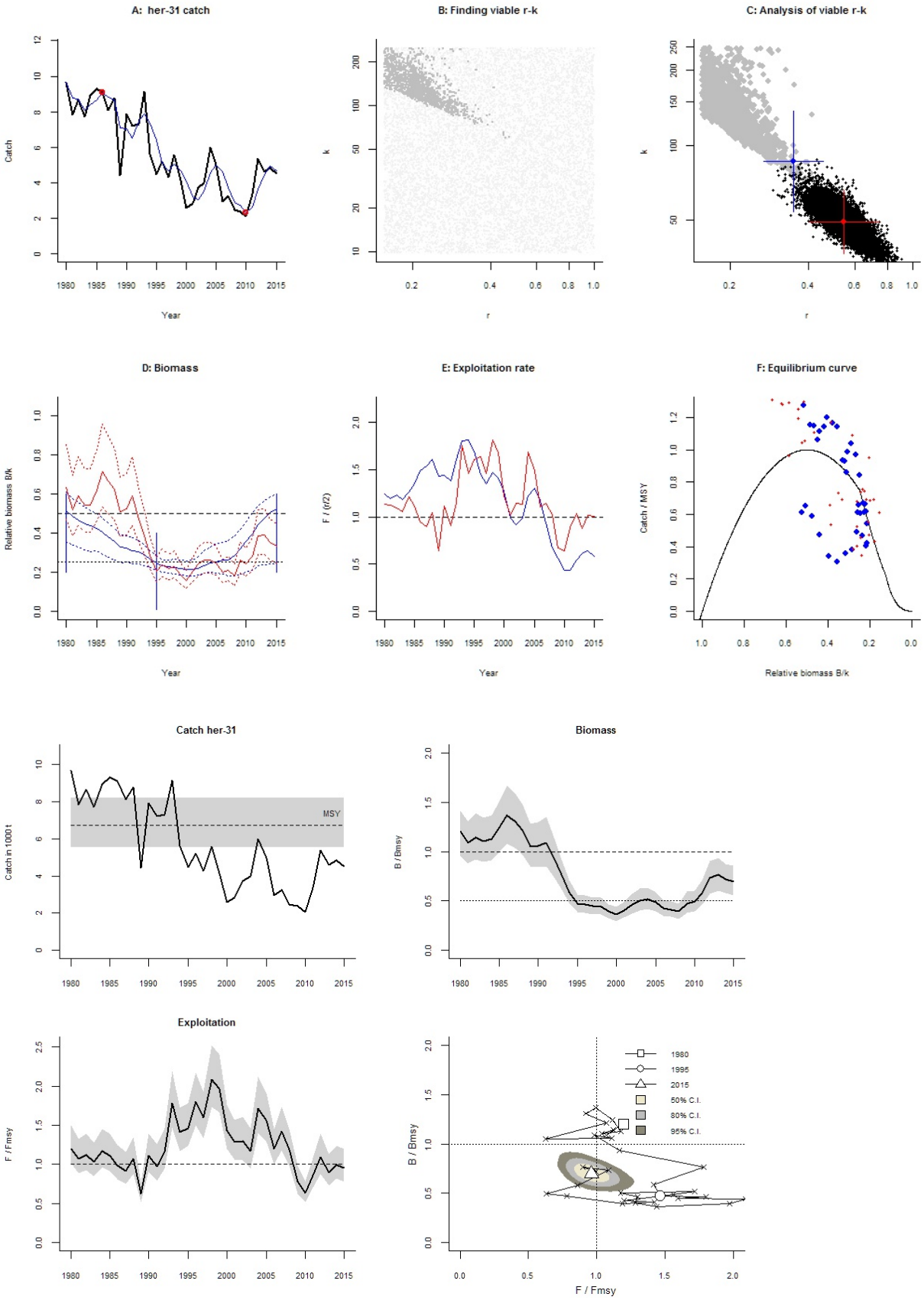
Species: *Clupea harengus* , stock: her-31
Herring in Subdivision 31 (BothnianBay)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/her-31.pdf
Region: Northeast Atlantic , Baltic Sea
Catch data used from years 1980 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
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 = 0.16 - 1 expert, , prior range for k = 9.7 - 248
Prior range of q = 4.62e-05 - 0.000234

Results of CMSY analysis with altogether 2075 viable trajectories for 1501 r-k pairs
r = 0.35 , 95% CL = 0.269 - 0.454 , k = 86.6 , 95% CL = 54.4 - 138
MSY = 7.58 , 95% CL = 5.08 - 11.3
Relative biomass last year = 0.525 k, 2.5th = 0.242 , 97.5th = 0.598
Exploitation F/(r/2) in last year = 0.585

Results from Bayesian Schaefer model using catch & CPUE
r = 0.546 , 95% CL = 0.4 - 0.745 , k = 49.3 , 95% CL = 36.8 - 66.1
MSY = 6.73 , 95% CL = 5.53 - 8.2
Relative biomass in last year = 0.35 k, 2.5th perc = 0.28 , 97.5th perc = 0.429
Exploitation F/(r/2) in last year = 0.961
q = 5.41e-05 , lcl = 4.16e-05 , ucl = 7.02e-05

Results for Management (based on BSM analysis)
Fmsy = 0.273 , 95% CL = 0.2 - 0.373 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.273 , 95% CL = 0.2 - 0.373 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 6.73 , 95% CL = 5.53 - 8.2
Bmsy = 24.7 , 95% CL = 18.4 - 33
Biomass in last year = 17.2 , 2.5th perc = 13.8 , 97.5 perc = 21.1
B/Bmsy in last year = 0.7 , 2.5th perc = 0.56 , 97.5 perc = 0.857
Fishing mortality in last year = 0.262 , 2.5th perc = 0.214 , 97.5 perc = 0.328
F/Fmsy = 0.961 , 2.5th perc = 0.784 , 97.5 perc = 1.2

Stock status and exploitation in 2014
Biomass = 17.8 , B/Bmsy = 0.721 , fishing mortality F = 0.272 , F/Fmsy = 0.995
Comment: OK (RF 21.09.16)


A: her-31 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 her-31
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1980
1995
2015
50% C.I.
80% C.I.
95% C.I.

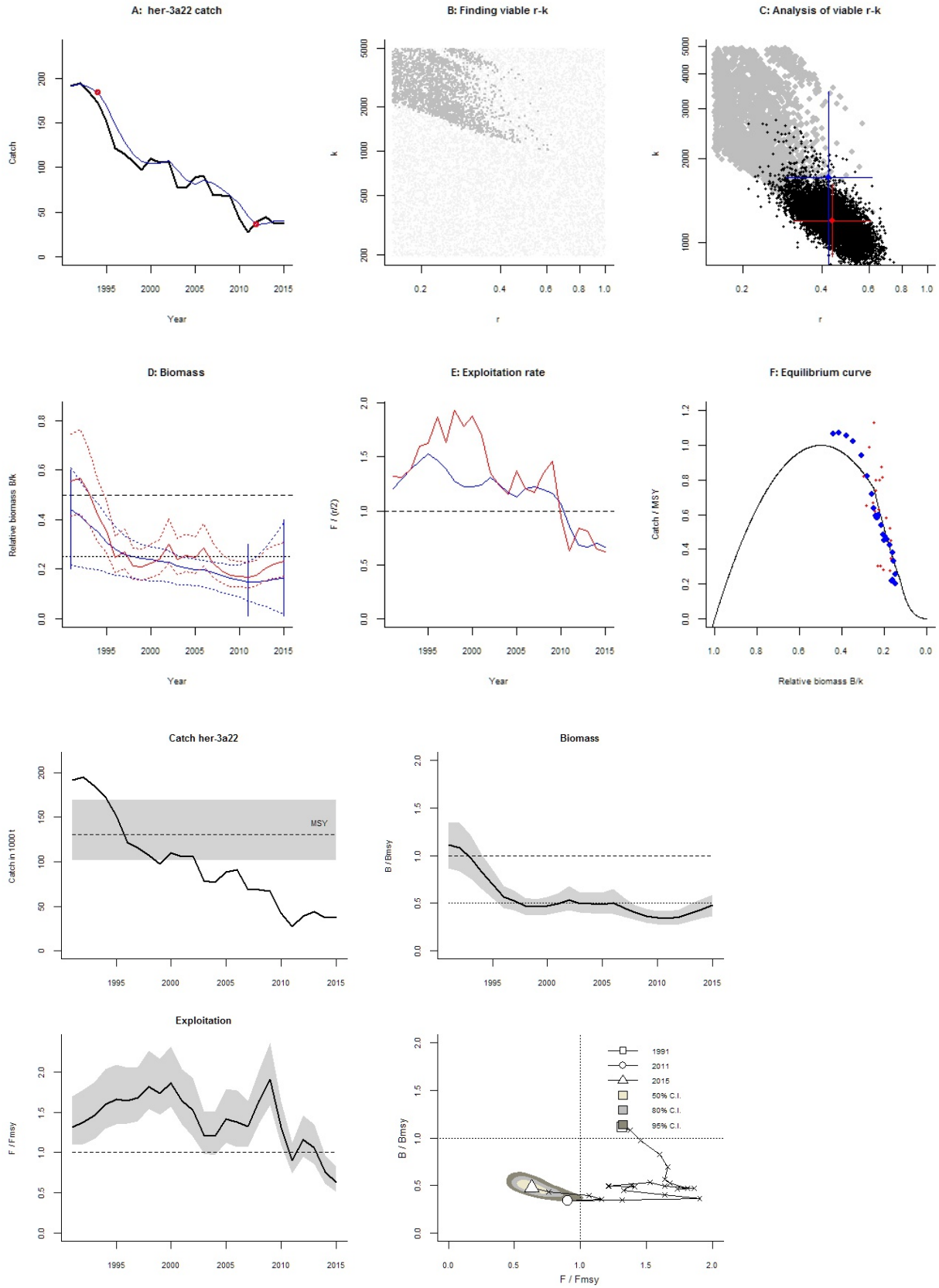
Species: *Clupea harengus* , stock: her-3a22
Herring in Division IIIa and Subdivisions 22 - 24
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/her-3a22.pdf
Region: Northeast Atlantic , Baltic Sea
Catch data used from years 1991 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.01 - 0.3 in year 2011 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.16 - 1 expert, , prior range for k = 194 - 4949
Prior range of q = 0.278 - 1.41

Results of CMSY analysis with altogether 3011 viable trajectories for 2497 r-k pairs
r = 0.423 , 95% CL = 0.291 - 0.615 , k = 1704 , 95% CL = 841 - 3450
MSY = 180 , 95% CL = 83.6 - 389
Relative biomass last year = 0.165 k, 2.5th = 0.0173 , 97.5th = 0.386
Exploitation F/(r/2) in last year = 0.665

Results from Bayesian Schaefer model using catch & CPUE
r = 0.436 , 95% CL = 0.31 - 0.612 , k = 1201 , 95% CL = 894 - 1613
MSY = 131 , 95% CL = 101 - 169
Relative biomass in last year = 0.238 k, 2.5th perc = 0.183 , 97.5th perc = 0.296
Exploitation F/(r/2) in last year = 0.601
q = 0.455 , lcl = 0.346 , ucl = 0.597

Results for Management (based on BSM analysis)
Fmsy = 0.218 , 95% CL = 0.155 - 0.306 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.208 , 95% CL = 0.148 - 0.292 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 131 , 95% CL = 101 - 169
Bmsy = 600 , 95% CL = 447 - 807
Biomass in last year = 286 , 2.5th perc = 220 , 97.5 perc = 355
B/Bmsy in last year = 0.477 , 2.5th perc = 0.366 , 97.5 perc = 0.591
Fishing mortality in last year = 0.131 , 2.5th perc = 0.106 , 97.5 perc = 0.171
F/Fmsy = 0.631 , 2.5th perc = 0.509 , 97.5 perc = 0.822

Stock status and exploitation in 2014
Biomass = 260 , B/Bmsy = 0.434 , fishing mortality F = 0.143 , F/Fmsy = 0.759
Comment: OK (RF 21.09.16)


A: her-3a22 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 her-3a22
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1991
2011
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

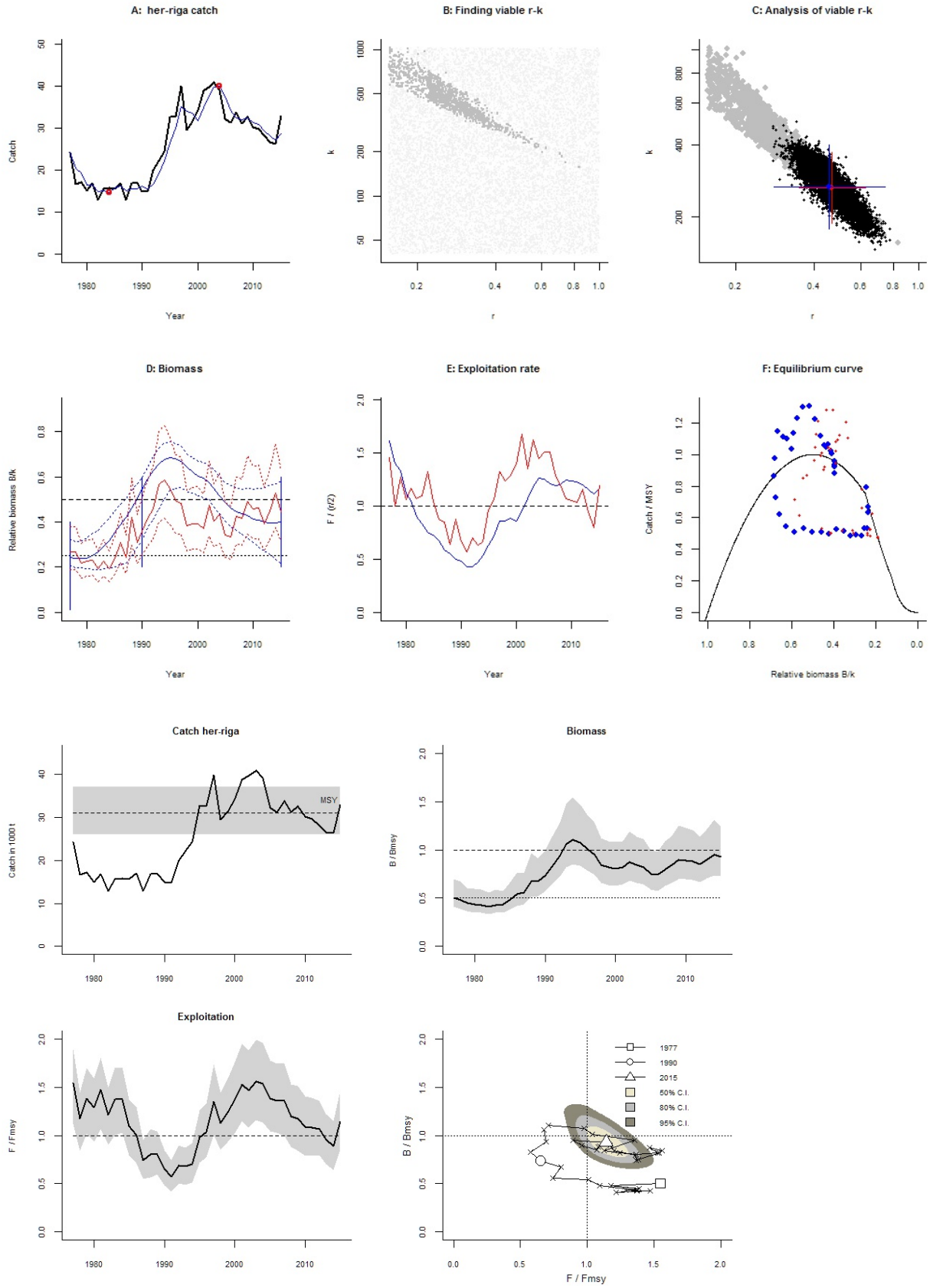
Species: *Clupea harengus* , stock: her-riga
Herring in the Gulf of Riga
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/her-riga.pdf
Region: Northeast Atlantic , Baltic Sea
Catch data used from years 1977 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 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 = 0.16 - 1 expert, , prior range for k = 40 - 1022
Prior range of q = 0.585 - 2.96

Results of CMSY analysis with altogether 2106 viable trajectories for 1216 r-k pairs
r = 0.456 , 95% CL = 0.28 - 0.743 , k = 268 , 95% CL = 179 - 402
MSY = 30.6 , 95% CL = 26.8 - 34.9
Relative biomass last year = 0.398 k, 2.5th = 0.215 , 97.5th = 0.58
Exploitation F/(r/2) in last year = 1.17

Results from Bayesian Schaefer model using catch & CPUE
r = 0.467 , 95% CL = 0.348 - 0.626 , k = 266 , 95% CL = 188 - 375
MSY = 31 , 95% CL = 25.9 - 37.1
Relative biomass in last year = 0.464 k, 2.5th perc = 0.363 , 97.5th perc = 0.617
Exploitation F/(r/2) in last year = 1.14
q = 0.796 , lcl = 0.603 , ucl = 1.05

Results for Management (based on BSM analysis)
Fmsy = 0.234 , 95% CL = 0.174 - 0.313 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.234 , 95% CL = 0.174 - 0.313 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 31 , 95% CL = 25.9 - 37.1
Bmsy = 133 , 95% CL = 94.2 - 187
Biomass in last year = 123 , 2.5th perc = 96.5 , 97.5 perc = 164
B/Bmsy in last year = 0.928 , 2.5th perc = 0.726 , 97.5 perc = 1.23
Fishing mortality in last year = 0.266 , 2.5th perc = 0.2 , 97.5 perc = 0.341
F/Fmsy = 1.14 , 2.5th perc = 0.858 , 97.5 perc = 1.46

Stock status and exploitation in 2014
Biomass = 126 , B/Bmsy = 0.949 , fishing mortality F = 0.208 , F/Fmsy = 0.892
Comment: OK (RF 21.09.16)


A: her-riga 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 her-riga
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1977
1990
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

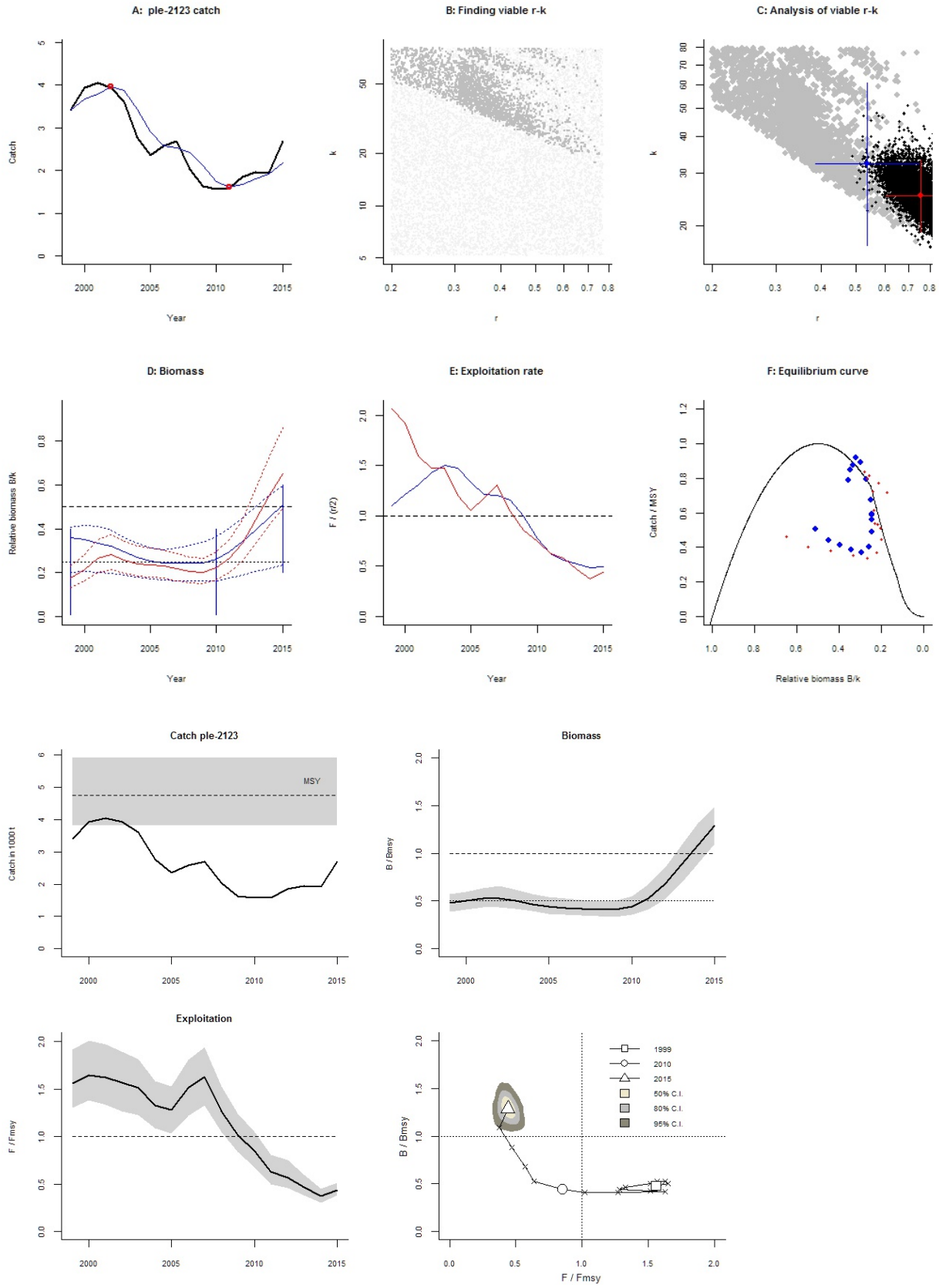
Species: *Pleuronectes platessa* , stock: ple-2123
Plaice in Subdivisions 21, 22, and 23 (Kattegat, Belts, and Sound)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/ple-2123.pdf
Region: Northeast Atlantic , Baltic Sea
Catch data used from years 1999 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2010 default
Prior final relative biomass = 0.2 - 0.6 , default
Prior range for r = 0.2 - 0.77 expert, , prior range for k = 5.16 - 79.5
Prior range of q = 0.714 - 2.8

Results of CMSY analysis with altogether 3708 viable trajectories for 2692 r-k pairs
r = 0.537 , 95% CL = 0.385 - 0.747 , k = 32.3 , 95% CL = 17.1 - 60.9
MSY = 4.33 , 95% CL = 2.3 - 8.17
Relative biomass last year = 0.51 k, 2.5th = 0.235 , 97.5th = 0.597
Exploitation F/(r/2) in last year = 0.496

Results from Bayesian Schaefer model using catch & CPUE
r = 0.755 , 95% CL = 0.604 - 0.944 , k = 25.2 , 95% CL = 19 - 33.3
MSY = 4.75 , 95% CL = 3.82 - 5.92
Relative biomass in last year = 0.643 k, 2.5th perc = 0.547 , 97.5th perc = 0.739
Exploitation F/(r/2) in last year = 0.44
q = 0.956 , lcl = 0.763 , ucl = 1.2

Results for Management (based on BSM analysis)
Fmsy = 0.378 , 95% CL = 0.302 - 0.472 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.378 , 95% CL = 0.302 - 0.472 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 4.75 , 95% CL = 3.82 - 5.92
Bmsy = 12.6 , 95% CL = 9.52 - 16.6
Biomass in last year = 16.2 , 2.5th perc = 13.8 , 97.5 perc = 18.6
B/Bmsy in last year = 1.29 , 2.5th perc = 1.09 , 97.5 perc = 1.48
Fishing mortality in last year = 0.166 , 2.5th perc = 0.144 , 97.5 perc = 0.195
F/Fmsy = 0.44 , 2.5th perc = 0.382 , 97.5 perc = 0.517

Stock status and exploitation in 2014
Biomass = 13.7 , B/Bmsy = 1.09 , fishing mortality F = 0.141 , F/Fmsy = 0.372
Comment: OK (RF 21.09.16) r updated


A: ple-2123 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 ple-2123
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1999
2010
2015
50% C.I.
80% C.I.
95% C.I.

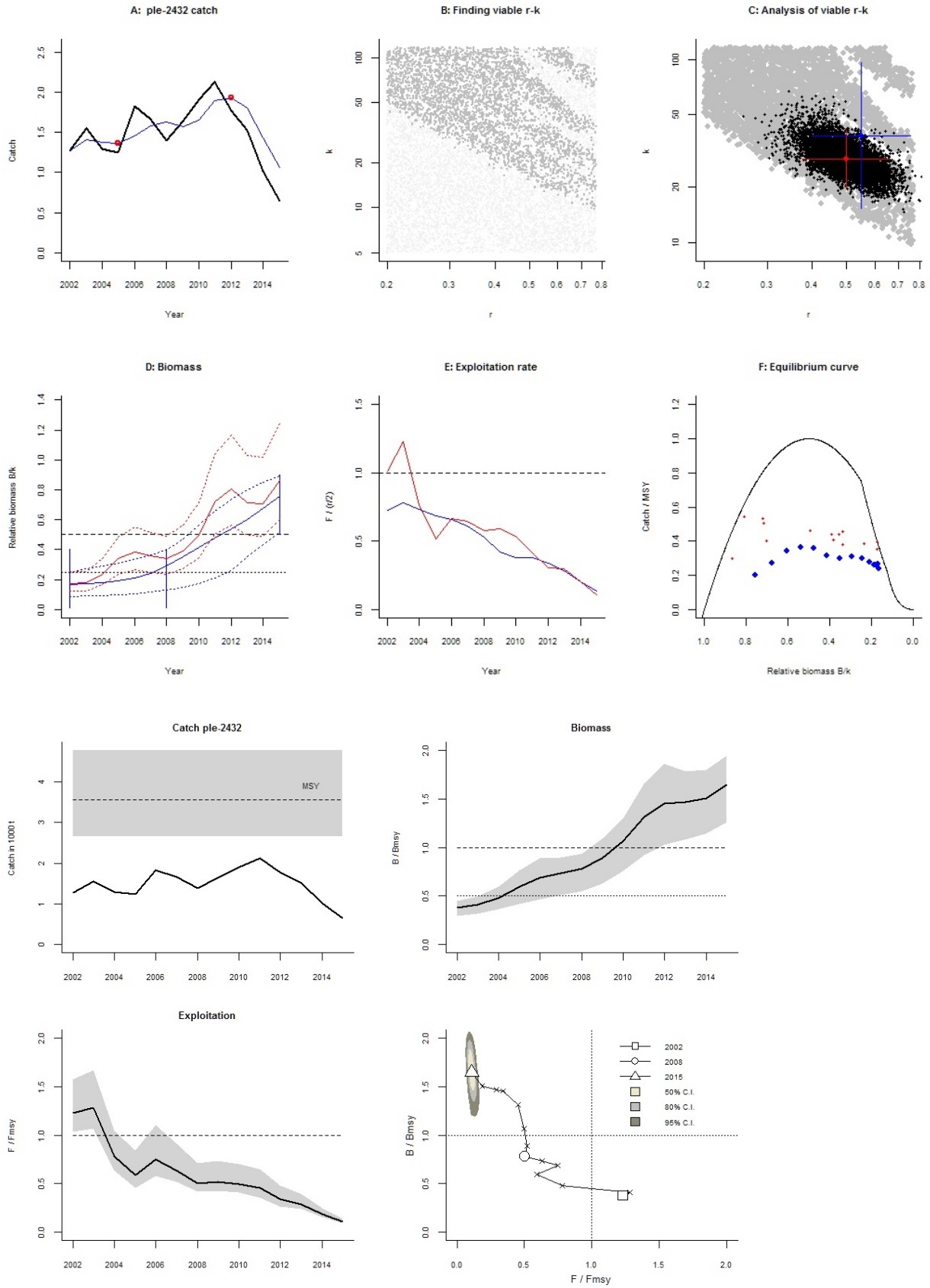
Species: *Pleuronectes platessa* , stock: ple-2432
Plaice in Subdivisions 24-32 (Baltic Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/ple-2432.pdf
Region: Northeast Atlantic , Baltic Sea
Catch data used from years 2002 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2008 expert
Prior final relative biomass = 0.5 - 0.9 expert
Prior range for r = 0.2 - 0.77 expert, , prior range for k = 5.01 - 116
Prior range of q = 3.81e-05 - 0.00015

Results of CMSY analysis with altogether 4431 viable trajectories for 3917 r-k pairs
r = 0.549 , 95% CL = 0.399 - 0.754 , k = 38.4 , 95% CL = 15.3 - 96.5
MSY = 5.27 , 95% CL = 1.62 - 17.2
Relative biomass last year = 0.755 k, 2.5th = 0.512 , 97.5th = 0.895
Exploitation F/(r/2) in last year = 0.133

Results from Bayesian Schaefer model using catch & CPUE
r = 0.498 , 95% CL = 0.377 - 0.658 , k = 28.6 , 95% CL = 19.9 - 41.2
MSY = 3.57 , 95% CL = 2.66 - 4.78
Relative biomass in last year = 0.823 k, 2.5th perc = 0.63 , 97.5th perc = 0.97
Exploitation F/(r/2) in last year = 0.11
q = 6.81e-05 , lcl = 5.07e-05 , ucl = 9.14e-05

Results for Management (based on BSM analysis)
Fmsy = 0.249 , 95% CL = 0.188 - 0.329 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.249 , 95% CL = 0.188 - 0.329 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 3.57 , 95% CL = 2.66 - 4.78
Bmsy = 14.3 , 95% CL = 9.95 - 20.6
Biomass in last year = 23.6 , 2.5th perc = 18.1 , 97.5 perc = 27.8
B/Bmsy in last year = 1.65 , 2.5th perc = 1.26 , 97.5 perc = 1.94
Fishing mortality in last year = 0.0275 , 2.5th perc = 0.0233 , 97.5 perc = 0.0358
F/Fmsy = 0.11 , 2.5th perc = 0.0935 , 97.5 perc = 0.144

Stock status and exploitation in 2014
Biomass = 21.6 , B/Bmsy = 1.51 , fishing mortality F = 0.047 , F/Fmsy = 0.189
Comment: OK (RF 21.09.16)

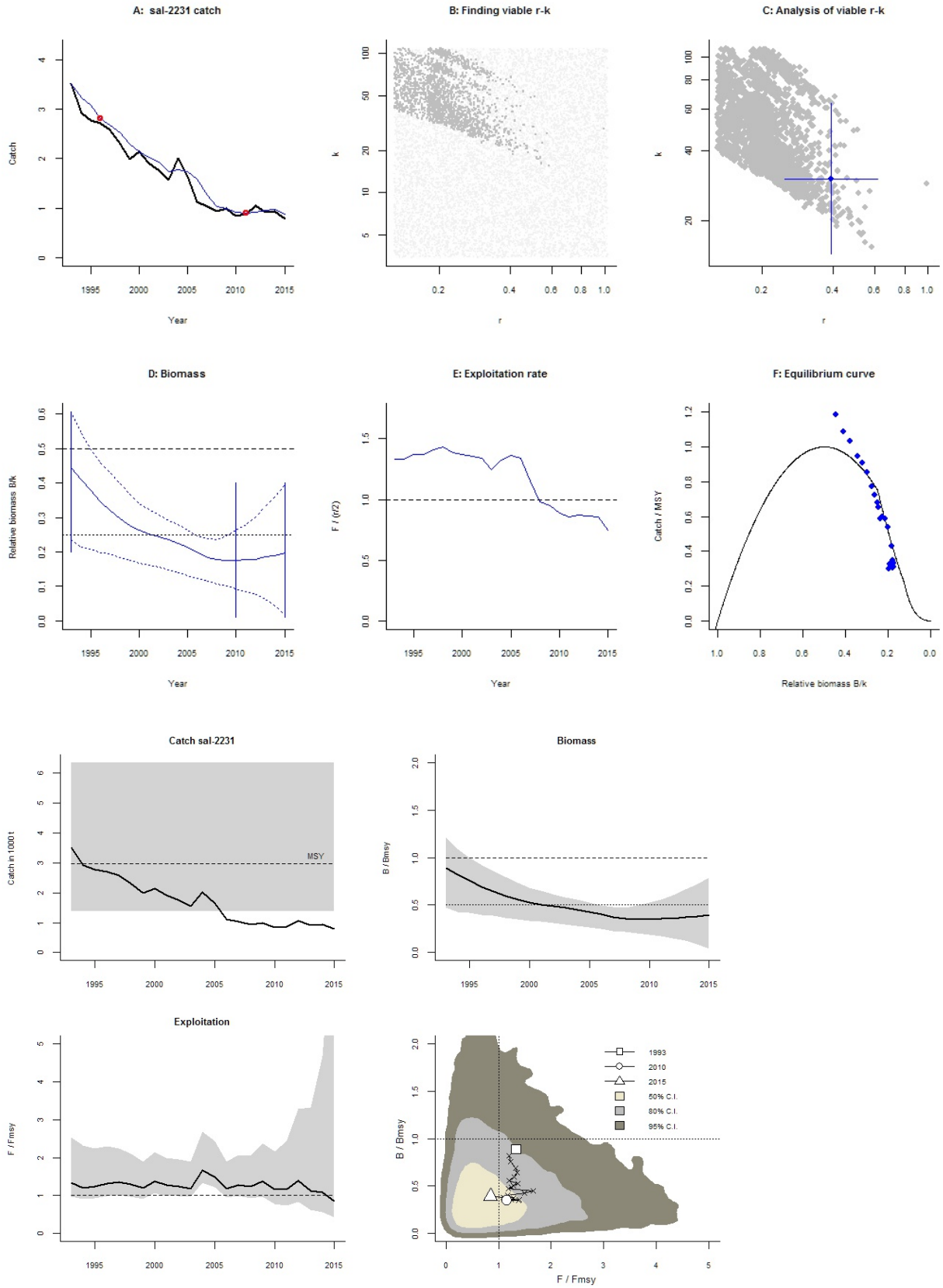

A: ple-2432 catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch ple-2432
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
2002
2008
2015
50% C.I.
80% C.I.
95% C.I.

Species: *Salmo salar* , stock: sal-2231
Salmon in Subdivisions 22-31 (Baltic Sea, excluding Gulf of Finland)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/sal-2231.pdf
Region: Northeast Atlantic , Baltic Sea
Catch data used from years 1993 - 2015 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2010 default
Prior final relative biomass = 0.01 - 0.4 , default
Prior range for r = 0.13 - 1 expert, , prior range for k = 3.42 - 108

Results of CMSY analysis with altogether 2612 viable trajectories for 1992 r-k pairs
r = 0.393 , 95% CL = 0.25 - 0.616 , k = 30.2 , 95% CL = 14.5 - 63.1
MSY = 2.97 , 95% CL = 1.39 - 6.36
Relative biomass last year = 0.198 k, 2.5th = 0.0196 , 97.5th = 0.394
Exploitation F/(r/2) in last year = 0.75

Results for Management (based on CMSY analysis)
Fmsy = 0.196 , 95% CL = 0.125 - 0.308 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.155 , 95% CL = 0.0989 - 0.244 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 2.97 , 95% CL = 1.39 - 6.36
Bmsy = 15.1 , 95% CL = 7.25 - 31.6
Biomass in last year = 5.98 , 2.5th perc = 0.594 , 97.5 perc = 11.9
B/Bmsy in last year = 0.395 , 2.5th perc = 0.0393 , 97.5 perc = 0.788
Fishing mortality in last year = 0.132 , 2.5th perc = 0.0663 , 97.5 perc = 1.33
F/Fmsy = 0.852 , 2.5th perc = 0.427 , 97.5 perc = 8.57

Stock status and exploitation in 2014
Biomass = 5.74 , B/Bmsy = 0.38 , fishing mortality F = 0.162 , F/Fmsy = 1.09
Comment: OK (RF 21.09.16)

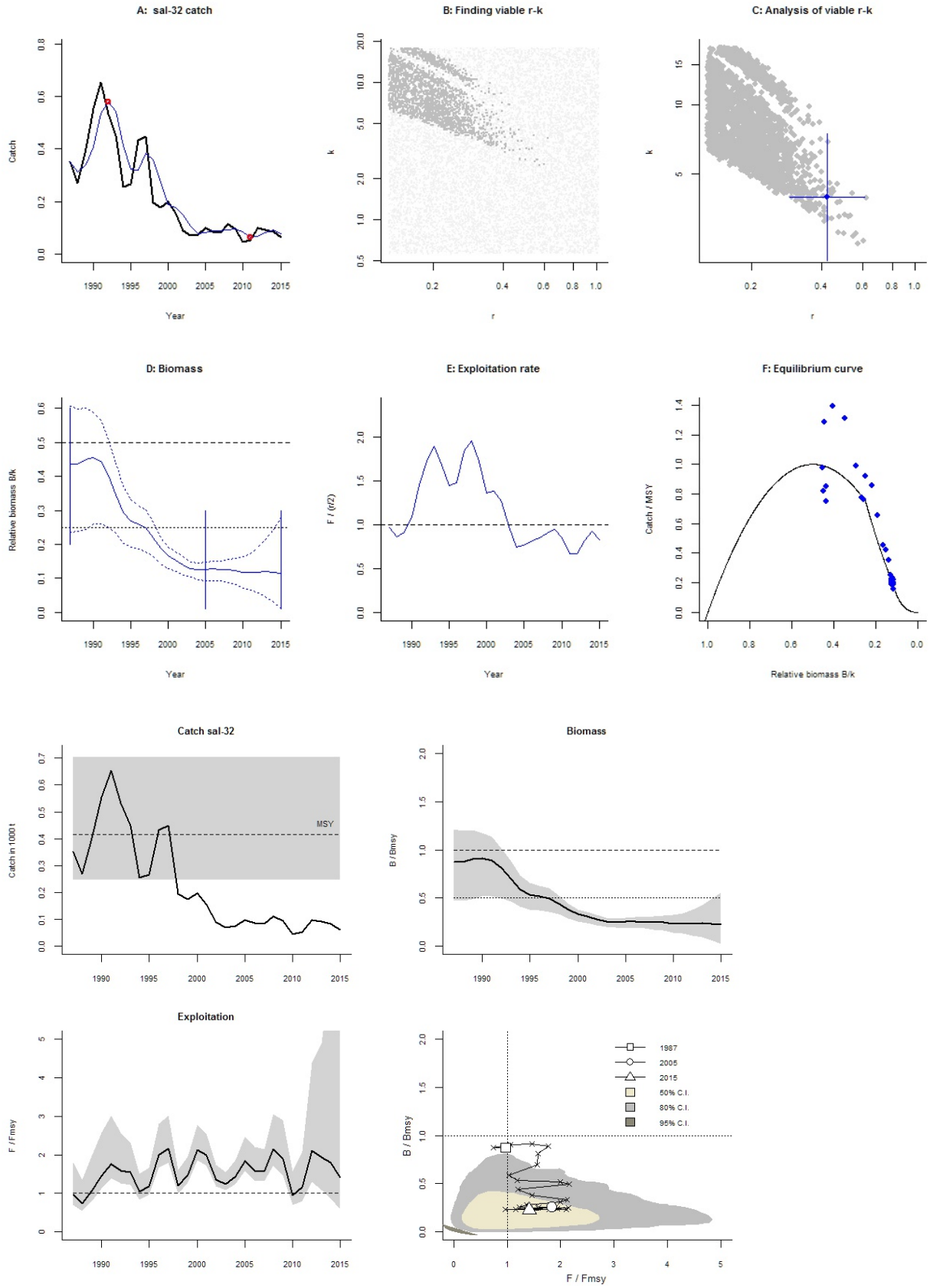

A: sal-2231 catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch sal-2231
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1993
2010
2015
50% C.I.
80% C.I.
95% C.I.

Species: *Salmo salar* , stock: sal-32
Salmon in Subdivision 32 (Gulf of Finland)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/sal-32.pdf
Region: Northeast Atlantic , Baltic Sea
Catch data used from years 1987 - 2015 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.3 in year 2005 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.13 - 1 expert, , prior range for k = 0.562 - 17.8

Results of CMSY analysis with altogether 2596 viable trajectories for 2255 r-k pairs
r = 0.422 , 95% CL = 0.292 - 0.61 , k = 3.95 , 95% CL = 2.09 - 7.45
MSY = 0.416 , 95% CL = 0.247 - 0.703
Relative biomass last year = 0.115 k, 2.5th = 0.0117 , 97.5th = 0.28
Exploitation F/(r/2) in last year = 0.831

Results for Management (based on CMSY analysis)
Fmsy = 0.211 , 95% CL = 0.146 - 0.305 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0968 , 95% CL = 0.067 - 0.14 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.416 , 95% CL = 0.247 - 0.703
Bmsy = 1.97 , 95% CL = 1.05 - 3.72
Biomass in last year = 0.452 , 2.5th perc = 0.046 , 97.5 perc = 1.1
B/Bmsy in last year = 0.229 , 2.5th perc = 0.0233 , 97.5 perc = 0.559
Fishing mortality in last year = 0.137 , 2.5th perc = 0.0562 , 97.5 perc = 1.35
F/Fmsy = 1.42 , 2.5th perc = 0.581 , 97.5 perc = 13.9

Stock status and exploitation in 2014
Biomass = 0.468 , B/Bmsy = 0.237 , fishing mortality F = 0.179 , F/Fmsy = 1.79
Comment: OK (RF 21.09.16)


A: sal-32 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 sal-32
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1987
2005
2015
50% C.I.
80% C.I.
95% C.I.

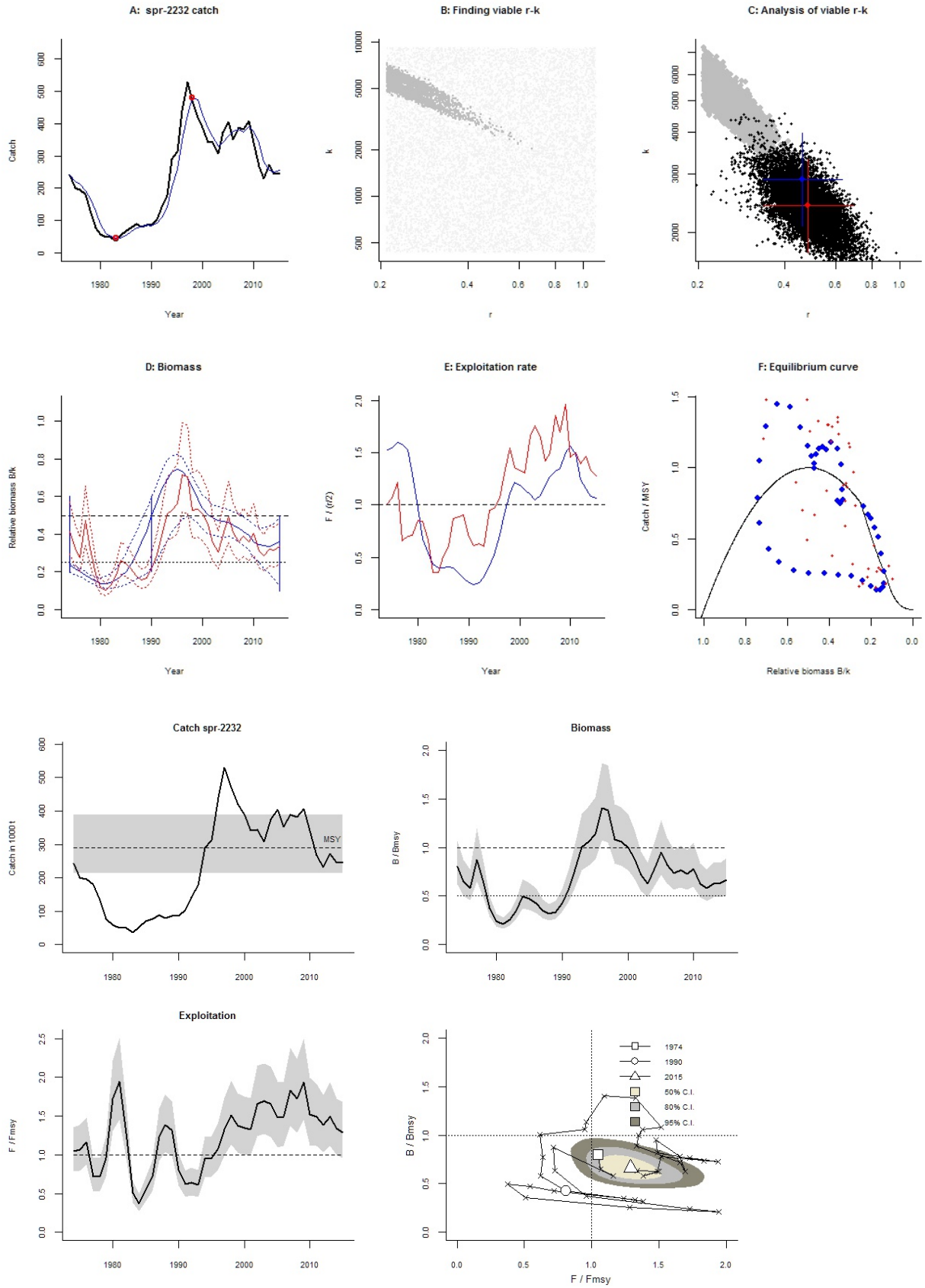
Species: *Sprattus sprattus* , stock: spr-2232
Sprat in Subdivisions 22 - 32 (Baltic Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/spr-2232.pdf
Region: Northeast Atlantic , Baltic Sea
Catch data used from years 1974 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.2 - 0.6 in year 1990 expert
Prior final relative biomass = 0.1 - 0.5 expert
Prior range for r = 0.21 - 1.1 expert, , prior range for k = 433 - 9149
Prior range of q = 0.72 - 3.31

Results of CMSY analysis with altogether 2049 viable trajectories for 2030 r-k pairs
r = 0.461 , 95% CL = 0.337 - 0.629 , k = 2885 , 95% CL = 2084 - 3993
MSY = 332 , 95% CL = 288 - 384
Relative biomass last year = 0.359 k, 2.5th = 0.124 , 97.5th = 0.489
Exploitation F/(r/2) in last year = 1.07

Results from Bayesian Schaefer model using catch & CPUE
r = 0.481 , 95% CL = 0.337 - 0.688 , k = 2401 , 95% CL = 1733 - 3326
MSY = 289 , 95% CL = 215 - 389
Relative biomass in last year = 0.332 k, 2.5th perc = 0.253 , 97.5th perc = 0.446
Exploitation F/(r/2) in last year = 1.29
q = 1.11 , lcl = 0.843 , ucl = 1.45

Results for Management (based on BSM analysis)
Fmsy = 0.241 , 95% CL = 0.168 - 0.344 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.241 , 95% CL = 0.168 - 0.344 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 289 , 95% CL = 215 - 389
Bmsy = 1200 , 95% CL = 866 - 1663
Biomass in last year = 796 , 2.5th perc = 608 , 97.5 perc = 1071
B/Bmsy in last year = 0.663 , 2.5th perc = 0.506 , 97.5 perc = 0.892
Fishing mortality in last year = 0.31 , 2.5th perc = 0.231 , 97.5 perc = 0.407
F/Fmsy = 1.29 , 2.5th perc = 0.958 , 97.5 perc = 1.69

Stock status and exploitation in 2014
Biomass = 759 , B/Bmsy = 0.632 , fishing mortality F = 0.322 , F/Fmsy = 1.34
Comment: OK (RF 21.09.16)

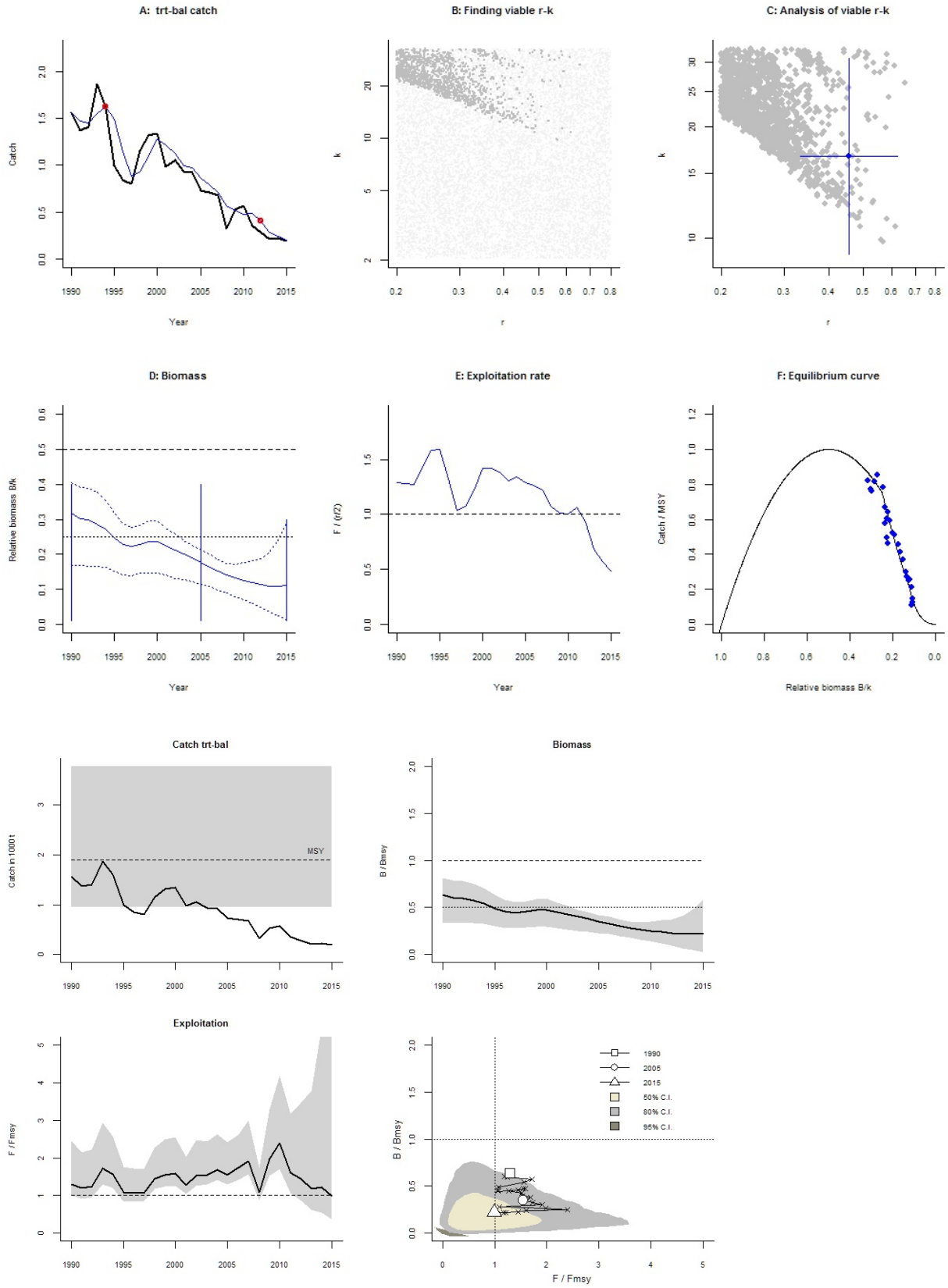

A: spr-2232 catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch spr-2232
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1974
1990
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

Species: *Salmo trutta* , stock: trt-bal
Sea trout in Subdivisions 22–32 (Baltic Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/trt-bal.pdf
Region: Northeast Atlantic , Baltic Sea
Catch data used from years 1990 - 2015 , 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 = 0.2 - 0.8 default , prior range for k = 2.03 - 32.5

Results of CMSY analysis with altogether 1498 viable trajectories for 1428 r-k pairs
r = 0.456 , 95% CL = 0.333 - 0.624 , k = 16.7 , 95% CL = 9.05 - 30.7
MSY = 1.9 , 95% CL = 0.958 - 3.78
Relative biomass last year = 0.112 k, 2.5th = 0.012 , 97.5th = 0.291
Exploitation F/(r/2) in last year = 0.486

Results for Management (based on CMSY analysis)
Fmsy = 0.228 , 95% CL = 0.167 - 0.312 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.102 , 95% CL = 0.0745 - 0.14 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1.9 , 95% CL = 0.958 - 3.78
Bmsy = 8.34 , 95% CL = 4.53 - 15.4
Biomass in last year = 1.87 , 2.5th perc = 0.201 , 97.5 perc = 4.85
B/Bmsy in last year = 0.224 , 2.5th perc = 0.0241 , 97.5 perc = 0.581
Fishing mortality in last year = 0.101 , 2.5th perc = 0.0389 , 97.5 perc = 0.94
F/Fmsy = 0.993 , 2.5th perc = 0.382 , 97.5 perc = 9.22

Stock status and exploitation in 2014
Biomass = 1.82 , B/Bmsy = 0.218 , fishing mortality F = 0.121 , F/Fmsy = 1.21
Comment: OK (RF 21.09.16)


A: trt-bal 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 trt-bal
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1990
2005
2015
50% C.I.
80% C.I.
95% C.I.

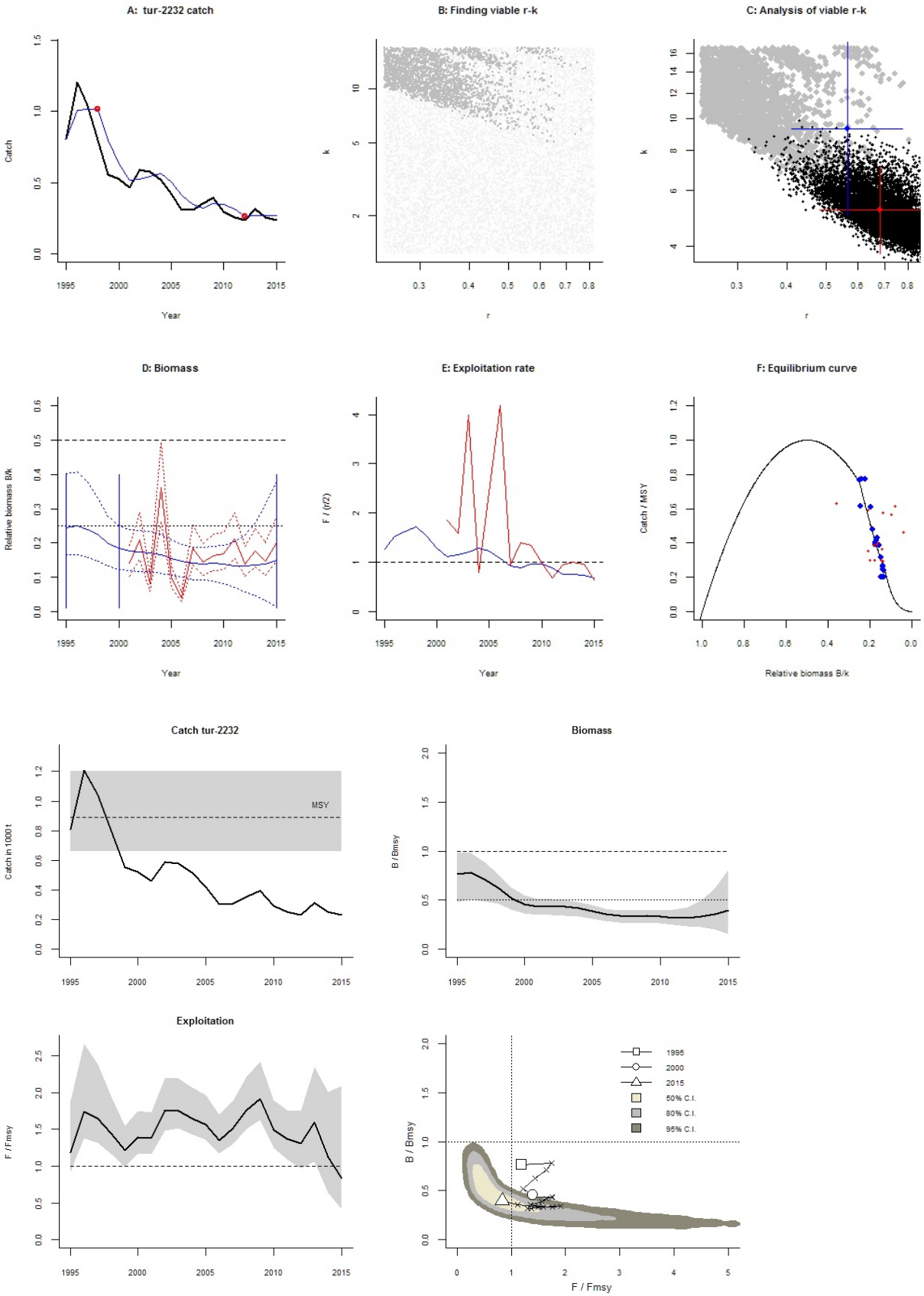
Species: *Scophthalmus maximus* , stock: tur-2232
Turbot in Subdivisions 22–32 (Baltic Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/tur-2232.pdf
Region: Northeast Atlantic , Baltic Sea
Catch data used from years 1995 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert
Prior final relative biomass = 0.01 - 0.4 , default
Prior range for r = 0.24 - 0.82 expert, , prior range for k = 1.24 - 16.6
Prior range of q = 0.00222 - 0.00811

Results of CMSY analysis with altogether 2641 viable trajectories for 2504 r-k pairs
r = 0.564 , 95% CL = 0.41 - 0.777 , k = 9.34 , 95% CL = 5.02 - 17.4
MSY = 1.32 , 95% CL = 0.655 - 2.65
Relative biomass last year = 0.149 k, 2.5th = 0.0129 , 97.5th = 0.38
Exploitation F/(r/2) in last year = 0.68

Results from Bayesian Schaefer model using catch & CPUE
r = 0.683 , 95% CL = 0.481 - 0.971 , k = 5.22 , 95% CL = 3.81 - 7.15
MSY = 0.891 , 95% CL = 0.661 - 1.2
Relative biomass in last year = 0.198 k, 2.5th perc = 0.0794 , 97.5th perc = 0.405
Exploitation F/(r/2) in last year = 0.663
q = 0.00313 , lcl = 0.00237 , ucl = 0.00414

Results for Management (based on BSM analysis)
Fmsy = 0.342 , 95% CL = 0.24 - 0.486 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.271 , 95% CL = 0.191 - 0.385 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.891 , 95% CL = 0.661 - 1.2
Bmsy = 2.61 , 95% CL = 1.9 - 3.57
Biomass in last year = 1.03 , 2.5th perc = 0.414 , 97.5 perc = 2.11
B/Bmsy in last year = 0.396 , 2.5th perc = 0.159 , 97.5 perc = 0.81
Fishing mortality in last year = 0.226 , 2.5th perc = 0.111 , 97.5 perc = 0.565
F/Fmsy = 0.836 , 2.5th perc = 0.409 , 97.5 perc = 2.09

Stock status and exploitation in 2014
Biomass = 0.927 , B/Bmsy = 0.355 , fishing mortality F = 0.273 , F/Fmsy = 1.12
Comment: OK (RF 21.09.16)


A: tur-2232 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 tur-2232
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1995
2000
2015
50% C.I.
80% C.I.
95% C.I.

Celtic Seas and Rockall (analyzed with CMSY_O_7m.R)

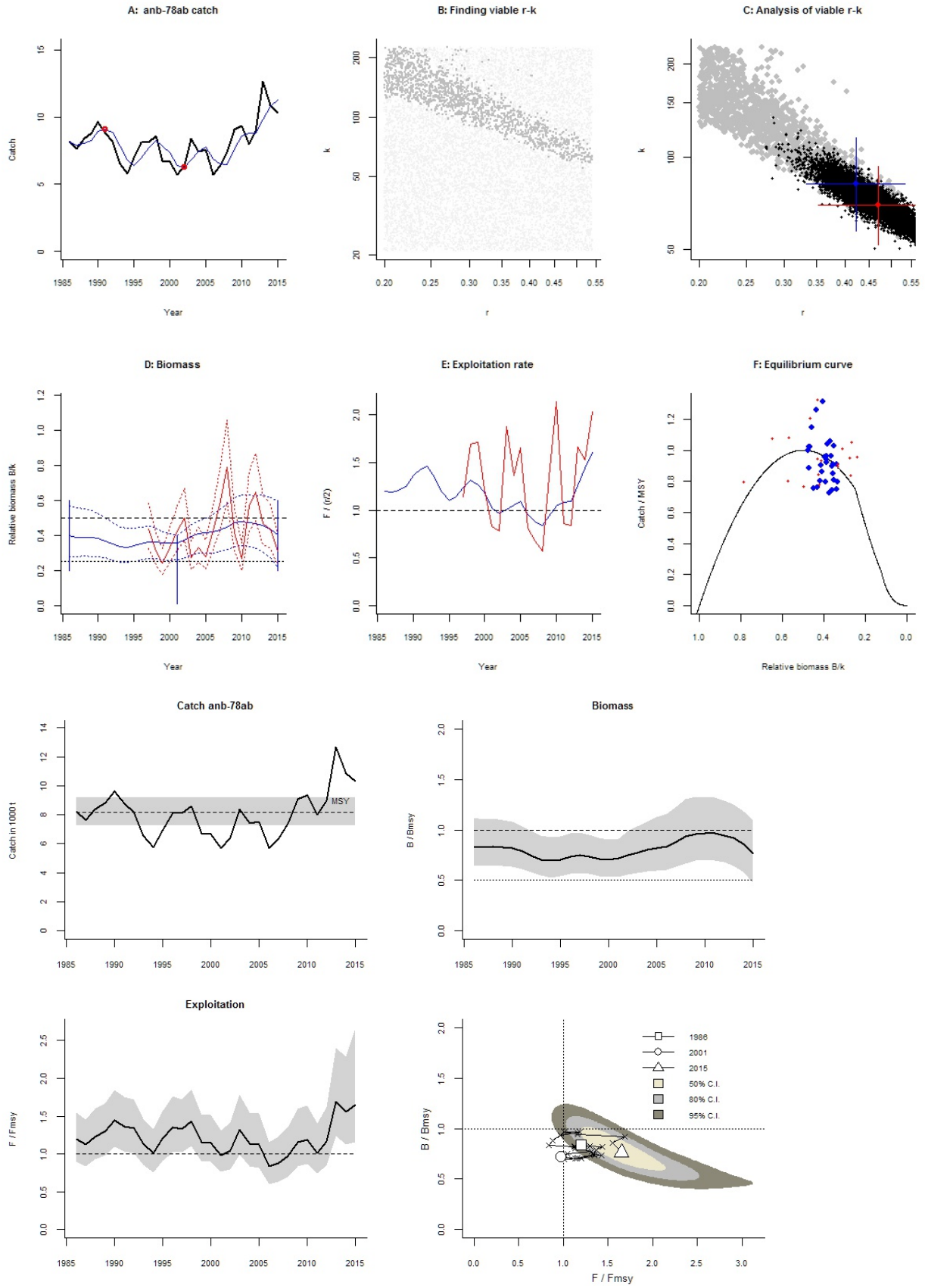
Species: *Lophius budegassa* , stock: anb-78ab
Black-bellied anglerfish in Divisions VIIb–k and VIIIa,b,d (West and Southwest of Ireland, Bay of Biscay)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/anb-78ab.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1986 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2001 default
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.2 - 0.54 expert, , prior range for k = 20.9 - 226
Prior range of q = 1.7e-05 - 5.57e-05

Results of CMSY analysis with altogether 2324 viable trajectories for 1540 r-k pairs
r = 0.422 , 95% CL = 0.334 - 0.534 , k = 81.6 , 95% CL = 57.6 - 115
MSY = 8.61 , 95% CL = 6.91 - 10.7
Relative biomass last year = 0.407 k, 2.5th = 0.215 , 97.5th = 0.596
Exploitation F/(r/2) in last year = 1.61

Results from Bayesian Schaefer model using catch & CPUE
r = 0.469 , 95% CL = 0.352 - 0.626 , k = 69.7 , 95% CL = 52 - 93.3
MSY = 8.17 , 95% CL = 7.26 - 9.21
Relative biomass in last year = 0.382 k, 2.5th perc = 0.236 , 97.5th perc = 0.547
Exploitation F/(r/2) in last year = 1.65
q = 2.68e-05 , lcl = 2.1e-05 , ucl = 3.42e-05

Results for Management (based on BSM analysis)
Fmsy = 0.235 , 95% CL = 0.176 - 0.313 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.235 , 95% CL = 0.176 - 0.313 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 8.17 , 95% CL = 7.26 - 9.21
Bmsy = 34.8 , 95% CL = 26 - 46.7
Biomass in last year = 26.6 , 2.5th perc = 16.5 , 97.5 perc = 38.1
B/Bmsy in last year = 0.765 , 2.5th perc = 0.473 , 97.5 perc = 1.09
Fishing mortality in last year = 0.388 , 2.5th perc = 0.271 , 97.5 perc = 0.627
F/Fmsy = 1.65 , 2.5th perc = 1.15 , 97.5 perc = 2.67

Stock status and exploitation in 2014
Biomass = 29.8 , B/Bmsy = 0.856 , fishing mortality F = 0.365 , F/Fmsy = 1.55
Comment: OK (RF 27.9.16)


A: anb-78ab 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 anb-78ab
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1986
2001
2015
50% C.I.
80% C.I.
95% C.I.

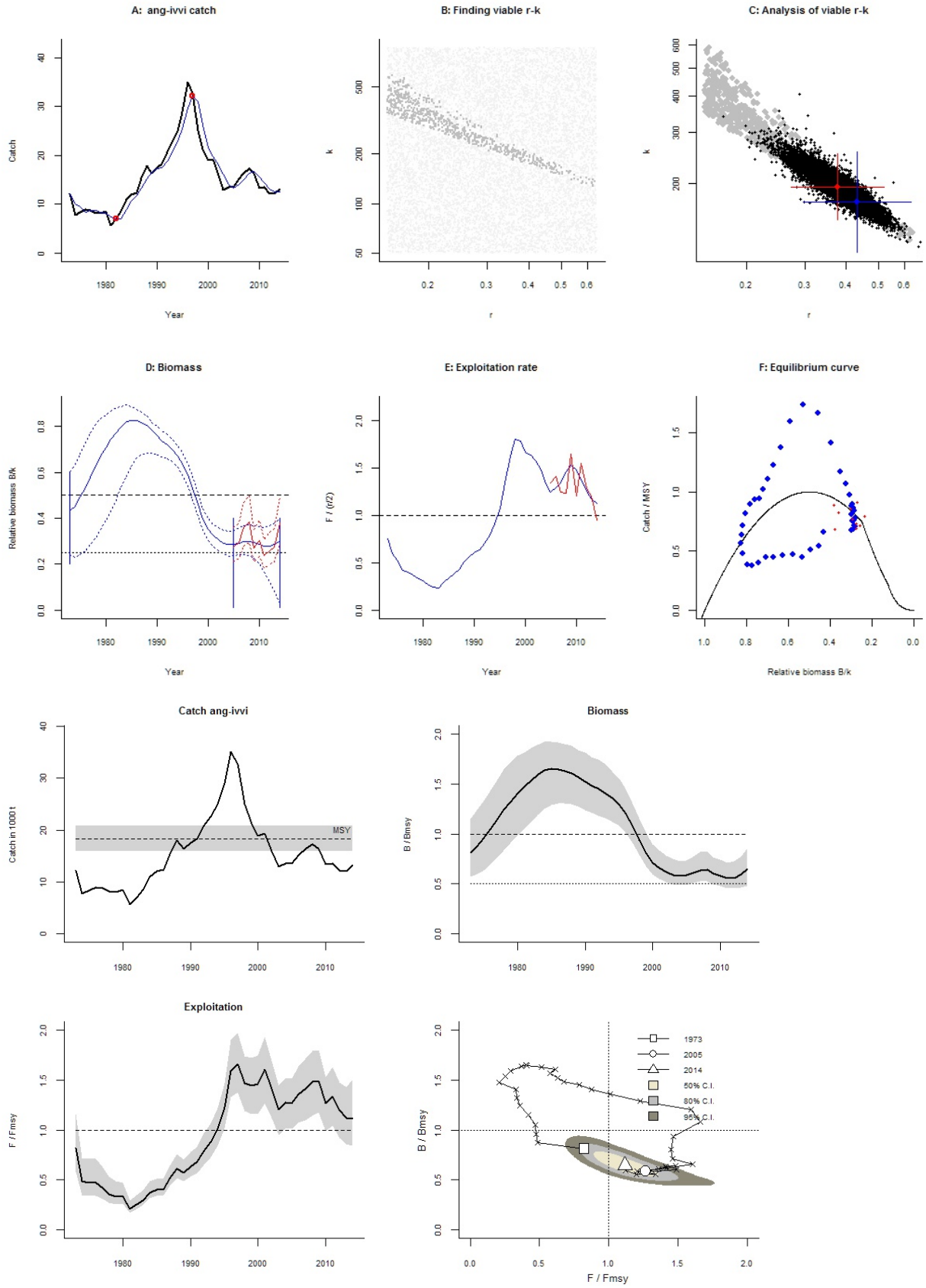
Species: *Lophius* spp. , stock: ang-ivvi
Anglerfish (Lophius piscatorius and L. budegassa) in Subareas IV and VI and Division IIIa (North Sea, Rockall and West of Scotland, Skagerrak and Kattegat)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/ang-ivvi.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1973 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2005 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.15 - 0.64 expert, , prior range for k = 50.4 - 860
Prior range of q = 0.402 - 1.66

Results of CMSY analysis with altogether 2324 viable trajectories for 684 r-k pairs
r = 0.432 , 95% CL = 0.297 - 0.627 , k = 172 , 95% CL = 116 - 256
MSY = 18.6 , 95% CL = 16.4 - 21.1
Relative biomass last year = 0.298 k, 2.5th = 0.0289 , 97.5th = 0.396
Exploitation F/(r/2) in last year = 1.13

Results from Bayesian Schaefer model using catch & CPUE
r = 0.376 , 95% CL = 0.273 - 0.518 , k = 194 , 95% CL = 150 - 252
MSY = 18.3 , 95% CL = 16 - 20.9
Relative biomass in last year = 0.324 k, 2.5th perc = 0.24 , 97.5th perc = 0.429
Exploitation F/(r/2) in last year = 1.12
q = 0.719 , lcl = 0.542 , ucl = 0.953

Results for Management (based on BSM analysis)
Fmsy = 0.188 , 95% CL = 0.136 - 0.259 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.188 , 95% CL = 0.136 - 0.259 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 18.3 , 95% CL = 16 - 20.9
Bmsy = 97.2 , 95% CL = 74.8 - 126
Biomass in last year = 62.9 , 2.5th perc = 46.7 , 97.5 perc = 83.5
B/Bmsy in last year = 0.648 , 2.5th perc = 0.481 , 97.5 perc = 0.859
Fishing mortality in last year = 0.21 , 2.5th perc = 0.158 , 97.5 perc = 0.283
F/Fmsy = 1.12 , 2.5th perc = 0.841 , 97.5 perc = 1.5

Stock status and exploitation in 2014
Biomass = 62.9 , B/Bmsy = 0.648 , fishing mortality F = 0.21 , F/Fmsy = 1.12
Comment: OK (RF 27.09.16)


A: ang-ivvi 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 ang-ivvi
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1973
2005
2014
50% C.I.
80% C.I.
95% C.I.

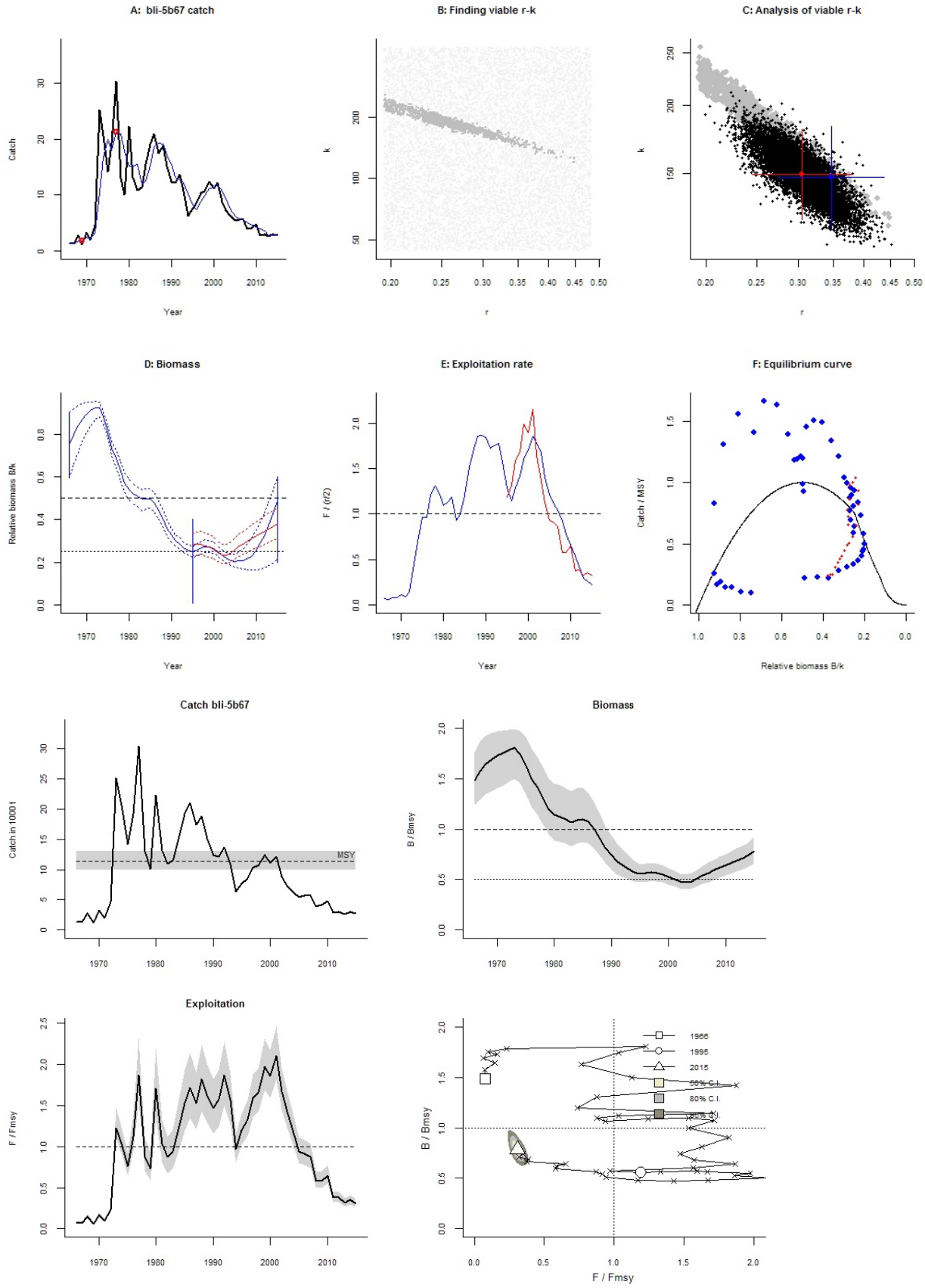
Species: *Molva dypterygia* , stock: bli-5b67
Blue ling in subareas 6–7 and Division 5.b (Celtic Seas, English Channel, and Faroes grounds)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/bli-5b67.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1966 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.6 - 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 = 0.19 - 0.48 expert, , prior range for k = 44 - 438
Prior range of q = 1.58 - 5

Results of CMSY analysis with altogether 3318 viable trajectories for 1369 r-k pairs
r = 0.347 , 95% CL = 0.275 - 0.439 , k = 147 , 95% CL = 119 - 183
MSY = 12.8 , 95% CL = 12 - 13.7
Relative biomass last year = 0.488 k, 2.5th = 0.217 , 97.5th = 0.595
Exploitation F/(r/2) in last year = 0.221

Results from Bayesian Schaefer model using catch & CPUE
r = 0.306 , 95% CL = 0.245 - 0.382 , k = 149 , 95% CL = 123 - 181
MSY = 11.4 , 95% CL = 9.99 - 13
Relative biomass in last year = 0.392 k, 2.5th perc = 0.331 , 97.5th perc = 0.462
Exploitation F/(r/2) in last year = 0.308
q = 1.64 , lcl = 1.35 , ucl = 2

Results for Management (based on BSM analysis)
Fmsy = 0.153 , 95% CL = 0.123 - 0.191 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.153 , 95% CL = 0.123 - 0.191 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 11.4 , 95% CL = 9.99 - 13
Bmsy = 74.7 , 95% CL = 61.7 - 90.4
Biomass in last year = 58.6 , 2.5th perc = 49.4 , 97.5 perc = 68.9
B/Bmsy in last year = 0.784 , 2.5th perc = 0.661 , 97.5 perc = 0.923
Fishing mortality in last year = 0.0471 , 2.5th perc = 0.04 , 97.5 perc = 0.0559
F/Fmsy = 0.308 , 2.5th perc = 0.262 , 97.5 perc = 0.365

Stock status and exploitation in 2014
Biomass = 55.2 , B/Bmsy = 0.74 , fishing mortality F = 0.0534 , F/Fmsy = 0.349
Comment: OK (RF 27.09.16)


A: bli-5b67 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-5b67
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1966
1995
2015
50% C.I.
80% C.I.

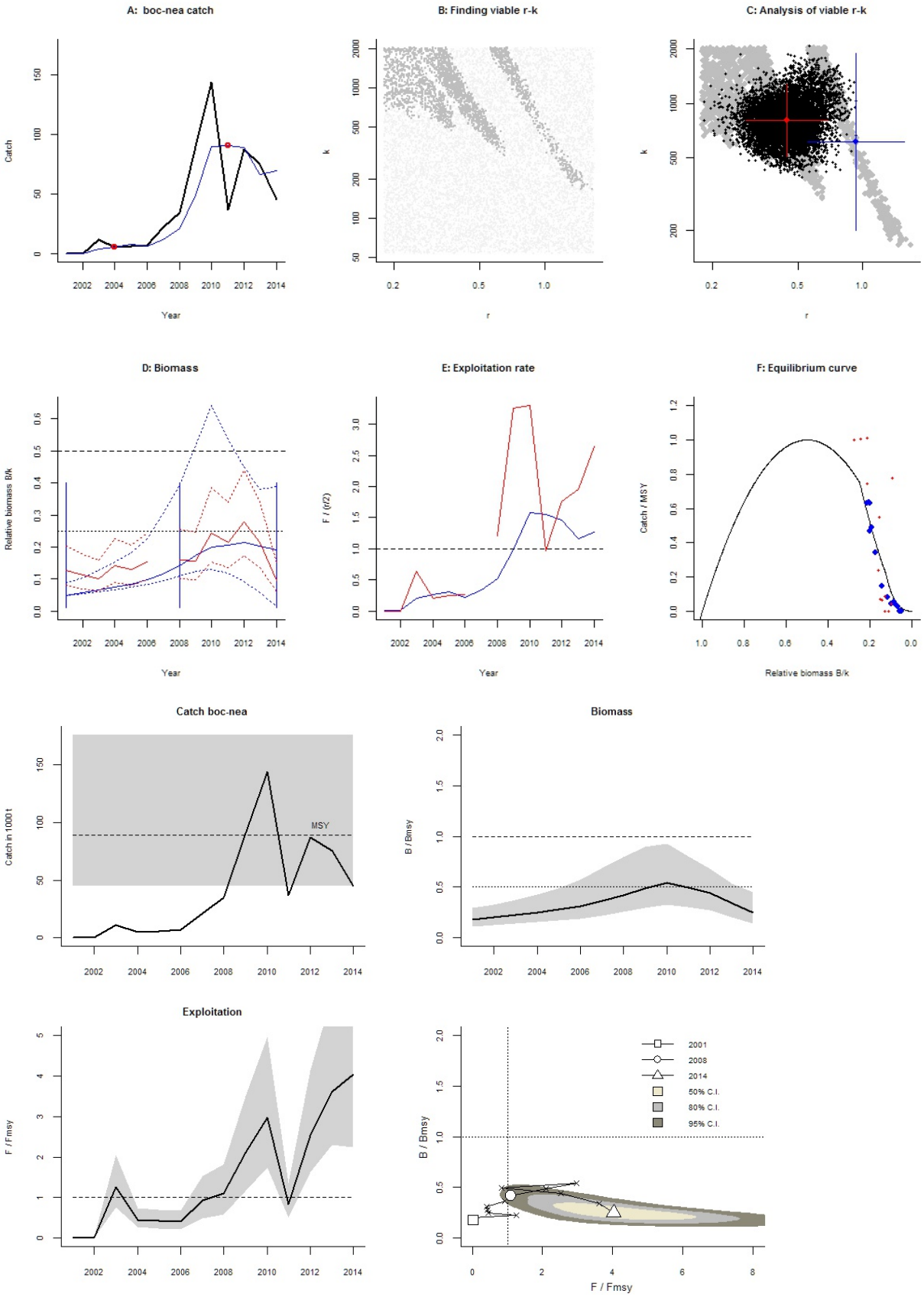
Species: *Capros aper* , stock: boc-nea
Boarfish in Subareas VI–VIII (Celtic Seas and the English Channel, Bay of Biscay)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/boc-nea.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 2001 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2008 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.18 - 1.7 expert, , prior range for k = 53.6 - 2011
Prior range of q = 0.00484 - 0.0296

Results of CMSY analysis with altogether 2559 viable trajectories for 2422 r-k pairs
r = 0.928 , 95% CL = 0.553 - 1.56 , k = 614 , 95% CL = 200 - 1884
MSY = 142 , 95% CL = 43.6 - 465
Relative biomass last year = 0.192 k, 2.5th = 0.0155 , 97.5th = 0.39
Exploitation F/(r/2) in last year = 1.27

Results from Bayesian Schaefer model using catch & CPUE
r = 0.443 , 95% CL = 0.287 - 0.686 , k = 806 , 95% CL = 509 - 1276
MSY = 89.4 , 95% CL = 45.3 - 176
Relative biomass in last year = 0.125 k, 2.5th perc = 0.0723 , 97.5th perc = 0.225
Exploitation F/(r/2) in last year = 2.02
q = 0.00822 , lcl = 0.00607 , ucl = 0.0111

Results for Management (based on BSM analysis)
Fmsy = 0.222 , 95% CL = 0.143 - 0.343 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.111 , 95% CL = 0.0718 - 0.172 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 89.4 , 95% CL = 45.3 - 176
Bmsy = 403 , 95% CL = 255 - 638
Biomass in last year = 101 , 2.5th perc = 58.3 , 97.5 perc = 181
B/Bmsy in last year = 0.251 , 2.5th perc = 0.145 , 97.5 perc = 0.449
Fishing mortality in last year = 0.448 , 2.5th perc = 0.25 , 97.5 perc = 0.776
F/Fmsy = 4.03 , 2.5th perc = 2.25 , 97.5 perc = 6.98

Stock status and exploitation in 2014
Biomass = 101 , B/Bmsy = 0.251 , fishing mortality F = 0.448 , F/Fmsy = 4.03
Comment: OK (RF 27.09.16)


A: boc-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 boc-nea
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
2001
2008
2014
50% C.I.
80% C.I.
95% C.I.

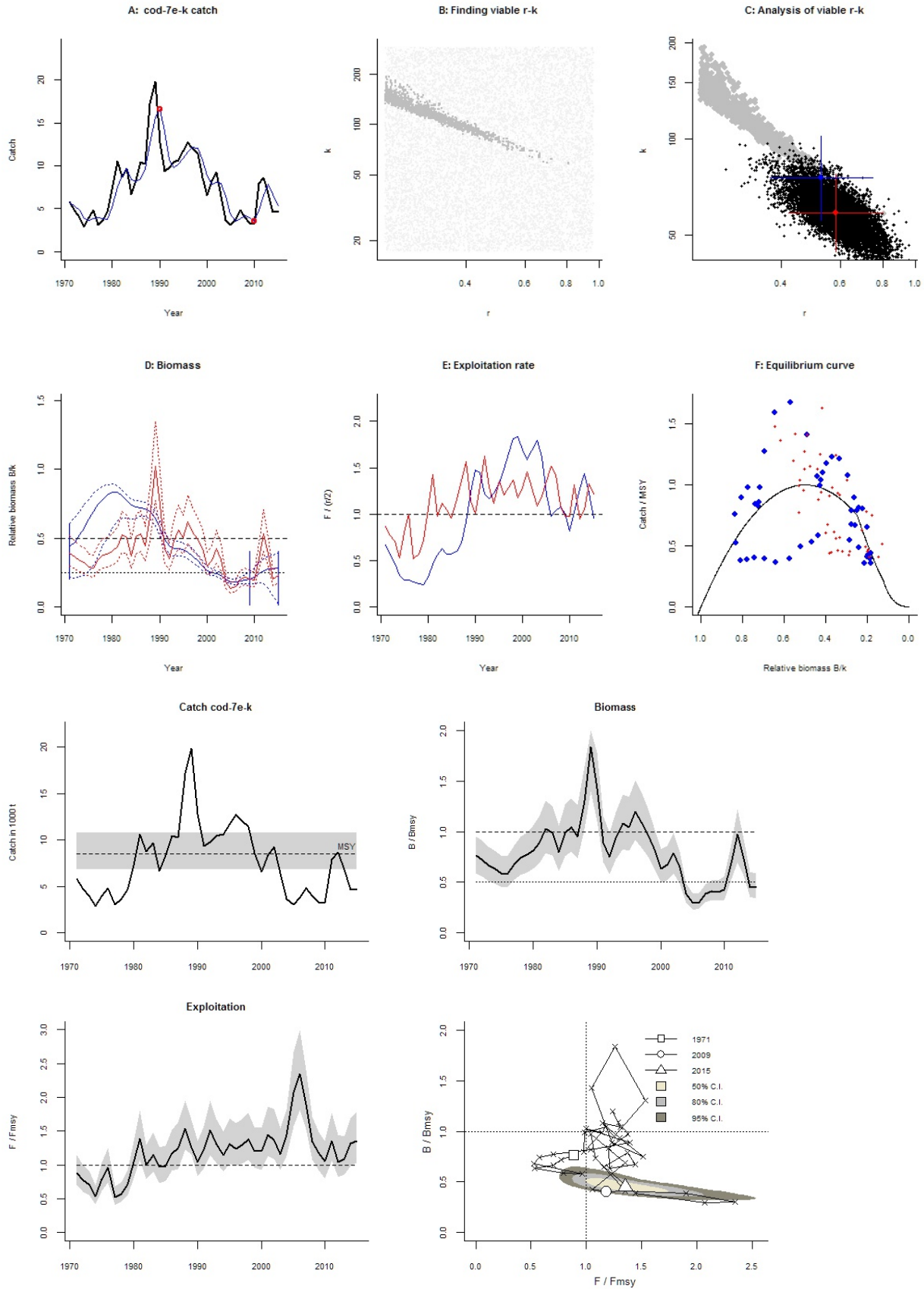
Species: *Gadus morhua* , stock: cod-7e-k
Cod in Divisions VIIe-k (Celtic Sea cod)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/cod-7e-k.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1971 - 2015 , abundance = CPUE
Prior initial relative biomass = 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 = 0.23 - 0.96 expert, , prior range for k = 17.3 - 288
Prior range of q = 0.329 - 1.34

Results of CMSY analysis with altogether 2215 viable trajectories for 1346 r-k pairs
r = 0.525 , 95% CL = 0.369 - 0.746 , k = 75.5 , 95% CL = 55.6 - 102
MSY = 9.9 , 95% CL = 9.08 - 10.8
Relative biomass last year = 0.284 k, 2.5th = 0.0211 , 97.5th = 0.395
Exploitation F/(r/2) in last year = 0.957

Results from Bayesian Schaefer model using catch & CPUE
r = 0.581 , 95% CL = 0.42 - 0.804 , k = 58.8 , 95% CL = 44.4 - 77.8
MSY = 8.55 , 95% CL = 6.8 - 10.7
Relative biomass in last year = 0.226 k, 2.5th perc = 0.171 , 97.5th perc = 0.296
Exploitation F/(r/2) in last year = 1.22
q = 0.439 , lcl = 0.346 , ucl = 0.557

Results for Management (based on BSM analysis)
Fmsy = 0.291 , 95% CL = 0.21 - 0.402 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.262 , 95% CL = 0.19 - 0.363 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 8.55 , 95% CL = 6.8 - 10.7
Bmsy = 29.4 , 95% CL = 22.2 - 38.9
Biomass in last year = 13.3 , 2.5th perc = 10 , 97.5 perc = 17.4
B/Bmsy in last year = 0.451 , 2.5th perc = 0.341 , 97.5 perc = 0.592
Fishing mortality in last year = 0.355 , 2.5th perc = 0.271 , 97.5 perc = 0.47
F/Fmsy = 1.35 , 2.5th perc = 1.03 , 97.5 perc = 1.79

Stock status and exploitation in 2014
Biomass = 13.3 , B/Bmsy = 0.452 , fishing mortality F = 0.347 , F/Fmsy = 1.32
Comment: OK (RF 27.09.16)


A: cod-7e-k 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 cod-7e-k
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1971
2009
2015
50% C.I.
80% C.I.
95% C.I.

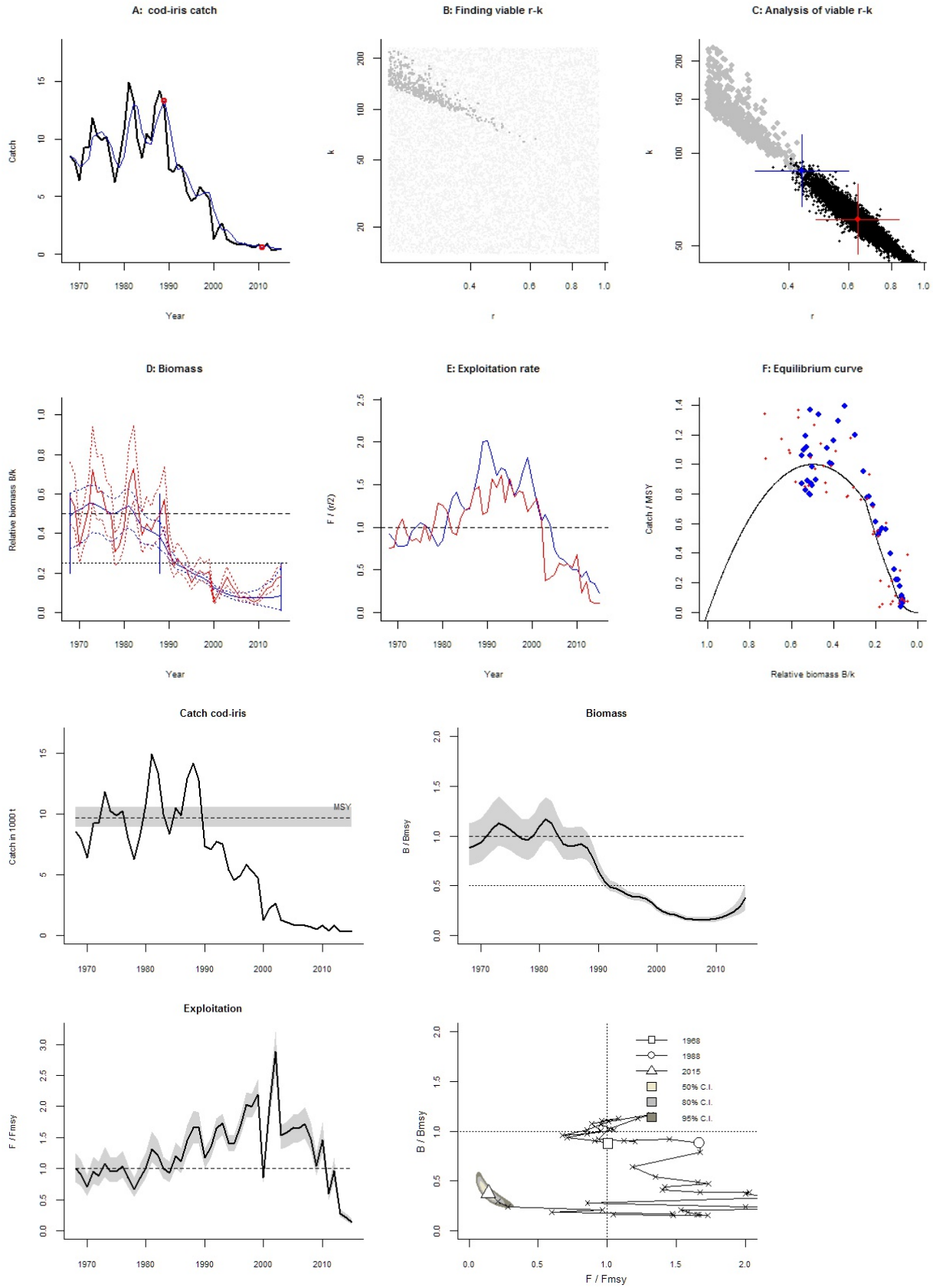
Species: *Gadus morhua* , stock: cod-iris
Cod in Division VIIa (Irish Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/cod-iris.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1968 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 1988 expert
Prior final relative biomass = 0.01 - 0.25 expert
Prior range for r = 0.23 - 0.96 expert, , prior range for k = 13.8 - 231
Prior range of q = 0.292 - 1.19

Results of CMSY analysis with altogether 538 viable trajectories for 523 r-k pairs
r = 0.436 , 95% CL = 0.317 - 0.599 , k = 87.5 , 95% CL = 66.9 - 115
MSY = 9.54 , 95% CL = 8.5 - 10.7
Relative biomass last year = 0.0829 k, 2.5th = 0.0138 , 97.5th = 0.227
Exploitation F/(r/2) in last year = 0.226

Results from Bayesian Schaefer model using catch & CPUE
r = 0.638 , 95% CL = 0.481 - 0.845 , k = 60.9 , 95% CL = 46.9 - 79.1
MSY = 9.71 , 95% CL = 8.91 - 10.6
Relative biomass in last year = 0.188 k, 2.5th perc = 0.129 , 97.5th perc = 0.263
Exploitation F/(r/2) in last year = 0.105
q = 0.446 , lcl = 0.35 , ucl = 0.567

Results for Management (based on BSM analysis)
Fmsy = 0.319 , 95% CL = 0.241 - 0.422 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.24 , 95% CL = 0.181 - 0.318 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 9.71 , 95% CL = 8.91 - 10.6
Bmsy = 30.4 , 95% CL = 23.4 - 39.6
Biomass in last year = 11.5 , 2.5th perc = 7.87 , 97.5 perc = 16
B/Bmsy in last year = 0.377 , 2.5th perc = 0.259 , 97.5 perc = 0.526
Fishing mortality in last year = 0.0336 , 2.5th perc = 0.024 , 97.5 perc = 0.0489
F/Fmsy = 0.14 , 2.5th perc = 0.1 , 97.5 perc = 0.204

Stock status and exploitation in 2014
Biomass = 9.06 , B/Bmsy = 0.297 , fishing mortality F = 0.04 , F/Fmsy = 0.211
Comment: OK (RF 27.09.16). Discards 2007 ff added to landings. Harvest rate strongly underestimates final F.


A: cod-iris 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 cod-iris
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1968
1988
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

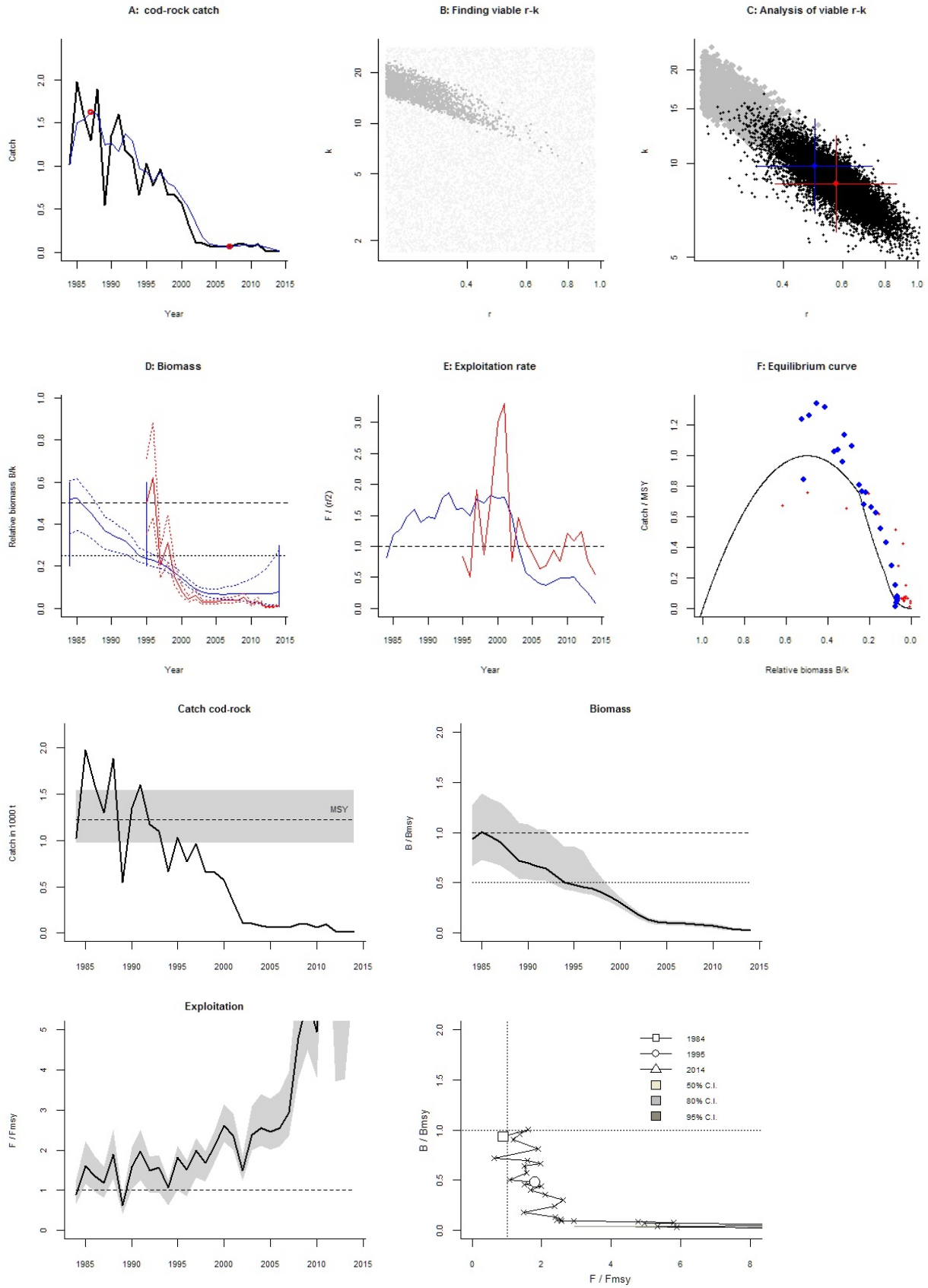
Species: *Gadus morhua* , stock: cod-rock
Cod in Division VIb (Rockall)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/cod-rock.pdf
Region: Northeast Atlantic , Rockall
Catch data used from years 1984 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.2 - 0.6 in year 1995 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.23 - 0.96 expert, , prior range for k = 1.69 - 28.2
Prior range of q = 0.00822 - 0.0336

Results of CMSY analysis with altogether 2025 viable trajectories for 1844 r-k pairs
r = 0.497 , 95% CL = 0.335 - 0.736 , k = 9.76 , 95% CL = 6.88 - 13.9
MSY = 1.21 , 95% CL = 0.981 - 1.5
Relative biomass last year = 0.0766 k, 2.5th = 0.0116 , 97.5th = 0.275
Exploitation F/(r/2) in last year = 0.0933

Results from Bayesian Schaefer model using catch & CPUE
r = 0.572 , 95% CL = 0.378 - 0.865 , k = 8.56 , 95% CL = 6 - 12.2
MSY = 1.22 , 95% CL = 0.971 - 1.54
Relative biomass in last year = 0.0118 k, 2.5th perc = 0.0108 , 97.5th perc = 0.0206
Exploitation F/(r/2) in last year = 0.519
q = 0.0106 , lcl = 0.00805 , ucl = 0.0141

Results for Management (based on BSM analysis)
Fmsy = 0.286 , 95% CL = 0.189 - 0.433 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0135 , 95% CL = 0.00892 - 0.0204 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1.22 , 95% CL = 0.971 - 1.54
Bmsy = 4.28 , 95% CL = 3 - 6.11
Biomass in last year = 0.101 , 2.5th perc = 0.0929 , 97.5 perc = 0.176
B/Bmsy in last year = 0.0236 , 2.5th perc = 0.0217 , 97.5 perc = 0.0411
Fishing mortality in last year = 0.148 , 2.5th perc = 0.0852 , 97.5 perc = 0.161
F/Fmsy = 11 , 2.5th perc = 6.31 , 97.5 perc = 12

Stock status and exploitation in 2014
Biomass = 0.101 , B/Bmsy = 0.0236 , fishing mortality F = 0.148 , F/Fmsy = 11
Comment: OK (RF 27.09.16)


A: cod-rock 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 cod-rock
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1984
1995
2014
50% C.I.
80% C.I.
95% C.I.

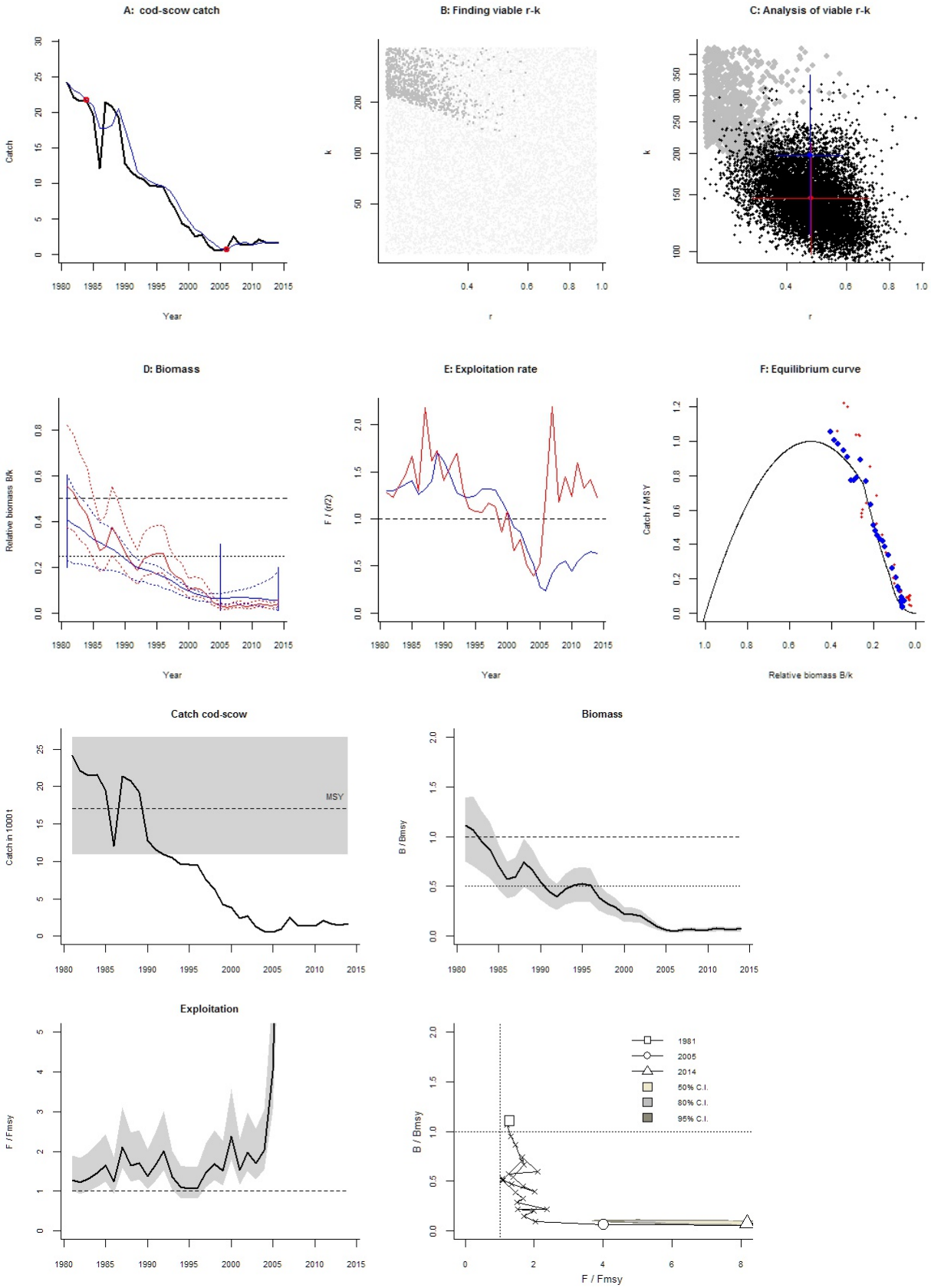
Species: *Gadus morhua* , stock: cod-scow
Cod in Division VIa (West of Scotland)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/cod-scow.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1981 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.3 in year 2005 expert
Prior final relative biomass = 0.01 - 0.2 expert
Prior range for r = 0.23 - 0.96 expert, , prior range for k = 25.2 - 420
Prior range of q = 0.411 - 1.68

Results of CMSY analysis with altogether 1077 viable trajectories for 1031 r-k pairs
r = 0.466 , 95% CL = 0.372 - 0.585 , k = 197 , 95% CL = 112 - 347
MSY = 23 , 95% CL = 11.8 - 44.8
Relative biomass last year = 0.0553 k, 2.5th = 0.0111 , 97.5th = 0.183
Exploitation F/(r/2) in last year = 0.63

Results from Bayesian Schaefer model using catch & CPUE
r = 0.469 , 95% CL = 0.315 - 0.7 , k = 145 , 95% CL = 98.3 - 215
MSY = 17.1 , 95% CL = 10.9 - 26.6
Relative biomass in last year = 0.0387 k, 2.5th perc = 0.0255 , 97.5th perc = 0.0513
Exploitation F/(r/2) in last year = 1.26
q = 0.504 , lcl = 0.404 , ucl = 0.629

Results for Management (based on BSM analysis)
Fmsy = 0.235 , 95% CL = 0.157 - 0.35 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0363 , 95% CL = 0.0244 - 0.0542 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 17.1 , 95% CL = 10.9 - 26.6
Bmsy = 72.7 , 95% CL = 49.2 - 107
Biomass in last year = 5.62 , 2.5th perc = 3.71 , 97.5 perc = 7.45
B/Bmsy in last year = 0.0774 , 2.5th perc = 0.051 , 97.5 perc = 0.103
Fishing mortality in last year = 0.297 , 2.5th perc = 0.224 , 97.5 perc = 0.45
F/Fmsy = 8.16 , 2.5th perc = 6.16 , 97.5 perc = 12.4

Stock status and exploitation in 2014
Biomass = 5.62 , B/Bmsy = 0.0774 , fishing mortality F = 0.297 , F/Fmsy = 8.16
Comment: OK (RF 27.09.16)


A: cod-scow 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 cod-scow
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1981
2005
2014
50% C.I.
80% C.I.
95% C.I.

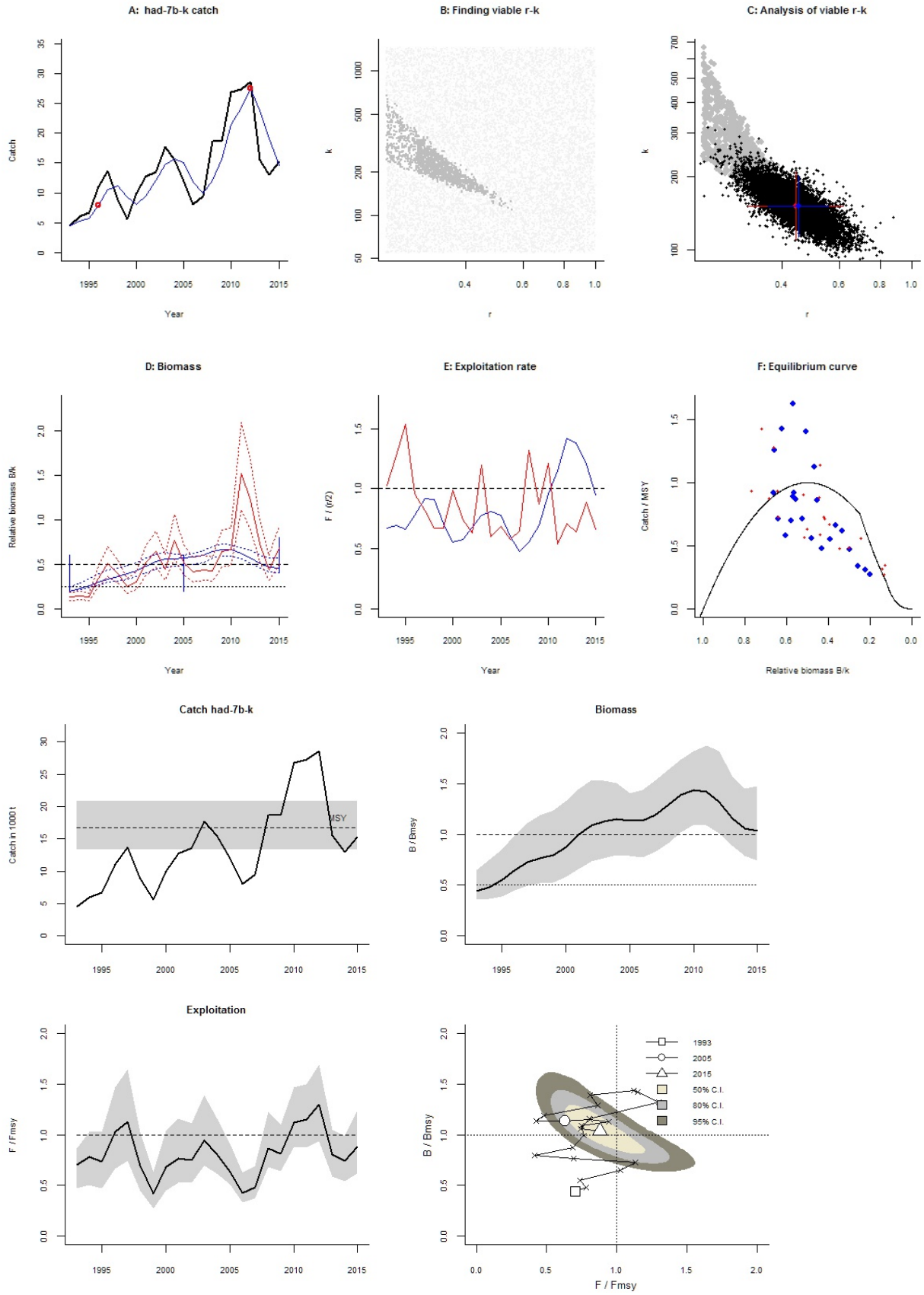
Species: *Melanogrammus aeglefinus* , stock: had-7b-k
Haddock in Divisions VIIb,c,e-k
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/had-7b-k.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1993 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2005 expert
Prior final relative biomass = 0.4 - 0.8 expert
Prior range for r = 0.23 - 1 expert, , prior range for k = 55.1 - 1437
Prior range of q = 0.247 - 1.03

Results of CMSY analysis with altogether 2049 viable trajectories for 1438 r-k pairs
r = 0.449 , 95% CL = 0.363 - 0.556 , k = 151 , 95% CL = 113 - 201
MSY = 17 , 95% CL = 14.7 - 19.6
Relative biomass last year = 0.452 k, 2.5th = 0.402 , 97.5th = 0.567
Exploitation F/(r/2) in last year = 0.951

Results from Bayesian Schaefer model using catch & CPUE
r = 0.441 , 95% CL = 0.315 - 0.616 , k = 152 , 95% CL = 111 - 208
MSY = 16.7 , 95% CL = 13.4 - 20.8
Relative biomass in last year = 0.519 k, 2.5th perc = 0.37 , 97.5th perc = 0.737
Exploitation F/(r/2) in last year = 0.88
q = 0.368 , lcl = 0.273 , ucl = 0.497

Results for Management (based on BSM analysis)
Fmsy = 0.22 , 95% CL = 0.158 - 0.308 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.22 , 95% CL = 0.158 - 0.308 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 16.7 , 95% CL = 13.4 - 20.8
Bmsy = 75.8 , 95% CL = 55.3 - 104
Biomass in last year = 78.6 , 2.5th perc = 56.1 , 97.5 perc = 112
B/Bmsy in last year = 1.04 , 2.5th perc = 0.741 , 97.5 perc = 1.47
Fishing mortality in last year = 0.194 , 2.5th perc = 0.136 , 97.5 perc = 0.271
F/Fmsy = 0.88 , 2.5th perc = 0.619 , 97.5 perc = 1.23

Stock status and exploitation in 2014
Biomass = 79.9 , B/Bmsy = 1.05 , fishing mortality F = 0.163 , F/Fmsy = 0.74
Comment: OK (RF 27.09.16)


A: had-7b-k 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 had-7b-k
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1993
2005
2015
50% C.I.
80% C.I.
95% C.I.

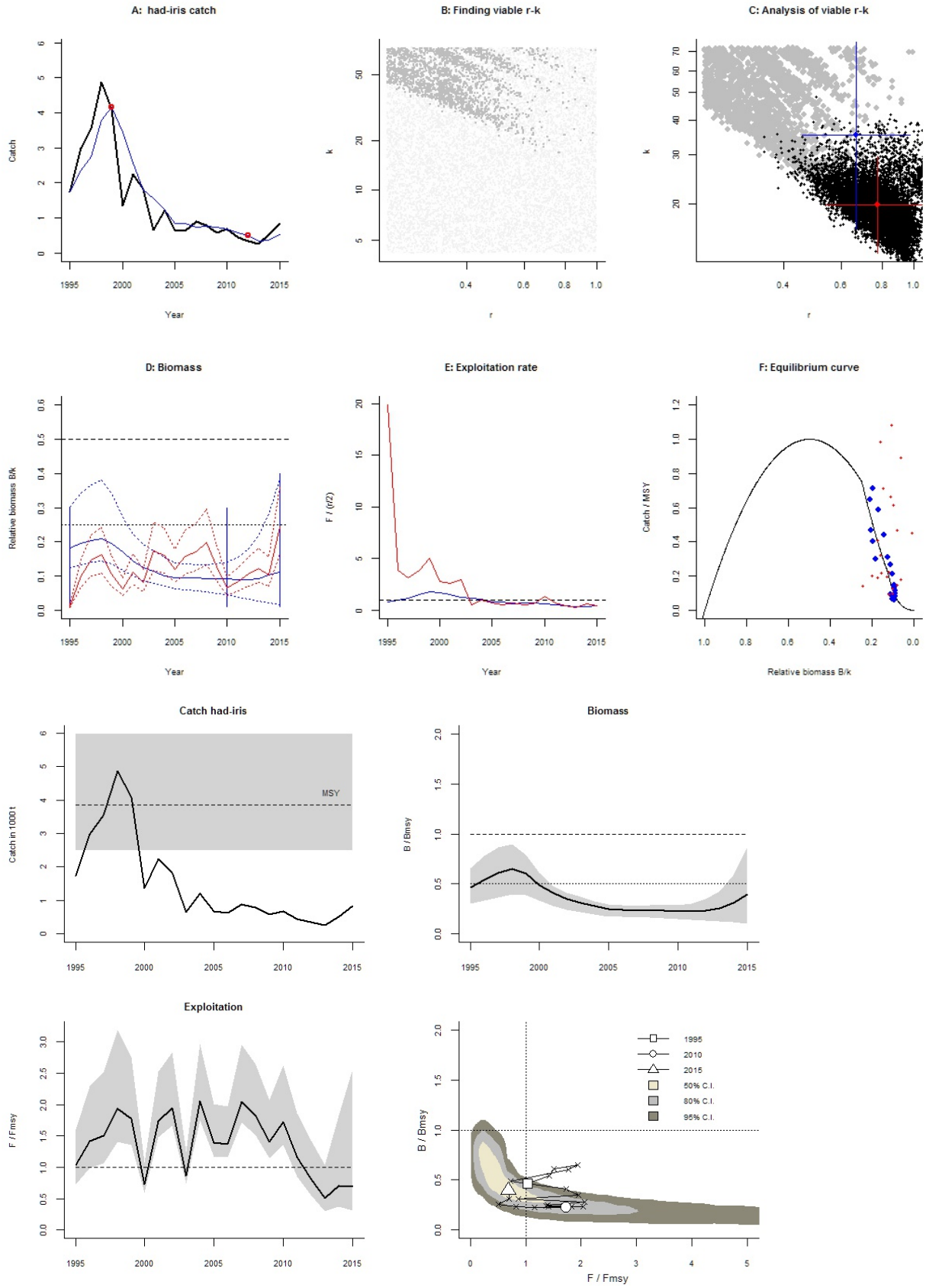
Species: *Melanogrammus aeglefinus* , stock: had-iris
Haddock in Division VIIa (Irish Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/had-iris.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1995 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.3 expert
Prior intermediate rel. biomass= 0.01 - 0.3 in year 2010 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.23 - 1 expert, , prior range for k = 4.17 - 72.6
Prior range of q = 0.000305 - 0.00127

Results of CMSY analysis with altogether 2172 viable trajectories for 2055 r-k pairs
r = 0.667 , 95% CL = 0.457 - 0.973 , k = 35.2 , 95% CL = 16.3 - 75.9
MSY = 5.87 , 95% CL = 2.51 - 13.7
Relative biomass last year = 0.112 k, 2.5th = 0.0157 , 97.5th = 0.382
Exploitation F/(r/2) in last year = 0.407

Results from Bayesian Schaefer model using catch & CPUE
r = 0.777 , 95% CL = 0.537 - 1.12 , k = 19.9 , 95% CL = 13.3 - 29.6
MSY = 3.86 , 95% CL = 2.49 - 5.98
Relative biomass in last year = 0.198 k, 2.5th perc = 0.0532 , 97.5th perc = 0.436
Exploitation F/(r/2) in last year = 0.545
q = 0.000427 , lcl = 0.000315 , ucl = 0.000578

Results for Management (based on BSM analysis)
Fmsy = 0.388 , 95% CL = 0.269 - 0.561 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.308 , 95% CL = 0.213 - 0.445 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 3.86 , 95% CL = 2.49 - 5.98
Bmsy = 9.93 , 95% CL = 6.67 - 14.8
Biomass in last year = 3.94 , 2.5th perc = 1.06 , 97.5 perc = 8.67
B/Bmsy in last year = 0.397 , 2.5th perc = 0.106 , 97.5 perc = 0.873
Fishing mortality in last year = 0.212 , 2.5th perc = 0.0961 , 97.5 perc = 0.788
F/Fmsy = 0.687 , 2.5th perc = 0.312 , 97.5 perc = 2.56

Stock status and exploitation in 2014
Biomass = 3.07 , B/Bmsy = 0.309 , fishing mortality F = 0.169 , F/Fmsy = 0.704
Comment: OK (RF 27.09.16)


A: had-iris 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 had-iris
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1995
2010
2015
50% C.I.
80% C.I.
95% C.I.

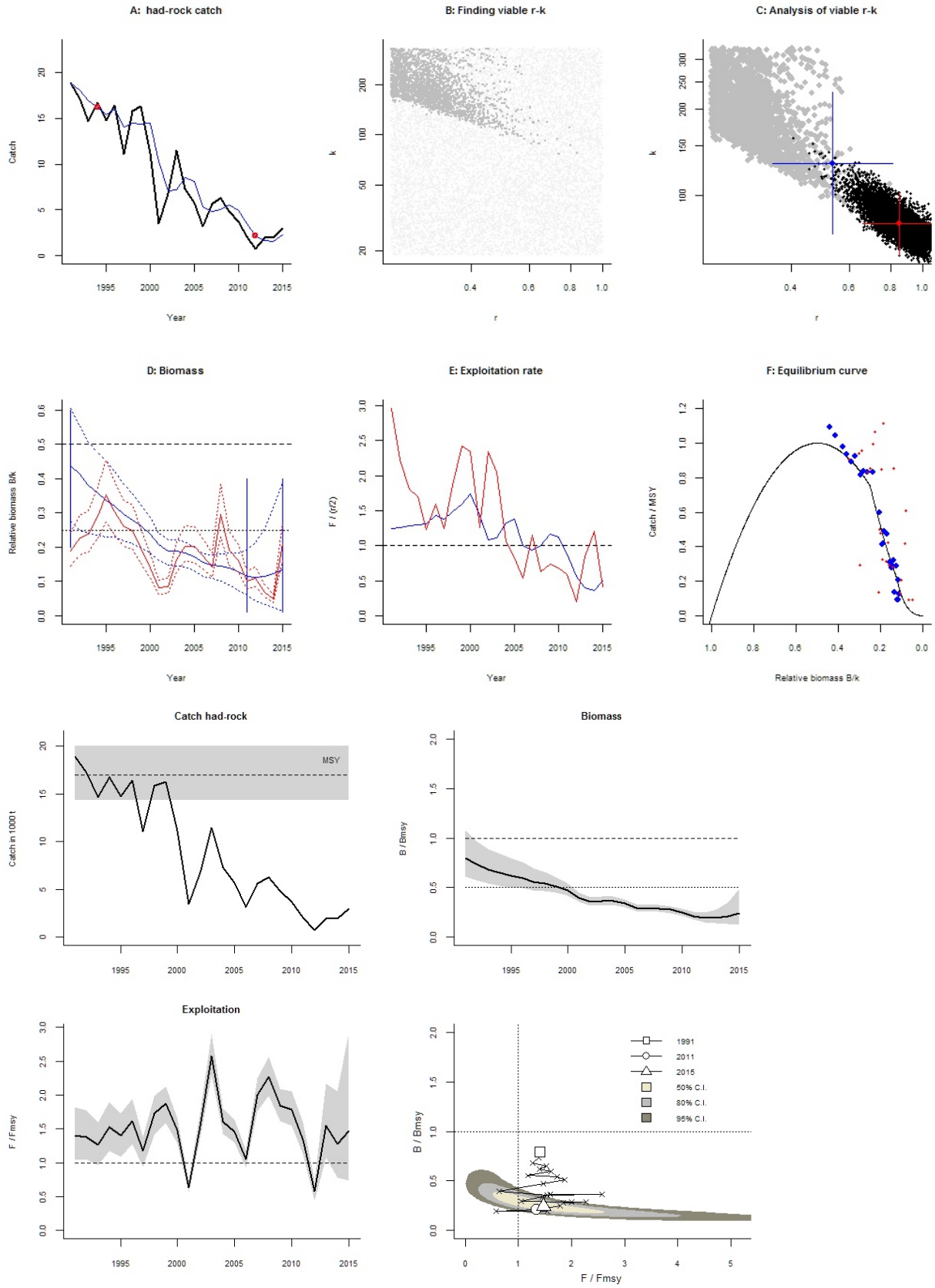
Species: *Melanogrammus aeglefinus* , stock: had-rock
Haddock in Division VIb (Rockall)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/had-rock.pdf
Region: Northeast Atlantic , Rockall
Catch data used from years 1991 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2011 default
Prior final relative biomass = 0.01 - 0.4 , default
Prior range for r = 0.23 - 1 expert, , prior range for k = 18.9 - 328
Prior range of q = 0.873 - 3.64

Results of CMSY analysis with altogether 2710 viable trajectories for 2398 r-k pairs
r = 0.533 , 95% CL = 0.351 - 0.809 , k = 130 , 95% CL = 73.7 - 229
MSY = 17.3 , 95% CL = 9.59 - 31.2
Relative biomass last year = 0.133 k, 2.5th = 0.0145 , 97.5th = 0.388
Exploitation F/(r/2) in last year = 0.5

Results from Bayesian Schaefer model using catch & CPUE
r = 0.851 , 95% CL = 0.659 - 1.1 , k = 79.8 , 95% CL = 61.9 - 103
MSY = 17 , 95% CL = 14.4 - 20
Relative biomass in last year = 0.122 k, 2.5th perc = 0.0613 , 97.5th perc = 0.243
Exploitation F/(r/2) in last year = 0.718
q = 1.04 , lcl = 0.822 , ucl = 1.33

Results for Management (based on BSM analysis)
Fmsy = 0.425 , 95% CL = 0.33 - 0.549 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.208 , 95% CL = 0.161 - 0.268 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 17 , 95% CL = 14.4 - 20
Bmsy = 39.9 , 95% CL = 31 - 51.4
Biomass in last year = 9.73 , 2.5th perc = 4.89 , 97.5 perc = 19.4
B/Bmsy in last year = 0.244 , 2.5th perc = 0.123 , 97.5 perc = 0.485
Fishing mortality in last year = 0.305 , 2.5th perc = 0.154 , 97.5 perc = 0.608
F/Fmsy = 1.47 , 2.5th perc = 0.74 , 97.5 perc = 2.93

Stock status and exploitation in 2014
Biomass = 8.46 , B/Bmsy = 0.212 , fishing mortality F = 0.23 , F/Fmsy = 1.28
Comment: OK (RF 27.09.16)


A: had-rock 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 had-rock
MSY
Catch in 1000 t
Biomass
B / Bmsy
Exploitation
F / Fmsy
1991
2011
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

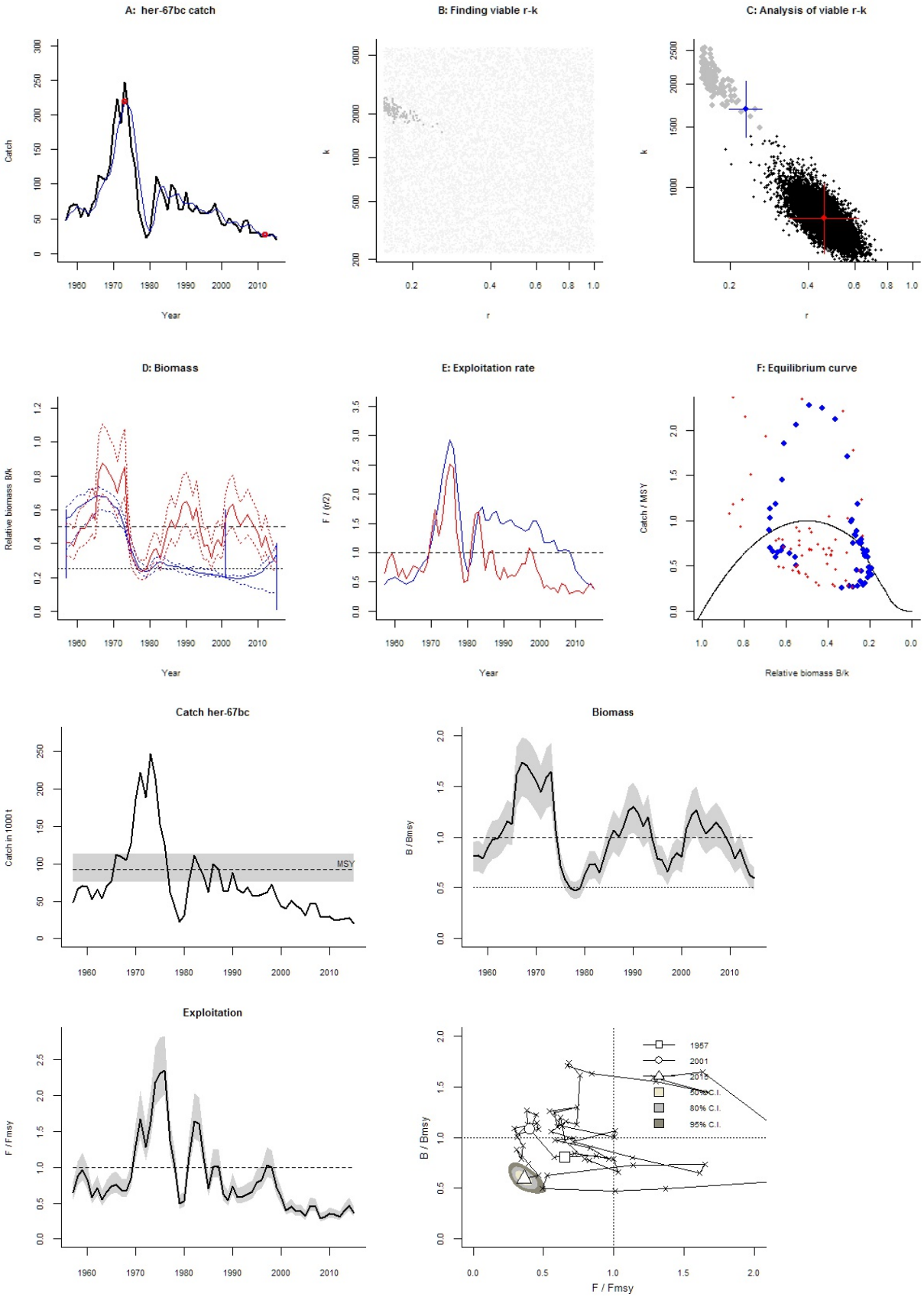
Species: *Clupea harengus* , stock: her-67bc
Herring in Divisions VIa and VIIb,c (West of Scotland, West of Ireland)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/her-67bc.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1957 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2001 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.16 - 1 expert, , prior range for k = 220 - 5619
Prior range of q = 2.41 - 12.2

Results of CMSY analysis with altogether 127 viable trajectories for 121 r-k pairs
r = 0.229 , 95% CL = 0.198 - 0.264 , k = 1686 , 95% CL = 1398 - 2033
MSY = 96.4 , 95% CL = 88.5 - 105
Relative biomass last year = 0.336 k, 2.5th = 0.102 , 97.5th = 0.388
Exploitation F/(r/2) in last year = 0.381

Results from Bayesian Schaefer model using catch & CPUE
r = 0.457 , 95% CL = 0.337 - 0.621 , k = 808 , 95% CL = 639 - 1022
MSY = 92.3 , 95% CL = 75.4 - 113
Relative biomass in last year = 0.296 k, 2.5th perc = 0.239 , 97.5th perc = 0.354
Exploitation F/(r/2) in last year = 0.363
q = 1.08 , lcl = 0.898 , ucl = 1.3

Results for Management (based on BSM analysis)
Fmsy = 0.229 , 95% CL = 0.168 - 0.31 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.229 , 95% CL = 0.168 - 0.31 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 92.3 , 95% CL = 75.4 - 113
Bmsy = 404 , 95% CL = 320 - 511
Biomass in last year = 239 , 2.5th perc = 193 , 97.5 perc = 286
B/Bmsy in last year = 0.593 , 2.5th perc = 0.478 , 97.5 perc = 0.707
Fishing mortality in last year = 0.0831 , 2.5th perc = 0.0696 , 97.5 perc = 0.103
F/Fmsy = 0.363 , 2.5th perc = 0.304 , 97.5 perc = 0.451

Stock status and exploitation in 2014
Biomass = 254 , B/Bmsy = 0.63 , fishing mortality F = 0.107 , F/Fmsy = 0.467
Comment: OK (RF 27.09.16)


A: her-67bc 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 her-67bc
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1957
2001
2015
50% C.I.
80% C.I.
95% C.I.

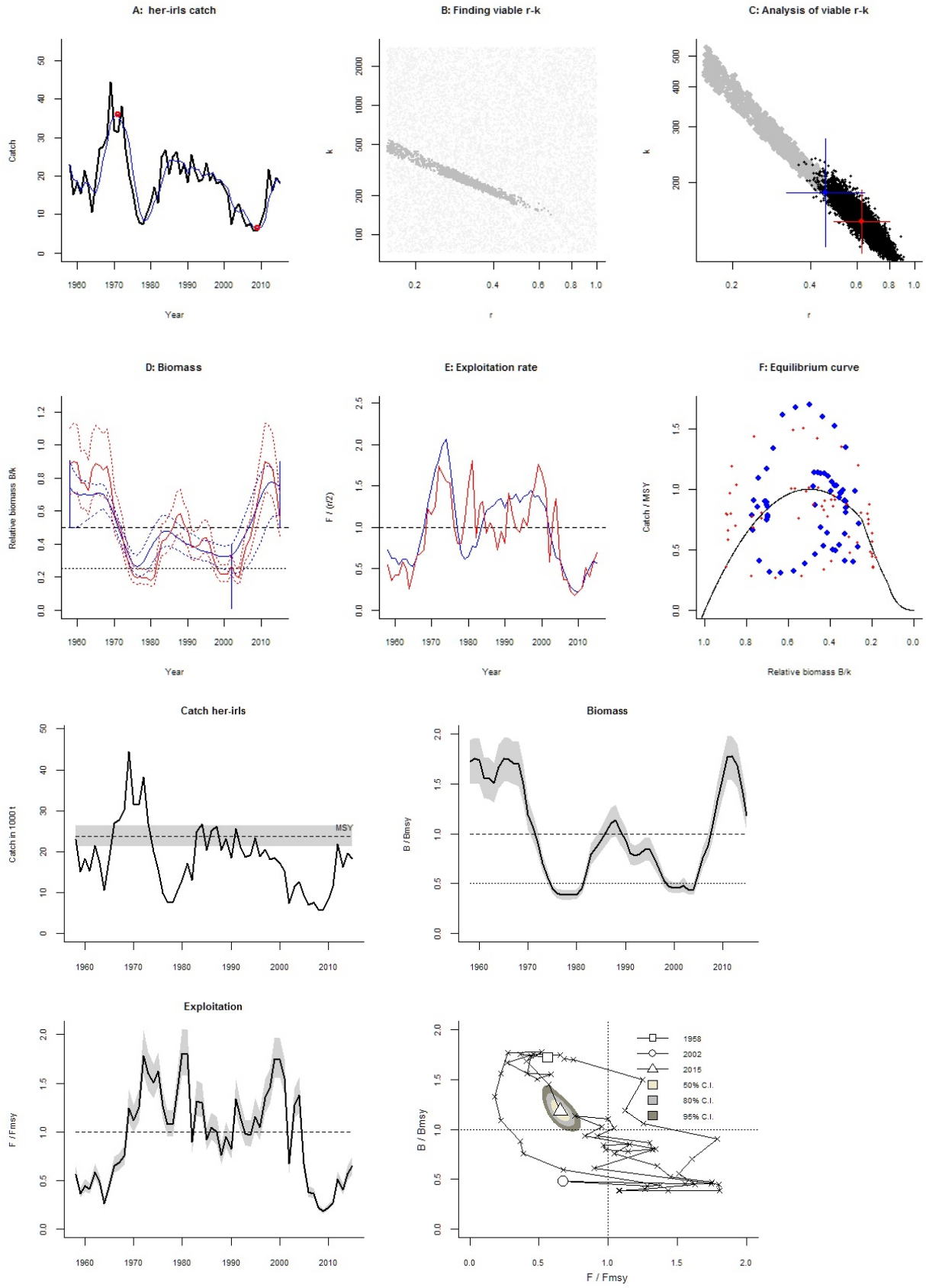
Species: *Clupea harengus* , stock: her-irls
Herring in Division VIIa South of 52° 30' N and VIIg,h,j,k
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/her-irls.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1958 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2002 expert
Prior final relative biomass = 0.5 - 0.9 expert
Prior range for r = 0.16 - 1 expert, , prior range for k = 72 - 2757
Prior range of q = 1.02 - 5.18

Results of CMSY analysis with altogether 4021 viable trajectories for 1440 r-k pairs
r = 0.455 , 95% CL = 0.322 - 0.642 , k = 186 , 95% CL = 126 - 274
MSY = 21.1 , 95% CL = 19.4 - 23.1
Relative biomass last year = 0.746 k, 2.5th = 0.582 , 97.5th = 0.805
Exploitation F/(r/2) in last year = 0.572

Results from Bayesian Schaefer model using catch & CPUE
r = 0.628 , 95% CL = 0.49 - 0.806 , k = 151 , 95% CL = 121 - 190
MSY = 23.8 , 95% CL = 21.3 - 26.5
Relative biomass in last year = 0.591 k, 2.5th perc = 0.513 , 97.5th perc = 0.687
Exploitation F/(r/2) in last year = 0.654
q = 1.21 , lcl = 0.97 , ucl = 1.51

Results for Management (based on BSM analysis)
Fmsy = 0.314 , 95% CL = 0.245 - 0.403 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.314 , 95% CL = 0.245 - 0.403 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 23.8 , 95% CL = 21.3 - 26.5
Bmsy = 75.6 , 95% CL = 60.3 - 94.9
Biomass in last year = 89.4 , 2.5th perc = 77.6 , 97.5 perc = 104
B/Bmsy in last year = 1.18 , 2.5th perc = 1.03 , 97.5 perc = 1.37
Fishing mortality in last year = 0.205 , 2.5th perc = 0.177 , 97.5 perc = 0.237
F/Fmsy = 0.654 , 2.5th perc = 0.563 , 97.5 perc = 0.753

Stock status and exploitation in 2014
Biomass = 110 , B/Bmsy = 1.45 , fishing mortality F = 0.179 , F/Fmsy = 0.569
Comment: OK (RF 27.09.16)


A: her-irls 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 her-irls
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1958
2002
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

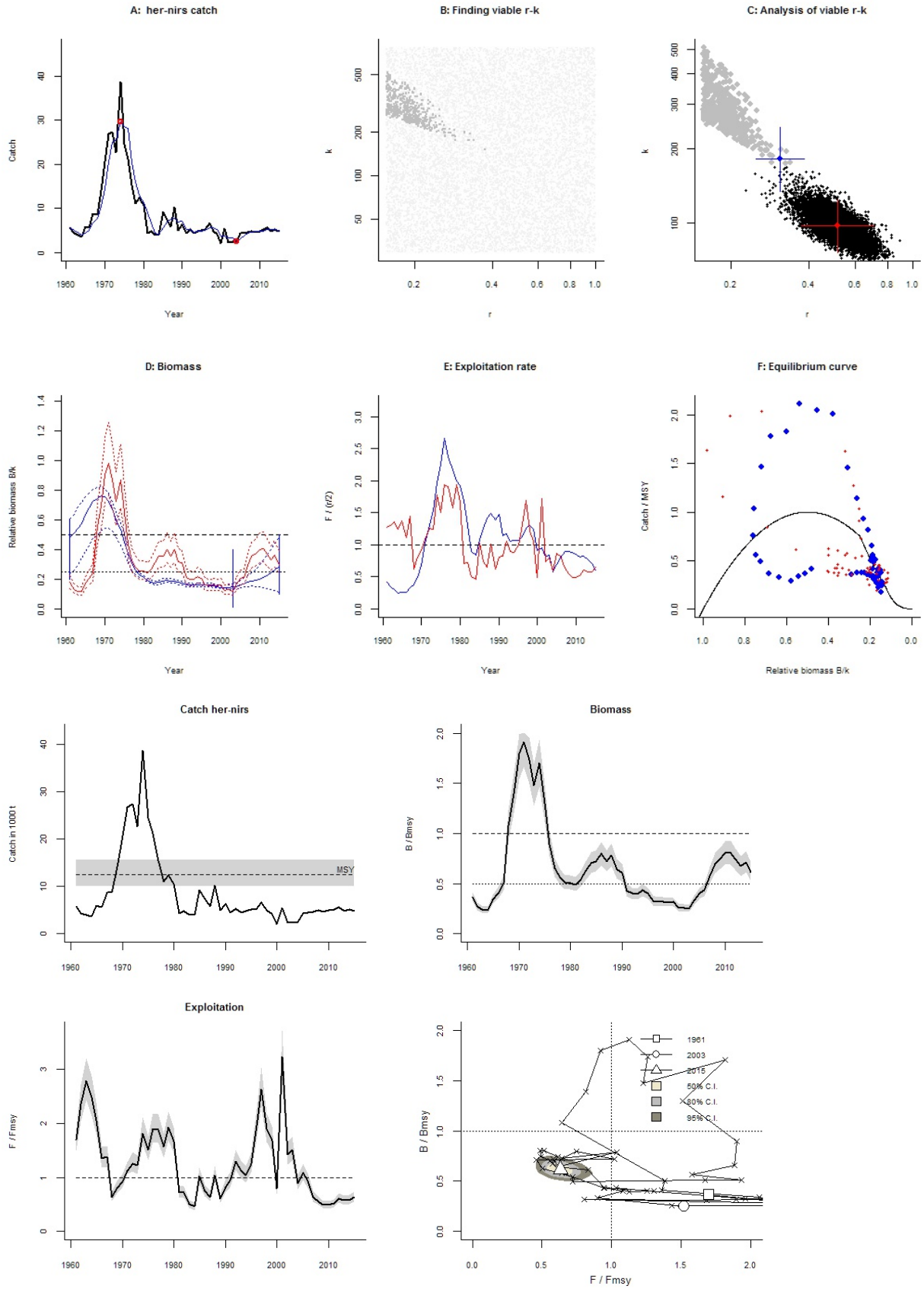
Species: *Clupea harengus* , stock: her-nirs
Herring in Division VIIa North of 52° 30' N (Irish Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/her-nirs.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1961 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2003 default
Prior final relative biomass = 0.1 - 0.5 expert
Prior range for r = 0.16 - 1 expert, , prior range for k = 29.6 - 757
Prior range of q = 0.62 - 3.13

Results of CMSY analysis with altogether 528 viable trajectories for 514 r-k pairs
r = 0.309 , 95% CL = 0.249 - 0.382 , k = 181 , 95% CL = 134 - 243
MSY = 14 , 95% CL = 11.9 - 16.4
Relative biomass last year = 0.29 k, 2.5th = 0.11 , 97.5th = 0.479
Exploitation F/(r/2) in last year = 0.614

Results from Bayesian Schaefer model using catch & CPUE
r = 0.514 , 95% CL = 0.373 - 0.709 , k = 97.4 , 95% CL = 76.2 - 124
MSY = 12.5 , 95% CL = 9.98 - 15.7
Relative biomass in last year = 0.308 k, 2.5th perc = 0.265 , 97.5th perc = 0.357
Exploitation F/(r/2) in last year = 0.632
q = 0.452 , lcl = 0.357 , ucl = 0.572

Results for Management (based on BSM analysis)
Fmsy = 0.257 , 95% CL = 0.186 - 0.355 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.257 , 95% CL = 0.186 - 0.355 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 12.5 , 95% CL = 9.98 - 15.7
Bmsy = 48.7 , 95% CL = 38.1 - 62.2
Biomass in last year = 30 , 2.5th perc = 25.8 , 97.5 perc = 34.8
B/Bmsy in last year = 0.616 , 2.5th perc = 0.529 , 97.5 perc = 0.714
Fishing mortality in last year = 0.162 , 2.5th perc = 0.14 , 97.5 perc = 0.189
F/Fmsy = 0.632 , 2.5th perc = 0.545 , 97.5 perc = 0.735

Stock status and exploitation in 2014
Biomass = 34.9 , B/Bmsy = 0.716 , fishing mortality F = 0.149 , F/Fmsy = 0.58
Comment: OK (RF 27.09.16)


A: her-nirs 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 her-nirs
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1961
2003
2015
50% C.I.
80% C.I.
95% C.I.

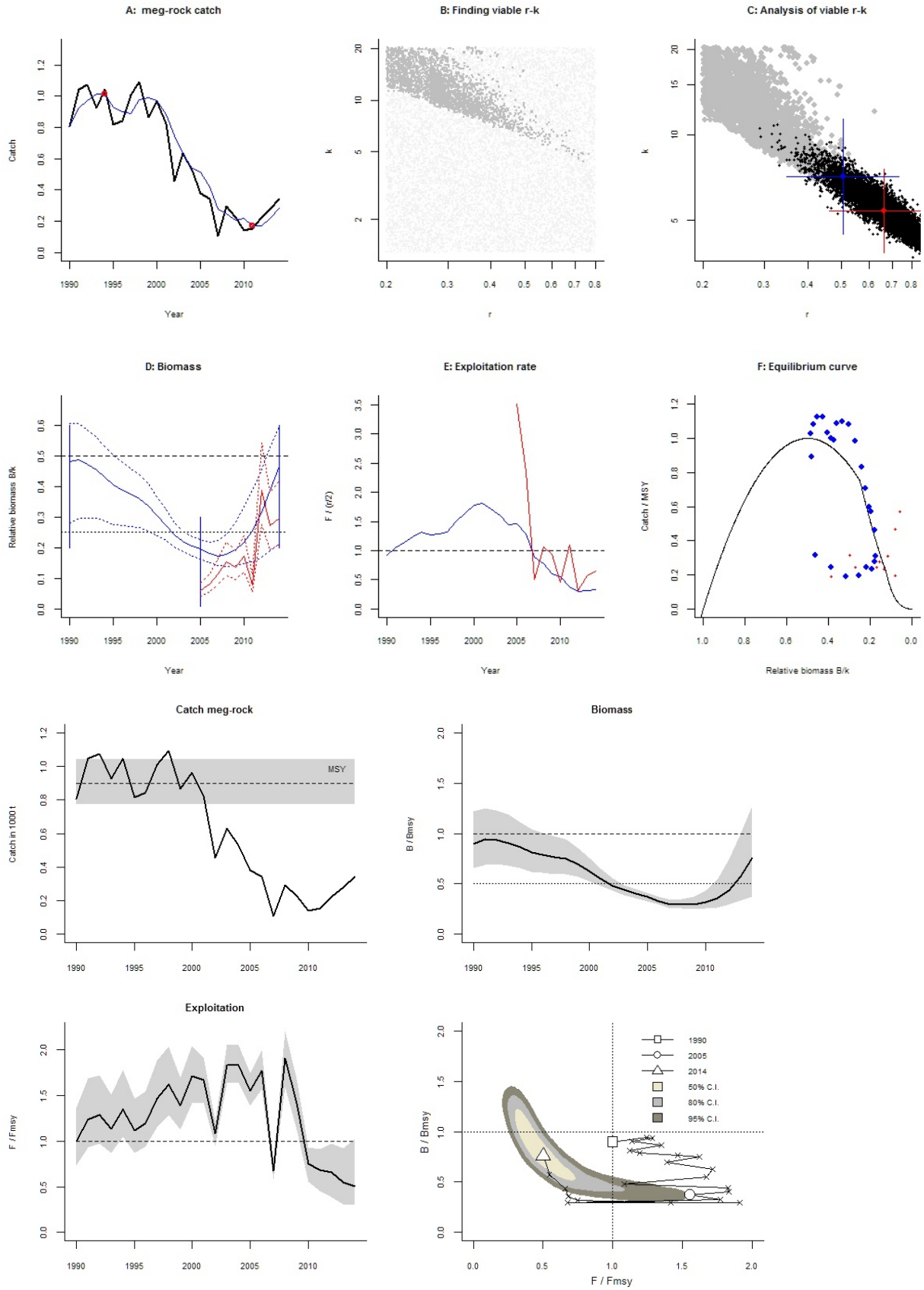
Species: *Lepidorhombus* spp. , stock: meg-rock
Megrim (Lepidorhombus spp.) in Division VIb (Rockall)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/meg-rock.pdf
Region: Northeast Atlantic , Rockall
Catch data used from years 1990 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.3 in year 2005 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 1.27 - 20.3
Prior range of q = 1.42 - 5.68

Results of CMSY analysis with altogether 3930 viable trajectories for 2754 r-k pairs
r = 0.505 , 95% CL = 0.348 - 0.733 , k = 7.13 , 95% CL = 4.45 - 11.4
MSY = 0.9 , 95% CL = 0.635 - 1.28
Relative biomass last year = 0.464 k, 2.5th = 0.211 , 97.5th = 0.594
Exploitation F/(r/2) in last year = 0.337

Results from Bayesian Schaefer model using catch & CPUE
r = 0.665 , 95% CL = 0.462 - 0.959 , k = 5.39 , 95% CL = 3.84 - 7.57
MSY = 0.897 , 95% CL = 0.771 - 1.04
Relative biomass in last year = 0.381 k, 2.5th perc = 0.187 , 97.5th perc = 0.639
Exploitation F/(r/2) in last year = 0.502
q = 2.07 , lcl = 1.51 , ucl = 2.85

Results for Management (based on BSM analysis)
Fmsy = 0.333 , 95% CL = 0.231 - 0.479 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.333 , 95% CL = 0.231 - 0.479 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.897 , 95% CL = 0.771 - 1.04
Bmsy = 2.7 , 95% CL = 1.92 - 3.78
Biomass in last year = 2.05 , 2.5th perc = 1.01 , 97.5 perc = 3.44
B/Bmsy in last year = 0.761 , 2.5th perc = 0.375 , 97.5 perc = 1.28
Fishing mortality in last year = 0.167 , 2.5th perc = 0.0996 , 97.5 perc = 0.339
F/Fmsy = 0.502 , 2.5th perc = 0.299 , 97.5 perc = 1.02

Stock status and exploitation in 2014
Biomass = 2.05 , B/Bmsy = 0.761 , fishing mortality F = 0.167 , F/Fmsy = 0.502
Comment: OK (RF 27.09.16)


A: meg-rock 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 meg-rock
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.

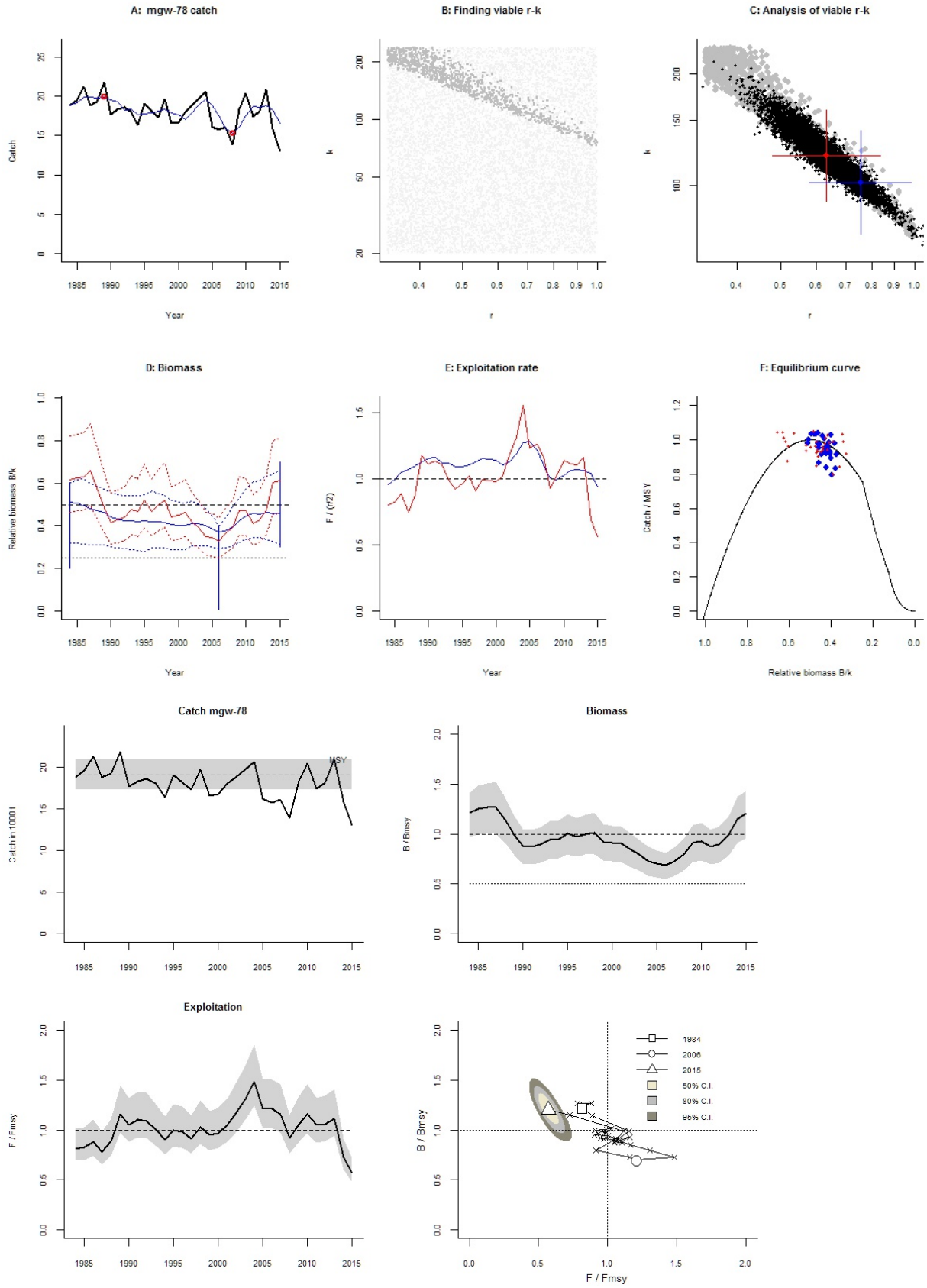
Species: *Lepidorhombus whiffiagonis* , stock: mgw-78
Megrim in Divisions VIIb–k and VIIIa, b, d (West and Southwest of Ireland, Bay of Biscay)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/mgw-78.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1984 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2006 expert
Prior final relative biomass = 0.3 - 0.7 expert
Prior range for r = 0.34 - 1 expert, , prior range for k = 20 - 235
Prior range of q = 0.443 - 1.52

Results of CMSY analysis with altogether 1576 viable trajectories for 1152 r-k pairs
r = 0.756 , 95% CL = 0.582 - 0.982 , k = 102 , 95% CL = 73.7 - 140
MSY = 19.2 , 95% CL = 16.8 - 22
Relative biomass last year = 0.458 k, 2.5th = 0.312 , 97.5th = 0.663
Exploitation F/(r/2) in last year = 0.945

Results from Bayesian Schaefer model using catch & CPUE
r = 0.633 , 95% CL = 0.479 - 0.835 , k = 120 , 95% CL = 90.5 - 160
MSY = 19 , 95% CL = 17.3 - 20.9
Relative biomass in last year = 0.601 k, 2.5th perc = 0.478 , 97.5th perc = 0.713
Exploitation F/(r/2) in last year = 0.571
q = 0.944 , lcl = 0.733 , ucl = 1.22

Results for Management (based on BSM analysis)
Fmsy = 0.316 , 95% CL = 0.24 - 0.418 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.316 , 95% CL = 0.24 - 0.418 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 19 , 95% CL = 17.3 - 20.9
Bmsy = 60.2 , 95% CL = 45.3 - 80
Biomass in last year = 72.3 , 2.5th perc = 57.6 , 97.5 perc = 85.8
B/Bmsy in last year = 1.2 , 2.5th perc = 0.957 , 97.5 perc = 1.43
Fishing mortality in last year = 0.181 , 2.5th perc = 0.152 , 97.5 perc = 0.227
F/Fmsy = 0.571 , 2.5th perc = 0.482 , 97.5 perc = 0.718

Stock status and exploitation in 2014
Biomass = 69.2 , B/Bmsy = 1.15 , fishing mortality F = 0.229 , F/Fmsy = 0.723
Comment: OK (RF 27.09.16)


A: mgw-78 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 mgw-78
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1984
2006
2015
50% C.I.
80% C.I.
95% C.I.

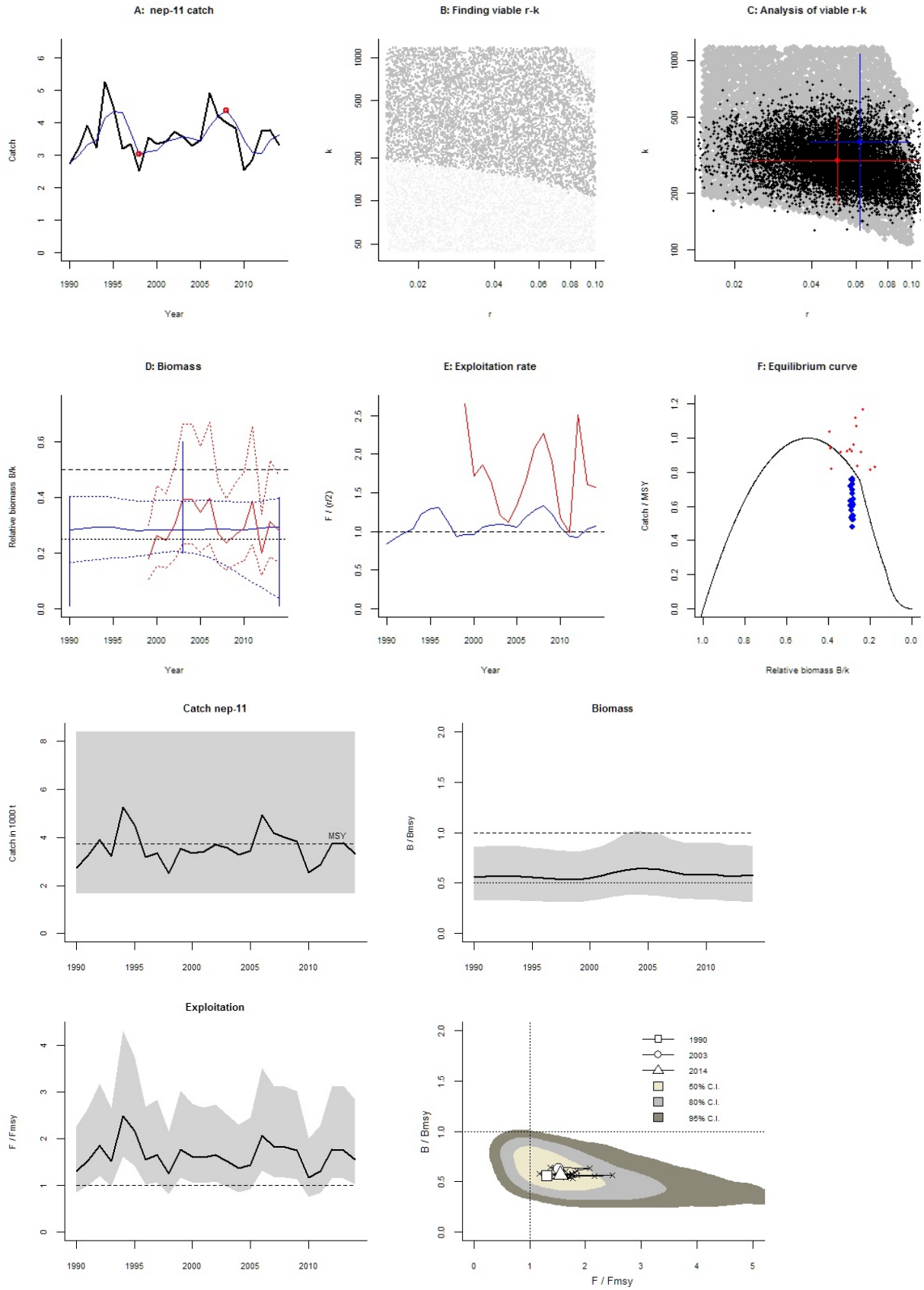
Species: *Nephrops norvegicus* , stock: nep-11
Norway lobster in Division VIa – FU 11 (West of Scotland, North Minch)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/nep-11.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1990 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
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 = 0.015 - 0.1 default , prior range for k = 43.7 - 1165
Prior range of q = 0.00728 - 0.0376

Results of CMSY analysis with altogether 17185 viable trajectories for 6008 r-k pairs
r = 0.062 , 95% CL = 0.0397 - 0.097 , k = 371 , 95% CL = 127 - 1083
MSY = 5.75 , 95% CL = 1.69 - 19.6
Relative biomass last year = 0.293 k, 2.5th = 0.0363 , 97.5th = 0.397
Exploitation F/(r/2) in last year = 1.07

Results from Bayesian Schaefer model using catch & CPUE
r = 0.0509 , 95% CL = 0.0229 - 0.113 , k = 295 , 95% CL = 174 - 498
MSY = 3.74 , 95% CL = 1.67 - 8.41
Relative biomass in last year = 0.285 k, 2.5th perc = 0.156 , 97.5th perc = 0.435
Exploitation F/(r/2) in last year = 1.55
q = 0.0152 , lcl = 0.0106 , ucl = 0.0217

Results for Management (based on BSM analysis)
Fmsy = 0.0254 , 95% CL = 0.0115 - 0.0564 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0254 , 95% CL = 0.0115 - 0.0564 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 3.74 , 95% CL = 1.67 - 8.41
Bmsy = 147 , 95% CL = 87 - 249
Biomass in last year = 84 , 2.5th perc = 45.9 , 97.5 perc = 128
B/Bmsy in last year = 0.571 , 2.5th perc = 0.312 , 97.5 perc = 0.869
Fishing mortality in last year = 0.0394 , 2.5th perc = 0.0259 , 97.5 perc = 0.0722
F/Fmsy = 1.55 , 2.5th perc = 1.02 , 97.5 perc = 2.84

Stock status and exploitation in 2014
Biomass = 84 , B/Bmsy = 0.571 , fishing mortality F = 0.0394 , F/Fmsy = 1.55
Comment: OK (RF 27.09.16)


A: nep-11 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 nep-11
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1990
2003
2014
50% C.I.
80% C.I.
95% C.I.

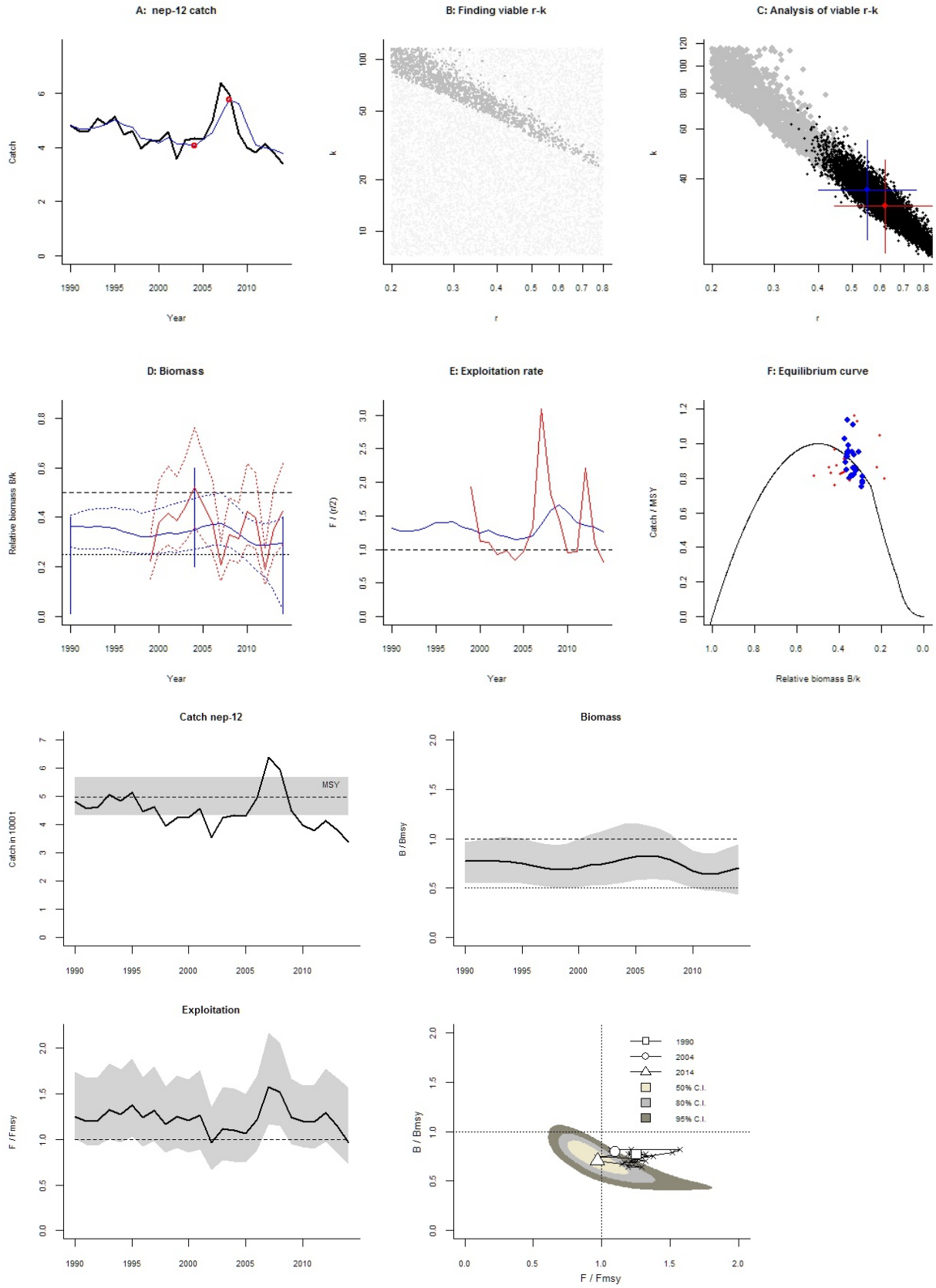
Species: *Nephrops norvegicus* , stock: nep-12
Norway lobster in Division VIa – FU 12 (West of Scotland, South Minch)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/nep-12.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1990 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 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 = 0.2 - 0.8 default , prior range for k = 7.2 - 115
Prior range of q = 0.0948 - 0.379

Results of CMSY analysis with altogether 2319 viable trajectories for 1652 r-k pairs
r = 0.553 , 95% CL = 0.401 - 0.762 , k = 36.6 , 95% CL = 24.5 - 54.9
MSY = 5.06 , 95% CL = 4.3 - 5.96
Relative biomass last year = 0.296 k, 2.5th = 0.0254 , 97.5th = 0.396
Exploitation F/(r/2) in last year = 1.26

Results from Bayesian Schaefer model using catch & CPUE
r = 0.619 , 95% CL = 0.445 - 0.863 , k = 32.1 , 95% CL = 22 - 46.7
MSY = 4.97 , 95% CL = 4.33 - 5.69
Relative biomass in last year = 0.353 k, 2.5th perc = 0.218 , 97.5th perc = 0.47
Exploitation F/(r/2) in last year = 0.967
q = 0.153 , lcl = 0.116 , ucl = 0.2

Results for Management (based on BSM analysis)
Fmsy = 0.31 , 95% CL = 0.222 - 0.431 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.31 , 95% CL = 0.222 - 0.431 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 4.97 , 95% CL = 4.33 - 5.69
Bmsy = 16 , 95% CL = 11 - 23.3
Biomass in last year = 11.3 , 2.5th perc = 7 , 97.5 perc = 15.1
B/Bmsy in last year = 0.707 , 2.5th perc = 0.437 , 97.5 perc = 0.94
Fishing mortality in last year = 0.3 , 2.5th perc = 0.225 , 97.5 perc = 0.485
F/Fmsy = 0.967 , 2.5th perc = 0.727 , 97.5 perc = 1.57

Stock status and exploitation in 2014
Biomass = 11.3 , B/Bmsy = 0.707 , fishing mortality F = 0.3 , F/Fmsy = 0.967
Comment: OK (RF 27.09.16)


A: nep-12 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 nep-12
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1990
2004
2014
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

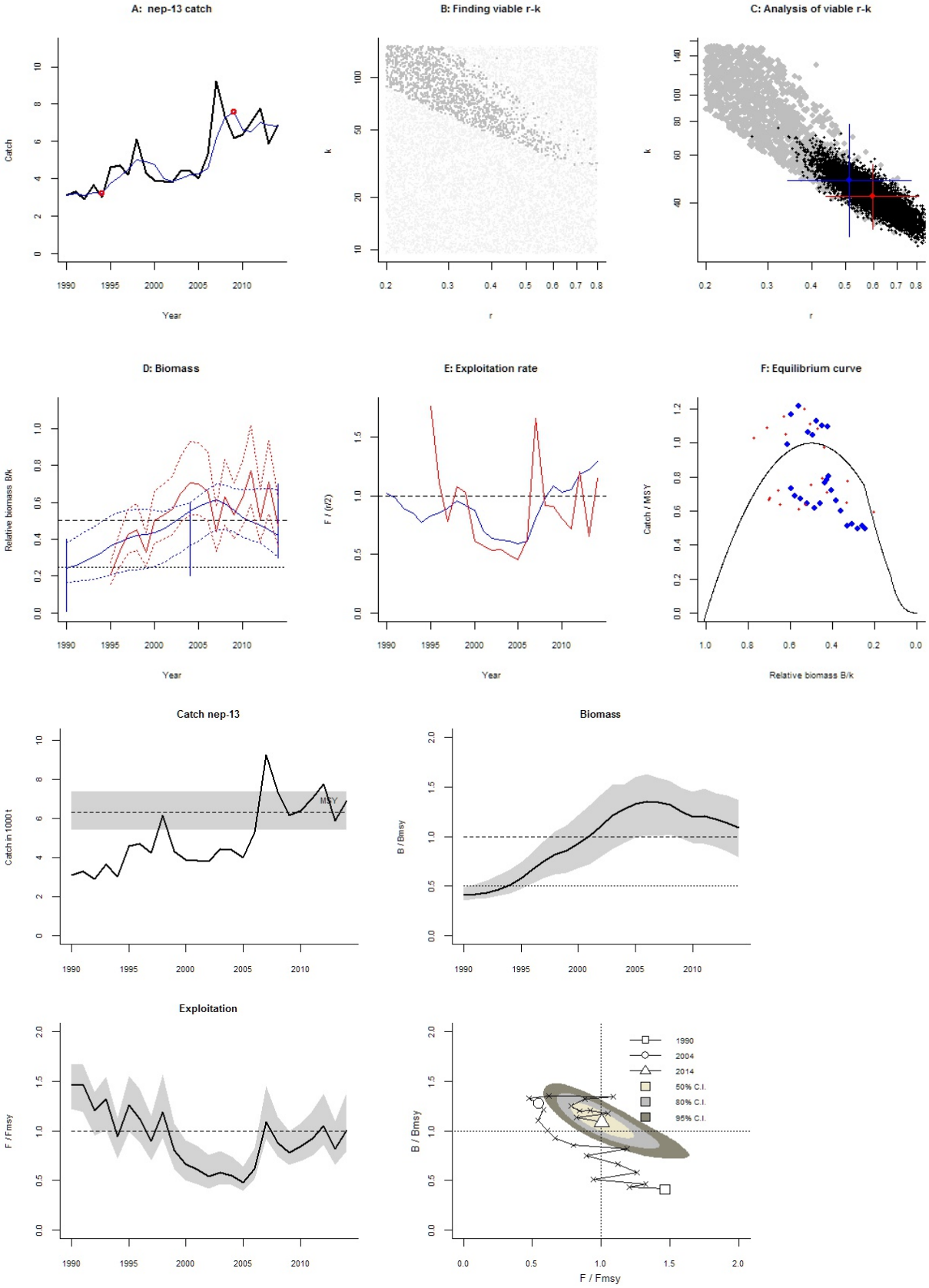
Species: *Nephrops norvegicus* , stock: nep-13
Norway lobster in Division VIa – FU 13 (West of Scotland, the Firth of Clyde, and the Sound of Jura)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/nep-13.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1990 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2004 expert
Prior final relative biomass = 0.3 - 0.7 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 9.48 - 152
Prior range of q = 0.0406 - 0.162

Results of CMSY analysis with altogether 2827 viable trajectories for 1511 r-k pairs
r = 0.513 , 95% CL = 0.342 - 0.771 , k = 48.6 , 95% CL = 30.1 - 78.5
MSY = 6.24 , 95% CL = 4.37 - 8.9
Relative biomass last year = 0.423 k, 2.5th = 0.305 , 97.5th = 0.672
Exploitation F/(r/2) in last year = 1.3

Results from Bayesian Schaefer model using catch & CPUE
r = 0.598 , 95% CL = 0.44 - 0.811 , k = 42.3 , 95% CL = 32.1 - 55.7
MSY = 6.32 , 95% CL = 5.42 - 7.37
Relative biomass in last year = 0.543 k, 2.5th perc = 0.394 , 97.5th perc = 0.681
Exploitation F/(r/2) in last year = 1
q = 0.0663 , lcl = 0.0505 , ucl = 0.0869

Results for Management (based on BSM analysis)
Fmsy = 0.299 , 95% CL = 0.22 - 0.405 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.299 , 95% CL = 0.22 - 0.405 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 6.32 , 95% CL = 5.42 - 7.37
Bmsy = 21.1 , 95% CL = 16 - 27.9
Biomass in last year = 23 , 2.5th perc = 16.7 , 97.5 perc = 28.8
B/Bmsy in last year = 1.09 , 2.5th perc = 0.789 , 97.5 perc = 1.36
Fishing mortality in last year = 0.3 , 2.5th perc = 0.239 , 97.5 perc = 0.413
F/Fmsy = 1 , 2.5th perc = 0.799 , 97.5 perc = 1.38

Stock status and exploitation in 2014
Biomass = 23 , B/Bmsy = 1.09 , fishing mortality F = 0.3 , F/Fmsy = 1
Comment: OK (RF 27.09.16)


A: nep-13 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 nep-13
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1990
2004
2014
50% C.I.
80% C.I.
95% C.I.

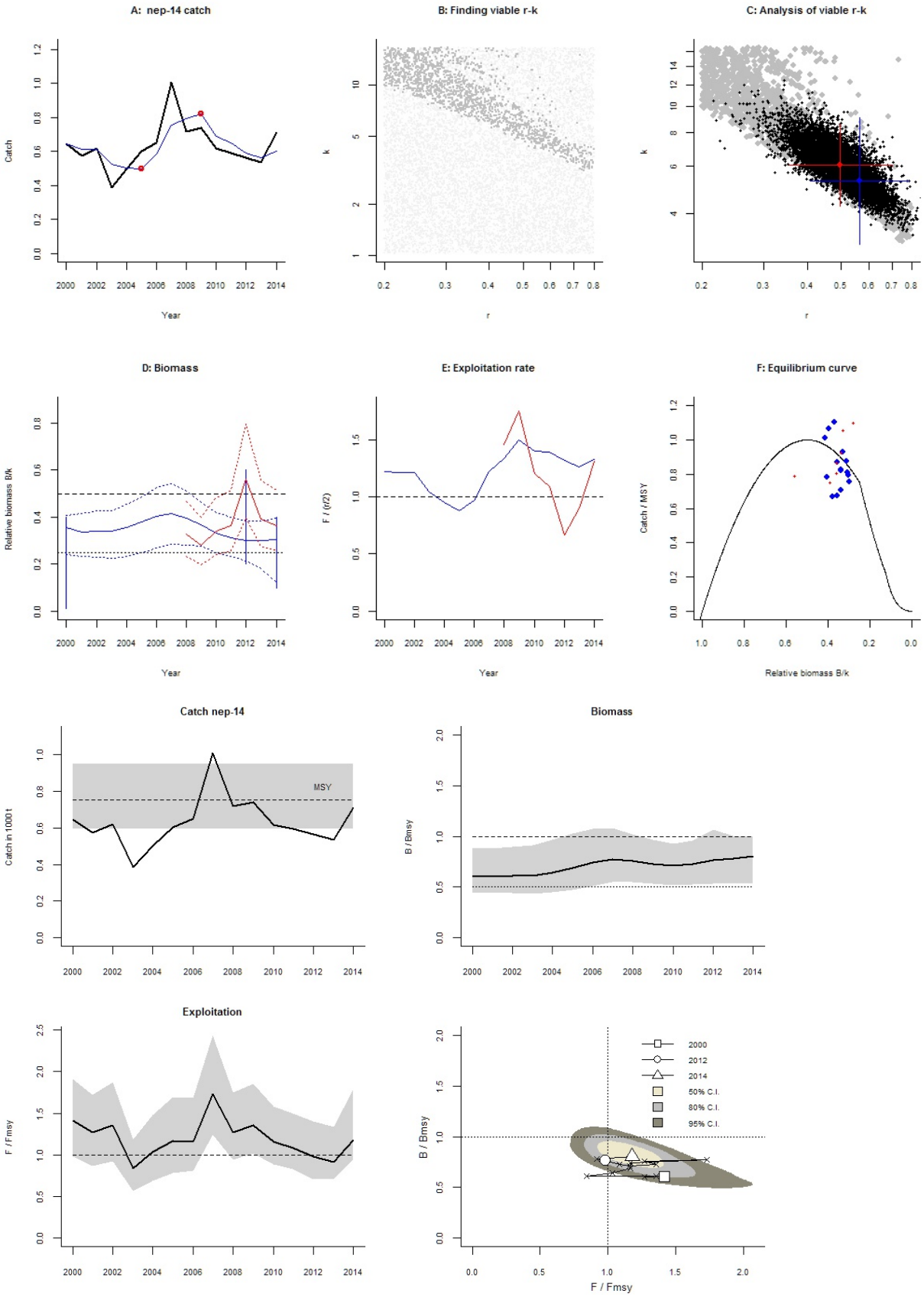
Species: *Nephrops norvegicus* , stock: nep-14
Norway lobster in Division VIIa – FU 14 (Irish Sea, East)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/nep-14.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 2000 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2012 expert
Prior final relative biomass = 0.1 - 0.4 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 1.03 - 16.4
Prior range of q = 0.11 - 0.441

Results of CMSY analysis with altogether 2571 viable trajectories for 1582 r-k pairs
r = 0.566 , 95% CL = 0.407 - 0.785 , k = 5.26 , 95% CL = 3.06 - 9.05
MSY = 0.744 , 95% CL = 0.489 - 1.13
Relative biomass last year = 0.306 k, 2.5th = 0.123 , 97.5th = 0.396
Exploitation F/(r/2) in last year = 1.32

Results from Bayesian Schaefer model using catch & CPUE
r = 0.498 , 95% CL = 0.354 - 0.7 , k = 6.03 , 95% CL = 4.25 - 8.54
MSY = 0.75 , 95% CL = 0.594 - 0.946
Relative biomass in last year = 0.402 k, 2.5th perc = 0.266 , 97.5th perc = 0.499
Exploitation F/(r/2) in last year = 1.18
q = 0.206 , lcl = 0.155 , ucl = 0.272

Results for Management (based on BSM analysis)
Fmsy = 0.249 , 95% CL = 0.177 - 0.35 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.249 , 95% CL = 0.177 - 0.35 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.75 , 95% CL = 0.594 - 0.946
Bmsy = 3.01 , 95% CL = 2.12 - 4.27
Biomass in last year = 2.42 , 2.5th perc = 1.6 , 97.5 perc = 3.01
B/Bmsy in last year = 0.804 , 2.5th perc = 0.531 , 97.5 perc = 0.998
Fishing mortality in last year = 0.293 , 2.5th perc = 0.237 , 97.5 perc = 0.444
F/Fmsy = 1.18 , 2.5th perc = 0.95 , 97.5 perc = 1.78

Stock status and exploitation in 2014
Biomass = 2.42 , B/Bmsy = 0.804 , fishing mortality F = 0.293 , F/Fmsy = 1.18
Comment: OK (RF 27.09.16)


A: nep-14 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 nep-14
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
2000
2012
2014
50% C.I.
80% C.I.
95% C.I.

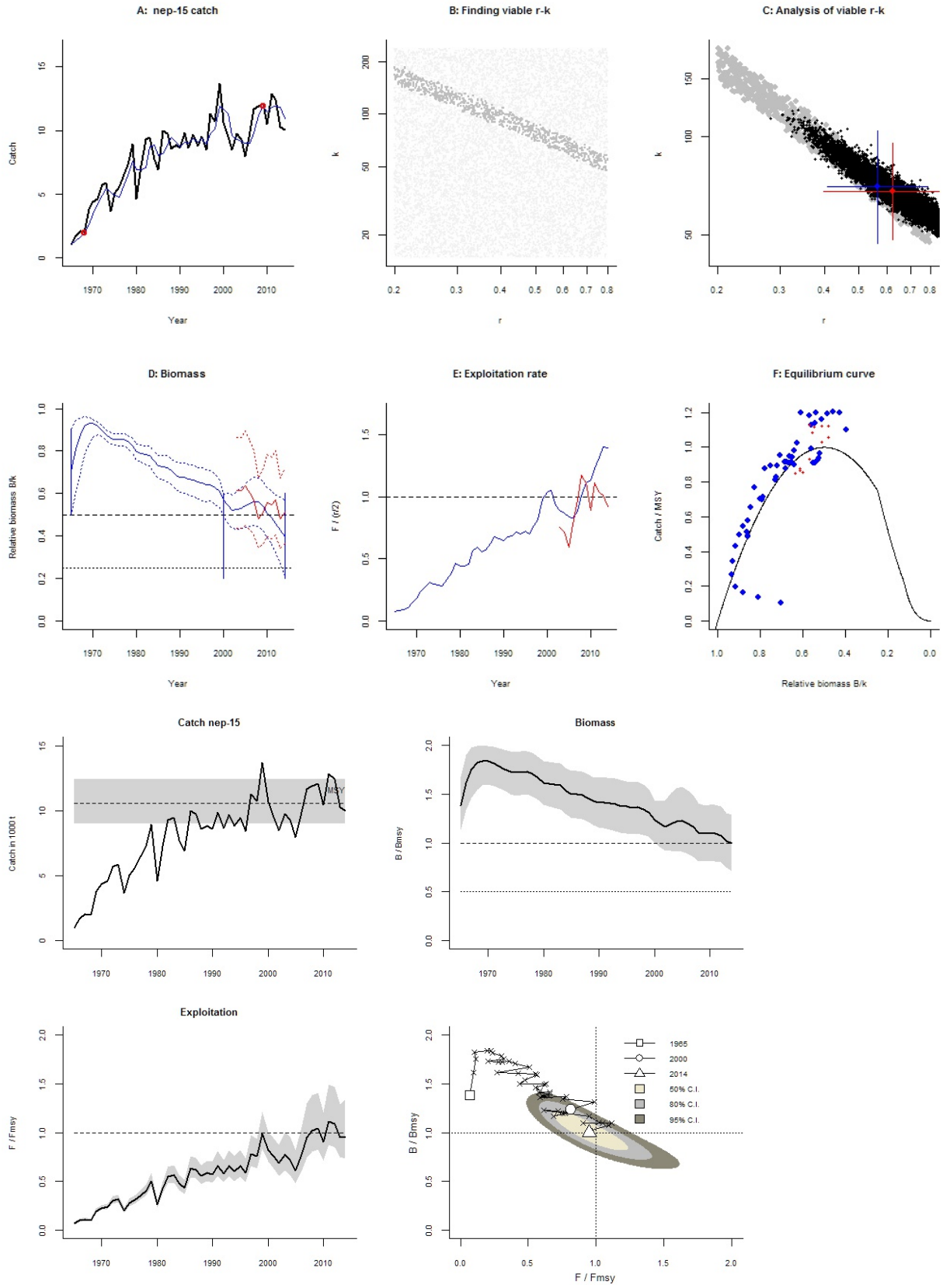
Species: *Nephrops norvegicus* , stock: nep-15
Norway lobster in Division VIIa – FU 15 (Irish Sea, West)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/nep-15.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1965 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.2 - 0.6 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 = 14.9 - 238
Prior range of q = 0.0816 - 0.326

Results of CMSY analysis with altogether 5643 viable trajectories for 811 r-k pairs
r = 0.566 , 95% CL = 0.407 - 0.785 , k = 70.1 , 95% CL = 47.2 - 104
MSY = 9.91 , 95% CL = 8.67 - 11.3
Relative biomass last year = 0.395 k, 2.5th = 0.211 , 97.5th = 0.566
Exploitation F/(r/2) in last year = 1.39

Results from Bayesian Schaefer model using catch & CPUE
r = 0.623 , 95% CL = 0.398 - 0.976 , k = 67.9 , 95% CL = 48.3 - 95.5
MSY = 10.6 , 95% CL = 9 - 12.4
Relative biomass in last year = 0.499 k, 2.5th perc = 0.354 , 97.5th perc = 0.646
Exploitation F/(r/2) in last year = 0.949
q = 0.132 , lcl = 0.101 , ucl = 0.172

Results for Management (based on BSM analysis)
Fmsy = 0.312 , 95% CL = 0.199 - 0.488 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.312 , 95% CL = 0.199 - 0.488 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 10.6 , 95% CL = 9 - 12.4
Bmsy = 33.9 , 95% CL = 24.1 - 47.8
Biomass in last year = 33.9 , 2.5th perc = 24 , 97.5 perc = 43.8
B/Bmsy in last year = 0.998 , 2.5th perc = 0.708 , 97.5 perc = 1.29
Fishing mortality in last year = 0.296 , 2.5th perc = 0.228 , 97.5 perc = 0.416
F/Fmsy = 0.949 , 2.5th perc = 0.733 , 97.5 perc = 1.34

Stock status and exploitation in 2014
Biomass = 33.9 , B/Bmsy = 0.998 , fishing mortality F = 0.296 , F/Fmsy = 0.949
Comment: OK (RF 27.09.16)


A: nep-15 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 nep-15
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1965
2000
2014
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

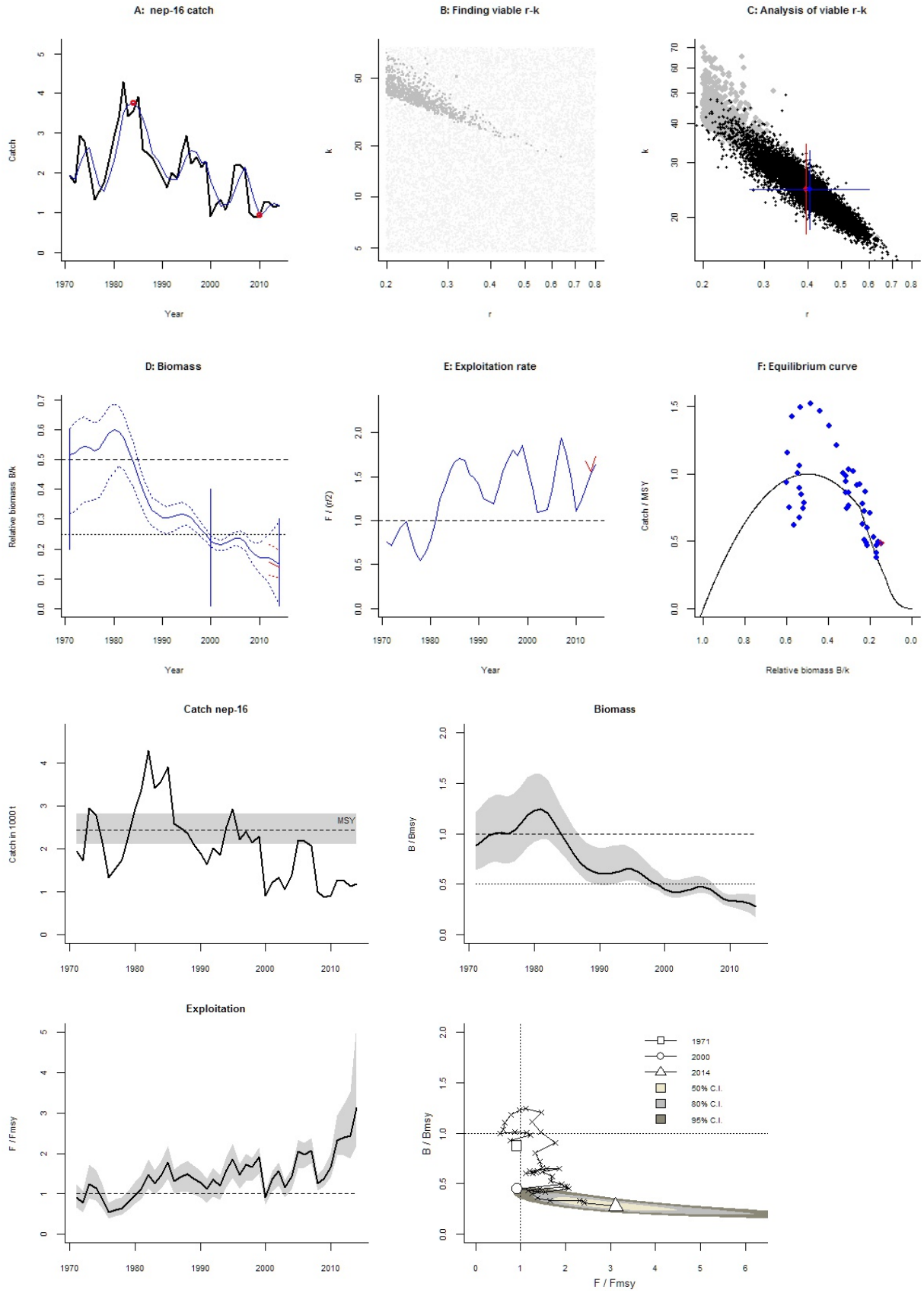
Species: *Nephrops norvegicus* , stock: nep-16
Norway lobster in Divisions VIIb, VIIc, VIIj, and VIIk – FU 16 (West and Southwest of Ireland, Porcupine Bank)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/nep-16.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1971 - 2014 , 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 = 0.2 - 0.8 default , prior range for k = 4.7 - 75.2
Prior range of q = 0.127 - 0.51

Results of CMSY analysis with altogether 1044 viable trajectories for 965 r-k pairs
r = 0.405 , 95% CL = 0.272 - 0.601 , k = 24.5 , 95% CL = 18.3 - 32.6
MSY = 2.47 , 95% CL = 2.18 - 2.81
Relative biomass last year = 0.148 k, 2.5th = 0.013 , 97.5th = 0.293
Exploitation F/(r/2) in last year = 1.63

Results from Bayesian Schaefer model using catch & CPUE
r = 0.397 , 95% CL = 0.273 - 0.578 , k = 24.6 , 95% CL = 17.7 - 34.2
MSY = 2.44 , 95% CL = 2.11 - 2.82
Relative biomass in last year = 0.14 k, 2.5th perc = 0.0844 , 97.5th perc = 0.199
Exploitation F/(r/2) in last year = 1.74
q = 0.208 , lcl = 0.159 , ucl = 0.273

Results for Management (based on BSM analysis)
Fmsy = 0.199 , 95% CL = 0.136 - 0.289 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.111 , 95% CL = 0.0763 - 0.161 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 2.44 , 95% CL = 2.11 - 2.82
Bmsy = 12.3 , 95% CL = 8.83 - 17.1
Biomass in last year = 3.44 , 2.5th perc = 2.08 , 97.5 perc = 4.89
B/Bmsy in last year = 0.279 , 2.5th perc = 0.169 , 97.5 perc = 0.398
Fishing mortality in last year = 0.346 , 2.5th perc = 0.243 , 97.5 perc = 0.573
F/Fmsy = 3.12 , 2.5th perc = 2.19 , 97.5 perc = 5.16

Stock status and exploitation in 2014
Biomass = 3.44 , B/Bmsy = 0.279 , fishing mortality F = 0.346 , F/Fmsy = 3.12
Comment: OK (RF 27.09.16)


A: nep-16 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 nep-16
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.

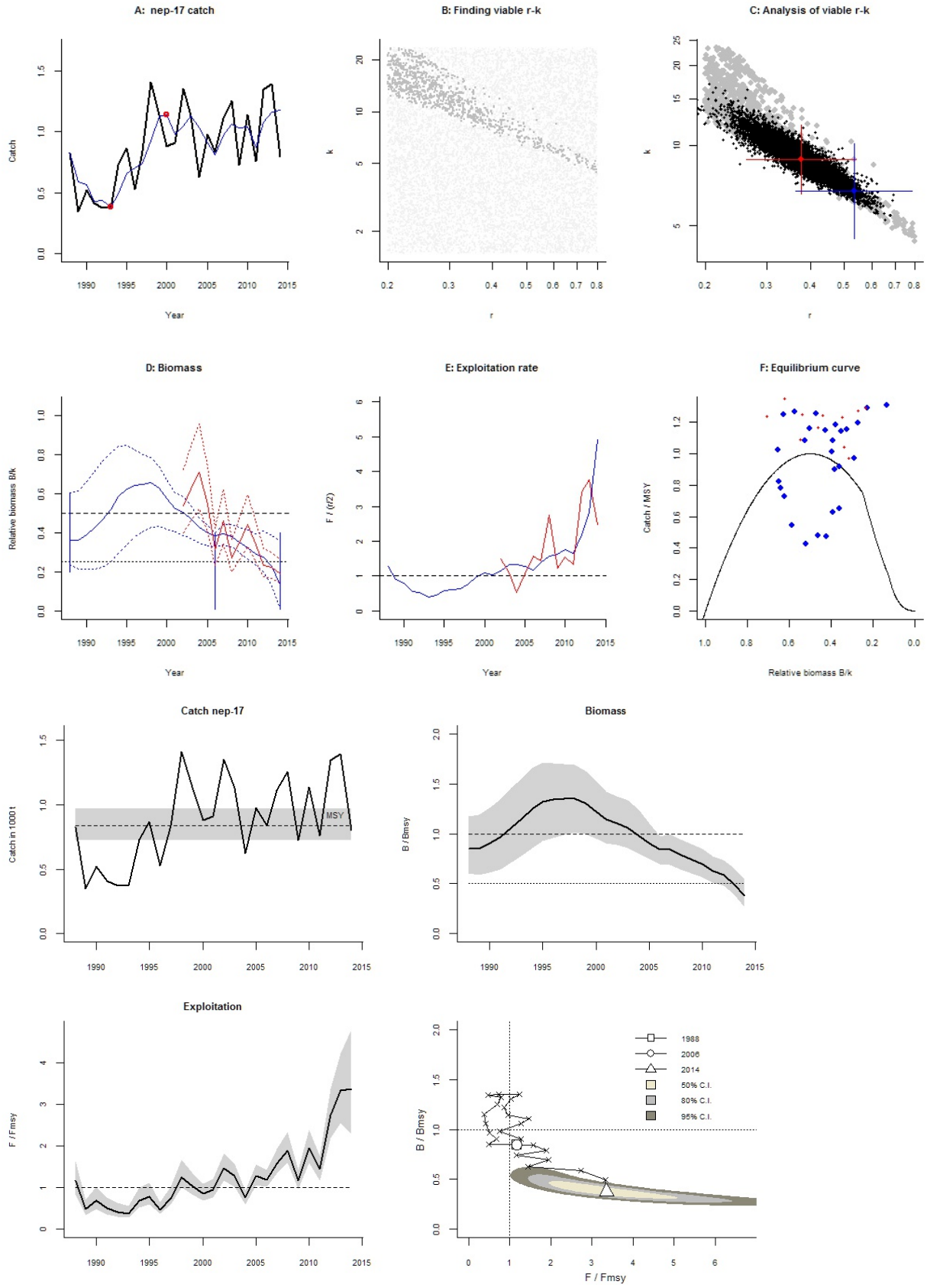
Species: *Nephrops norvegicus* , stock: nep-17
Norway lobster in Division VIIb – FU 17 (West of Ireland, Aran Grounds)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/nep-17.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1988 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2006 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 1.48 - 23.6
Prior range of q = 0.111 - 0.444

Results of CMSY analysis with altogether 1529 viable trajectories for 945 r-k pairs
r = 0.534 , 95% CL = 0.363 - 0.786 , k = 6.77 , 95% CL = 4.49 - 10.2
MSY = 0.903 , 95% CL = 0.751 - 1.09
Relative biomass last year = 0.133 k, 2.5th = 0.0157 , 97.5th = 0.358
Exploitation F/(r/2) in last year = 4.92

Results from Bayesian Schaefer model using catch & CPUE
r = 0.377 , 95% CL = 0.262 - 0.543 , k = 8.89 , 95% CL = 6.59 - 12
MSY = 0.839 , 95% CL = 0.725 - 0.97
Relative biomass in last year = 0.188 k, 2.5th perc = 0.132 , 97.5th perc = 0.276
Exploitation F/(r/2) in last year = 2.53
q = 0.224 , lcl = 0.178 , ucl = 0.283

Results for Management (based on BSM analysis)
Fmsy = 0.189 , 95% CL = 0.131 - 0.271 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.142 , 95% CL = 0.0988 - 0.205 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.839 , 95% CL = 0.725 - 0.97
Bmsy = 4.45 , 95% CL = 3.3 - 6
Biomass in last year = 1.68 , 2.5th perc = 1.17 , 97.5 perc = 2.46
B/Bmsy in last year = 0.377 , 2.5th perc = 0.264 , 97.5 perc = 0.553
Fishing mortality in last year = 0.478 , 2.5th perc = 0.326 , 97.5 perc = 0.681
F/Fmsy = 3.36 , 2.5th perc = 2.29 , 97.5 perc = 4.79

Stock status and exploitation in 2014
Biomass = 1.68 , B/Bmsy = 0.377 , fishing mortality F = 0.478 , F/Fmsy = 3.36
Comment: OK (RF 27.09.16)


A: nep-17 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 nep-17
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1988
2006
2014
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

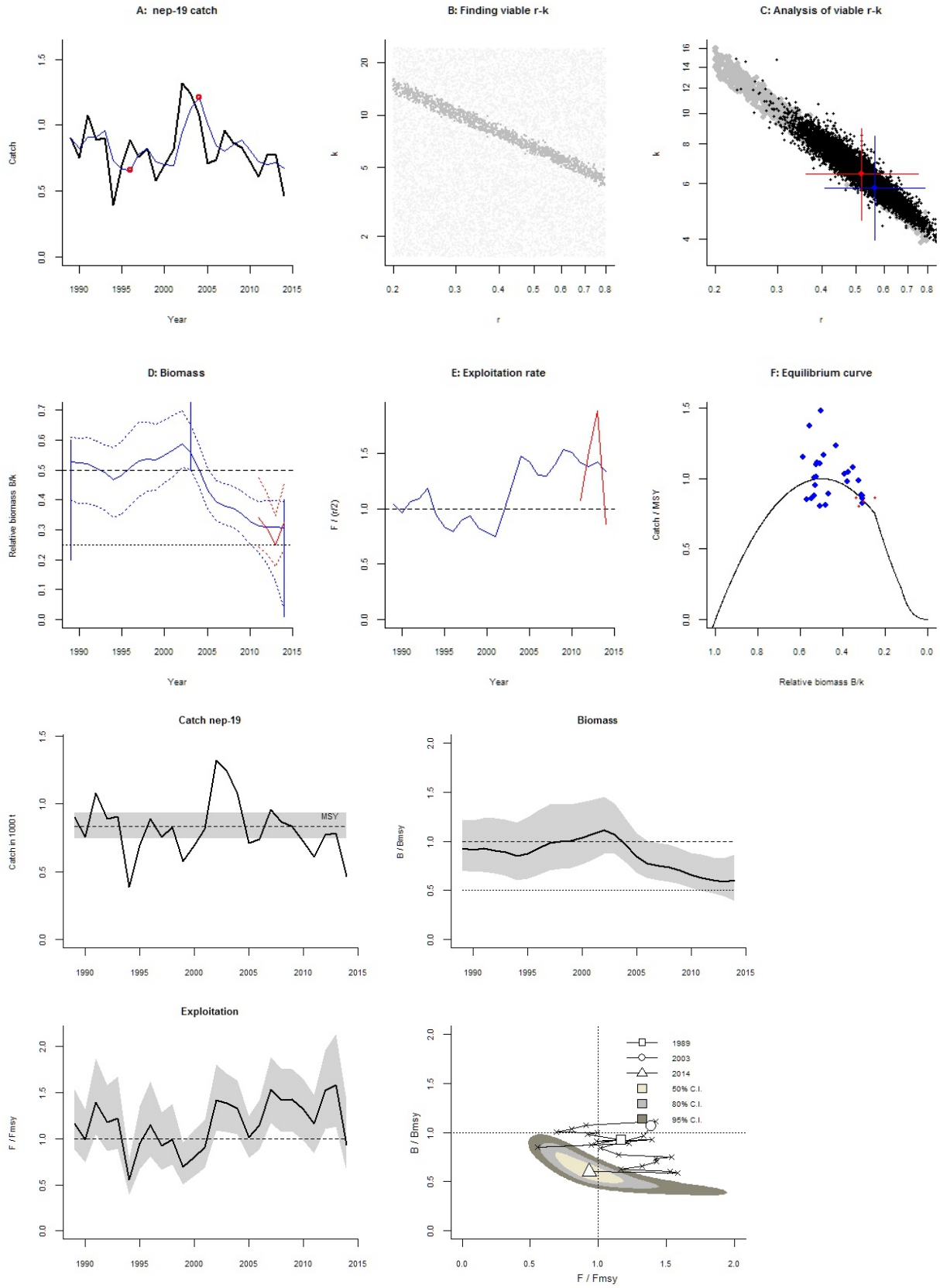
Species: *Nephrops norvegicus* , stock: nep-19
Norway lobster in Divisions VIIa, VIIg, and VIIj – FU 19 (Irish Sea, Celtic Sea, Eastern Southwest of Ireland)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/nep-19.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1989 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.5 - 0.9 in year 2003 default
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 1.51 - 24.2
Prior range of q = 0.169 - 0.677

Results of CMSY analysis with altogether 2523 viable trajectories for 1223 r-k pairs
r = 0.566 , 95% CL = 0.407 - 0.785 , k = 5.78 , 95% CL = 3.96 - 8.44
MSY = 0.818 , 95% CL = 0.741 - 0.903
Relative biomass last year = 0.307 k, 2.5th = 0.0336 , 97.5th = 0.396
Exploitation F/(r/2) in last year = 1.34

Results from Bayesian Schaefer model using catch & CPUE
r = 0.52 , 95% CL = 0.36 - 0.752 , k = 6.42 , 95% CL = 4.59 - 8.96
MSY = 0.834 , 95% CL = 0.743 - 0.936
Relative biomass in last year = 0.301 k, 2.5th perc = 0.199 , 97.5th perc = 0.434
Exploitation F/(r/2) in last year = 0.933
q = 0.306 , lcl = 0.228 , ucl = 0.41

Results for Management (based on BSM analysis)
Fmsy = 0.26 , 95% CL = 0.18 - 0.376 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.26 , 95% CL = 0.18 - 0.376 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.834 , 95% CL = 0.743 - 0.936
Bmsy = 3.21 , 95% CL = 2.3 - 4.48
Biomass in last year = 1.93 , 2.5th perc = 1.27 , 97.5 perc = 2.79
B/Bmsy in last year = 0.601 , 2.5th perc = 0.397 , 97.5 perc = 0.868
Fishing mortality in last year = 0.243 , 2.5th perc = 0.168 , 97.5 perc = 0.367
F/Fmsy = 0.933 , 2.5th perc = 0.646 , 97.5 perc = 1.41

Stock status and exploitation in 2014
Biomass = 1.93 , B/Bmsy = 0.601 , fishing mortality F = 0.243 , F/Fmsy = 0.933
Comment: OK (RF 27.09.16)


A: nep-19 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 nep-19
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1989
2003
2014
50% C.I.
80% C.I.
95% C.I.

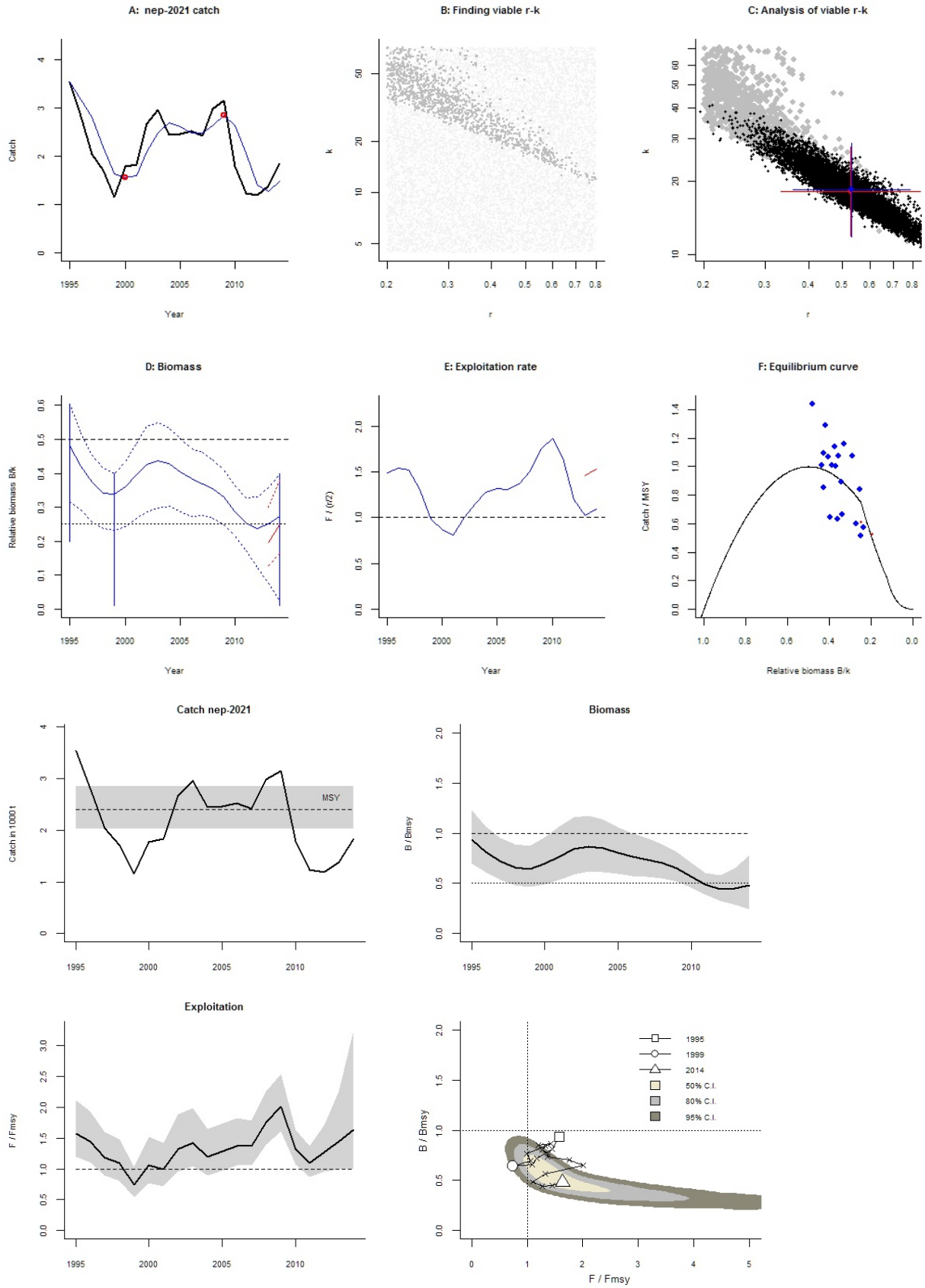
Species: *Nephrops norvegicus* , stock: nep-2021
Norway lobster in Divisions VIIg and VIIh – FUs 20 and 21 (Celtic Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/nep-2021.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1995 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 1999 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 4.42 - 70.7
Prior range of q = 0.268 - 1.07

Results of CMSY analysis with altogether 2104 viable trajectories for 1269 r-k pairs
r = 0.533 , 95% CL = 0.361 - 0.786 , k = 18.5 , 95% CL = 11.9 - 28.7
MSY = 2.46 , 95% CL = 1.9 - 3.18
Relative biomass last year = 0.274 k, 2.5th = 0.0245 , 97.5th = 0.395
Exploitation F/(r/2) in last year = 1.09

Results from Bayesian Schaefer model using catch & CPUE
r = 0.529 , 95% CL = 0.333 - 0.839 , k = 18.2 , 95% CL = 11.9 - 27.7
MSY = 2.4 , 95% CL = 2.02 - 2.85
Relative biomass in last year = 0.242 k, 2.5th perc = 0.121 , 97.5th perc = 0.392
Exploitation F/(r/2) in last year = 1.58
q = 0.452 , lcl = 0.33 , ucl = 0.619

Results for Management (based on BSM analysis)
Fmsy = 0.264 , 95% CL = 0.167 - 0.419 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.256 , 95% CL = 0.161 - 0.406 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 2.4 , 95% CL = 2.02 - 2.85
Bmsy = 9.09 , 95% CL = 5.96 - 13.9
Biomass in last year = 4.4 , 2.5th perc = 2.21 , 97.5 perc = 7.13
B/Bmsy in last year = 0.484 , 2.5th perc = 0.243 , 97.5 perc = 0.784
Fishing mortality in last year = 0.418 , 2.5th perc = 0.258 , 97.5 perc = 0.832
F/Fmsy = 1.63 , 2.5th perc = 1.01 , 97.5 perc = 3.25

Stock status and exploitation in 2014
Biomass = 4.4 , B/Bmsy = 0.484 , fishing mortality F = 0.418 , F/Fmsy = 1.63
Comment: OK (RF 27.09.16)


A: nep-2021 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 nep-2021
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1995
1999
2014
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

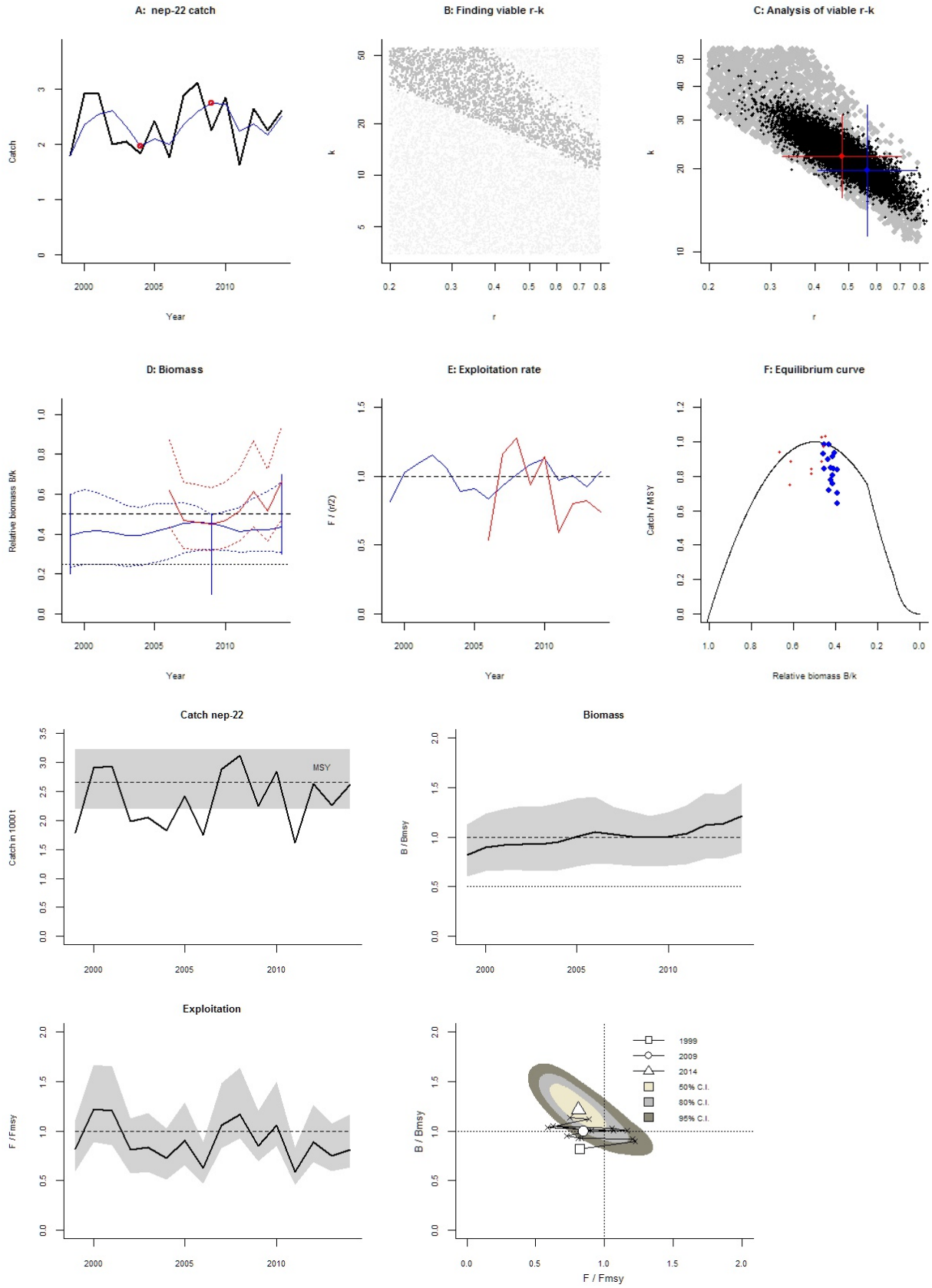
Species: *Nephrops norvegicus* , stock: nep-22
Norway lobster in Divisions VIIg and VIIf – FU 22 (Celtic Sea, Bristol Channel)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/nep-22.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1999 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.1 - 0.5 in year 2009 expert
Prior final relative biomass = 0.3 - 0.7 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 3.43 - 54.9
Prior range of q = 0.0533 - 0.213

Results of CMSY analysis with altogether 5873 viable trajectories for 2412 r-k pairs
r = 0.566 , 95% CL = 0.407 - 0.785 , k = 19.7 , 95% CL = 11.4 - 34.2
MSY = 2.79 , 95% CL = 1.8 - 4.32
Relative biomass last year = 0.434 k, 2.5th = 0.309 , 97.5th = 0.663
Exploitation F/(r/2) in last year = 1.03

Results from Bayesian Schaefer model using catch & CPUE
r = 0.478 , 95% CL = 0.324 - 0.707 , k = 22.2 , 95% CL = 15.7 - 31.4
MSY = 2.66 , 95% CL = 2.2 - 3.22
Relative biomass in last year = 0.607 k, 2.5th perc = 0.421 , 97.5th perc = 0.771
Exploitation F/(r/2) in last year = 0.81
q = 0.109 , lcl = 0.0824 , ucl = 0.146

Results for Management (based on BSM analysis)
Fmsy = 0.239 , 95% CL = 0.162 - 0.353 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.239 , 95% CL = 0.162 - 0.353 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 2.66 , 95% CL = 2.2 - 3.22
Bmsy = 11.1 , 95% CL = 7.87 - 15.7
Biomass in last year = 13.5 , 2.5th perc = 9.36 , 97.5 perc = 17.1
B/Bmsy in last year = 1.21 , 2.5th perc = 0.842 , 97.5 perc = 1.54
Fishing mortality in last year = 0.194 , 2.5th perc = 0.152 , 97.5 perc = 0.279
F/Fmsy = 0.81 , 2.5th perc = 0.638 , 97.5 perc = 1.17

Stock status and exploitation in 2014
Biomass = 13.5 , B/Bmsy = 1.21 , fishing mortality F = 0.194 , F/Fmsy = 0.81
Comment: OK (RF 27.09.16)

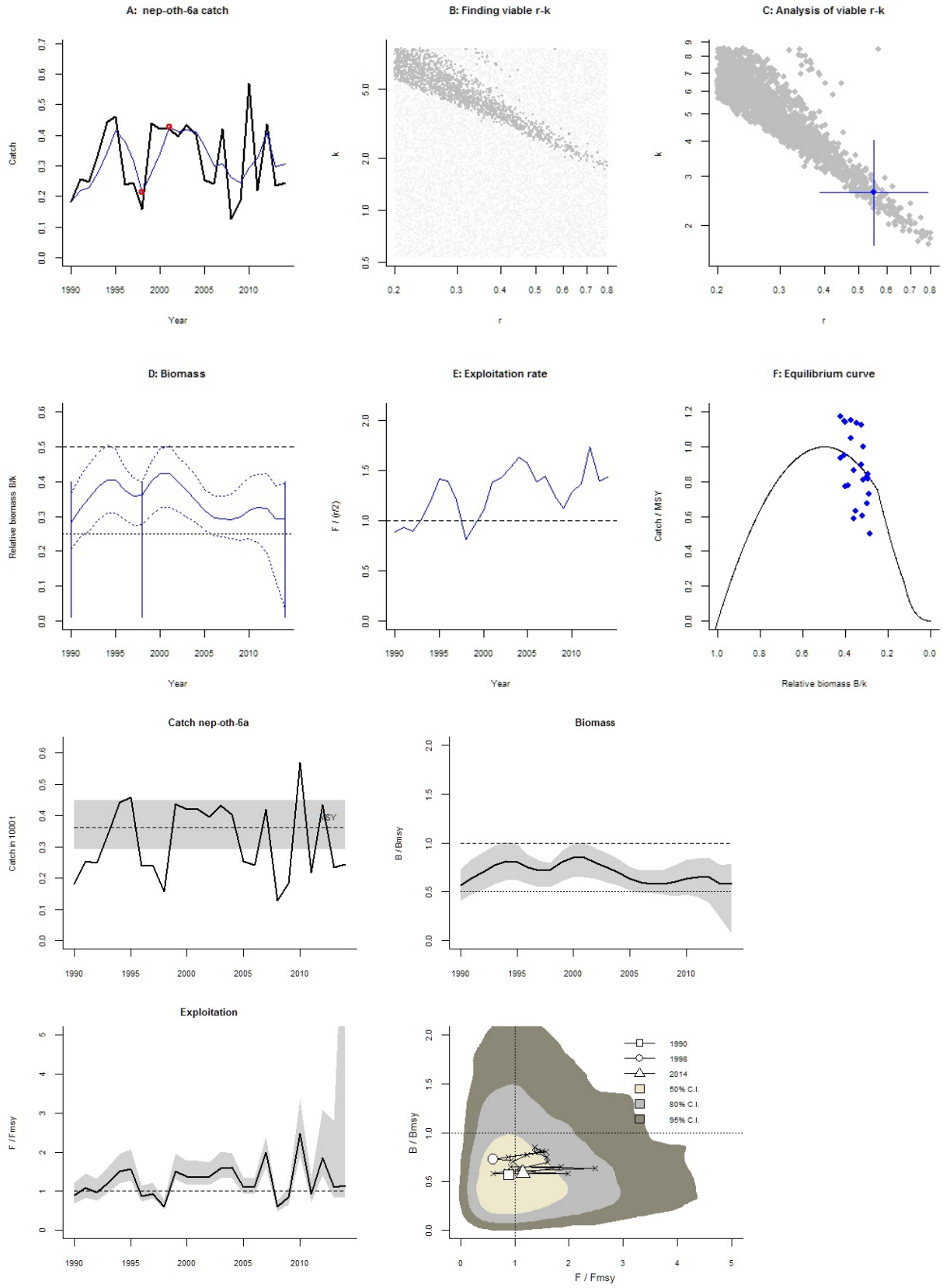

A: nep-22 catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch nep-22
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1999
2009
2014
50% C.I.
80% C.I.
95% C.I.

Species: *Nephrops norvegicus* , stock: nep-oth-6a
Norway lobster in DivisionVIa, outside the functional units (West of Scotland)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/nep-oth-6a.pdf
Region: Northeast Atlantic , Celtic Seas
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 1998 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 0.533 - 8.53

Results of CMSY analysis with altogether 2565 viable trajectories for 1800 r-k pairs
r = 0.553 , 95% CL = 0.389 - 0.785 , k = 2.62 , 95% CL = 1.7 - 4.03
MSY = 0.362 , 95% CL = 0.292 - 0.449
Relative biomass last year = 0.294 k, 2.5th = 0.0358 , 97.5th = 0.394
Exploitation F/(r/2) in last year = 1.43

Results for Management (based on CMSY analysis)
Fmsy = 0.276 , 95% CL = 0.195 - 0.393 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.276 , 95% CL = 0.195 - 0.393 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.362 , 95% CL = 0.292 - 0.449
Bmsy = 1.31 , 95% CL = 0.852 - 2.02
Biomass in last year = 0.77 , 2.5th perc = 0.0939 , 97.5 perc = 1.03
B/Bmsy in last year = 0.588 , 2.5th perc = 0.0716 , 97.5 perc = 0.788
Fishing mortality in last year = 0.318 , 2.5th perc = 0.237 , 97.5 perc = 2.61
F/Fmsy = 1.15 , 2.5th perc = 0.858 , 97.5 perc = 9.44

Stock status and exploitation in 2014
Biomass = 0.77 , B/Bmsy = 0.588 , fishing mortality F = 0.318 , F/Fmsy = 1.15
Comment: OK (RF 27.09.16)

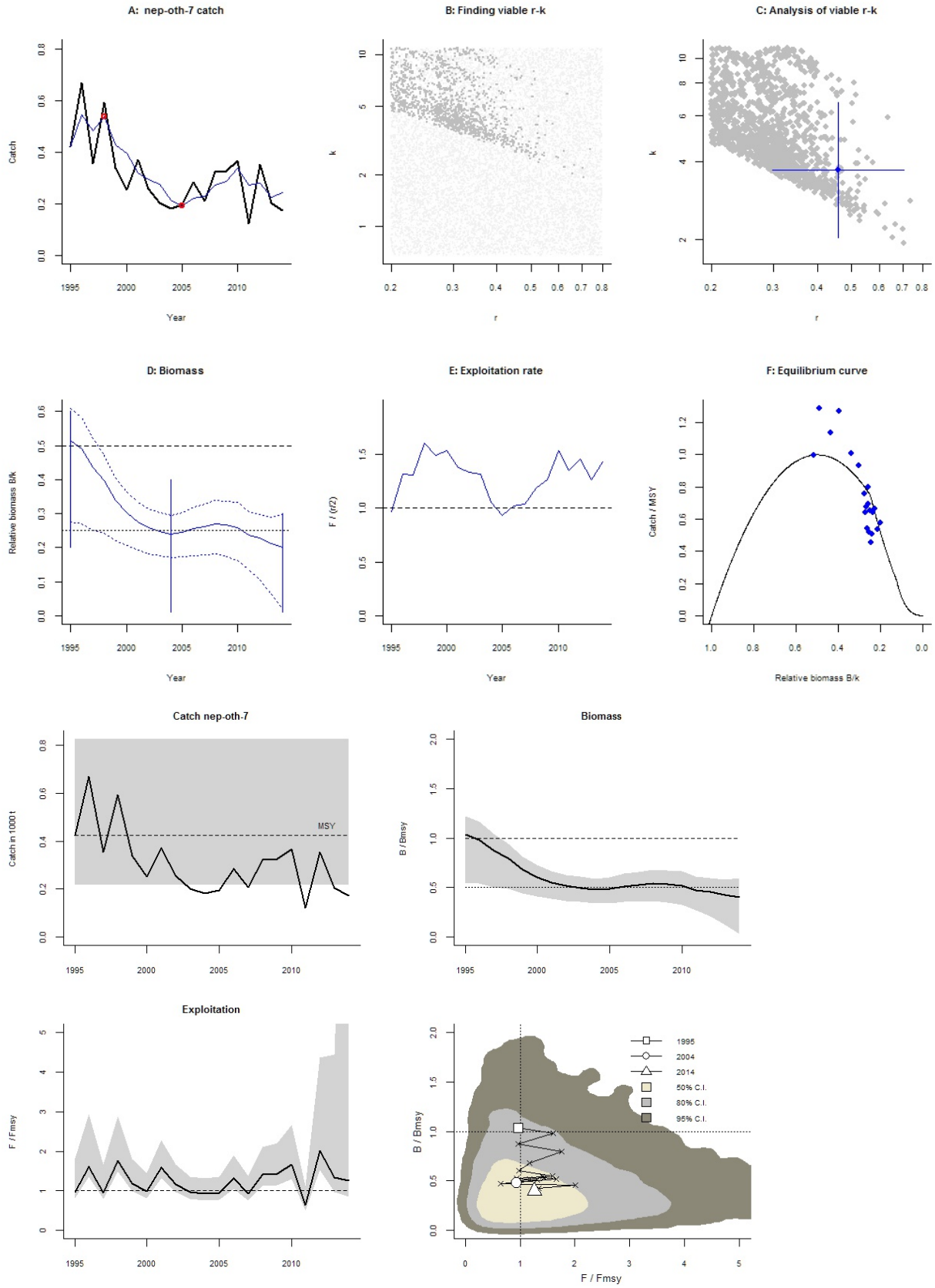

A: nep-oth-6a catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch nep-oth-6a
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1990
1998
2014
50% C.I.
80% C.I.
95% C.I.

Species: *Nephrops norvegicus* , stock: nep-oth-7
Norway lobster in Subarea VII – Functional Unit 18 and rectangles outside the functional units (Southern Celtic Seas, Southwest of Ireland)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/nep-oth-7.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1995 - 2014 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2004 default
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 0.682 - 10.9

Results of CMSY analysis with altogether 1749 viable trajectories for 1384 r-k pairs
r = 0.458 , 95% CL = 0.298 - 0.706 , k = 3.7 , 95% CL = 2.03 - 6.75
MSY = 0.424 , 95% CL = 0.218 - 0.825
Relative biomass last year = 0.202 k, 2.5th = 0.0177 , 97.5th = 0.296
Exploitation F/(r/2) in last year = 1.42

Results for Management (based on CMSY analysis)
Fmsy = 0.229 , 95% CL = 0.149 - 0.353 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.185 , 95% CL = 0.12 - 0.284 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.424 , 95% CL = 0.218 - 0.825
Bmsy = 1.85 , 95% CL = 1.02 - 3.38
Biomass in last year = 0.746 , 2.5th perc = 0.0656 , 97.5 perc = 1.1
B/Bmsy in last year = 0.403 , 2.5th perc = 0.0354 , 97.5 perc = 0.593
Fishing mortality in last year = 0.233 , 2.5th perc = 0.159 , 97.5 perc = 2.65
F/Fmsy = 1.26 , 2.5th perc = 0.858 , 97.5 perc = 14.4

Stock status and exploitation in 2014
Biomass = 0.746 , B/Bmsy = 0.403 , fishing mortality F = 0.233 , F/Fmsy = 1.26
Comment: OK (RF 27.09.16)

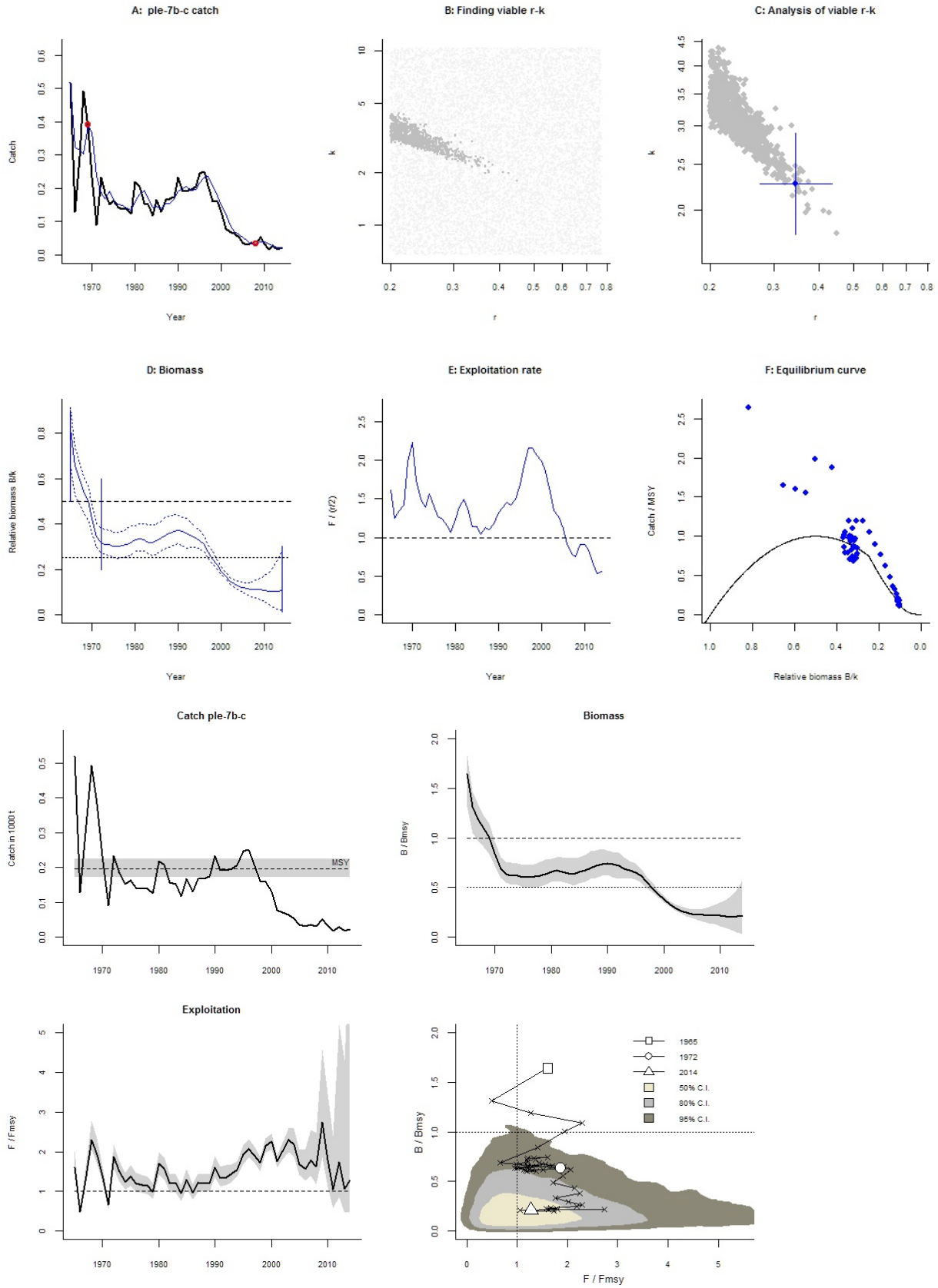

A: nep-oth-7 catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch nep-oth-7
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1995
2004
2014
50% C.I.
80% C.I.
95% C.I.

Species: *Pleuronectes platessa* , stock: ple-7b-c
Plaice in Divisions VIIb,c (West of Ireland)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/ple-7b-c.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1965 - 2014 , abundance = None
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 1972 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.2 - 0.77 expert, , prior range for k = 0.673 - 10.4

Results of CMSY analysis with altogether 1095 viable trajectories for 972 r-k pairs
r = 0.346 , 95% CL = 0.275 - 0.434 , k = 2.27 , 95% CL = 1.78 - 2.9
MSY = 0.196 , 95% CL = 0.172 - 0.224
Relative biomass last year = 0.107 k, 2.5th = 0.0186 , 97.5th = 0.285
Exploitation F/(r/2) in last year = 0.555

Results for Management (based on CMSY analysis)
Fmsy = 0.173 , 95% CL = 0.138 - 0.217 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.074 , 95% CL = 0.0589 - 0.093 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.196 , 95% CL = 0.172 - 0.224
Bmsy = 1.14 , 95% CL = 0.889 - 1.45
Biomass in last year = 0.243 , 2.5th perc = 0.0423 , 97.5 perc = 0.647
B/Bmsy in last year = 0.214 , 2.5th perc = 0.0372 , 97.5 perc = 0.57
Fishing mortality in last year = 0.0945 , 2.5th perc = 0.0355 , 97.5 perc = 0.544
F/Fmsy = 1.28 , 2.5th perc = 0.48 , 97.5 perc = 7.34

Stock status and exploitation in 2014
Biomass = 0.243 , B/Bmsy = 0.214 , fishing mortality F = 0.0945 , F/Fmsy = 1.28
Comment: OK (RF 27.09.16)


A: ple-7b-c 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 ple-7b-c
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1965
1972
2014
50% C.I.
80% C.I.
95% C.I.

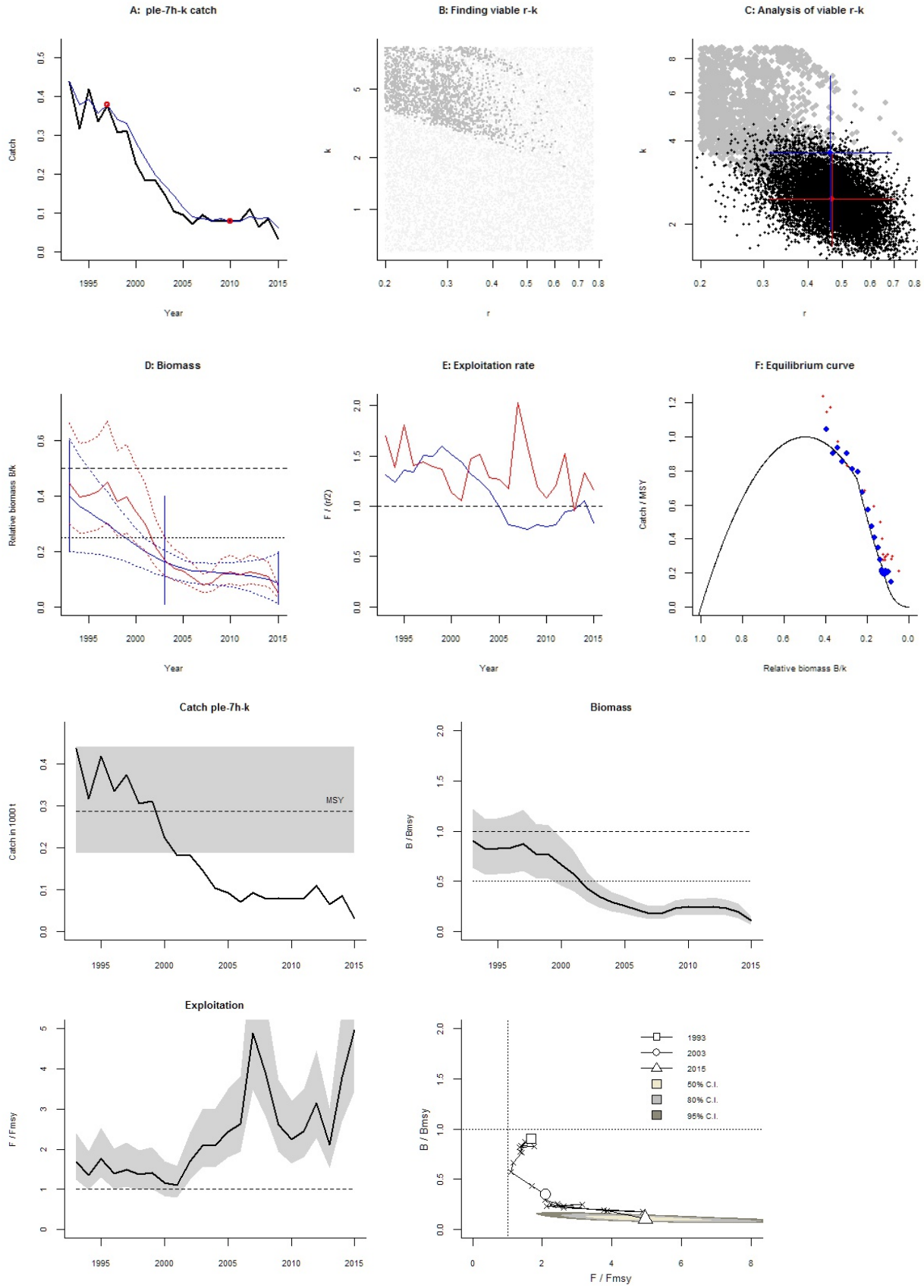
Species: *Pleuronectes platessa* , stock: ple-7h-k
Plaice in Divisions VIIh–k (Celtic Sea South, Southwest of Ireland)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/ple-7h-k.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1993 - 2015 , abundance = CPUE
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 - 0.2 expert
Prior range for r = 0.2 - 0.77 expert, , prior range for k = 0.568 - 8.74
Prior range of q = 0.00123 - 0.00484

Results of CMSY analysis with altogether 2149 viable trajectories for 1985 r-k pairs
r = 0.462 , 95% CL = 0.311 - 0.685 , k = 3.62 , 95% CL = 1.9 - 6.88
MSY = 0.418 , 95% CL = 0.199 - 0.878
Relative biomass last year = 0.0875 k, 2.5th = 0.0122 , 97.5th = 0.193
Exploitation F/(r/2) in last year = 0.833

Results from Bayesian Schaefer model using catch & CPUE
r = 0.468 , 95% CL = 0.311 - 0.703 , k = 2.46 , 95% CL = 1.66 - 3.66
MSY = 0.288 , 95% CL = 0.188 - 0.441
Relative biomass in last year = 0.0538 k, 2.5th perc = 0.0365 , 97.5th perc = 0.0775
Exploitation F/(r/2) in last year = 1.06
q = 0.00186 , lcl = 0.00147 , ucl = 0.00235

Results for Management (based on BSM analysis)
Fmsy = 0.234 , 95% CL = 0.156 - 0.351 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0503 , 95% CL = 0.0335 - 0.0756 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.288 , 95% CL = 0.188 - 0.441
Bmsy = 1.23 , 95% CL = 0.83 - 1.83
Biomass in last year = 0.133 , 2.5th perc = 0.0899 , 97.5 perc = 0.191
B/Bmsy in last year = 0.108 , 2.5th perc = 0.0729 , 97.5 perc = 0.155
Fishing mortality in last year = 0.249 , 2.5th perc = 0.173 , 97.5 perc = 0.367
F/Fmsy = 4.95 , 2.5th perc = 3.44 , 97.5 perc = 7.3

Stock status and exploitation in 2014
Biomass = 0.244 , B/Bmsy = 0.198 , fishing mortality F = 0.349 , F/Fmsy = 3.77
Comment: OK (RF 27.09.16)


A: ple-7h-k 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 ple-7h-k
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1993
2003
2015
50% C.I.
80% C.I.
95% C.I.

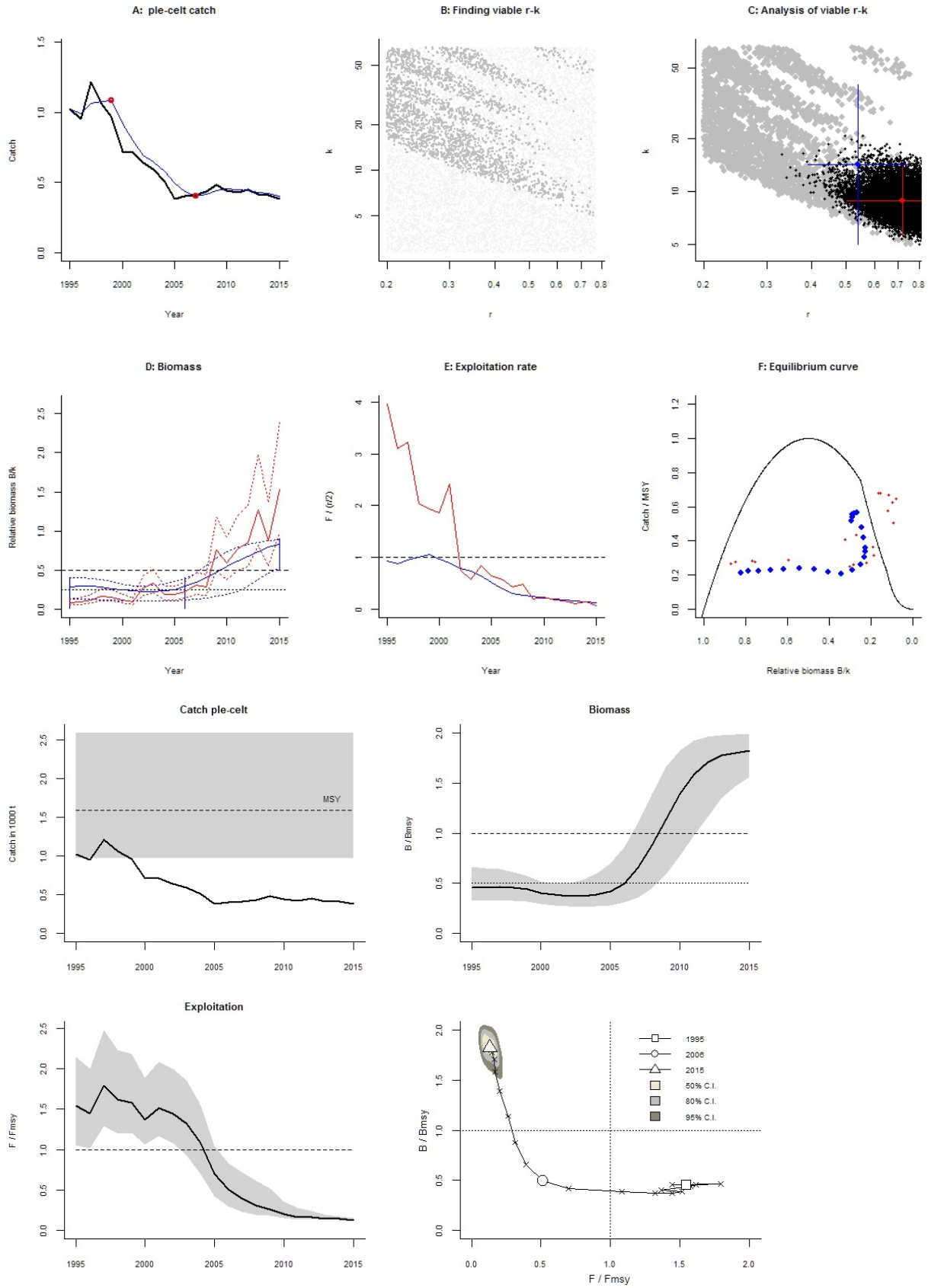
Species: *Pleuronectes platessa* , stock: ple-celt
Plaice in Divisions VIIf,g (Celtic Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/ple-celt.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1995 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2006 default
Prior final relative biomass = 0.5 - 0.9 expert
Prior range for r = 0.2 - 0.77 expert, , prior range for k = 2.82 - 65
Prior range of q = 0.00032 - 0.00126

Results of CMSY analysis with altogether 2993 viable trajectories for 2497 r-k pairs
r = 0.541 , 95% CL = 0.391 - 0.747 , k = 14.2 , 95% CL = 5.02 - 40.2
MSY = 1.92 , 95% CL = 0.462 - 7.98
Relative biomass last year = 0.825 k, 2.5th = 0.537 , 97.5th = 0.895
Exploitation F/(r/2) in last year = 0.127

Results from Bayesian Schaefer model using catch & CPUE
r = 0.721 , 95% CL = 0.502 - 1.03 , k = 8.83 , 95% CL = 5.67 - 13.7
MSY = 1.59 , 95% CL = 0.974 - 2.6
Relative biomass in last year = 0.911 k, 2.5th perc = 0.779 , 97.5th perc = 0.991
Exploitation F/(r/2) in last year = 0.132
q = 0.000416 , lcl = 0.000307 , ucl = 0.000563

Results for Management (based on BSM analysis)
Fmsy = 0.36 , 95% CL = 0.251 - 0.517 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.36 , 95% CL = 0.251 - 0.517 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1.59 , 95% CL = 0.974 - 2.6
Bmsy = 4.41 , 95% CL = 2.83 - 6.87
Biomass in last year = 8.04 , 2.5th perc = 6.87 , 97.5 perc = 8.75
B/Bmsy in last year = 1.82 , 2.5th perc = 1.56 , 97.5 perc = 1.98
Fishing mortality in last year = 0.0474 , 2.5th perc = 0.0435 , 97.5 perc = 0.0554
F/Fmsy = 0.132 , 2.5th perc = 0.121 , 97.5 perc = 0.154

Stock status and exploitation in 2014
Biomass = 7.94 , B/Bmsy = 1.8 , fishing mortality F = 0.0516 , F/Fmsy = 0.143
Comment: OK (RF 27.09.16)


A: ple-celt 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 ple-celt
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1995
2006
2015
50% C.I.
80% C.I.
95% C.I.

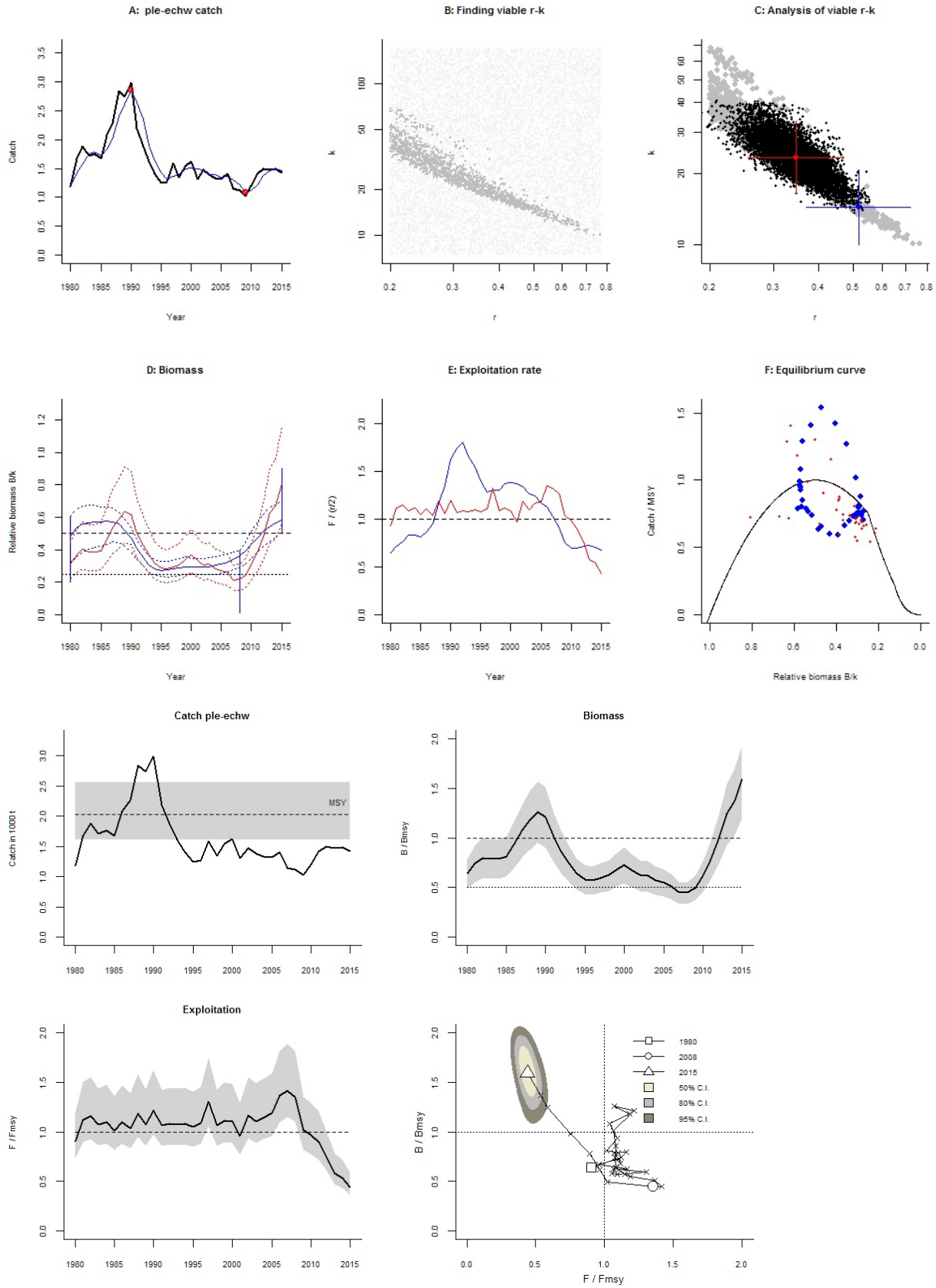
Species: *Pleuronectes platessa* , stock: ple-echw
Plaice in Division VIIe (Western Channel)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/ple-echw.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1980 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2008 default
Prior final relative biomass = 0.5 - 0.9 expert
Prior range for r = 0.2 - 0.77 expert, , prior range for k = 7.41 - 171
Prior range of q = 5.36e-05 - 0.00021

Results of CMSY analysis with altogether 1745 viable trajectories for 1493 r-k pairs
r = 0.517 , 95% CL = 0.371 - 0.72 , k = 14.4 , 95% CL = 10 - 20.7
MSY = 1.86 , 95% CL = 1.64 - 2.1
Relative biomass last year = 0.582 k, 2.5th = 0.506 , 97.5th = 0.704
Exploitation F/(r/2) in last year = 0.677

Results from Bayesian Schaefer model using catch & CPUE
r = 0.346 , 95% CL = 0.255 - 0.471 , k = 23.4 , 95% CL = 16.4 - 33.5
MSY = 2.03 , 95% CL = 1.61 - 2.56
Relative biomass in last year = 0.796 k, 2.5th perc = 0.597 , 97.5th perc = 0.966
Exploitation F/(r/2) in last year = 0.44
q = 0.000107 , lcl = 7.97e-05 , ucl = 0.000145

Results for Management (based on BSM analysis)
Fmsy = 0.173 , 95% CL = 0.127 - 0.235 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.173 , 95% CL = 0.127 - 0.235 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 2.03 , 95% CL = 1.61 - 2.56
Bmsy = 11.7 , 95% CL = 8.2 - 16.7
Biomass in last year = 18.7 , 2.5th perc = 14 , 97.5 perc = 22.6
B/Bmsy in last year = 1.59 , 2.5th perc = 1.19 , 97.5 perc = 1.93
Fishing mortality in last year = 0.0763 , 2.5th perc = 0.0629 , 97.5 perc = 0.102
F/Fmsy = 0.44 , 2.5th perc = 0.363 , 97.5 perc = 0.588

Stock status and exploitation in 2014
Biomass = 16 , B/Bmsy = 1.37 , fishing mortality F = 0.0931 , F/Fmsy = 0.537
Comment: OK (RF 27.09.16)


A: ple-echw 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 ple-echw
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1980
2008
2015
50% C.I.
80% C.I.
95% C.I.

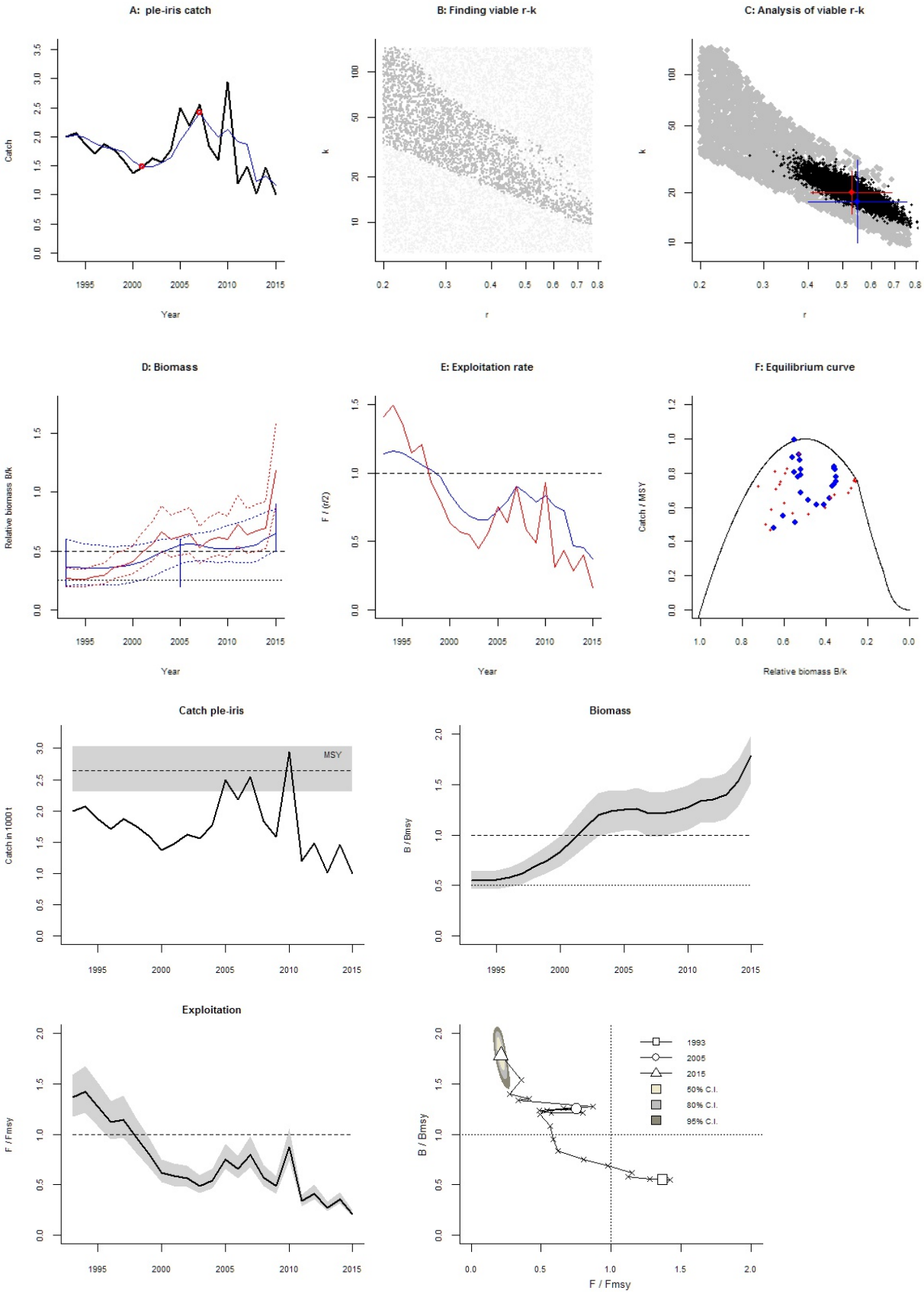
Species: *Pleuronectes platessa* , stock: ple-iris
Plaice in Divisionn VIIa (Irish Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/ple-iris.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1993 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2005 expert
Prior final relative biomass = 0.5 - 0.9 expert
Prior range for r = 0.2 - 0.77 expert, , prior range for k = 6.26 - 145
Prior range of q = 5.63e-05 - 0.000221

Results of CMSY analysis with altogether 5878 viable trajectories for 2735 r-k pairs
r = 0.549 , 95% CL = 0.399 - 0.754 , k = 17.6 , 95% CL = 10 - 31
MSY = 2.42 , 95% CL = 1.49 - 3.92
Relative biomass last year = 0.648 k, 2.5th = 0.507 , 97.5th = 0.851
Exploitation F/(r/2) in last year = 0.371

Results from Bayesian Schaefer model using catch & CPUE
r = 0.529 , 95% CL = 0.407 - 0.687 , k = 20 , 95% CL = 14.9 - 26.8
MSY = 2.65 , 95% CL = 2.31 - 3.03
Relative biomass in last year = 0.89 k, 2.5th perc = 0.757 , 97.5th perc = 0.992
Exploitation F/(r/2) in last year = 0.213
q = 9.33e-05 , lcl = 7.15e-05 , ucl = 0.000122

Results for Management (based on BSM analysis)
Fmsy = 0.264 , 95% CL = 0.204 - 0.344 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.264 , 95% CL = 0.204 - 0.344 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 2.65 , 95% CL = 2.31 - 3.03
Bmsy = 10 , 95% CL = 7.47 - 13.4
Biomass in last year = 17.8 , 2.5th perc = 15.2 , 97.5 perc = 19.9
B/Bmsy in last year = 1.78 , 2.5th perc = 1.51 , 97.5 perc = 1.98
Fishing mortality in last year = 0.0564 , 2.5th perc = 0.0506 , 97.5 perc = 0.0662
F/Fmsy = 0.213 , 2.5th perc = 0.191 , 97.5 perc = 0.25

Stock status and exploitation in 2014
Biomass = 15.4 , B/Bmsy = 1.54 , fishing mortality F = 0.0952 , F/Fmsy = 0.36
Comment: OK (RF 27.09.16)

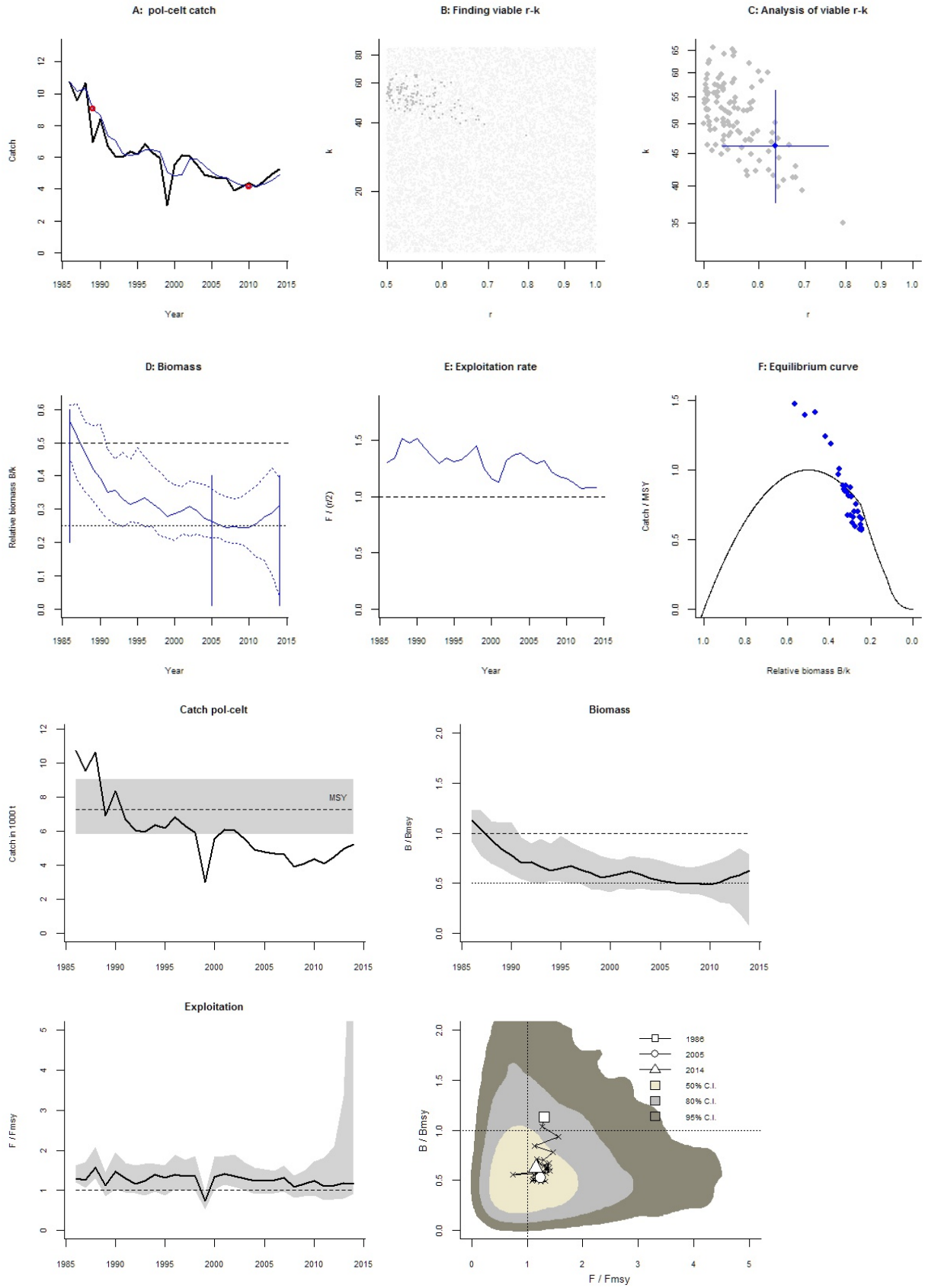

A: ple-iris catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch ple-iris
MSY
Catch in 1000 t
Biomass
B / Bmsy
Exploitation
F / Fmsy
1993
2005
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

Species: *Pollachius pollachius* , stock: pol-celt
Pollack in Subareas VI-VII (Celtic Seas and the English Channel)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/pol-celt.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1986 - 2014 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2005 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.5 - 1 expert, , prior range for k = 10.7 - 85.9

Results of CMSY analysis with altogether 112 viable trajectories for 111 r-k pairs
r = 0.633 , 95% CL = 0.531 - 0.754 , k = 46.1 , 95% CL = 37.7 - 56.3
MSY = 7.29 , 95% CL = 5.86 - 9.08
Relative biomass last year = 0.312 k, 2.5th = 0.0369 , 97.5th = 0.396
Exploitation F/(r/2) in last year = 1.08

Results for Management (based on CMSY analysis)
Fmsy = 0.316 , 95% CL = 0.266 - 0.377 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.316 , 95% CL = 0.266 - 0.377 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 7.29 , 95% CL = 5.86 - 9.08
Bmsy = 23.1 , 95% CL = 18.9 - 28.2
Biomass in last year = 14.4 , 2.5th perc = 1.7 , 97.5 perc = 18.3
B/Bmsy in last year = 0.623 , 2.5th perc = 0.0739 , 97.5 perc = 0.792
Fishing mortality in last year = 0.366 , 2.5th perc = 0.288 , 97.5 perc = 3.09
F/Fmsy = 1.16 , 2.5th perc = 0.91 , 97.5 perc = 9.75

Stock status and exploitation in 2014
Biomass = 14.4 , B/Bmsy = 0.623 , fishing mortality F = 0.366 , F/Fmsy = 1.16
Comment: OK (RF 27.09.16)


A: pol-celt 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 pol-celt
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1986
2005
2014
50% C.I.
80% C.I.
95% C.I.

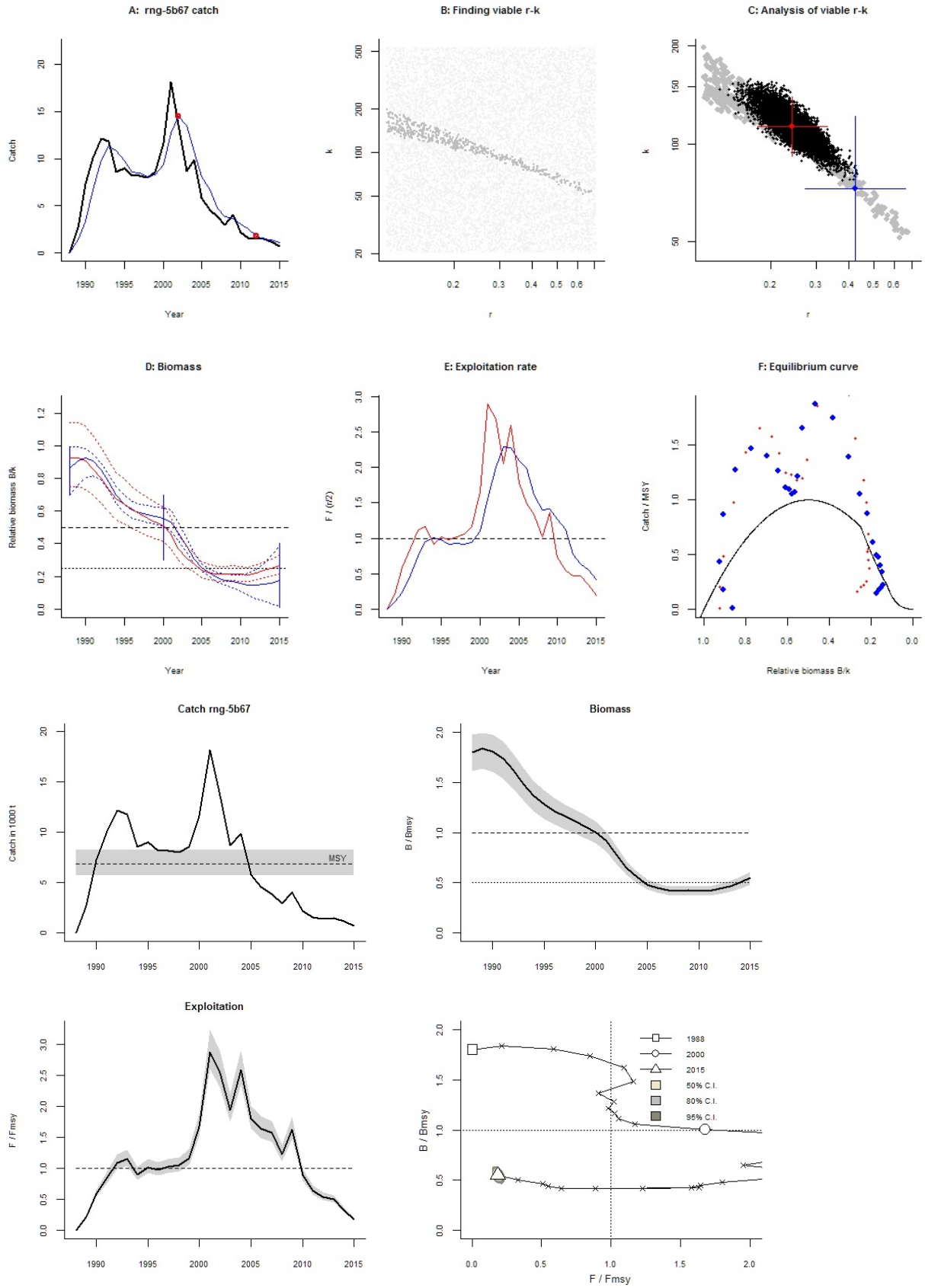
Species: *Coryphaenoides rupestris* , stock: rng-5b67
Roundnose grenadier in in Divisions Xb and XIIc, and Subdivisions XIIa1, XIVb1, and Va1 (Oceanic Northeast Atlantic and Northern Reykjanes Ridge)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/rng-5b67.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1988 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.7 - 0.99 expert
Prior intermediate rel. biomass= 0.3 - 0.7 in year 2000 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.11 - 0.71 expert, , prior range for k = 20.4 - 526
Prior range of q = 1.97e-05 - 9.99e-05

Results of CMSY analysis with altogether 2446 viable trajectories for 511 r-k pairs
r = 0.423 , 95% CL = 0.27 - 0.662 , k = 72.9 , 95% CL = 43.6 - 122
MSY = 7.71 , 95% CL = 6.52 - 9.12
Relative biomass last year = 0.175 k, 2.5th = 0.0168 , 97.5th = 0.387
Exploitation F/(r/2) in last year = 0.415

Results from Bayesian Schaefer model using catch & CPUE
r = 0.242 , 95% CL = 0.177 - 0.33 , k = 113 , 95% CL = 92 - 140
MSY = 6.87 , 95% CL = 5.72 - 8.24
Relative biomass in last year = 0.275 k, 2.5th perc = 0.241 , 97.5th perc = 0.307
Exploitation F/(r/2) in last year = 0.186
q = 1.91e-05 , lcl = 1.55e-05 , ucl = 2.35e-05

Results for Management (based on BSM analysis)
Fmsy = 0.121 , 95% CL = 0.0887 - 0.165 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.121 , 95% CL = 0.0887 - 0.165 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 6.87 , 95% CL = 5.72 - 8.24
Bmsy = 56.7 , 95% CL = 46 - 69.9
Biomass in last year = 31.2 , 2.5th perc = 27.3 , 97.5 perc = 34.8
B/Bmsy in last year = 0.55 , 2.5th perc = 0.482 , 97.5 perc = 0.613
Fishing mortality in last year = 0.0225 , 2.5th perc = 0.0201 , 97.5 perc = 0.0256
F/Fmsy = 0.186 , 2.5th perc = 0.166 , 97.5 perc = 0.212

Stock status and exploitation in 2014
Biomass = 28.5 , B/Bmsy = 0.502 , fishing mortality F = 0.0403 , F/Fmsy = 0.333
Comment: OK (RF 27.09.16)

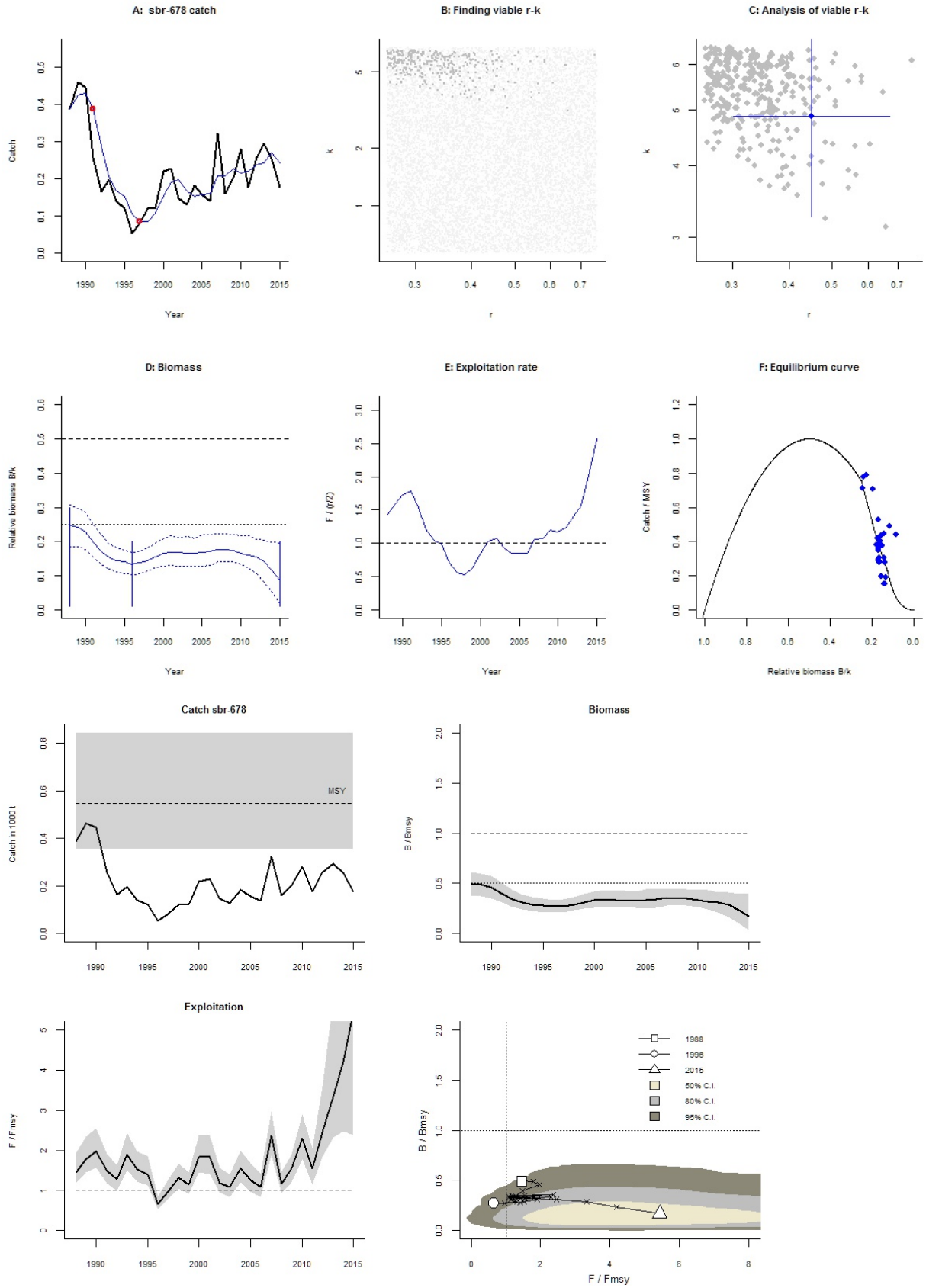

A: rng-5b67 catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch rng-5b67
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1988
2000
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

Species: *Pagellus bogaraveo* , stock: sbr-678
Red (= blackspot) seabream in subareas 6, 7, and 8 (Celtic Seas and the English Channel, Bay of Biscay)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/sbr-678.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1988 - 2015 , abundance = None
Prior initial relative biomass = 0.01 - 0.3 expert
Prior intermediate rel. biomass= 0.01 - 0.2 in year 1996 expert
Prior final relative biomass = 0.01 - 0.2 expert
Prior range for r = 0.26 - 0.76 expert, , prior range for k = 0.568 - 6.65

Results of CMSY analysis with altogether 328 viable trajectories for 323 r-k pairs
r = 0.449 , 95% CL = 0.301 - 0.671 , k = 4.88 , 95% CL = 3.25 - 7.33
MSY = 0.548 , 95% CL = 0.357 - 0.843
Relative biomass last year = 0.0862 k, 2.5th = 0.0176 , 97.5th = 0.196
Exploitation F/(r/2) in last year = 2.57

Results for Management (based on CMSY analysis)
Fmsy = 0.225 , 95% CL = 0.15 - 0.336 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0774 , 95% CL = 0.0518 - 0.116 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.548 , 95% CL = 0.357 - 0.843
Bmsy = 2.44 , 95% CL = 1.63 - 3.66
Biomass in last year = 0.421 , 2.5th perc = 0.0862 , 97.5 perc = 0.958
B/Bmsy in last year = 0.172 , 2.5th perc = 0.0353 , 97.5 perc = 0.393
Fishing mortality in last year = 0.421 , 2.5th perc = 0.185 , 97.5 perc = 2.05
F/Fmsy = 5.43 , 2.5th perc = 2.38 , 97.5 perc = 26.5

Stock status and exploitation in 2014
Biomass = 0.576 , B/Bmsy = 0.236 , fishing mortality F = 0.445 , F/Fmsy = 4.2
Comment: OK (RF 27.09.16)

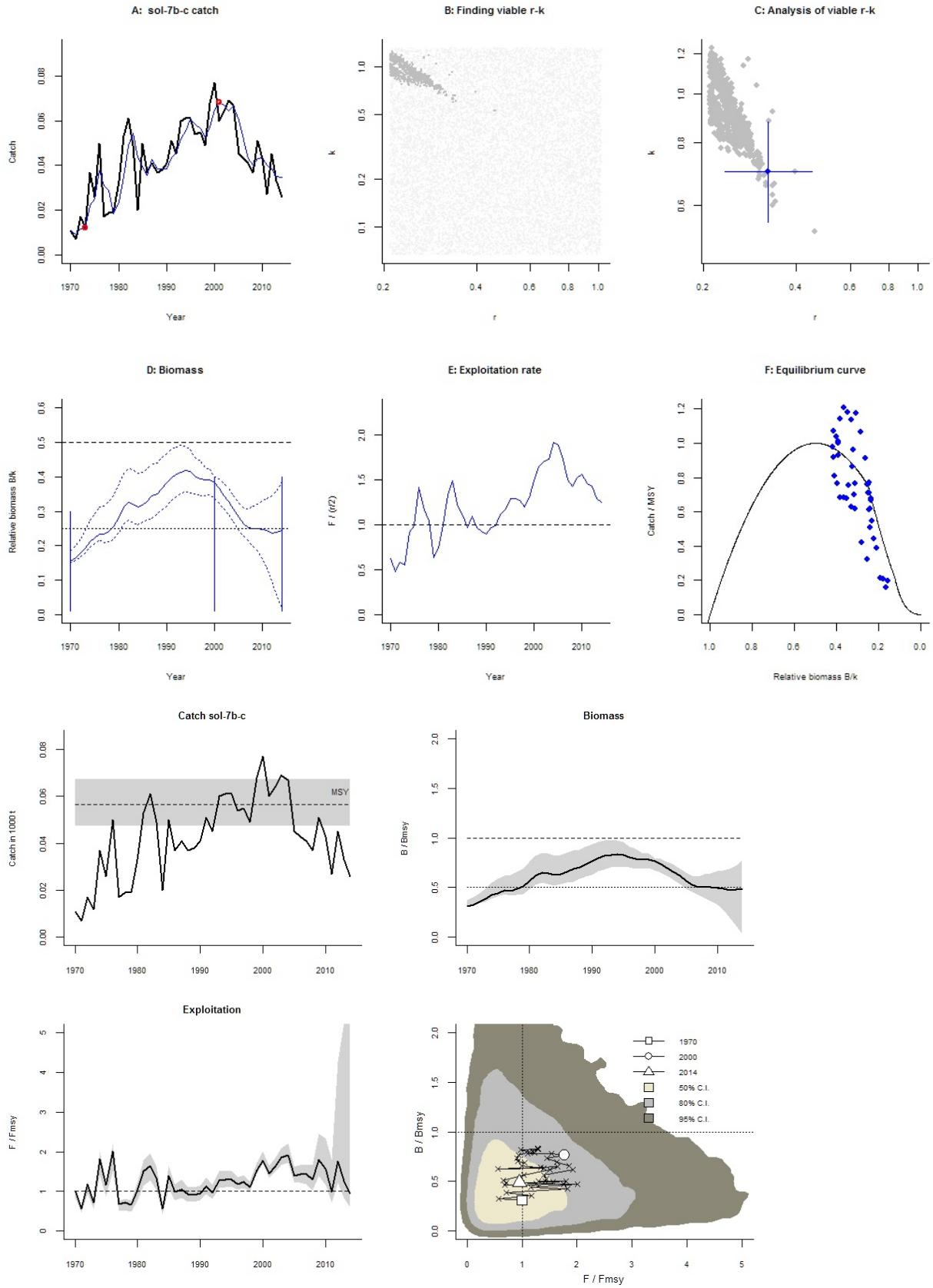

A: sbr-678 catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch sbr-678
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1988
1996
2015
50% C.I.
80% C.I.
95% C.I.

Species: *Solea solea* , stock: sol-7b-c
Sole (Solea solea) in Divisions VIIb,c (West of Ireland)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/sol-7b-c.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1970 - 2014 , abundance = None
Prior initial relative biomass = 0.01 - 0.3 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.21 - 1 expert, , prior range for k = 0.067 - 1.3

Results of CMSY analysis with altogether 592 viable trajectories for 591 r-k pairs
r = 0.325 , 95% CL = 0.234 - 0.45 , k = 0.698 , 95% CL = 0.554 - 0.88
MSY = 0.0566 , 95% CL = 0.0476 - 0.0674
Relative biomass last year = 0.245 k, 2.5th = 0.0187 , 97.5th = 0.386
Exploitation F/(r/2) in last year = 1.25

Results for Management (based on CMSY analysis)
Fmsy = 0.162 , 95% CL = 0.117 - 0.225 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.159 , 95% CL = 0.115 - 0.221 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.0566 , 95% CL = 0.0476 - 0.0674
Bmsy = 0.349 , 95% CL = 0.277 - 0.44
Biomass in last year = 0.171 , 2.5th perc = 0.0131 , 97.5 perc = 0.269
B/Bmsy in last year = 0.49 , 2.5th perc = 0.0374 , 97.5 perc = 0.772
Fishing mortality in last year = 0.152 , 2.5th perc = 0.0965 , 97.5 perc = 1.99
F/Fmsy = 0.954 , 2.5th perc = 0.606 , 97.5 perc = 12.5

Stock status and exploitation in 2014
Biomass = 0.171 , B/Bmsy = 0.49 , fishing mortality F = 0.152 , F/Fmsy = 0.954
Comment: OK (RF 27.09.16)


A: sol-7b-c 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 sol-7b-c
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1970
2000
2014
50% C.I.
80% C.I.
95% C.I.

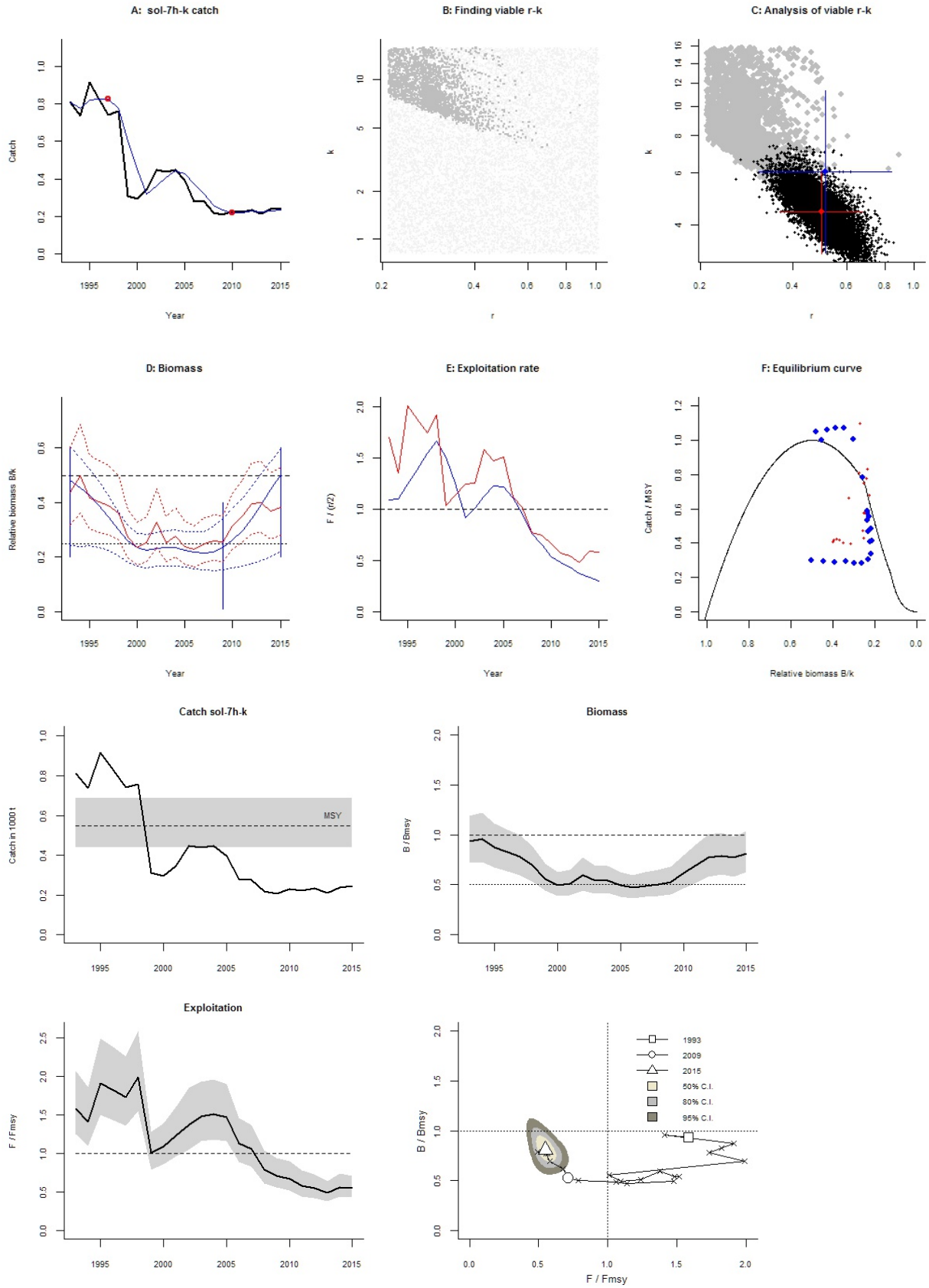
Species: Solea solea , stock: sol-7h-k
Sole in Divisions VIIh–k (Celtic Sea South, Southwest of Ireland)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/sol-7h-k.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1993 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2009 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.21 - 1 expert, , prior range for k = 0.811 - 15.8
Prior range of q = 0.000651 - 0.00287

Results of CMSY analysis with altogether 3420 viable trajectories for 2471 r-k pairs
r = 0.512 , 95% CL = 0.31 - 0.844 , k = 6.04 , 95% CL = 3.22 - 11.3
MSY = 0.773 , 95% CL = 0.394 - 1.52
Relative biomass last year = 0.504 k, 2.5th = 0.222 , 97.5th = 0.597
Exploitation F/(r/2) in last year = 0.297

Results from Bayesian Schaefer model using catch & CPUE
r = 0.497 , 95% CL = 0.363 - 0.68 , k = 4.42 , 95% CL = 3.21 - 6.09
MSY = 0.548 , 95% CL = 0.438 - 0.686
Relative biomass in last year = 0.405 k, 2.5th perc = 0.311 , 97.5th perc = 0.516
Exploitation F/(r/2) in last year = 0.55
q = 0.000677 , lcl = 0.000521 , ucl = 0.000878

Results for Management (based on BSM analysis)
Fmsy = 0.248 , 95% CL = 0.181 - 0.34 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.248 , 95% CL = 0.181 - 0.34 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.548 , 95% CL = 0.438 - 0.686
Bmsy = 2.21 , 95% CL = 1.6 - 3.04
Biomass in last year = 1.79 , 2.5th perc = 1.38 , 97.5 perc = 2.28
B/Bmsy in last year = 0.809 , 2.5th perc = 0.623 , 97.5 perc = 1.03
Fishing mortality in last year = 0.136 , 2.5th perc = 0.107 , 97.5 perc = 0.177
F/Fmsy = 0.55 , 2.5th perc = 0.431 , 97.5 perc = 0.714

Stock status and exploitation in 2014
Biomass = 1.7 , B/Bmsy = 0.769 , fishing mortality F = 0.141 , F/Fmsy = 0.566
Comment: OK (RF 27.09.16)


A: sol-7h-k 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 sol-7h-k
Catch in 1000t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1993
2009
2015
50% C.I.
80% C.I.
95% C.I.

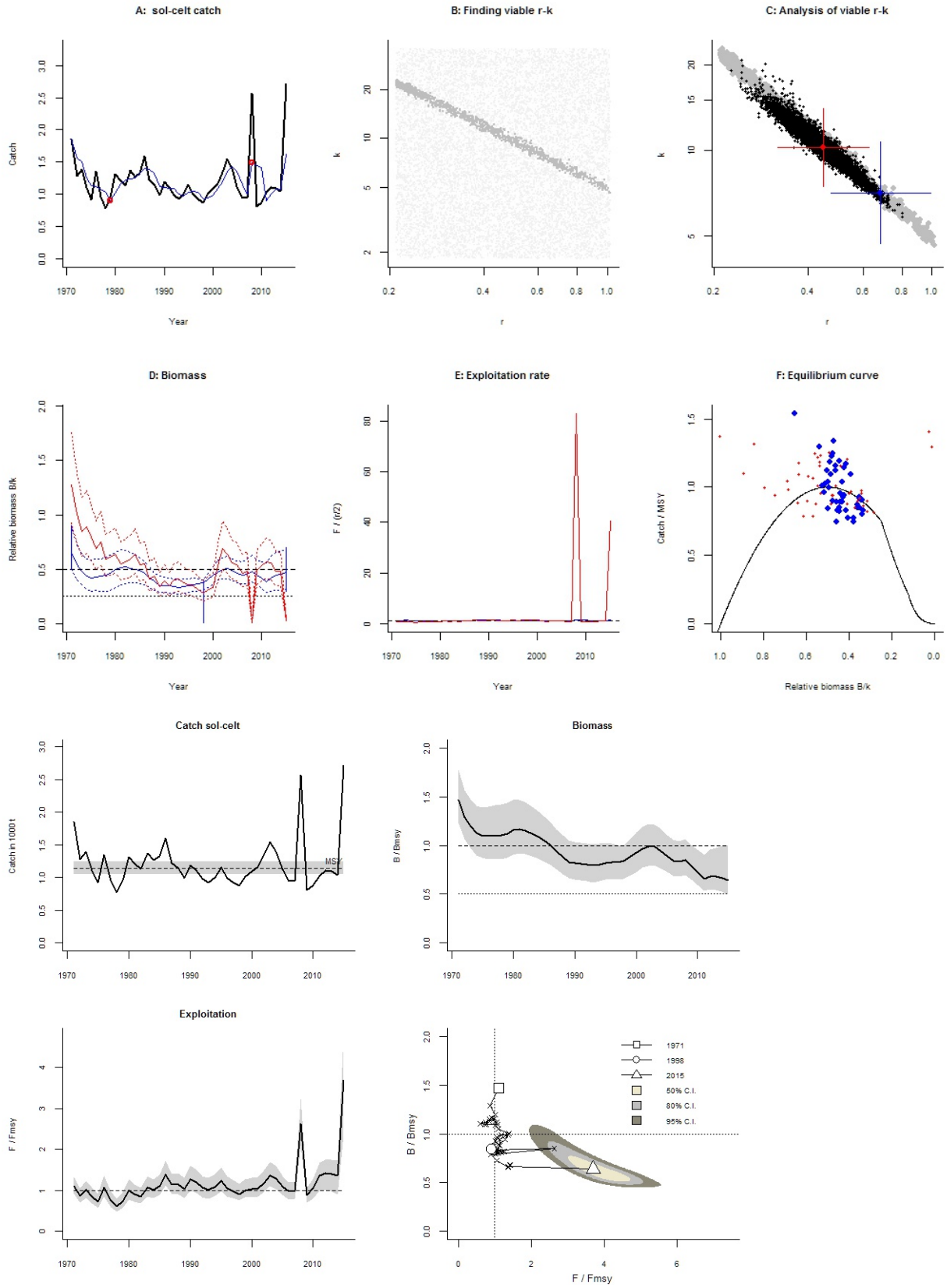
Species: *Solea solea* , stock: sol-celt
Sole in Divisions VIIf, g (Celtic Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/sol-celt.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1971 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 1998 expert
Prior final relative biomass = 0.3 - 0.7 expert
Prior range for r = 0.21 - 1 expert, , prior range for k = 1.82 - 35.4
Prior range of q = 0.303 - 1.34

Results of CMSY analysis with altogether 1010 viable trajectories for 935 r-k pairs
r = 0.684 , 95% CL = 0.472 - 0.991 , k = 7.08 , 95% CL = 4.7 - 10.7
MSY = 1.21 , 95% CL = 1.12 - 1.31
Relative biomass last year = 0.474 k, 2.5th = 0.311 , 97.5th = 0.681
Exploitation F/(r/2) in last year = 1.41

Results from Bayesian Schaefer model using catch & CPUE
r = 0.448 , 95% CL = 0.319 - 0.629 , k = 10.2 , 95% CL = 7.45 - 14.1
MSY = 1.15 , 95% CL = 1.05 - 1.25
Relative biomass in last year = 0.32 k, 2.5th perc = 0.249 , 97.5th perc = 0.503
Exploitation F/(r/2) in last year = 3.7
q = 0.578 , lcl = 0.429 , ucl = 0.779

Results for Management (based on BSM analysis)
Fmsy = 0.224 , 95% CL = 0.16 - 0.315 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.224 , 95% CL = 0.16 - 0.315 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1.15 , 95% CL = 1.05 - 1.25
Bmsy = 5.12 , 95% CL = 3.73 - 7.03
Biomass in last year = 3.27 , 2.5th perc = 2.54 , 97.5 perc = 5.15
B/Bmsy in last year = 0.64 , 2.5th perc = 0.497 , 97.5 perc = 1.01
Fishing mortality in last year = 0.829 , 2.5th perc = 0.527 , 97.5 perc = 1.07
F/Fmsy = 3.7 , 2.5th perc = 2.35 , 97.5 perc = 4.76

Stock status and exploitation in 2014
Biomass = 3.39 , B/Bmsy = 0.662 , fishing mortality F = 0.308 , F/Fmsy = 1.37
Comment: OK (RF 27.09.16) r updated


A: sol-celt 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 sol-celt
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1971
1998
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

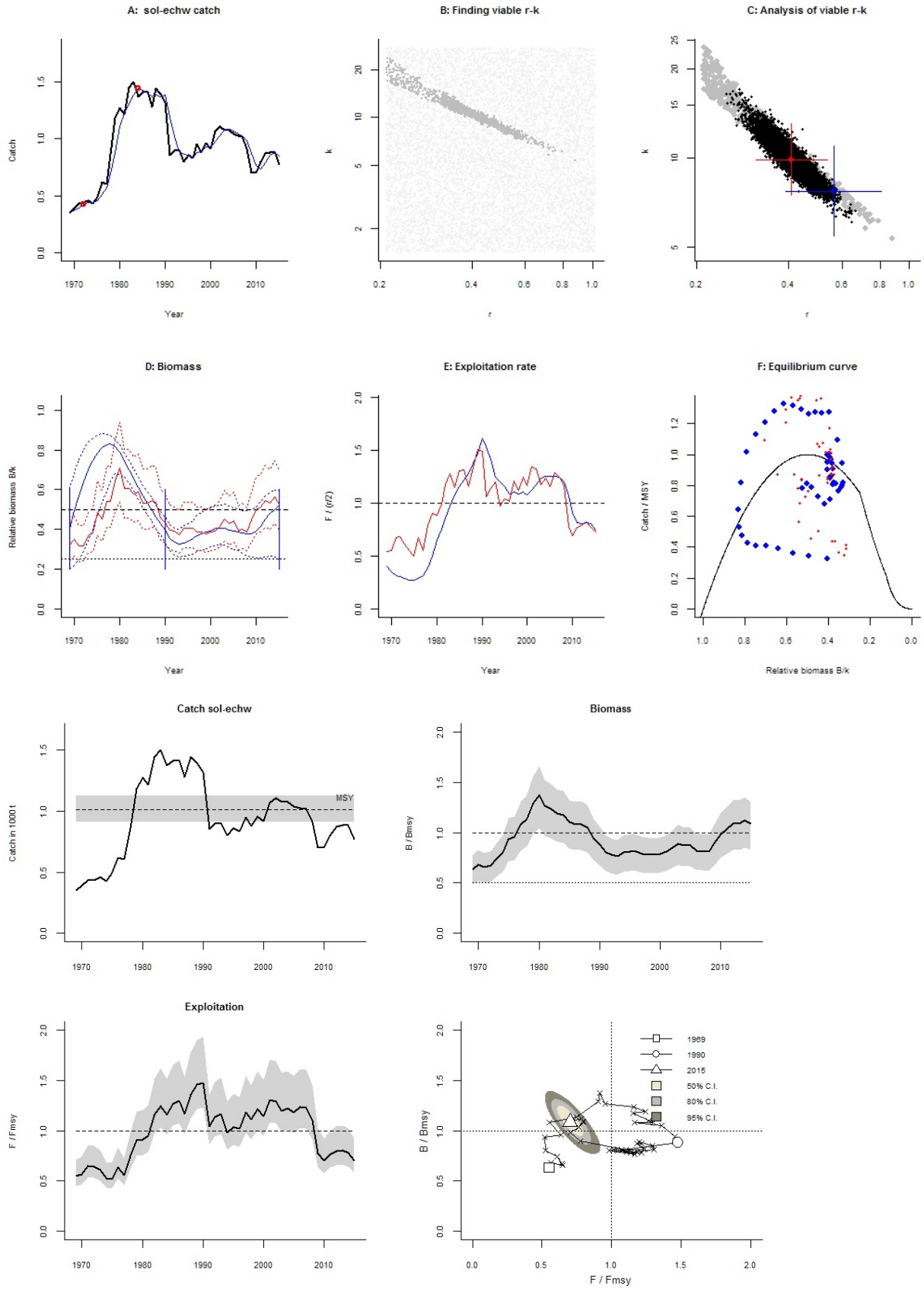
Species: *Solea solea* , stock: sol-echw
Sole in Division VIIe (Western Channel)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/sol-echw.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1969 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
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 = 0.21 - 1 expert, , prior range for k = 1.41 - 27.4
Prior range of q = 0.723 - 3.19

Results of CMSY analysis with altogether 3879 viable trajectories for 1065 r-k pairs
r = 0.563 , 95% CL = 0.391 - 0.81 , k = 7.71 , 95% CL = 5.44 - 10.9
MSY = 1.08 , 95% CL = 1 - 1.17
Relative biomass last year = 0.524 k, 2.5th = 0.253 , 97.5th = 0.598
Exploitation F/(r/2) in last year = 0.745

Results from Bayesian Schaefer model using catch & CPUE
r = 0.41 , 95% CL = 0.314 - 0.537 , k = 9.87 , 95% CL = 7.46 - 13.1
MSY = 1.01 , 95% CL = 0.912 - 1.12
Relative biomass in last year = 0.544 k, 2.5th perc = 0.416 , 97.5th perc = 0.652
Exploitation F/(r/2) in last year = 0.701
q = 0.764 , lcl = 0.594 , ucl = 0.982

Results for Management (based on BSM analysis)
Fmsy = 0.205 , 95% CL = 0.157 - 0.268 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.205 , 95% CL = 0.157 - 0.268 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1.01 , 95% CL = 0.912 - 1.12
Bmsy = 4.93 , 95% CL = 3.73 - 6.53
Biomass in last year = 5.37 , 2.5th perc = 4.11 , 97.5 perc = 6.44
B/Bmsy in last year = 1.09 , 2.5th perc = 0.833 , 97.5 perc = 1.3
Fishing mortality in last year = 0.144 , 2.5th perc = 0.12 , 97.5 perc = 0.188
F/Fmsy = 0.701 , 2.5th perc = 0.585 , 97.5 perc = 0.916

Stock status and exploitation in 2014
Biomass = 5.53 , B/Bmsy = 1.12 , fishing mortality F = 0.16 , F/Fmsy = 0.78
Comment: OK (RF 27.09.16)


A: sol-echw 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 sol-echw
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1969
1990
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

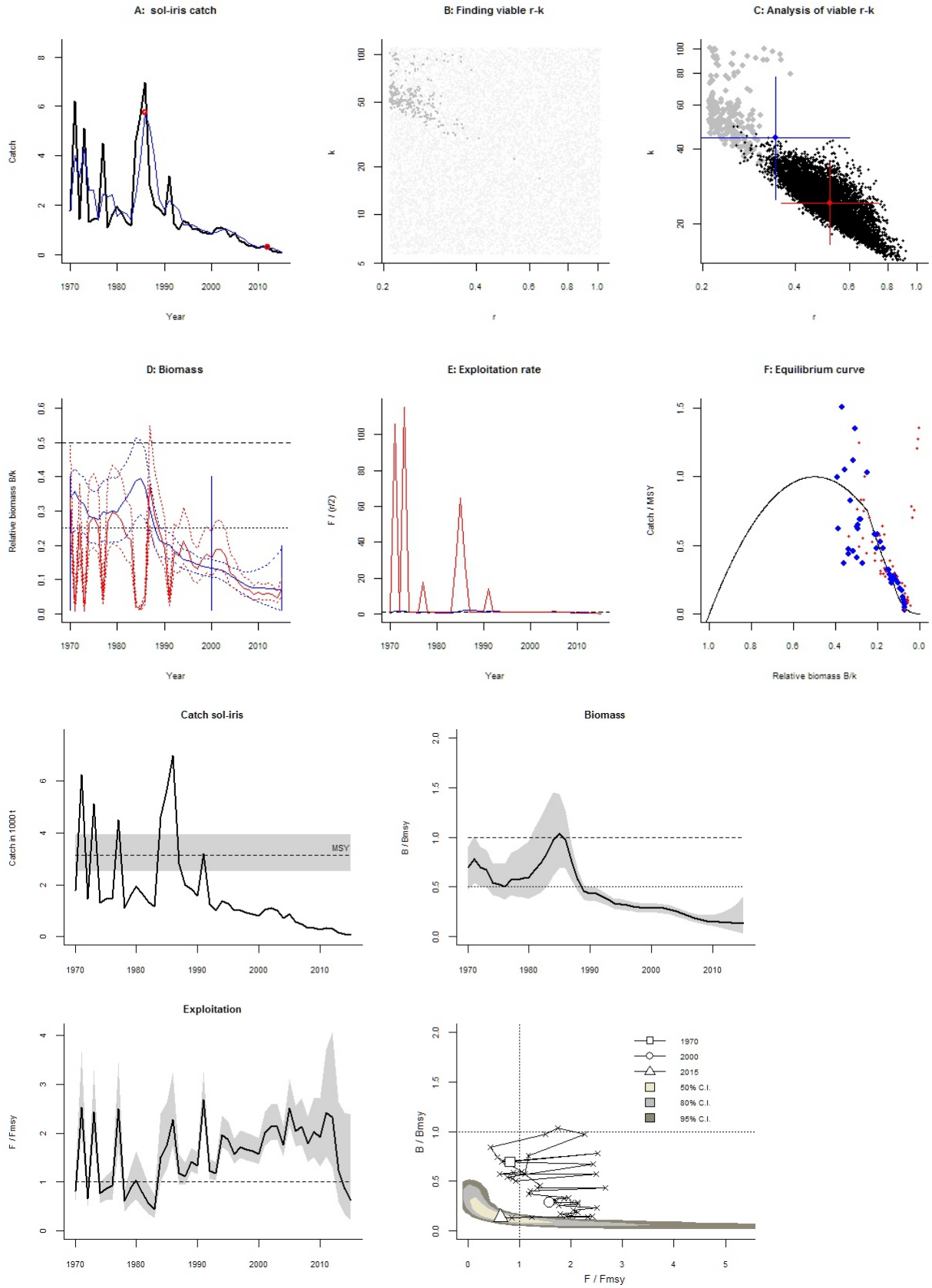
Species: *Solea solea* , stock: sol-iris
Sole in Division VIIa (Irish Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/sol-iris.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1970 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert
Prior final relative biomass = 0.01 - 0.2 expert
Prior range for r = 0.21 - 1 expert, , prior range for k = 5.63 - 109
Prior range of q = 0.672 - 2.96

Results of CMSY analysis with altogether 258 viable trajectories for 250 r-k pairs
r = 0.345 , 95% CL = 0.197 - 0.602 , k = 44.2 , 95% CL = 25.1 - 77.8
MSY = 3.81 , 95% CL = 1.75 - 8.3
Relative biomass last year = 0.0712 k, 2.5th = 0.0115 , 97.5th = 0.192
Exploitation F/(r/2) in last year = 0.198

Results from Bayesian Schaefer model using catch & CPUE
r = 0.52 , 95% CL = 0.361 - 0.75 , k = 24.2 , 95% CL = 16.6 - 35.2
MSY = 3.15 , 95% CL = 2.51 - 3.93
Relative biomass in last year = 0.0691 k, 2.5th perc = 0.0183 , 97.5th perc = 0.207
Exploitation F/(r/2) in last year = 0.175
q = 0.79 , lcl = 0.578 , ucl = 1.08

Results for Management (based on BSM analysis)
Fmsy = 0.26 , 95% CL = 0.181 - 0.375 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0719 , 95% CL = 0.0499 - 0.104 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 3.15 , 95% CL = 2.51 - 3.93
Bmsy = 12.1 , 95% CL = 8.3 - 17.6
Biomass in last year = 1.67 , 2.5th perc = 0.443 , 97.5 perc = 5
B/Bmsy in last year = 0.138 , 2.5th perc = 0.0367 , 97.5 perc = 0.414
Fishing mortality in last year = 0.0455 , 2.5th perc = 0.0152 , 97.5 perc = 0.171
F/Fmsy = 0.633 , 2.5th perc = 0.211 , 97.5 perc = 2.39

Stock status and exploitation in 2014
Biomass = 1.64 , B/Bmsy = 0.135 , fishing mortality F = 0.0605 , F/Fmsy = 0.861
Comment: OK (RF 27.09.16)

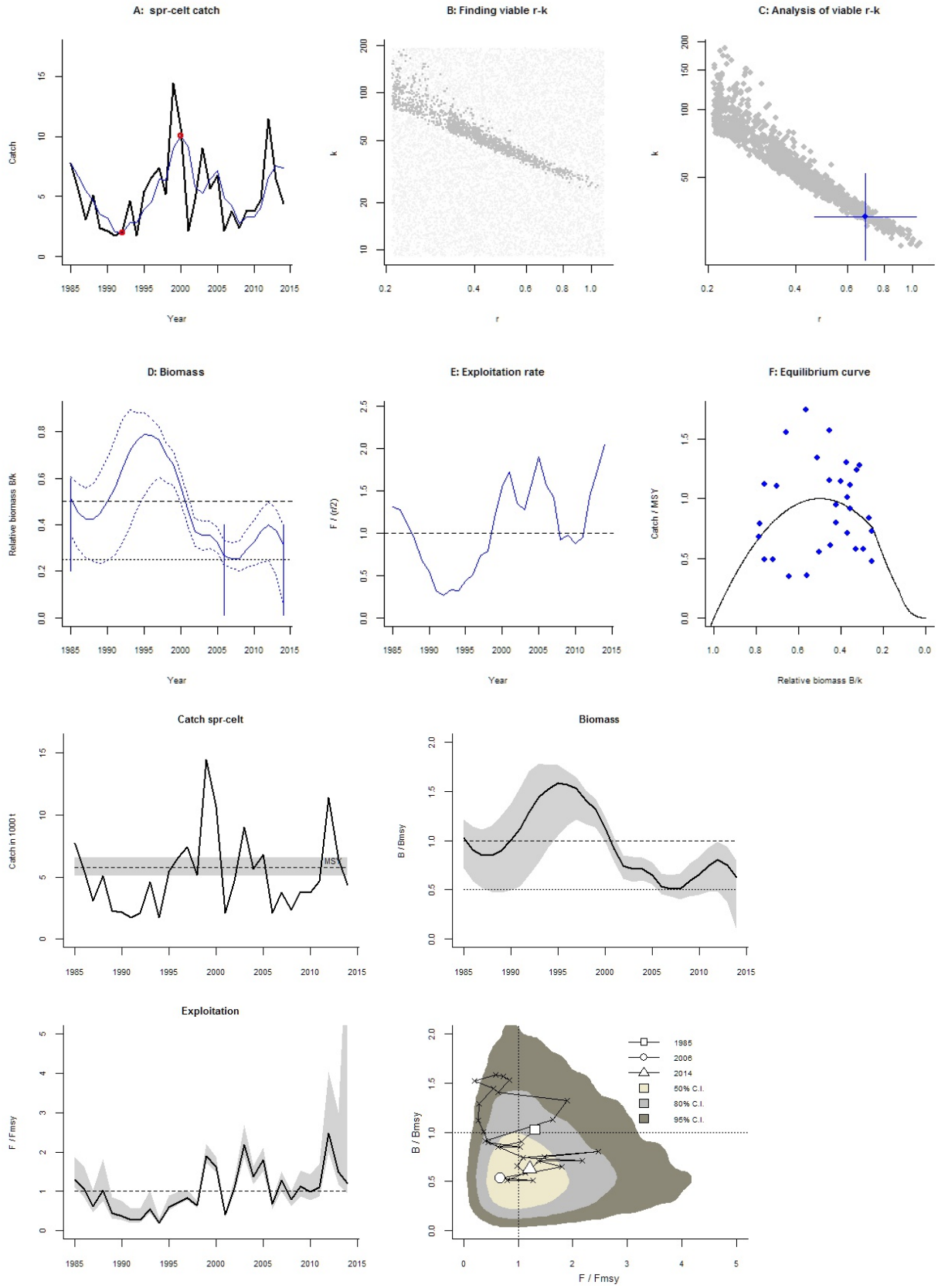

A: sol-iris catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch sol-iris
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1970
2000
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

Species: *Sprattus sprattus* , stock: spr-celt
Sprat in in Subarea VI and Divisions VIIa–c and f–k (West of Scotland, Southern Celtic Seas)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/spr-celt.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1985 - 2014 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2006 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.21 - 1.1 expert, , prior range for k = 9.08 - 192

Results of CMSY analysis with altogether 3020 viable trajectories for 1342 r-k pairs
r = 0.691 , 95% CL = 0.463 - 1.03 , k = 33.5 , 95% CL = 21.4 - 52.3
MSY = 5.78 , 95% CL = 5.08 - 6.58
Relative biomass last year = 0.314 k, 2.5th = 0.0487 , 97.5th = 0.397
Exploitation F/(r/2) in last year = 2.04

Results for Management (based on CMSY analysis)
Fmsy = 0.345 , 95% CL = 0.232 - 0.515 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.345 , 95% CL = 0.232 - 0.515 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 5.78 , 95% CL = 5.08 - 6.58
Bmsy = 16.7 , 95% CL = 10.7 - 26.2
Biomass in last year = 10.5 , 2.5th perc = 1.63 , 97.5 perc = 13.3
B/Bmsy in last year = 0.628 , 2.5th perc = 0.0973 , 97.5 perc = 0.794
Fishing mortality in last year = 0.418 , 2.5th perc = 0.33 , 97.5 perc = 2.69
F/Fmsy = 1.21 , 2.5th perc = 0.956 , 97.5 perc = 7.8

Stock status and exploitation in 2014
Biomass = 10.5 , B/Bmsy = 0.628 , fishing mortality F = 0.418 , F/Fmsy = 1.21
Comment: OK (RF 27.09.16)


A: spr-celt 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 spr-celt
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.

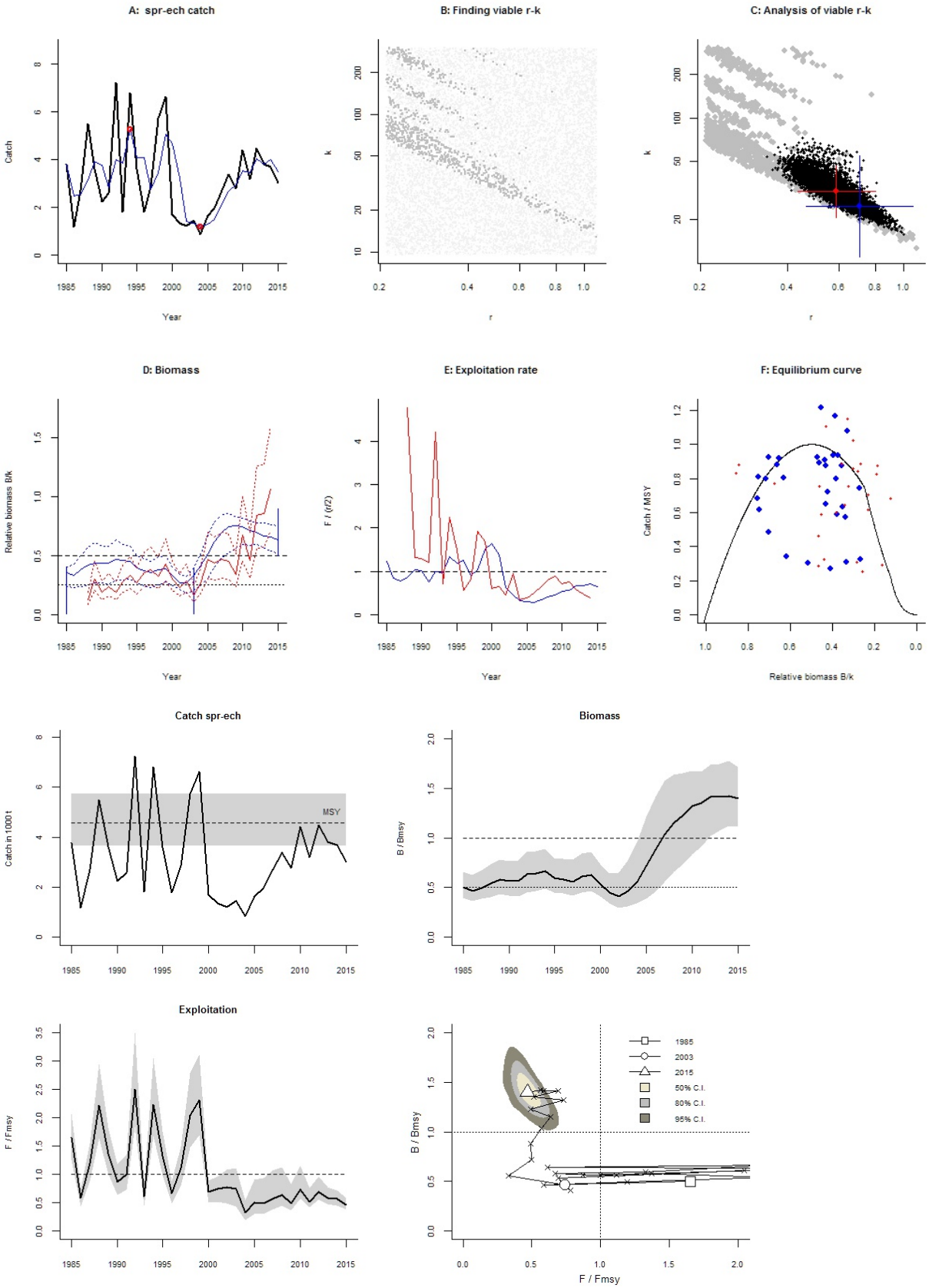
Species: *Sprattus sprattus* , stock: spr-ech
Sprat in Divisions VIId,e (English Channel)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/spr-ech.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1985 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2003 expert
Prior final relative biomass = 0.5 - 0.9 expert
Prior range for r = 0.21 - 1.1 expert, , prior range for k = 9.49 - 301
Prior range of q = 0.0552 - 0.254

Results of CMSY analysis with altogether 1151 viable trajectories for 945 r-k pairs
r = 0.705 , 95% CL = 0.463 - 1.07 , k = 24.6 , 95% CL = 11.1 - 54.8
MSY = 4.34 , 95% CL = 1.91 - 9.87
Relative biomass last year = 0.632 k, 2.5th = 0.517 , 97.5th = 0.751
Exploitation F/(r/2) in last year = 0.636

Results from Bayesian Schaefer model using catch & CPUE
r = 0.587 , 95% CL = 0.432 - 0.798 , k = 31.2 , 95% CL = 20.8 - 46.6
MSY = 4.58 , 95% CL = 3.66 - 5.72
Relative biomass in last year = 0.7 k, 2.5th perc = 0.555 , 97.5th perc = 0.858
Exploitation F/(r/2) in last year = 0.469
q = 0.0724 , lcl = 0.0543 , ucl = 0.0966

Results for Management (based on BSM analysis)
Fmsy = 0.294 , 95% CL = 0.216 - 0.399 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.294 , 95% CL = 0.216 - 0.399 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 4.58 , 95% CL = 3.66 - 5.72
Bmsy = 15.6 , 95% CL = 10.4 - 23.3
Biomass in last year = 21.8 , 2.5th perc = 17.3 , 97.5 perc = 26.7
B/Bmsy in last year = 1.4 , 2.5th perc = 1.11 , 97.5 perc = 1.72
Fishing mortality in last year = 0.138 , 2.5th perc = 0.112 , 97.5 perc = 0.174
F/Fmsy = 0.469 , 2.5th perc = 0.382 , 97.5 perc = 0.591

Stock status and exploitation in 2014
Biomass = 22.2 , B/Bmsy = 1.42 , fishing mortality F = 0.166 , F/Fmsy = 0.564
Comment: OK (RF 27.09.16)

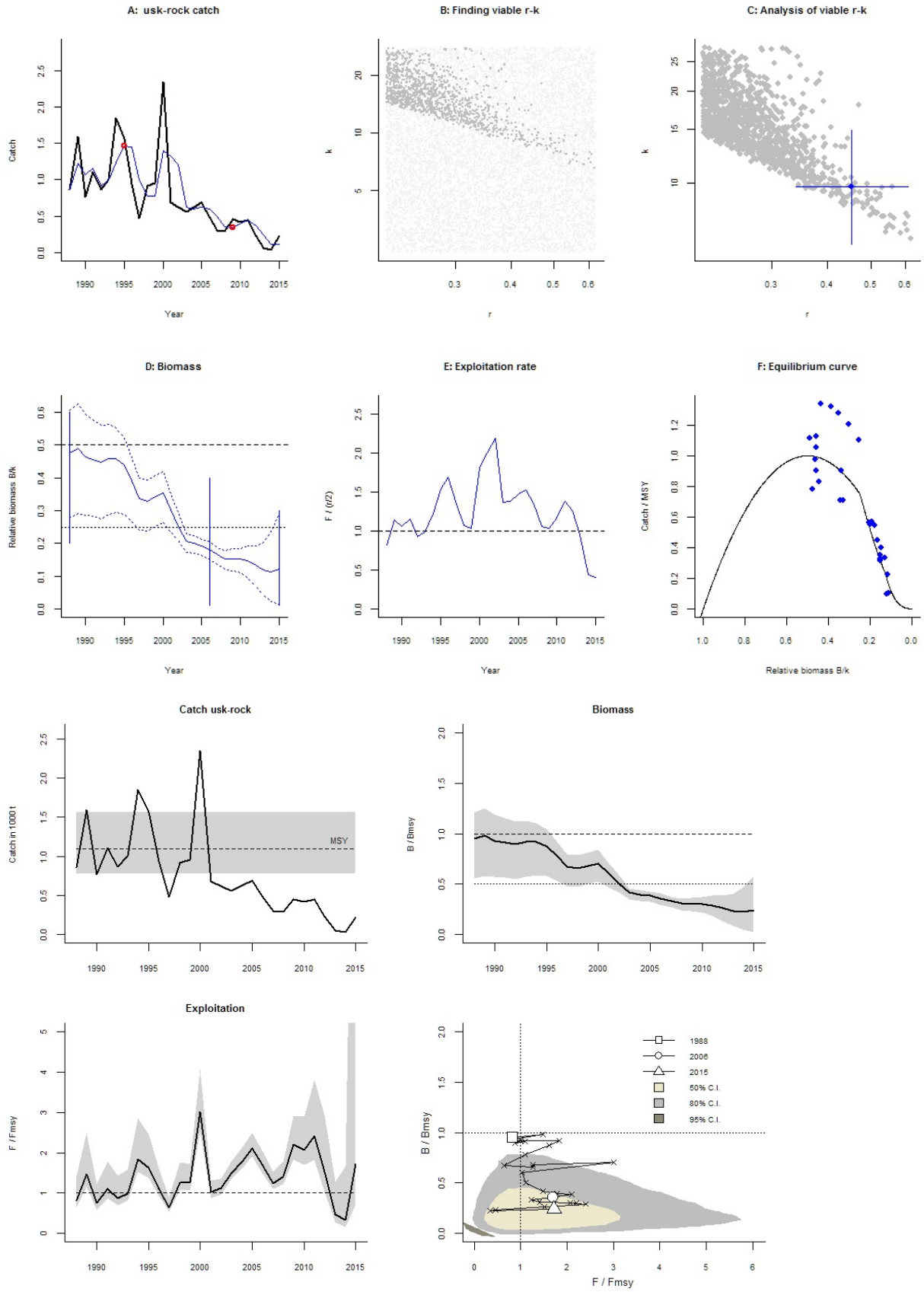

A: spr-ech catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch spr-ech
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1985
2003
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

Species: *Brosme brosme* , stock: usk-rock
Tusk in Division VIb (Rockall)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/usk-rock.pdf
Region: Northeast Atlantic , Rockall
Catch data used from years 1988 - 2015 , abundance = None
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 = 0.01 - 0.3 expert
Prior range for r = 0.21 - 0.62 expert, , prior range for k = 2.37 - 28

Results of CMSY analysis with altogether 1421 viable trajectories for 1189 r-k pairs
r = 0.454 , 95% CL = 0.339 - 0.608 , k = 9.69 , 95% CL = 6.29 - 14.9
MSY = 1.1 , 95% CL = 0.773 - 1.56
Relative biomass last year = 0.122 k, 2.5th = 0.0134 , 97.5th = 0.291
Exploitation F/(r/2) in last year = 0.398

Results for Management (based on CMSY analysis)
Fmsy = 0.227 , 95% CL = 0.169 - 0.304 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.111 , 95% CL = 0.0829 - 0.149 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1.1 , 95% CL = 0.773 - 1.56
Bmsy = 4.85 , 95% CL = 3.15 - 7.47
Biomass in last year = 1.19 , 2.5th perc = 0.13 , 97.5 perc = 2.82
B/Bmsy in last year = 0.245 , 2.5th perc = 0.0269 , 97.5 perc = 0.582
Fishing mortality in last year = 0.191 , 2.5th perc = 0.0802 , 97.5 perc = 1.74
F/Fmsy = 1.72 , 2.5th perc = 0.722 , 97.5 perc = 15.6

Stock status and exploitation in 2014
Biomass = 1.1 , B/Bmsy = 0.226 , fishing mortality F = 0.0347 , F/Fmsy = 0.338
Comment: OK (RF 27.09.16)


A: usk-rock 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-rock
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1988
2006
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

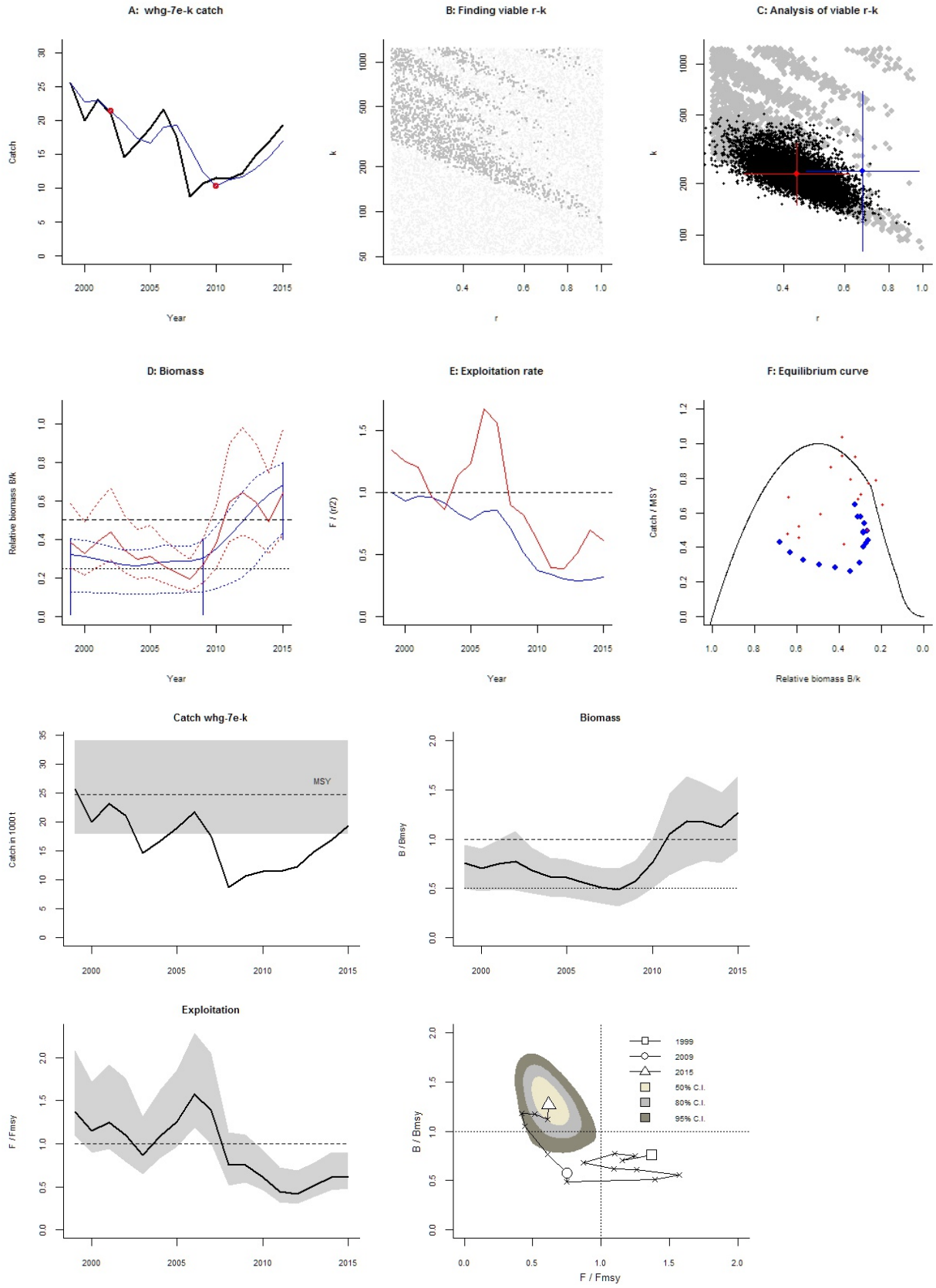
Species: *Merlangius merlangus* , stock: whg-7e-k
Whiting in Division VIIe-k
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/whg-7e-k.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1999 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2009 default
Prior final relative biomass = 0.4 - 0.8 expert
Prior range for r = 0.25 - 1 expert, , prior range for k = 50.7 - 1229
Prior range of q = 0.286 - 1.15

Results of CMSY analysis with altogether 2443 viable trajectories for 1982 r-k pairs
r = 0.674 , 95% CL = 0.464 - 0.979 , k = 235 , 95% CL = 80.5 - 686
MSY = 39.6 , 95% CL = 8.96 - 175
Relative biomass last year = 0.682 k, 2.5th = 0.435 , 97.5th = 0.793
Exploitation F/(r/2) in last year = 0.315

Results from Bayesian Schaefer model using catch & CPUE
r = 0.436 , 95% CL = 0.308 - 0.619 , k = 226 , 95% CL = 149 - 343
MSY = 24.7 , 95% CL = 17.9 - 34.1
Relative biomass in last year = 0.635 k, 2.5th perc = 0.439 , 97.5th perc = 0.818
Exploitation F/(r/2) in last year = 0.616
q = 0.575 , lcl = 0.428 , ucl = 0.773

Results for Management (based on BSM analysis)
Fmsy = 0.218 , 95% CL = 0.154 - 0.309 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.218 , 95% CL = 0.154 - 0.309 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 24.7 , 95% CL = 17.9 - 34.1
Bmsy = 113 , 95% CL = 74.6 - 171
Biomass in last year = 144 , 2.5th perc = 99.2 , 97.5 perc = 185
B/Bmsy in last year = 1.27 , 2.5th perc = 0.877 , 97.5 perc = 1.64
Fishing mortality in last year = 0.134 , 2.5th perc = 0.104 , 97.5 perc = 0.194
F/Fmsy = 0.616 , 2.5th perc = 0.477 , 97.5 perc = 0.89

Stock status and exploitation in 2014
Biomass = 127 , B/Bmsy = 1.12 , fishing mortality F = 0.133 , F/Fmsy = 0.609
Comment: OK (RF 27.09.16)


A: whg-7e-k 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 whg-7e-k
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1999
2009
2015
50% C.I.
80% C.I.
95% C.I.

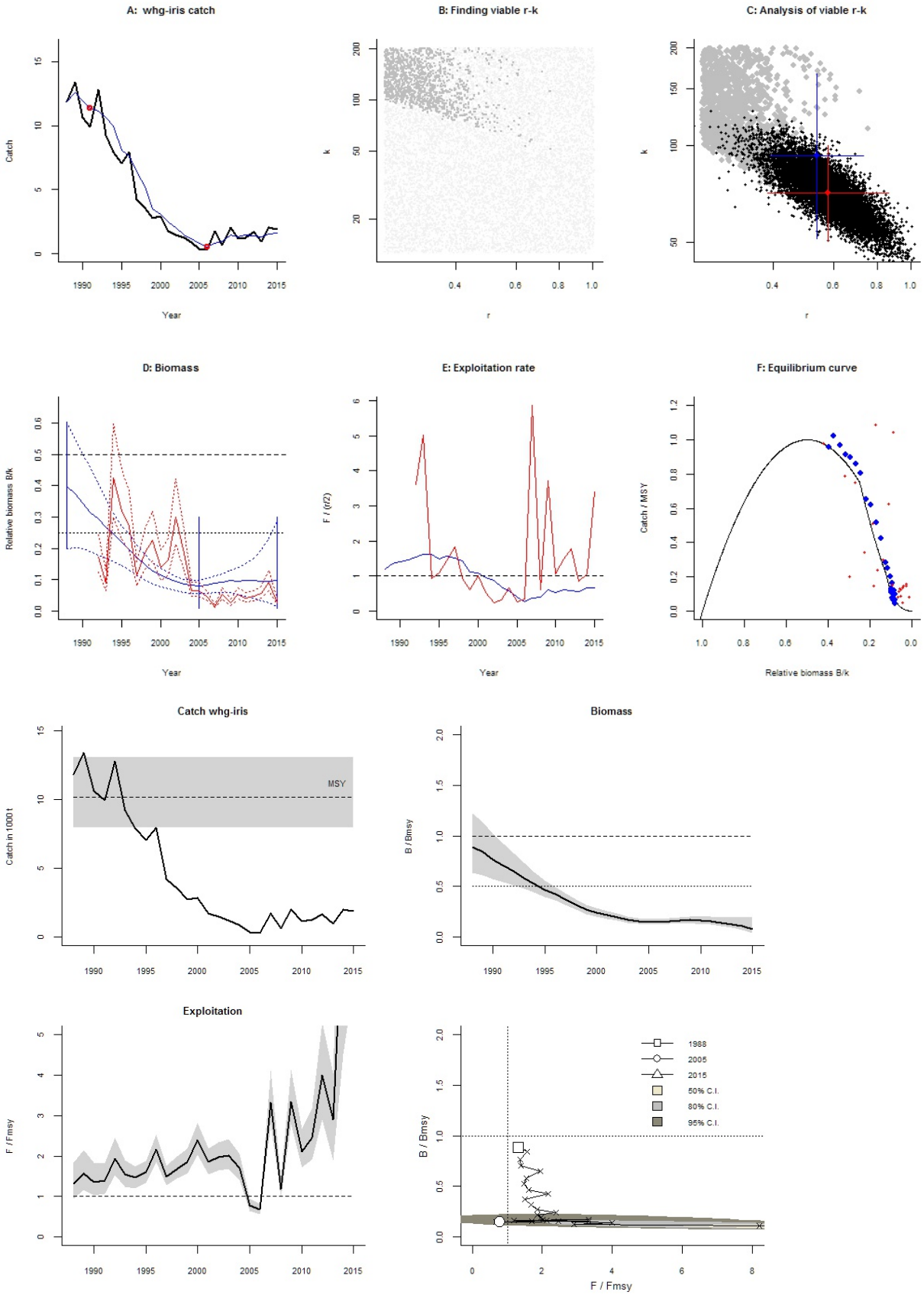
Species: *Merlangius merlangus* , stock: whg-iris
Whiting in Division VIIa (Irish Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/whg-iris.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1988 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.3 in year 2005 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.25 - 1 expert, , prior range for k = 12.5 - 202
Prior range of q = 6.94e-05 - 0.000279

Results of CMSY analysis with altogether 1379 viable trajectories for 1309 r-k pairs
r = 0.535 , 95% CL = 0.393 - 0.729 , k = 92.5 , 95% CL = 51.3 - 167
MSY = 12.4 , 95% CL = 6.27 - 24.4
Relative biomass last year = 0.0984 k, 2.5th = 0.0135 , 97.5th = 0.285
Exploitation F/(r/2) in last year = 0.669

Results from Bayesian Schaefer model using catch & CPUE
r = 0.577 , 95% CL = 0.385 - 0.865 , k = 70.8 , 95% CL = 50.3 - 99.7
MSY = 10.2 , 95% CL = 7.98 - 13.1
Relative biomass in last year = 0.0388 k, 2.5th perc = 0.0221 , 97.5th perc = 0.098
Exploitation F/(r/2) in last year = 2.43
q = 0.000107 , lcl = 8.14e-05 , ucl = 0.00014

Results for Management (based on BSM analysis)
Fmsy = 0.288 , 95% CL = 0.192 - 0.432 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0448 , 95% CL = 0.0299 - 0.0671 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 10.2 , 95% CL = 7.98 - 13.1
Bmsy = 35.4 , 95% CL = 25.2 - 49.9
Biomass in last year = 2.75 , 2.5th perc = 1.56 , 97.5 perc = 6.94
B/Bmsy in last year = 0.0776 , 2.5th perc = 0.0442 , 97.5 perc = 0.196
Fishing mortality in last year = 0.699 , 2.5th perc = 0.277 , 97.5 perc = 1.23
F/Fmsy = 15.6 , 2.5th perc = 6.19 , 97.5 perc = 27.5

Stock status and exploitation in 2014
Biomass = 3.87 , B/Bmsy = 0.109 , fishing mortality F = 0.517 , F/Fmsy = 8.2
Comment: OK (RF 27.09.16)


A: whg-iris 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 whg-iris
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1988
2005
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

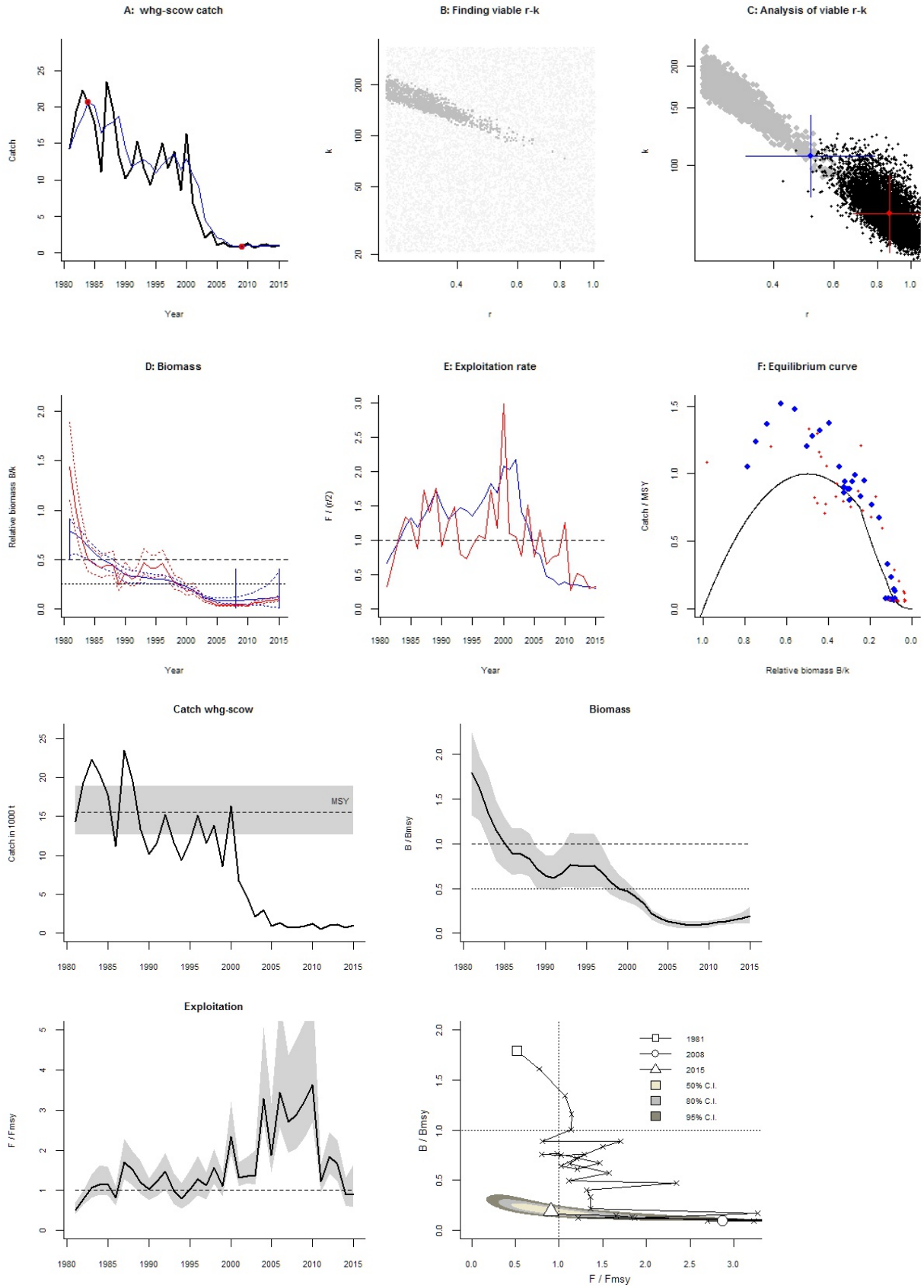
Species: *Merlangius merlangus* , stock: whg-scow
Whiting in Division VIa (West of Scotland)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/whg-scow.pdf
Region: Northeast Atlantic , Celtic Seas
Catch data used from years 1981 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2008 default
Prior final relative biomass = 0.01 - 0.4 , default
Prior range for r = 0.25 - 1 expert, , prior range for k = 20.5 - 331
Prior range of q = 1.78 - 7.17

Results of CMSY analysis with altogether 1598 viable trajectories for 1278 r-k pairs
r = 0.512 , 95% CL = 0.332 - 0.788 , k = 107 , 95% CL = 80 - 142
MSY = 13.6 , 95% CL = 12.1 - 15.3
Relative biomass last year = 0.125 k, 2.5th = 0.013 , 97.5th = 0.374
Exploitation F/(r/2) in last year = 0.293

Results from Bayesian Schaefer model using catch & CPUE
r = 0.871 , 95% CL = 0.683 - 1.11 , k = 71.1 , 95% CL = 54.3 - 93.2
MSY = 15.5 , 95% CL = 12.7 - 18.9
Relative biomass in last year = 0.0971 k, 2.5th perc = 0.0539 , 97.5th perc = 0.15
Exploitation F/(r/2) in last year = 0.353
q = 1.32 , lcl = 1.04 , ucl = 1.66

Results for Management (based on BSM analysis)
Fmsy = 0.436 , 95% CL = 0.341 - 0.556 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.169 , 95% CL = 0.133 - 0.216 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 15.5 , 95% CL = 12.7 - 18.9
Bmsy = 35.6 , 95% CL = 27.1 - 46.6
Biomass in last year = 6.91 , 2.5th perc = 3.83 , 97.5 perc = 10.7
B/Bmsy in last year = 0.194 , 2.5th perc = 0.108 , 97.5 perc = 0.301
Fishing mortality in last year = 0.154 , 2.5th perc = 0.0993 , 97.5 perc = 0.277
F/Fmsy = 0.908 , 2.5th perc = 0.587 , 97.5 perc = 1.64

Stock status and exploitation in 2014
Biomass = 5.94 , B/Bmsy = 0.167 , fishing mortality F = 0.129 , F/Fmsy = 0.886
Comment: OK (RF 27.09.16)


A: whg-scow 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 whg-scow
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1981
2008
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

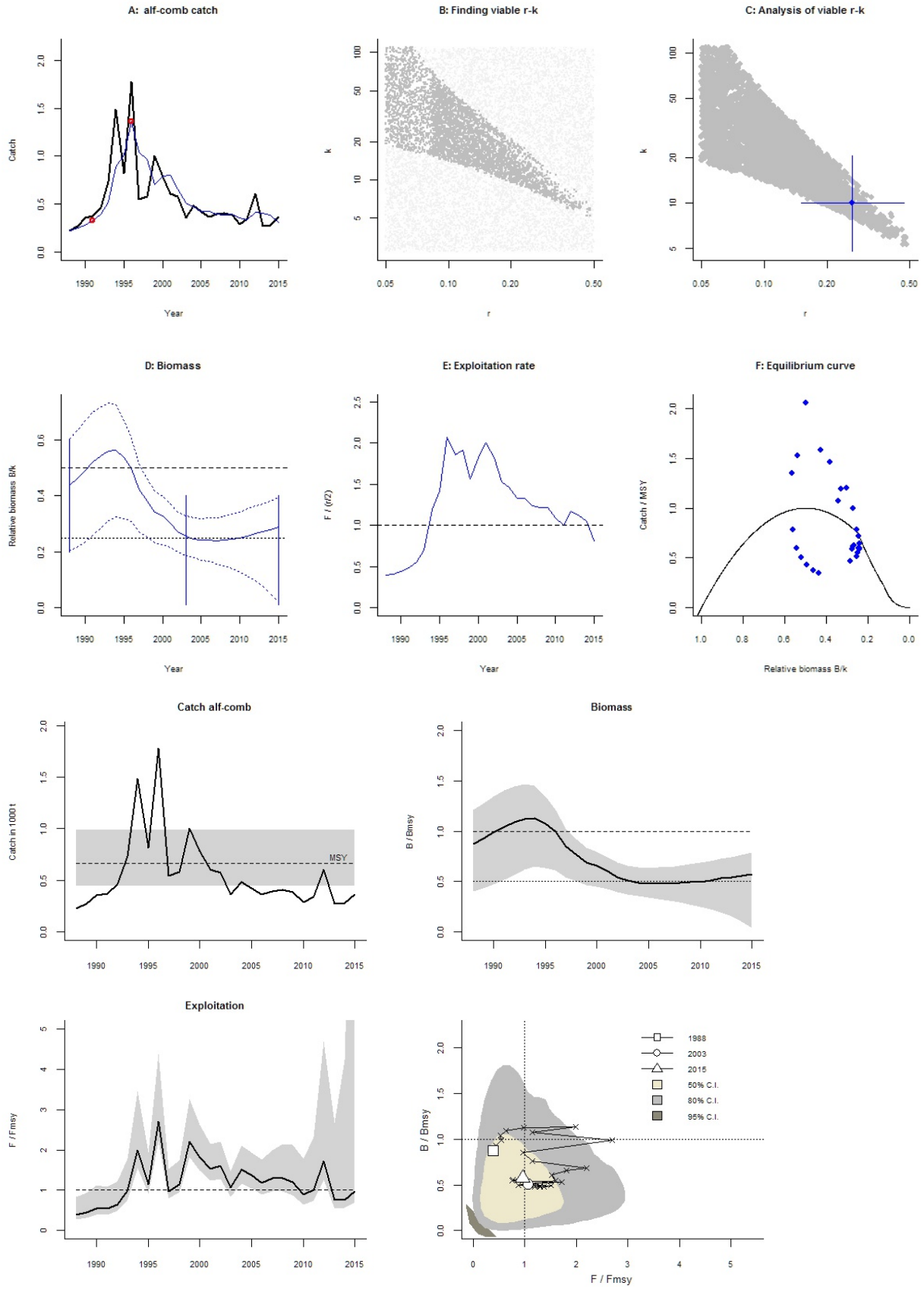
Bay of Biscay and Iberian Sea, including Azores (analyzed with CMSY_O_7m.R)

Species: *Beryx* spp. , stock: alf-comb
Alfonsinos/golden eye perch (Beryx spp.) in the Northeast Atlantic
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/alf-comb.pdf
Region: Northeast Atlantic , Azores
Catch data used from years 1988 - 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 - 0.4 expert
Prior range for r = 0.05 - 0.5 default , prior range for k = 2.72 - 109

Results of CMSY analysis with altogether 10760 viable trajectories for 4546 r-k pairs
r = 0.266 , 95% CL = 0.151 - 0.469 , k = 9.95 , 95% CL = 4.79 - 20.7
MSY = 0.661 , 95% CL = 0.443 - 0.986
Relative biomass last year = 0.287 k, 2.5th = 0.0202 , 97.5th = 0.396
Exploitation F/(r/2) in last year = 0.807

Results for Management (based on CMSY analysis)
Fmsy = 0.133 , 95% CL = 0.0754 - 0.234 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.133 , 95% CL = 0.0754 - 0.234 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.661 , 95% CL = 0.443 - 0.986
Bmsy = 4.98 , 95% CL = 2.4 - 10.3
Biomass in last year = 2.86 , 2.5th perc = 0.201 , 97.5 perc = 3.94
B/Bmsy in last year = 0.574 , 2.5th perc = 0.0403 , 97.5 perc = 0.792
Fishing mortality in last year = 0.128 , 2.5th perc = 0.0926 , 97.5 perc = 1.82
F/Fmsy = 0.962 , 2.5th perc = 0.697 , 97.5 perc = 13.7

Stock status and exploitation in 2014
Biomass = 2.77 , B/Bmsy = 0.556 , fishing mortality F = 0.102 , F/Fmsy = 0.767
Comment: OK (RF 28.09.16)


A: alf-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 alf-comb
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1988
2003
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

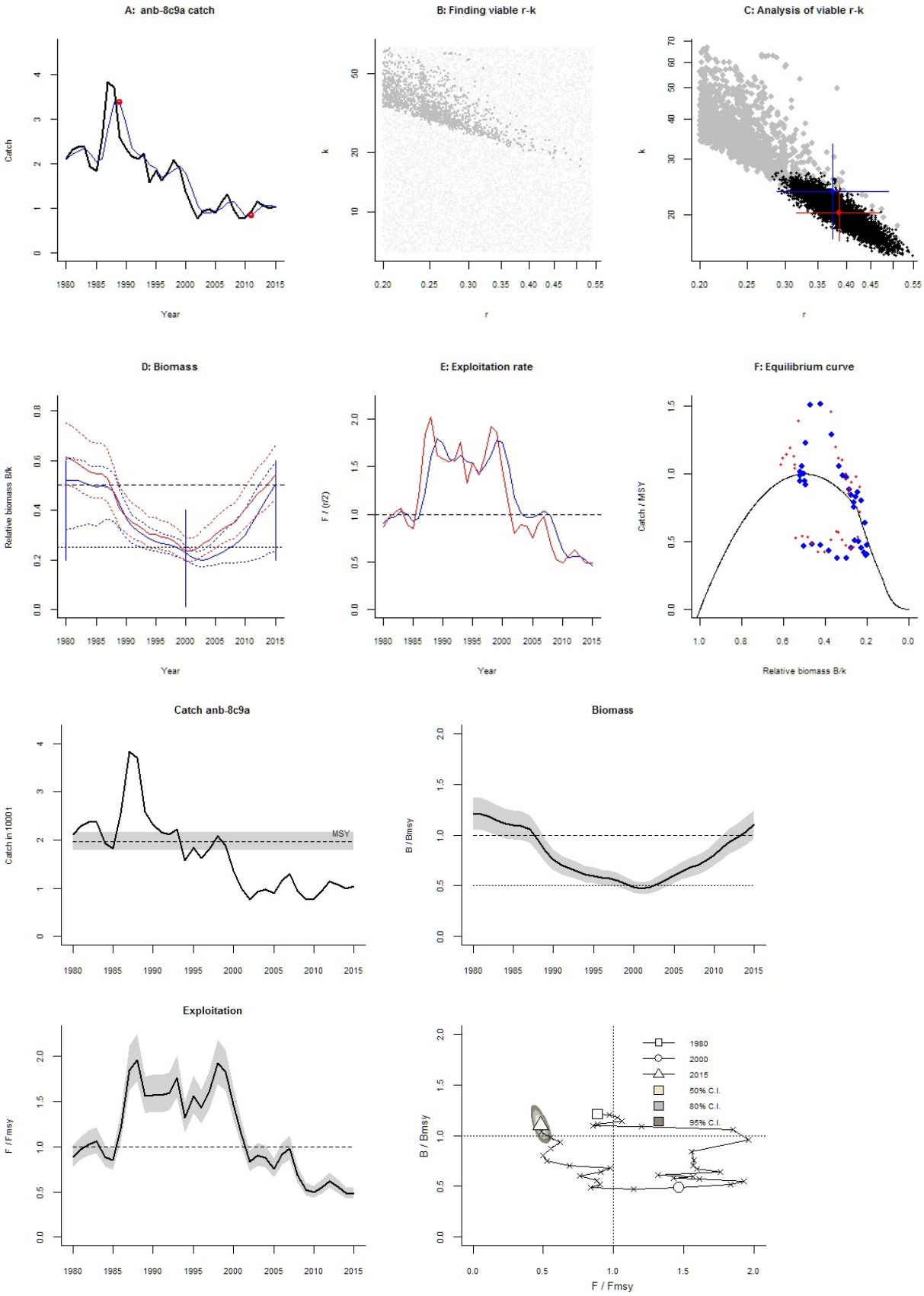
Species: *Lophius budegassa* , stock: anb-8c9a
Black-bellied anglerfish in Divisions VIIIc and IXa (Cantabrian Sea, Atlantic Iberian waters)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/anb-8c9a.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1980 - 2015 , 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 - 0.54 expert, , prior range for k = 6.25 - 67.4
Prior range of q = 0.000132 - 0.000435

Results of CMSY analysis with altogether 1945 viable trajectories for 1501 r-k pairs
r = 0.375 , 95% CL = 0.288 - 0.489 , k = 23.7 , 95% CL = 16.9 - 33.2
MSY = 2.22 , 95% CL = 1.71 - 2.89
Relative biomass last year = 0.504 k, 2.5th = 0.236 , 97.5th = 0.595
Exploitation F/(r/2) in last year = 0.46

Results from Bayesian Schaefer model using catch & CPUE
r = 0.386 , 95% CL = 0.317 - 0.471 , k = 20.4 , 95% CL = 16.7 - 24.9
MSY = 1.97 , 95% CL = 1.79 - 2.16
Relative biomass in last year = 0.55 k, 2.5th perc = 0.481 , 97.5th perc = 0.623
Exploitation F/(r/2) in last year = 0.481
q = 9.59e-05 , lcl = 8.04e-05 , ucl = 0.000114

Results for Management (based on BSM analysis)
Fmsy = 0.193 , 95% CL = 0.158 - 0.236 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.193 , 95% CL = 0.158 - 0.236 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1.97 , 95% CL = 1.79 - 2.16
Bmsy = 10.2 , 95% CL = 8.33 - 12.5
Biomass in last year = 11.2 , 2.5th perc = 9.8 , 97.5 perc = 12.7
B/Bmsy in last year = 1.1 , 2.5th perc = 0.962 , 97.5 perc = 1.25
Fishing mortality in last year = 0.0928 , 2.5th perc = 0.082 , 97.5 perc = 0.106
F/Fmsy = 0.481 , 2.5th perc = 0.425 , 97.5 perc = 0.55

Stock status and exploitation in 2014
Biomass = 10.5 , B/Bmsy = 1.04 , fishing mortality F = 0.0938 , F/Fmsy = 0.486
Comment: OK (RF 27.09.16)


A: anb-8c9a 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 anb-8c9a
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1980
2000
2015
50% C.I.
80% C.I.
95% C.I.

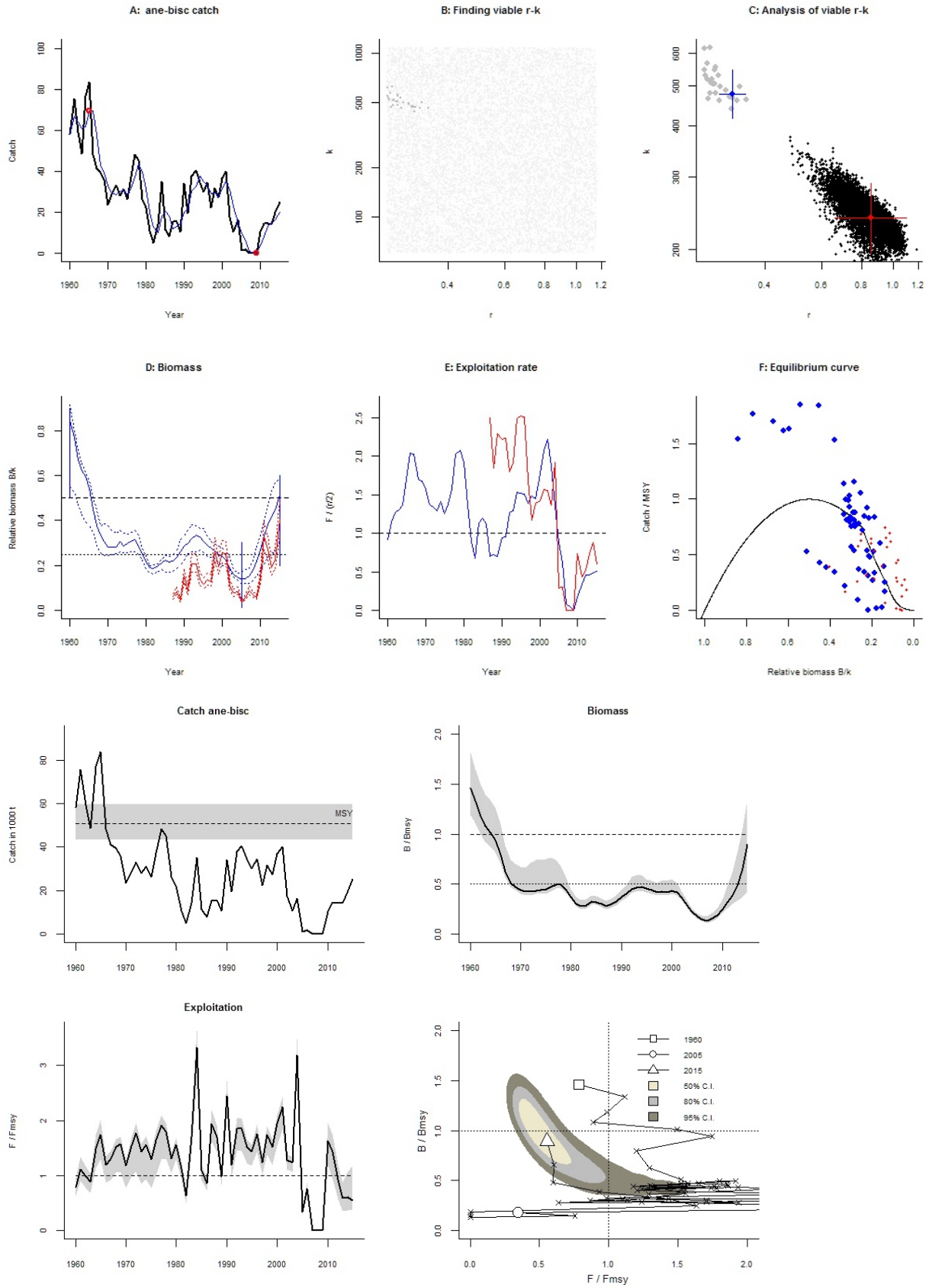
Species: *Engraulis encrasicolus* , stock: ane-bisc
Anchovy in in Subarea VIII (Bay of Biscay)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/ane-bisc.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1960 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.01 - 0.3 in year 2005 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.26 - 1.2 expert, , prior range for k = 60.1 - 1073
Prior range of q = 2.08 - 8.77

Results of CMSY analysis with altogether 27 viable trajectories for 26 r-k pairs
r = 0.317 , 95% CL = 0.288 - 0.348 , k = 477 , 95% CL = 416 - 547
MSY = 37.8 , 95% CL = 33.4 - 42.7
Relative biomass last year = 0.513 k, 2.5th = 0.302 , 97.5th = 0.582
Exploitation F/(r/2) in last year = 0.512

Results from Bayesian Schaefer model using catch & CPUE
r = 0.853 , 95% CL = 0.661 - 1.1 , k = 238 , 95% CL = 196 - 290
MSY = 50.7 , 95% CL = 43.3 - 59.5
Relative biomass in last year = 0.447 k, 2.5th perc = 0.209 , 97.5th perc = 0.668
Exploitation F/(r/2) in last year = 0.554
q = 1.52 , lcl = 1.15 , ucl = 2.02

Results for Management (based on BSM analysis)
Fmsy = 0.426 , 95% CL = 0.33 - 0.55 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.426 , 95% CL = 0.33 - 0.55 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 50.7 , 95% CL = 43.3 - 59.5
Bmsy = 119 , 95% CL = 97.8 - 145
Biomass in last year = 106 , 2.5th perc = 49.7 , 97.5 perc = 159
B/Bmsy in last year = 0.895 , 2.5th perc = 0.417 , 97.5 perc = 1.34
Fishing mortality in last year = 0.236 , 2.5th perc = 0.158 , 97.5 perc = 0.506
F/Fmsy = 0.554 , 2.5th perc = 0.371 , 97.5 perc = 1.19

Stock status and exploitation in 2014
Biomass = 78.3 , B/Bmsy = 0.658 , fishing mortality F = 0.257 , F/Fmsy = 0.603
Comment: OK (RF 27.09.16)


A: ane-bisc 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 ane-bisc
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1960
2005
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

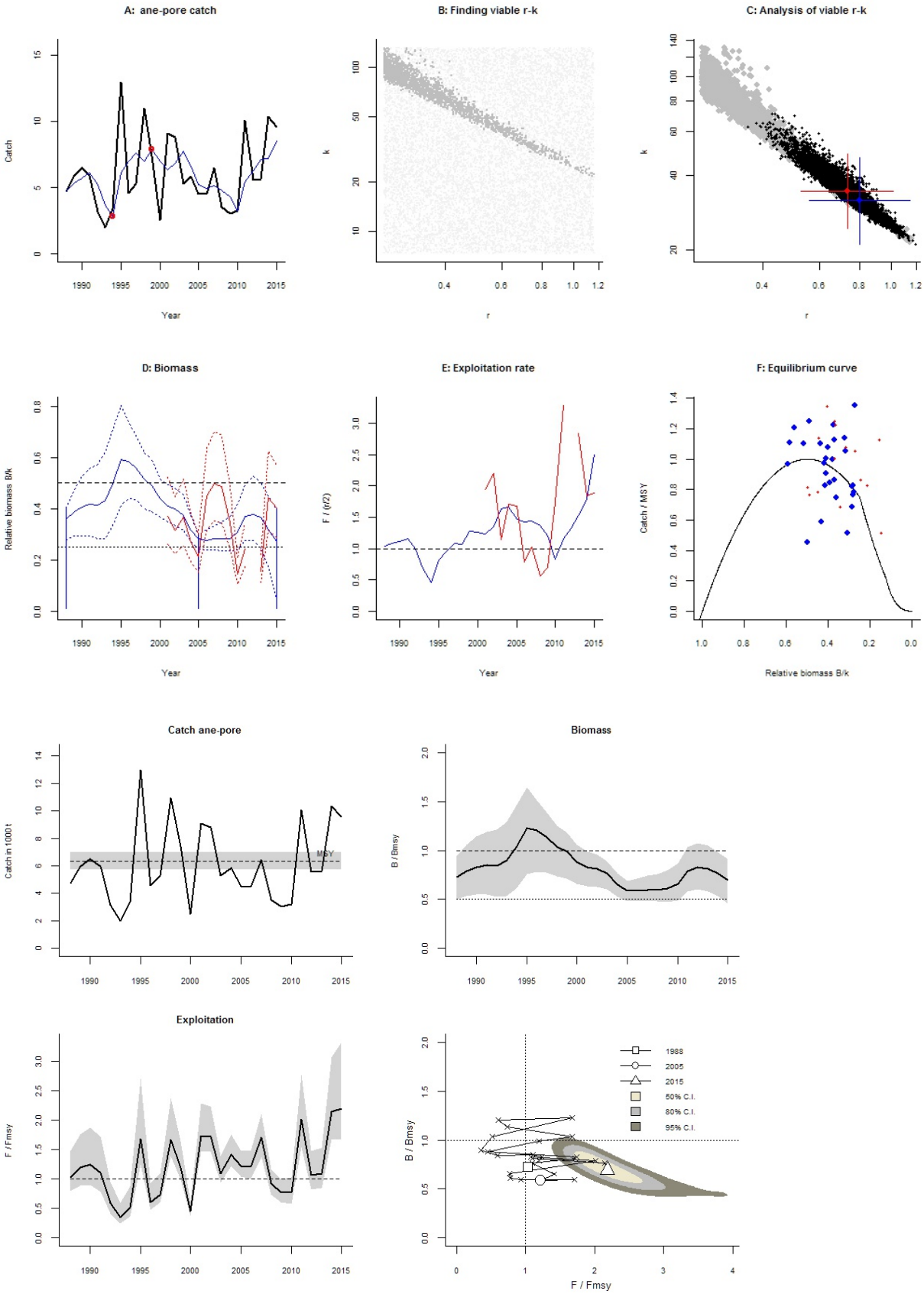
Species: *Engraulis encrasicolus* , stock: ane-pore
Anchovy in Division IXa (Atlantic Iberian Waters)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/ane-pore.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1988 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.3 in year 2005 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.26 - 1.2 expert, , prior range for k = 7.35 - 131
Prior range of q = 1.25 - 5.28

Results of CMSY analysis with altogether 2164 viable trajectories for 1763 r-k pairs
r = 0.799 , 95% CL = 0.559 - 1.14 , k = 31.6 , 95% CL = 21.1 - 47.3
MSY = 6.3 , 95% CL = 5.74 - 6.92
Relative biomass last year = 0.271 k, 2.5th = 0.0389 , 97.5th = 0.395
Exploitation F/(r/2) in last year = 2.49

Results from Bayesian Schaefer model using catch & CPUE
r = 0.73 , 95% CL = 0.526 - 1.01 , k = 34.6 , 95% CL = 24.5 - 48.7
MSY = 6.32 , 95% CL = 5.71 - 6.98
Relative biomass in last year = 0.347 k, 2.5th perc = 0.229 , 97.5th perc = 0.457
Exploitation F/(r/2) in last year = 2.19
q = 1.94 , lcl = 1.49 , ucl = 2.54

Results for Management (based on BSM analysis)
Fmsy = 0.365 , 95% CL = 0.263 - 0.507 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.365 , 95% CL = 0.263 - 0.507 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 6.32 , 95% CL = 5.71 - 6.98
Bmsy = 17.3 , 95% CL = 12.3 - 24.4
Biomass in last year = 12 , 2.5th perc = 7.91 , 97.5 perc = 15.8
B/Bmsy in last year = 0.695 , 2.5th perc = 0.457 , 97.5 perc = 0.913
Fishing mortality in last year = 0.799 , 2.5th perc = 0.608 , 97.5 perc = 1.21
F/Fmsy = 2.19 , 2.5th perc = 1.66 , 97.5 perc = 3.32

Stock status and exploitation in 2014
Biomass = 13.2 , B/Bmsy = 0.764 , fishing mortality F = 0.782 , F/Fmsy = 2.14
Comment: OK (RF 27.09.16)


A: ane-pore 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 ane-pore
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1988
2005
2015
50% C.I.
80% C.I.
95% C.I.

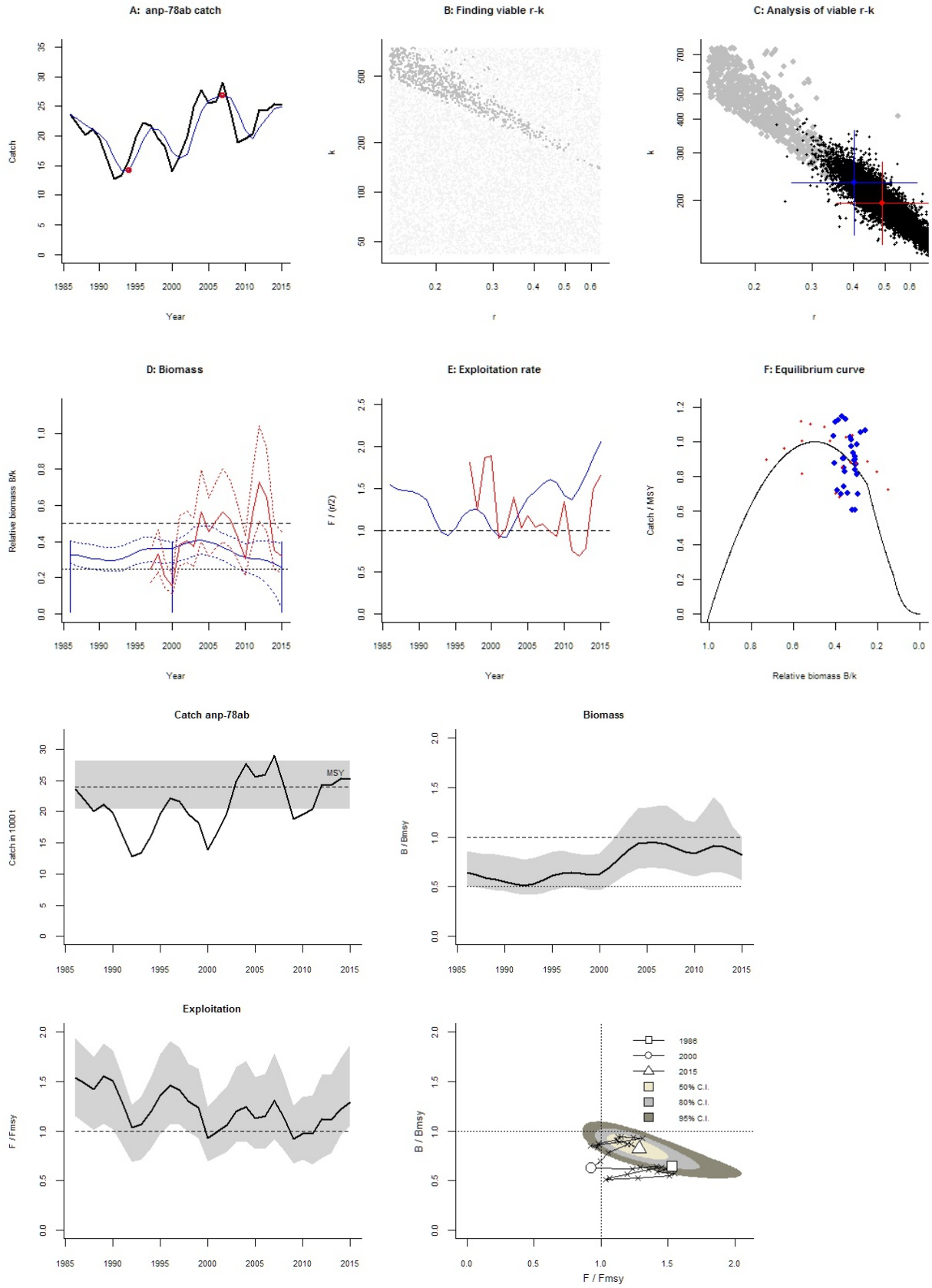
Species: *Lophius piscatorius* , stock: anp-78ab
White anglerfish in Divisions VIIb–k and VIIIa,b,d (Southern Celtic Seas, Bay of Biscay)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/anp-78ab.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1986 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.14 - 0.64 expert, , prior range for k = 41.9 - 739
Prior range of q = 1.83e-05 - 7.69e-05

Results of CMSY analysis with altogether 1096 viable trajectories for 792 r-k pairs
r = 0.403 , 95% CL = 0.258 - 0.627 , k = 233 , 95% CL = 149 - 364
MSY = 23.4 , 95% CL = 18.3 - 29.9
Relative biomass last year = 0.259 k, 2.5th = 0.0334 , 97.5th = 0.391
Exploitation F/(r/2) in last year = 2.06

Results from Bayesian Schaefer model using catch & CPUE
r = 0.491 , 95% CL = 0.354 - 0.68 , k = 195 , 95% CL = 137 - 277
MSY = 24 , 95% CL = 20.4 - 28.1
Relative biomass in last year = 0.41 k, 2.5th perc = 0.283 , 97.5th perc = 0.5
Exploitation F/(r/2) in last year = 1.29
q = 3.13e-05 , lcl = 2.37e-05 , ucl = 4.14e-05

Results for Management (based on BSM analysis)
Fmsy = 0.246 , 95% CL = 0.177 - 0.34 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.246 , 95% CL = 0.177 - 0.34 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 24 , 95% CL = 20.4 - 28.1
Bmsy = 97.6 , 95% CL = 68.7 - 139
Biomass in last year = 80 , 2.5th perc = 55.2 , 97.5 perc = 97.6
B/Bmsy in last year = 0.82 , 2.5th perc = 0.566 , 97.5 perc = 1
Fishing mortality in last year = 0.316 , 2.5th perc = 0.259 , 97.5 perc = 0.458
F/Fmsy = 1.29 , 2.5th perc = 1.05 , 97.5 perc = 1.86

Stock status and exploitation in 2014
Biomass = 84.4 , B/Bmsy = 0.865 , fishing mortality F = 0.3 , F/Fmsy = 1.22
Comment: OK (RF 27.09.16)


A: anp-78ab 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 anp-78ab
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1986
2000
2015
50% C.I.
80% C.I.
95% C.I.

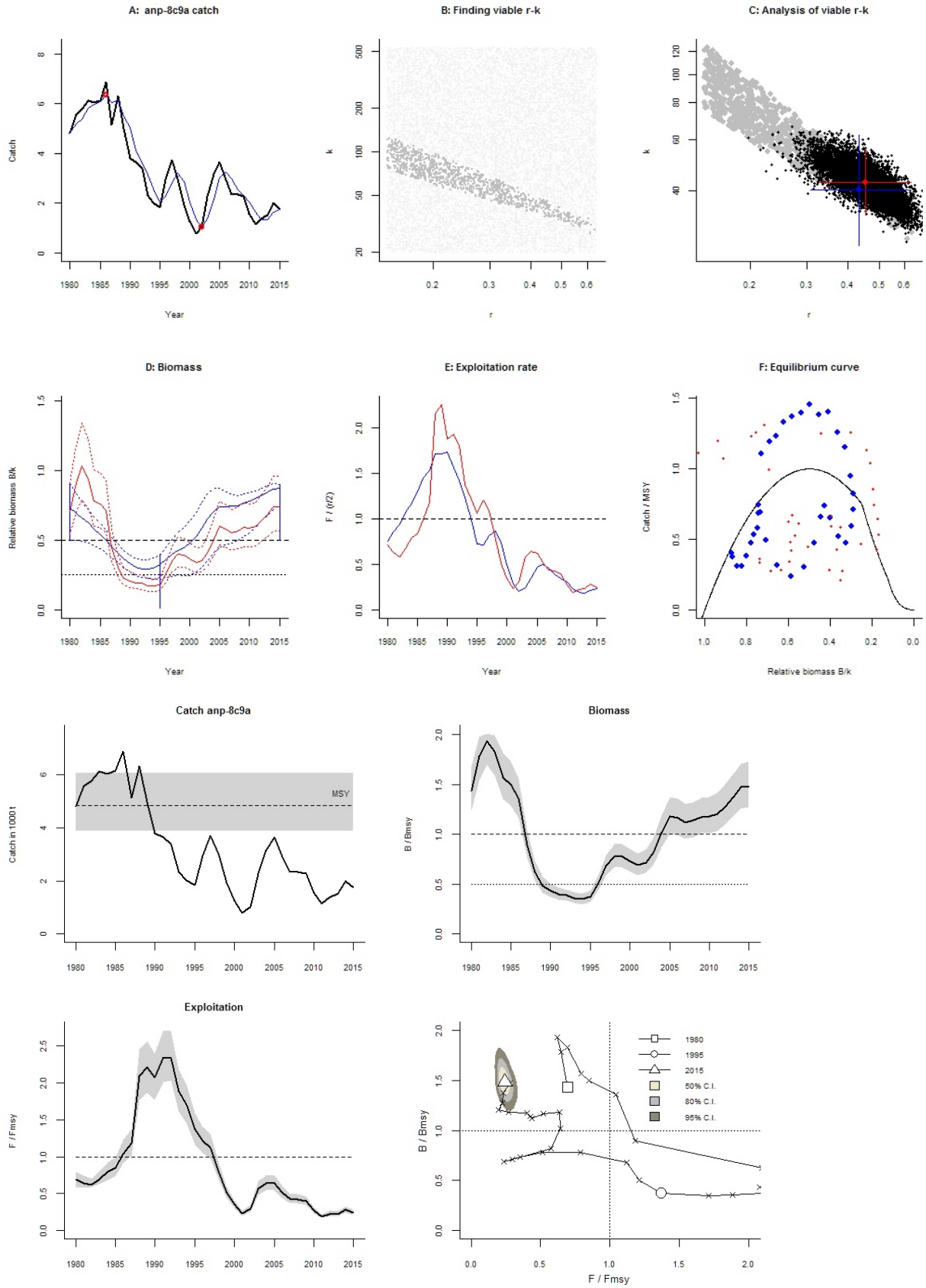
Species: *Lophius piscatorius* , stock: anp-8c9a
White anglerfish in Divisions VIIIc and IXa (Cantabrian Sea, Atlanic Iberian Waters)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/anp-8c9a.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1980 - 2015 , 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 = 0.5 - 0.9 expert
Prior range for r = 0.14 - 0.64 expert, , prior range for k = 19.8 - 525
Prior range of q = 0.238 - 0.999

Results of CMSY analysis with altogether 3275 viable trajectories for 954 r-k pairs
r = 0.434 , 95% CL = 0.307 - 0.614 , k = 40.2 , 95% CL = 26.1 - 62
MSY = 4.36 , 95% CL = 3.69 - 5.17
Relative biomass last year = 0.874 k, 2.5th = 0.758 , 97.5th = 0.899
Exploitation F/(r/2) in last year = 0.23

Results from Bayesian Schaefer model using catch & CPUE
r = 0.452 , 95% CL = 0.325 - 0.628 , k = 42.9 , 95% CL = 33 - 55.6
MSY = 4.84 , 95% CL = 3.87 - 6.06
Relative biomass in last year = 0.742 k, 2.5th perc = 0.636 , 97.5th perc = 0.866
Exploitation F/(r/2) in last year = 0.243
q = 0.254 , lcl = 0.203 , ucl = 0.317

Results for Management (based on BSM analysis)
Fmsy = 0.226 , 95% CL = 0.163 - 0.314 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.226 , 95% CL = 0.163 - 0.314 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 4.84 , 95% CL = 3.87 - 6.06
Bmsy = 21.4 , 95% CL = 16.5 - 27.8
Biomass in last year = 31.8 , 2.5th perc = 27.3 , 97.5 perc = 37.1
B/Bmsy in last year = 1.48 , 2.5th perc = 1.27 , 97.5 perc = 1.73
Fishing mortality in last year = 0.0549 , 2.5th perc = 0.0471 , 97.5 perc = 0.0641
F/Fmsy = 0.243 , 2.5th perc = 0.208 , 97.5 perc = 0.284

Stock status and exploitation in 2014
Biomass = 31.5 , B/Bmsy = 1.47 , fishing mortality F = 0.0635 , F/Fmsy = 0.281
Comment: OK (RF 27.09.16)


A: anp-8c9a 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 anp-8c9a
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1980
1995
2015
50% C.I.
80% C.I.
95% C.I.

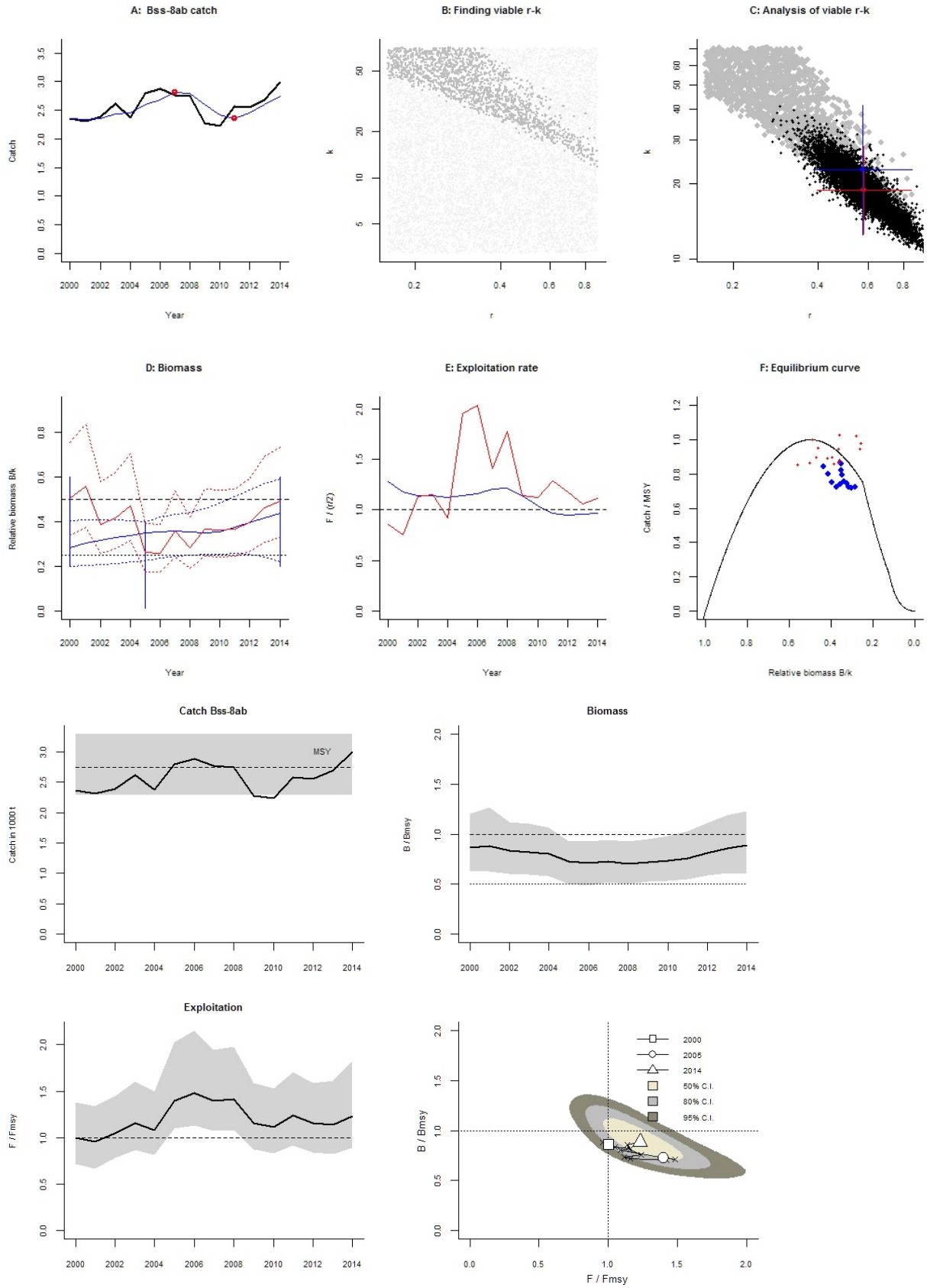
Species: *Dicentrarchus labrax* , stock: Bss-8ab
Sea bass in Divisions VIIIa,b (Bay of Biscay North and Central)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/Bss-8ab.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 2000 - 2014 , 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 = 0.2 - 0.6 expert
Prior range for r = 0.16 - 0.88 expert, , prior range for k = 3.2 - 70.3
Prior range of q = 9.91e-05 - 0.000465

Results of CMSY analysis with altogether 3192 viable trajectories for 1739 r-k pairs
r = 0.574 , 95% CL = 0.383 - 0.86 , k = 22.8 , 95% CL = 12.5 - 41.3
MSY = 3.27 , 95% CL = 2.24 - 4.77
Relative biomass last year = 0.435 k, 2.5th = 0.221 , 97.5th = 0.592
Exploitation F/(r/2) in last year = 0.965

Results from Bayesian Schaefer model using catch & CPUE
r = 0.58 , 95% CL = 0.396 - 0.849 , k = 18.9 , 95% CL = 12.6 - 28.2
MSY = 2.74 , 95% CL = 2.29 - 3.28
Relative biomass in last year = 0.444 k, 2.5th perc = 0.3 , 97.5th perc = 0.614
Exploitation F/(r/2) in last year = 1.23
q = 0.000174 , lcl = 0.000128 , ucl = 0.000238

Results for Management (based on BSM analysis)
Fmsy = 0.29 , 95% CL = 0.198 - 0.425 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.29 , 95% CL = 0.198 - 0.425 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 2.74 , 95% CL = 2.29 - 3.28
Bmsy = 9.44 , 95% CL = 6.32 - 14.1
Biomass in last year = 8.38 , 2.5th perc = 5.67 , 97.5 perc = 11.6
B/Bmsy in last year = 0.888 , 2.5th perc = 0.6 , 97.5 perc = 1.23
Fishing mortality in last year = 0.357 , 2.5th perc = 0.258 , 97.5 perc = 0.528
F/Fmsy = 1.23 , 2.5th perc = 0.888 , 97.5 perc = 1.82

Stock status and exploitation in 2014
Biomass = 8.38 , B/Bmsy = 0.888 , fishing mortality F = 0.357 , F/Fmsy = 1.23
Comment: OK (RF 27.09.16)

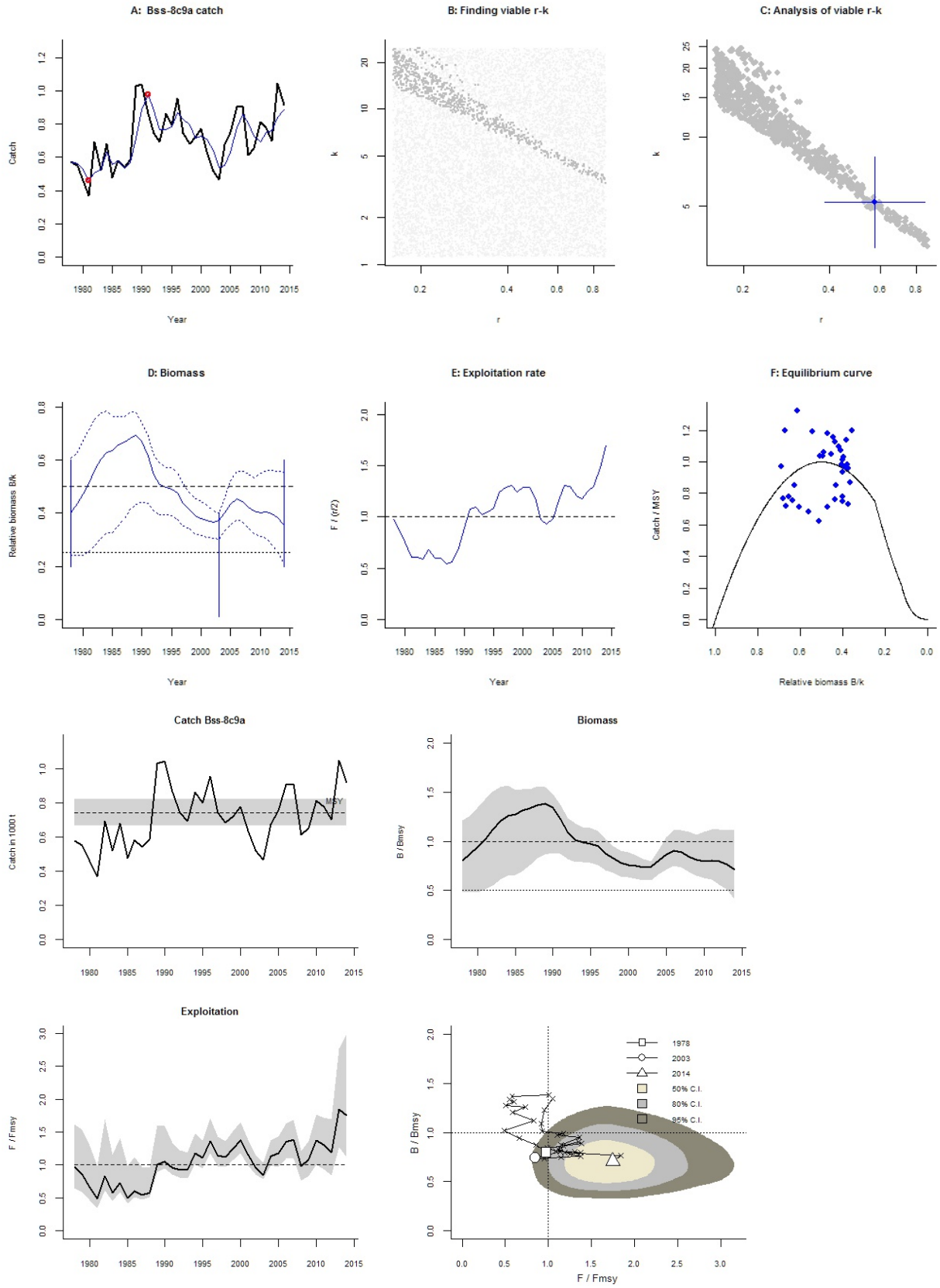

A: Bss-8ab catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch Bss-8ab
MSY
Catch in 1000 t
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
2000
2005
2014
50% C.I.
80% C.I.
95% C.I.

Species: *Dicentrarchus labrax* , stock: Bss-8c9a
Sea bass in Divisions VIIIc and IXa (Bay of Biscay South, Atlantic Iberian Waters)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/Bss-8c9a.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1978 - 2014 , 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 = 0.2 - 0.6 expert
Prior range for r = 0.16 - 0.88 expert, , prior range for k = 1.11 - 24.5

Results of CMSY analysis with altogether 1264 viable trajectories for 770 r-k pairs
r = 0.574 , 95% CL = 0.383 - 0.86 , k = 5.16 , 95% CL = 3.26 - 8.15
MSY = 0.74 , 95% CL = 0.666 - 0.823
Relative biomass last year = 0.354 k, 2.5th = 0.207 , 97.5th = 0.554
Exploitation F/(r/2) in last year = 1.69

Results for Management (based on CMSY analysis)
Fmsy = 0.287 , 95% CL = 0.192 - 0.43 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.287 , 95% CL = 0.192 - 0.43 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.74 , 95% CL = 0.666 - 0.823
Bmsy = 2.58 , 95% CL = 1.63 - 4.08
Biomass in last year = 1.83 , 2.5th perc = 1.07 , 97.5 perc = 2.86
B/Bmsy in last year = 0.709 , 2.5th perc = 0.415 , 97.5 perc = 1.11
Fishing mortality in last year = 0.502 , 2.5th perc = 0.321 , 97.5 perc = 0.858
F/Fmsy = 1.75 , 2.5th perc = 1.12 , 97.5 perc = 2.99

Stock status and exploitation in 2014
Biomass = 1.83 , B/Bmsy = 0.709 , fishing mortality F = 0.502 , F/Fmsy = 1.75
Comment: OK (RF 27.09.16)


A: Bss-8c9a 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 Bss-8c9a
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1978
2003
2014
50% C.I.
80% C.I.
95% C.I.

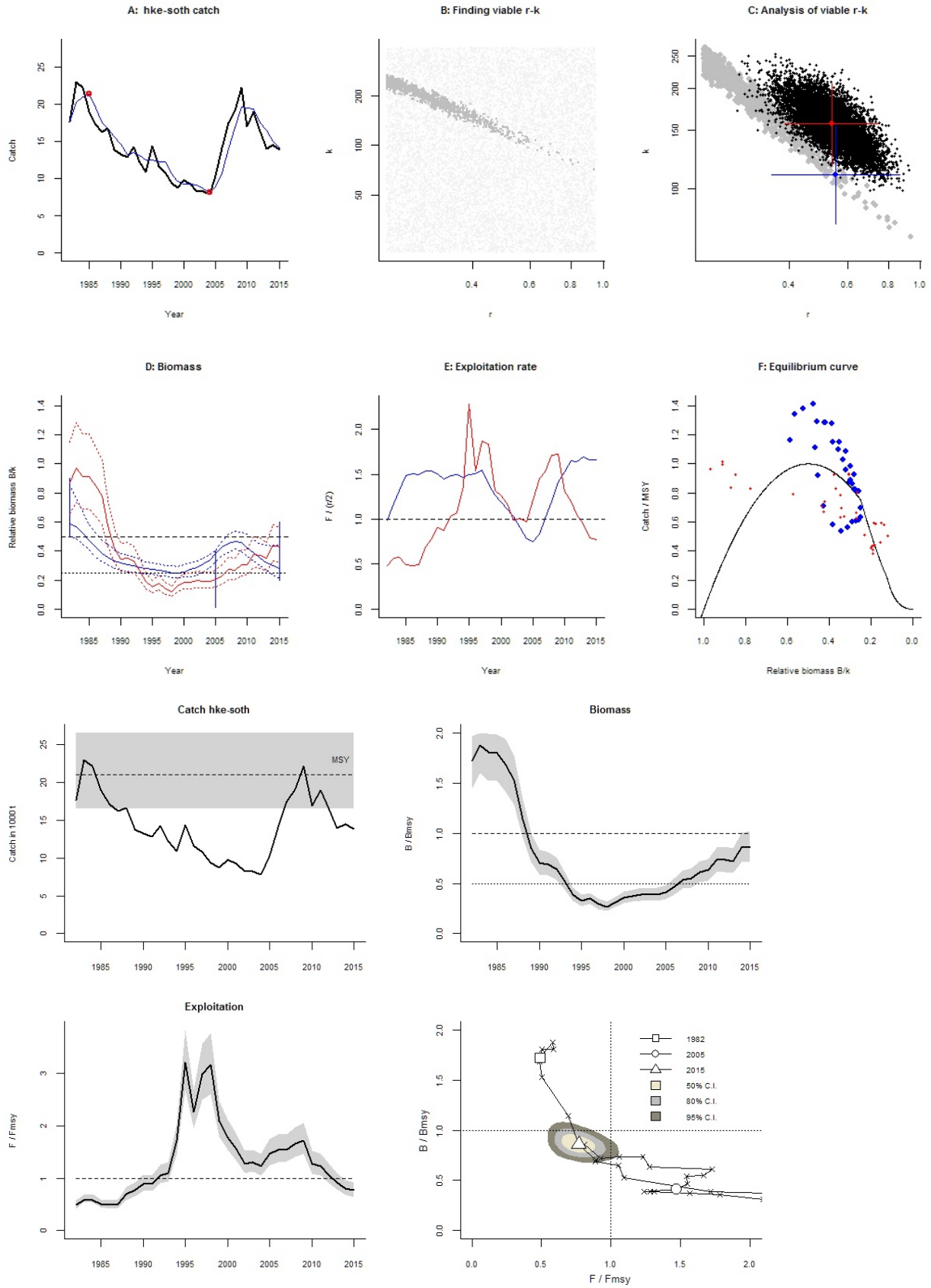
Species: *Merluccius merluccius* , stock: hke-soth
Hake in Divisions VIIIc and IXa (Southern stock) (Cantabrian Sea, Atlantic Iberian waters)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/hke-soth.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1982 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2005 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.22 - 0.95 expert, , prior range for k = 22.5 - 388
Prior range of q = 0.236 - 0.98

Results of CMSY analysis with altogether 1272 viable trajectories for 1118 r-k pairs
r = 0.552 , 95% CL = 0.352 - 0.864 , k = 110 , 95% CL = 78.1 - 154
MSY = 15.1 , 95% CL = 13.7 - 16.7
Relative biomass last year = 0.28 k, 2.5th = 0.21 , 97.5th = 0.444
Exploitation F/(r/2) in last year = 1.66

Results from Bayesian Schaefer model using catch & CPUE
r = 0.537 , 95% CL = 0.386 - 0.747 , k = 156 , 95% CL = 118 - 206
MSY = 21 , 95% CL = 16.6 - 26.6
Relative biomass in last year = 0.43 k, 2.5th perc = 0.359 , 97.5th perc = 0.509
Exploitation F/(r/2) in last year = 0.767
q = 0.302 , lcl = 0.236 , ucl = 0.387

Results for Management (based on BSM analysis)
Fmsy = 0.269 , 95% CL = 0.193 - 0.374 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.269 , 95% CL = 0.193 - 0.374 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 21 , 95% CL = 16.6 - 26.6
Bmsy = 78.1 , 95% CL = 59.1 - 103
Biomass in last year = 67.2 , 2.5th perc = 56.1 , 97.5 perc = 79.5
B/Bmsy in last year = 0.86 , 2.5th perc = 0.718 , 97.5 perc = 1.02
Fishing mortality in last year = 0.206 , 2.5th perc = 0.174 , 97.5 perc = 0.247
F/Fmsy = 0.767 , 2.5th perc = 0.648 , 97.5 perc = 0.918

Stock status and exploitation in 2014
Biomass = 66.8 , B/Bmsy = 0.856 , fishing mortality F = 0.217 , F/Fmsy = 0.806
Comment: OK (RF 27.09.16) r updated


A: hke-soth 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 hke-soth
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1982
2005
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

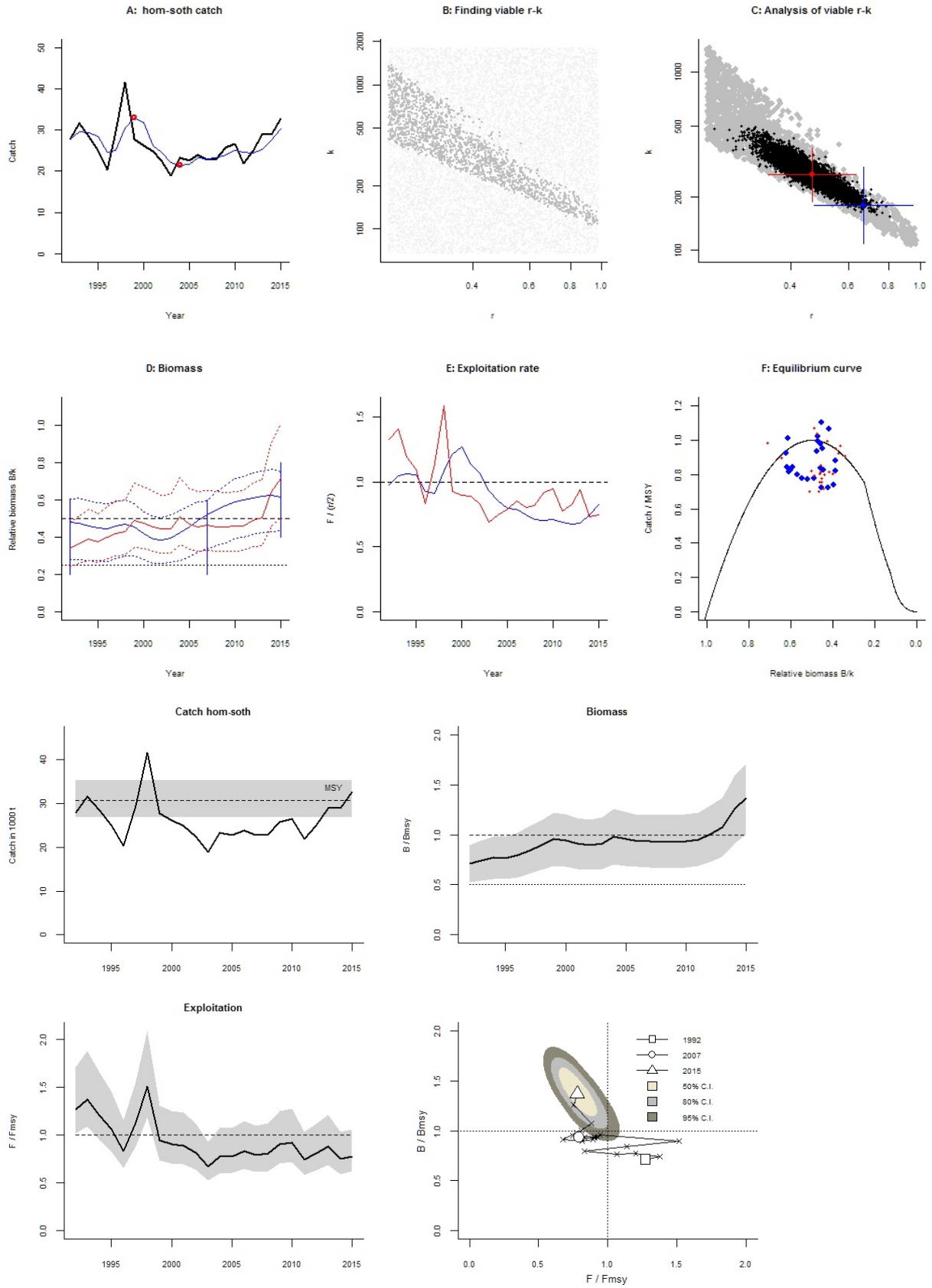
Species: *Trachurus trachurus* , stock: hom-soth
Horse mackerel in Division IXa (Atlantic Iberian Waters)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/hom-soth.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1992 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2007 expert
Prior final relative biomass = 0.4 - 0.8 expert
Prior range for r = 0.22 - 0.98 expert, , prior range for k = 67.4 - 1796
Prior range of q = 1.94 - 8.17

Results of CMSY analysis with altogether 4612 viable trajectories for 1787 r-k pairs
r = 0.67 , 95% CL = 0.472 - 0.953 , k = 178 , 95% CL = 109 - 291
MSY = 29.9 , 95% CL = 22.7 - 39.3
Relative biomass last year = 0.615 k, 2.5th = 0.433 , 97.5th = 0.75
Exploitation F/(r/2) in last year = 0.824

Results from Bayesian Schaefer model using catch & CPUE
r = 0.464 , 95% CL = 0.339 - 0.633 , k = 265 , 95% CL = 188 - 373
MSY = 30.7 , 95% CL = 26.8 - 35.2
Relative biomass in last year = 0.683 k, 2.5th perc = 0.503 , 97.5th perc = 0.854
Exploitation F/(r/2) in last year = 0.78
q = 3.04 , lcl = 2.31 , ucl = 3.99

Results for Management (based on BSM analysis)
Fmsy = 0.232 , 95% CL = 0.17 - 0.317 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.232 , 95% CL = 0.17 - 0.317 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 30.7 , 95% CL = 26.8 - 35.2
Bmsy = 133 , 95% CL = 94.1 - 187
Biomass in last year = 181 , 2.5th perc = 133 , 97.5 perc = 226
B/Bmsy in last year = 1.37 , 2.5th perc = 1.01 , 97.5 perc = 1.71
Fishing mortality in last year = 0.181 , 2.5th perc = 0.145 , 97.5 perc = 0.245
F/Fmsy = 0.78 , 2.5th perc = 0.624 , 97.5 perc = 1.06

Stock status and exploitation in 2014
Biomass = 167 , B/Bmsy = 1.26 , fishing mortality F = 0.174 , F/Fmsy = 0.75
Comment: OK (RF 27.09.16)


A: hom-soth 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-soth
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1992
2007
2015
50% C.I.
80% C.I.
95% C.I.

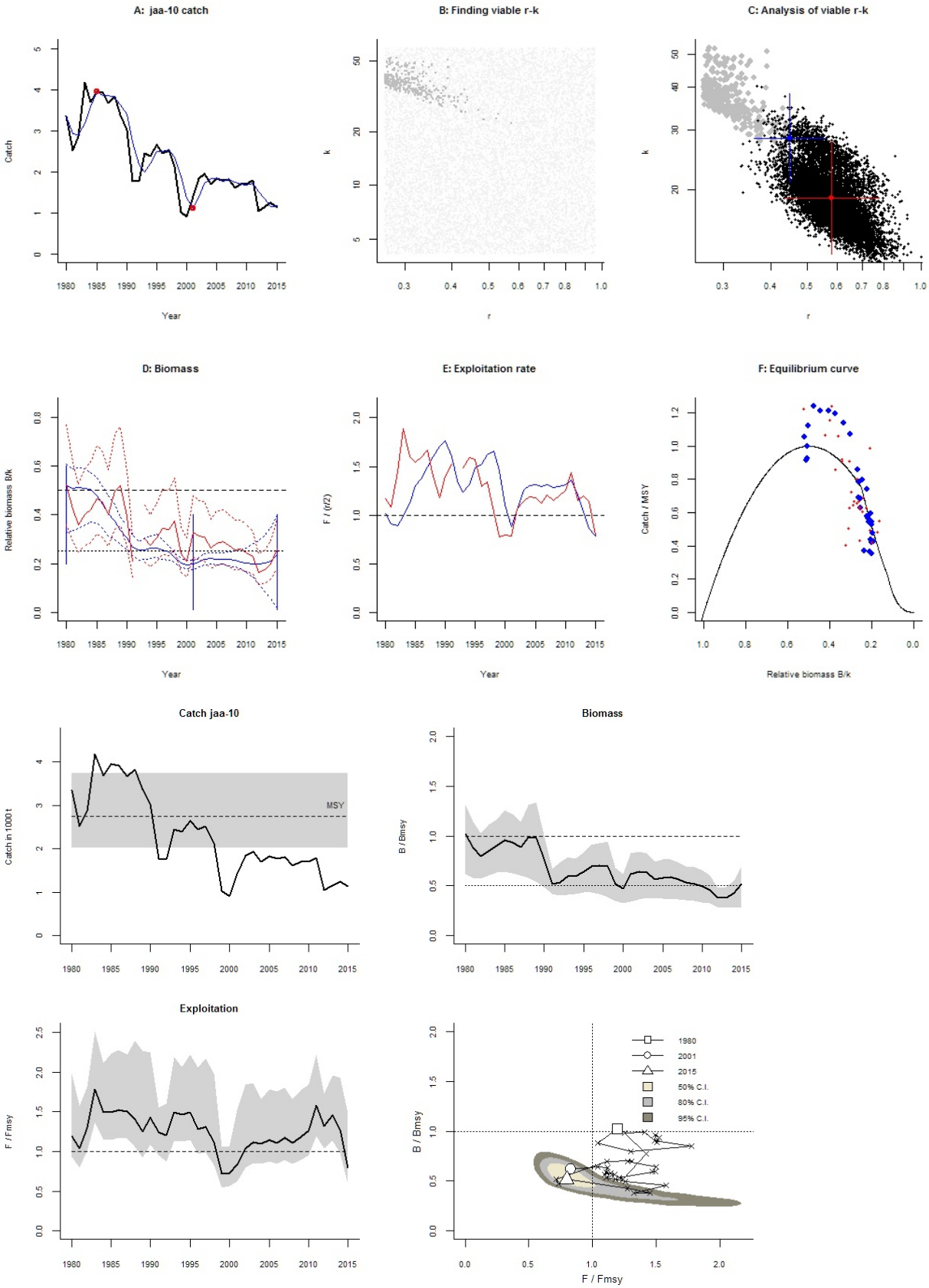
Species: *Trachurus picturatus* , stock: jaa-10
Blue jack mackerel (Trachurus picturatus) in Subdivision Xa2 (Azores)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/jaa-10.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1980 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2001 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.27 - 0.96 expert, , prior range for k = 4.11 - 59.2
Prior range of q = 0.0208 - 0.079

Results of CMSY analysis with altogether 344 viable trajectories for 329 r-k pairs
r = 0.449 , 95% CL = 0.362 - 0.558 , k = 28.3 , 95% CL = 20.9 - 38.2
MSY = 3.18 , 95% CL = 2.44 - 4.13
Relative biomass last year = 0.237 k, 2.5th = 0.0184 , 97.5th = 0.396
Exploitation F/(r/2) in last year = 0.784

Results from Bayesian Schaefer model using catch & CPUE
r = 0.581 , 95% CL = 0.435 - 0.776 , k = 18.9 , 95% CL = 12.9 - 27.7
MSY = 2.75 , 95% CL = 2.02 - 3.74
Relative biomass in last year = 0.259 k, 2.5th perc = 0.14 , 97.5th perc = 0.349
Exploitation F/(r/2) in last year = 0.798
q = 0.0293 , lcl = 0.0231 , ucl = 0.0372

Results for Management (based on BSM analysis)
Fmsy = 0.291 , 95% CL = 0.218 - 0.388 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.291 , 95% CL = 0.218 - 0.388 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 2.75 , 95% CL = 2.02 - 3.74
Bmsy = 9.45 , 95% CL = 6.46 - 13.8
Biomass in last year = 4.9 , 2.5th perc = 2.64 , 97.5 perc = 6.59
B/Bmsy in last year = 0.518 , 2.5th perc = 0.279 , 97.5 perc = 0.698
Fishing mortality in last year = 0.232 , 2.5th perc = 0.172 , 97.5 perc = 0.431
F/Fmsy = 0.798 , 2.5th perc = 0.593 , 97.5 perc = 1.48

Stock status and exploitation in 2014
Biomass = 4 , B/Bmsy = 0.423 , fishing mortality F = 0.313 , F/Fmsy = 1.27
Comment: OK (RF 27.09.16)


A: jaa-10 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 jaa-10
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1980
2001
2015
50% C.I.
80% C.I.
95% C.I.

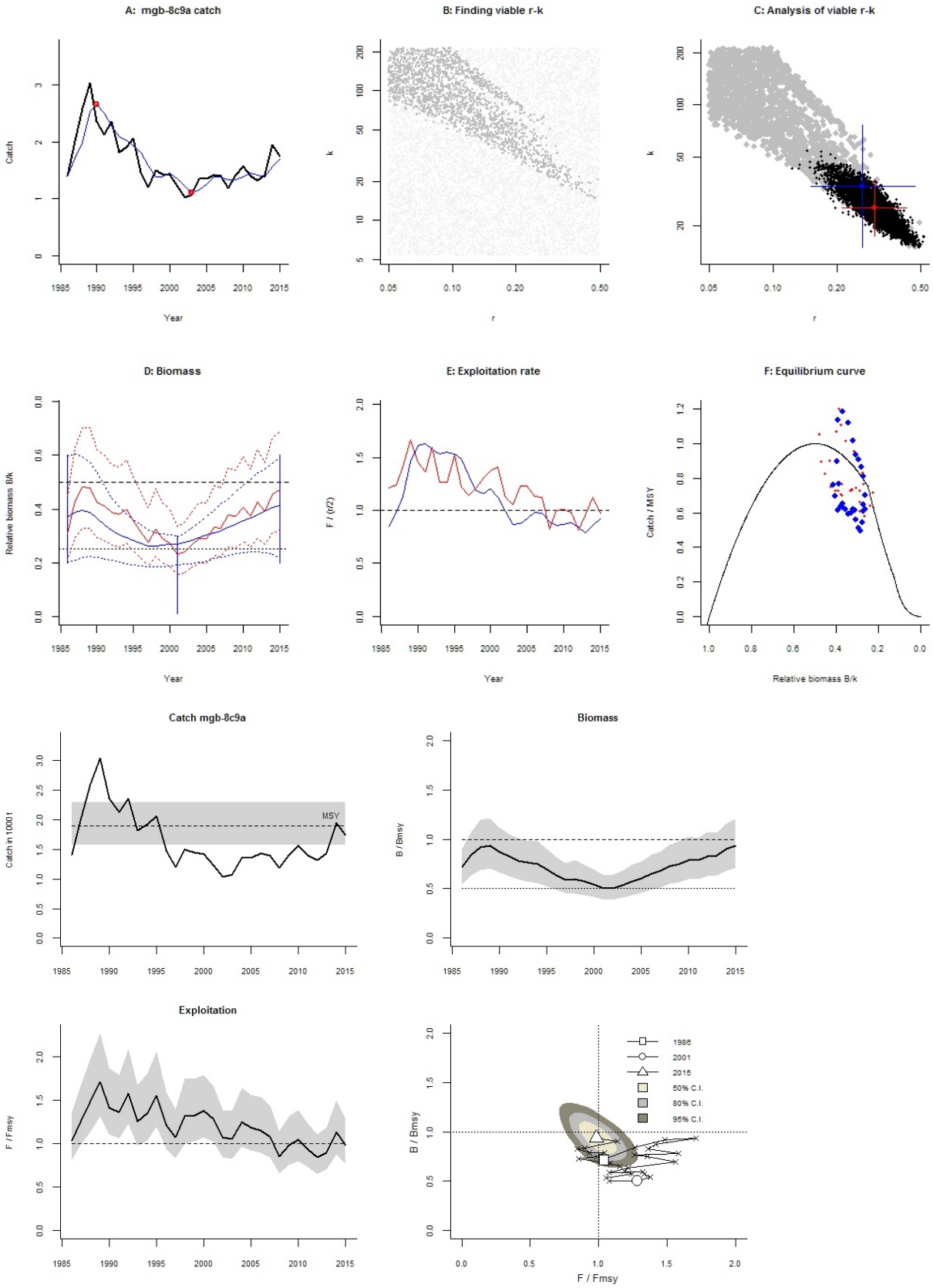
Species: *Lepidorhombus boscii* , stock: mgb-8c9a
Four-spot megrim in Divisions VIIIc and IXa (Bay of Biscay South, Atlantic Iberian Waters East)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/mgb-8c9a.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1986 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 expert
Prior intermediate rel. biomass= 0.01 - 0.3 in year 2001 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.05 - 0.5 default , prior range for k = 5.32 - 213
Prior range of q = 0.3 - 1.9

Results of CMSY analysis with altogether 2433 viable trajectories for 1987 r-k pairs
r = 0.266 , 95% CL = 0.151 - 0.469 , k = 33.7 , 95% CL = 14.8 - 76.7
MSY = 2.24 , 95% CL = 1.26 - 3.99
Relative biomass last year = 0.414 k, 2.5th = 0.216 , 97.5th = 0.591
Exploitation F/(r/2) in last year = 0.917

Results from Bayesian Schaefer model using catch & CPUE
r = 0.301 , 95% CL = 0.212 - 0.428 , k = 25.2 , 95% CL = 17.3 - 36.8
MSY = 1.9 , 95% CL = 1.57 - 2.29
Relative biomass in last year = 0.468 k, 2.5th perc = 0.356 , 97.5th perc = 0.602
Exploitation F/(r/2) in last year = 0.983
q = 0.557 , lcl = 0.399 , ucl = 0.778

Results for Management (based on BSM analysis)
Fmsy = 0.151 , 95% CL = 0.106 - 0.214 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.151 , 95% CL = 0.106 - 0.214 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1.9 , 95% CL = 1.57 - 2.29
Bmsy = 12.6 , 95% CL = 8.63 - 18.4
Biomass in last year = 11.8 , 2.5th perc = 8.97 , 97.5 perc = 15.2
B/Bmsy in last year = 0.936 , 2.5th perc = 0.713 , 97.5 perc = 1.2
Fishing mortality in last year = 0.148 , 2.5th perc = 0.115 , 97.5 perc = 0.194
F/Fmsy = 0.983 , 2.5th perc = 0.763 , 97.5 perc = 1.29

Stock status and exploitation in 2014
Biomass = 11.4 , B/Bmsy = 0.901 , fishing mortality F = 0.171 , F/Fmsy = 1.14
Comment: OK (RF 27.09.16)


A: mgb-8c9a 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 mgb-8c9a
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1986
2001
2015
50% C.I.
80% C.I.
95% C.I.

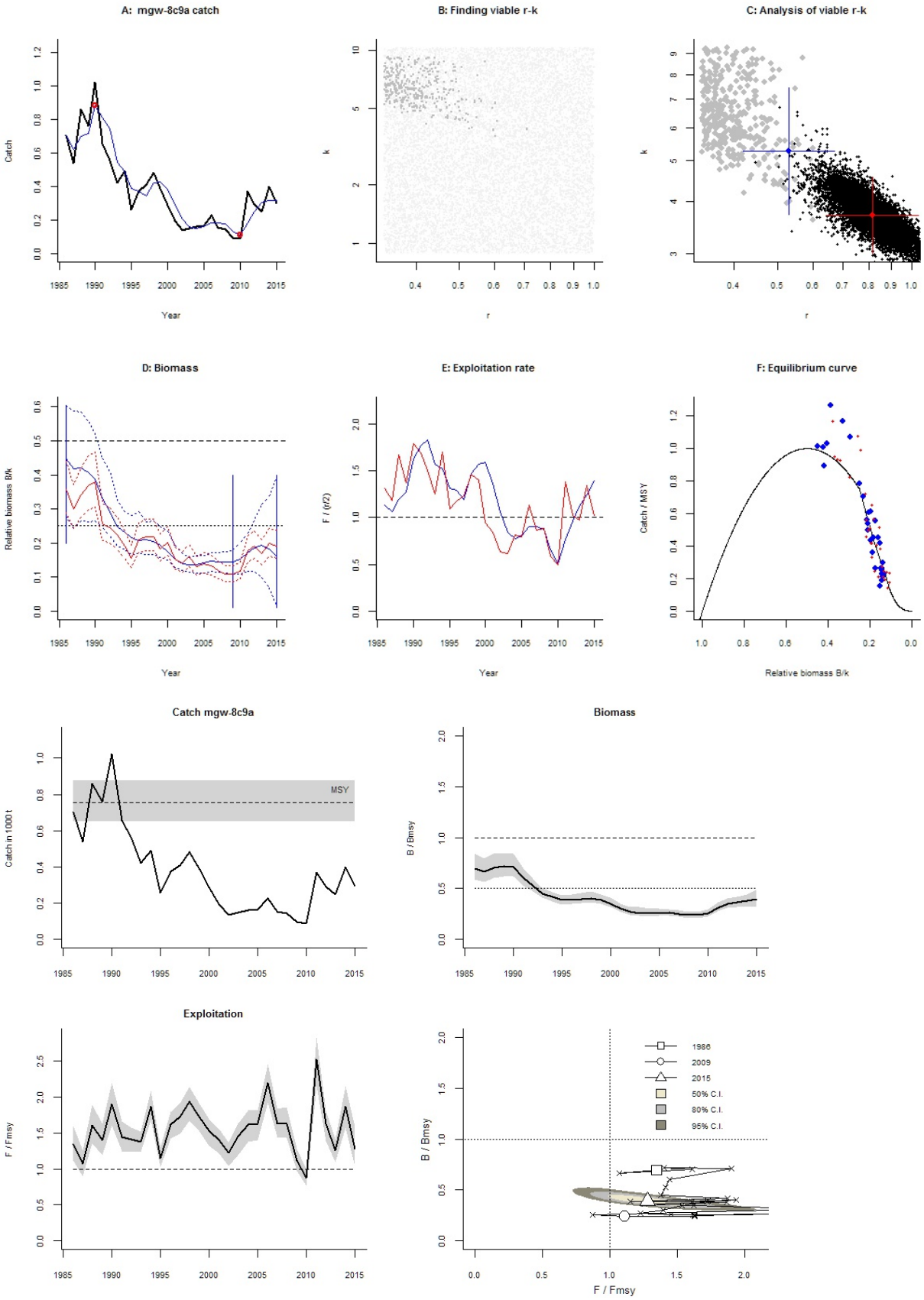
Species: *Lepidorhombus whiffiagonis* , stock: mgw-8c9a
Megrim in Divisions VIIIc and IXa
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/mgw-8c9a.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1986 - 2015 , abundance = CPUE
Prior 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 = 0.34 - 1 expert, , prior range for k = 0.881 - 10.4
Prior range of q = 1.32 - 4.51

Results of CMSY analysis with altogether 380 viable trajectories for 371 r-k pairs
r = 0.53 , 95% CL = 0.419 - 0.67 , k = 5.26 , 95% CL = 3.72 - 7.45
MSY = 0.697 , 95% CL = 0.462 - 1.05
Relative biomass last year = 0.162 k, 2.5th = 0.0159 , 97.5th = 0.394
Exploitation F/(r/2) in last year = 1.4

Results from Bayesian Schaefer model using catch & CPUE
r = 0.815 , 95% CL = 0.642 - 1.04 , k = 3.7 , 95% CL = 3 - 4.57
MSY = 0.755 , 95% CL = 0.649 - 0.877
Relative biomass in last year = 0.196 k, 2.5th perc = 0.158 , 97.5th perc = 0.244
Exploitation F/(r/2) in last year = 1
q = 1.72 , lcl = 1.4 , ucl = 2.13

Results for Management (based on BSM analysis)
Fmsy = 0.408 , 95% CL = 0.321 - 0.518 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.32 , 95% CL = 0.252 - 0.406 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.755 , 95% CL = 0.649 - 0.877
Bmsy = 1.85 , 95% CL = 1.5 - 2.29
Biomass in last year = 0.727 , 2.5th perc = 0.586 , 97.5 perc = 0.903
B/Bmsy in last year = 0.392 , 2.5th perc = 0.316 , 97.5 perc = 0.488
Fishing mortality in last year = 0.409 , 2.5th perc = 0.329 , 97.5 perc = 0.507
F/Fmsy = 1.28 , 2.5th perc = 1.03 , 97.5 perc = 1.59

Stock status and exploitation in 2014
Biomass = 0.699 , B/Bmsy = 0.377 , fishing mortality F = 0.573 , F/Fmsy = 1.86
Comment: OK (RF 27.09.16)


A: mgw-8c9a 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 mgw-8c9a
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1986
2009
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

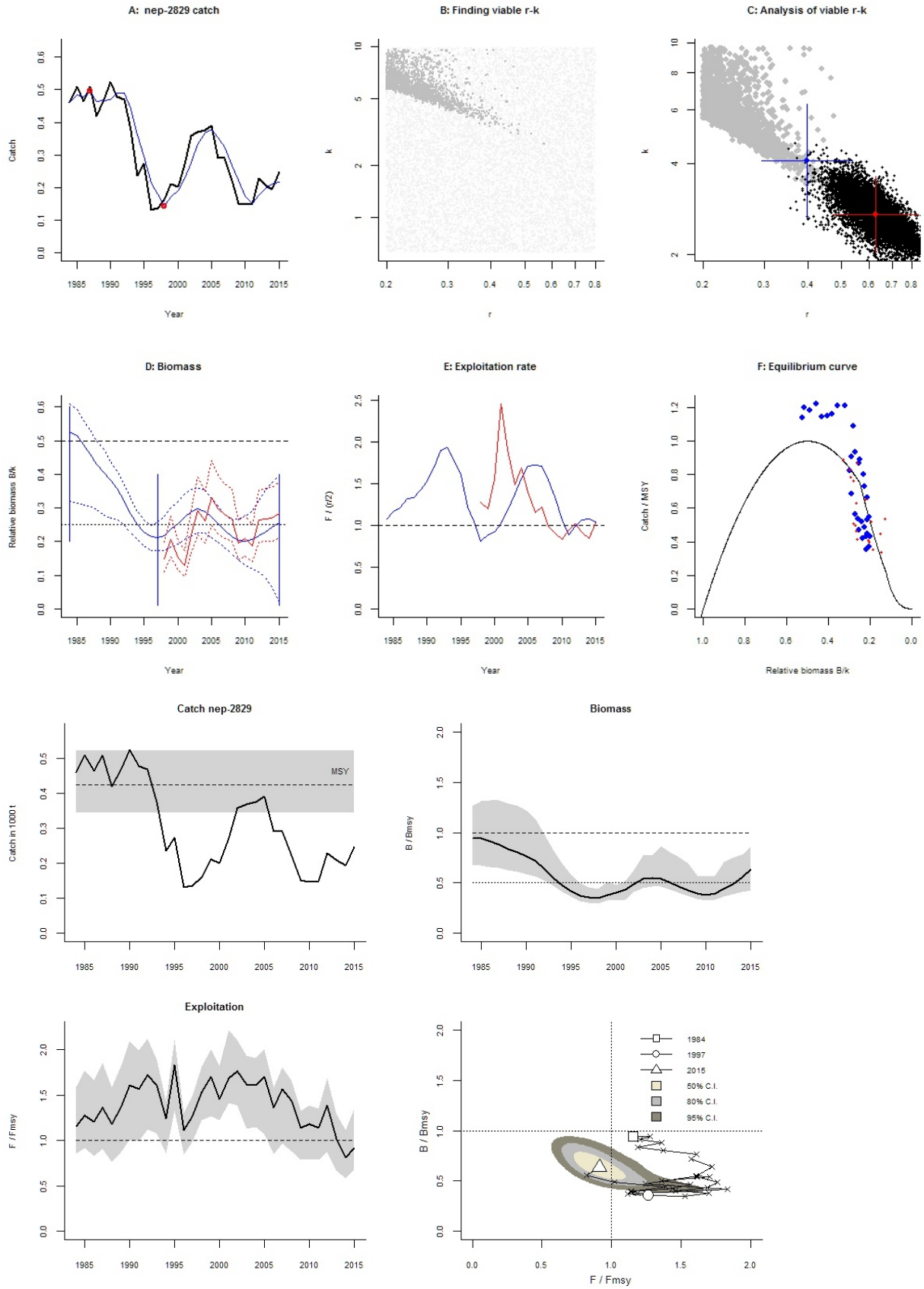
Species: *Nephrops norvegicus* , stock: nep-2829
Nephrops in FUs 28 and 29
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/nep-2829.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1984 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 1997 default
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 0.618 - 9.89
Prior range of q = 0.00726 - 0.029

Results of CMSY analysis with altogether 2065 viable trajectories for 1684 r-k pairs
r = 0.399 , 95% CL = 0.294 - 0.54 , k = 4.06 , 95% CL = 2.64 - 6.26
MSY = 0.405 , 95% CL = 0.266 - 0.615
Relative biomass last year = 0.257 k, 2.5th = 0.0214 , 97.5th = 0.396
Exploitation F/(r/2) in last year = 1.04

Results from Bayesian Schaefer model using catch & CPUE
r = 0.628 , 95% CL = 0.472 - 0.835 , k = 2.7 , 95% CL = 2.03 - 3.61
MSY = 0.424 , 95% CL = 0.345 - 0.521
Relative biomass in last year = 0.319 k, 2.5th perc = 0.215 , 97.5th perc = 0.427
Exploitation F/(r/2) in last year = 0.913
q = 0.0102 , lcl = 0.0077 , ucl = 0.0134

Results for Management (based on BSM analysis)
Fmsy = 0.314 , 95% CL = 0.236 - 0.417 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.314 , 95% CL = 0.236 - 0.417 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.424 , 95% CL = 0.345 - 0.521
Bmsy = 1.35 , 95% CL = 1.01 - 1.8
Biomass in last year = 0.862 , 2.5th perc = 0.582 , 97.5 perc = 1.15
B/Bmsy in last year = 0.637 , 2.5th perc = 0.43 , 97.5 perc = 0.854
Fishing mortality in last year = 0.287 , 2.5th perc = 0.214 , 97.5 perc = 0.425
F/Fmsy = 0.913 , 2.5th perc = 0.681 , 97.5 perc = 1.35

Stock status and exploitation in 2014
Biomass = 0.753 , B/Bmsy = 0.557 , fishing mortality F = 0.256 , F/Fmsy = 0.817
Comment: OK (RF 27.09.16)


A: nep-2829 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 nep-2829
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1984
1997
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

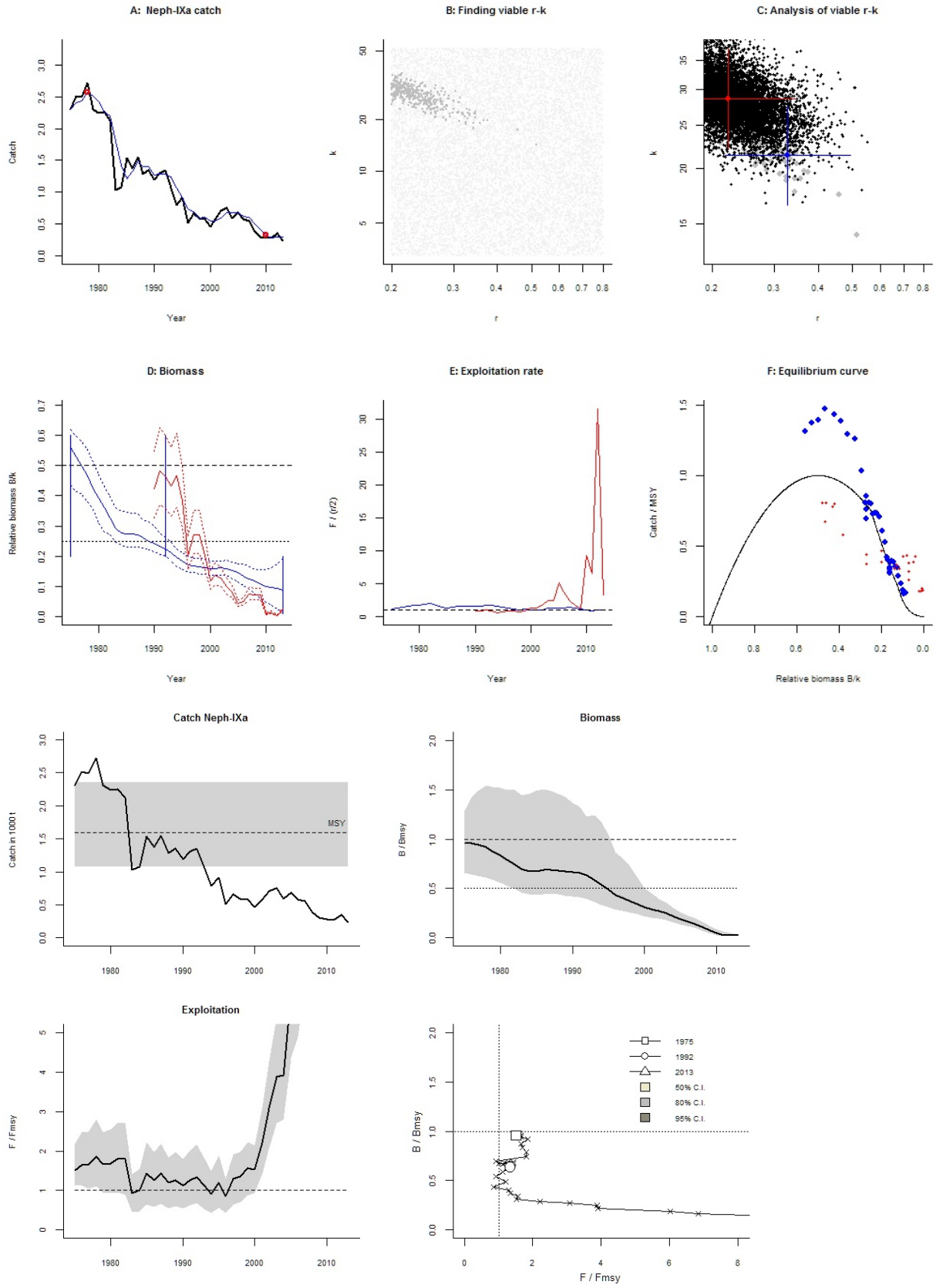
Species: *Nephrops norvegicus* , stock: Neph-IXa
Nephrops in Division Ixa
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2014/2014/Neph-IXa.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1975 - 2013 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.2 - 0.6 in year 1992 expert
Prior final relative biomass = 0.01 - 0.2 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 3.22 - 51.5
Prior range of q = 0.00445 - 0.0178

Results of CMSY analysis with altogether 389 viable trajectories for 374 r-k pairs
r = 0.328 , 95% CL = 0.218 - 0.493 , k = 21.4 , 95% CL = 16.6 - 27.6
MSY = 1.75 , 95% CL = 1.45 - 2.12
Relative biomass last year = 0.087 k, 2.5th = 0.0116 , 97.5th = 0.193
Exploitation F/(r/2) in last year = 0.945

Results from Bayesian Schaefer model using catch & CPUE
r = 0.222 , 95% CL = 0.143 - 0.344 , k = 28.7 , 95% CL = 22.1 - 37.2
MSY = 1.59 , 95% CL = 1.07 - 2.36
Relative biomass in last year = 0.0119 k, 2.5th perc = 0.0109 , 97.5th perc = 0.018
Exploitation F/(r/2) in last year = 6.31
q = 0.00852 , lcl = 0.00656 , ucl = 0.0111

Results for Management (based on BSM analysis)
Fmsy = 0.111 , 95% CL = 0.0716 - 0.172 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.00527 , 95% CL = 0.0034 - 0.00816 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1.59 , 95% CL = 1.07 - 2.36
Bmsy = 14.3 , 95% CL = 11 - 18.6
Biomass in last year = 0.34 , 2.5th perc = 0.311 , 97.5 perc = 0.515
B/Bmsy in last year = 0.0237 , 2.5th perc = 0.0217 , 97.5 perc = 0.0359
Fishing mortality in last year = 0.7 , 2.5th perc = 0.462 , 97.5 perc = 0.765
F/Fmsy = 133 , 2.5th perc = 87.7 , 97.5 perc = 145

Stock status and exploitation in 2014
Biomass = , B/Bmsy = , fishing mortality F = , F/Fmsy =
Comment: OK (RF 27.09.16)

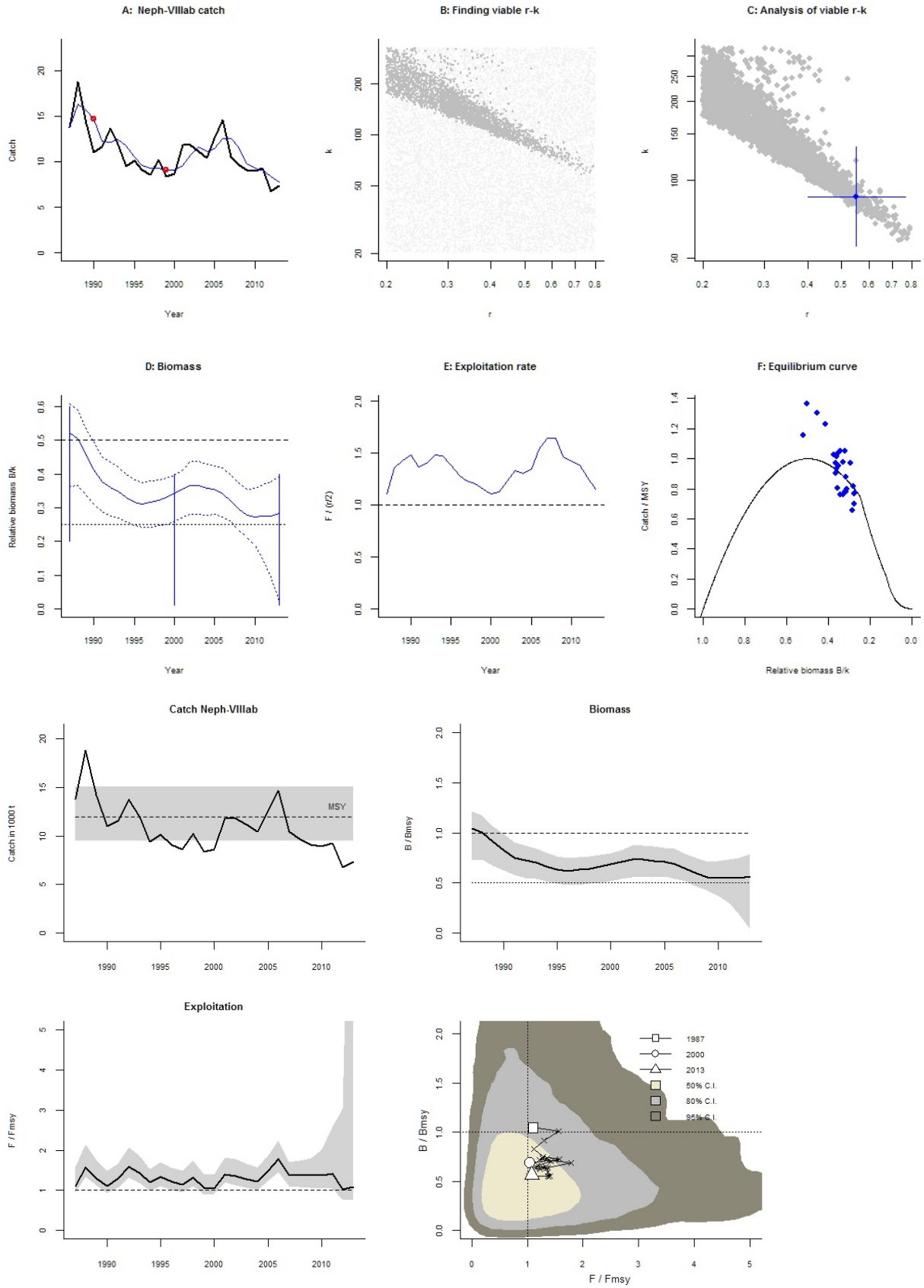

A: Neph-IXa catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch Neph-IXa
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1975
1992
2013
50% C.I.
80% C.I.
95% C.I.

Species: *Nephrops norvegicus* , stock: Neph-VIIIab
Nephrops in Divisions VIIIa,b (Bay of Biscay, FUs 23–24)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2014/2014/Neph-VIIIab.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1987 - 2013 , 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 - 0.4 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 20.3 - 326

Results of CMSY analysis with altogether 4349 viable trajectories for 2881 r-k pairs
r = 0.553 , 95% CL = 0.4 - 0.764 , k = 86.3 , 95% CL = 55.7 - 134
MSY = 11.9 , 95% CL = 9.48 - 15
Relative biomass last year = 0.284 k, 2.5th = 0.0216 , 97.5th = 0.394
Exploitation F/(r/2) in last year = 1.15

Results for Management (based on CMSY analysis)
Fmsy = 0.276 , 95% CL = 0.2 - 0.382 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.276 , 95% CL = 0.2 - 0.382 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 11.9 , 95% CL = 9.48 - 15
Bmsy = 43.2 , 95% CL = 27.9 - 66.9
Biomass in last year = 24.5 , 2.5th perc = 1.86 , 97.5 perc = 34
B/Bmsy in last year = 0.569 , 2.5th perc = 0.0431 , 97.5 perc = 0.788
Fishing mortality in last year = 0.299 , 2.5th perc = 0.216 , 97.5 perc = 3.95
F/Fmsy = 1.08 , 2.5th perc = 0.781 , 97.5 perc = 14.3

Stock status and exploitation in 2014
Biomass = , B/Bmsy = , fishing mortality F = , F/Fmsy =
Comment: OK (RF 27.09.16)


A: Neph-VIIIab 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 Neph-VIIIab
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1987
2000
2013
50% C.I.
80% C.I.
95% C.I.

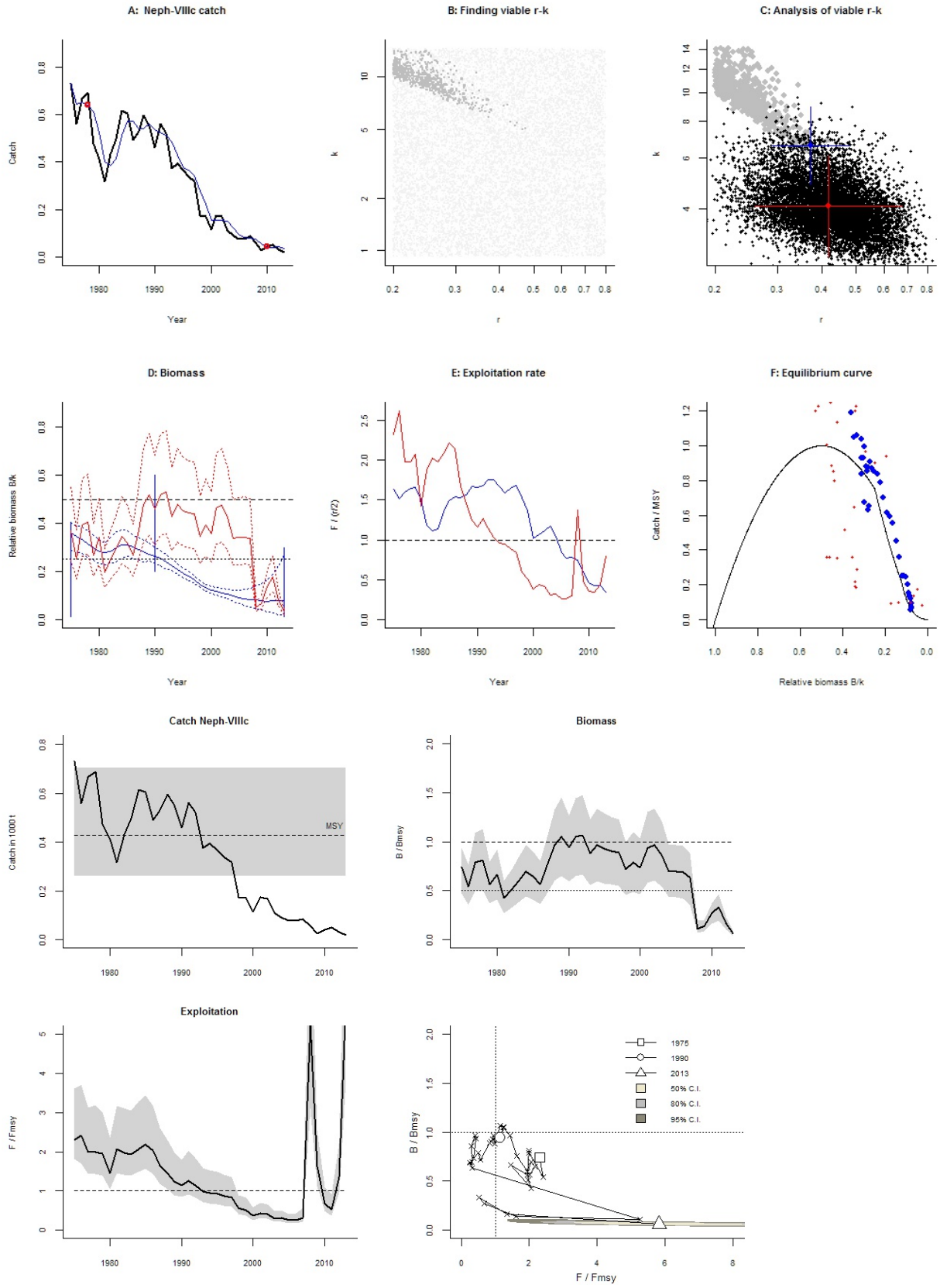
Species: *Nephrops norvegicus* , stock: Neph-VIIIc
Nephrops in Division VIIIc (North Galicia and Cantabrian Sea, FUs 25 and 31)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2014/2014/Neph-VIIIc.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1975 - 2013 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 1990 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 0.914 - 14.6
Prior range of q = 0.0357 - 0.143

Results of CMSY analysis with altogether 575 viable trajectories for 569 r-k pairs
r = 0.373 , 95% CL = 0.29 - 0.479 , k = 6.61 , 95% CL = 4.88 - 8.95
MSY = 0.615 , 95% CL = 0.504 - 0.751
Relative biomass last year = 0.0801 k, 2.5th = 0.0139 , 97.5th = 0.265
Exploitation F/(r/2) in last year = 0.345

Results from Bayesian Schaefer model using catch & CPUE
r = 0.418 , 95% CL = 0.258 - 0.677 , k = 4.09 , 95% CL = 2.75 - 6.09
MSY = 0.428 , 95% CL = 0.26 - 0.704
Relative biomass in last year = 0.0317 k, 2.5th perc = 0.0201 , 97.5th perc = 0.0482
Exploitation F/(r/2) in last year = 0.737
q = 0.0549 , lcl = 0.0427 , ucl = 0.0707

Results for Management (based on BSM analysis)
Fmsy = 0.209 , 95% CL = 0.129 - 0.338 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0265 , 95% CL = 0.0164 - 0.0429 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.428 , 95% CL = 0.26 - 0.704
Bmsy = 2.05 , 95% CL = 1.38 - 3.04
Biomass in last year = 0.13 , 2.5th perc = 0.0823 , 97.5 perc = 0.197
B/Bmsy in last year = 0.0634 , 2.5th perc = 0.0402 , 97.5 perc = 0.0964
Fishing mortality in last year = 0.154 , 2.5th perc = 0.101 , 97.5 perc = 0.243
F/Fmsy = 5.82 , 2.5th perc = 3.82 , 97.5 perc = 9.17

Stock status and exploitation in 2014
Biomass = , B/Bmsy = , fishing mortality F = , F/Fmsy =
Comment: OK (RF 27.09.16)

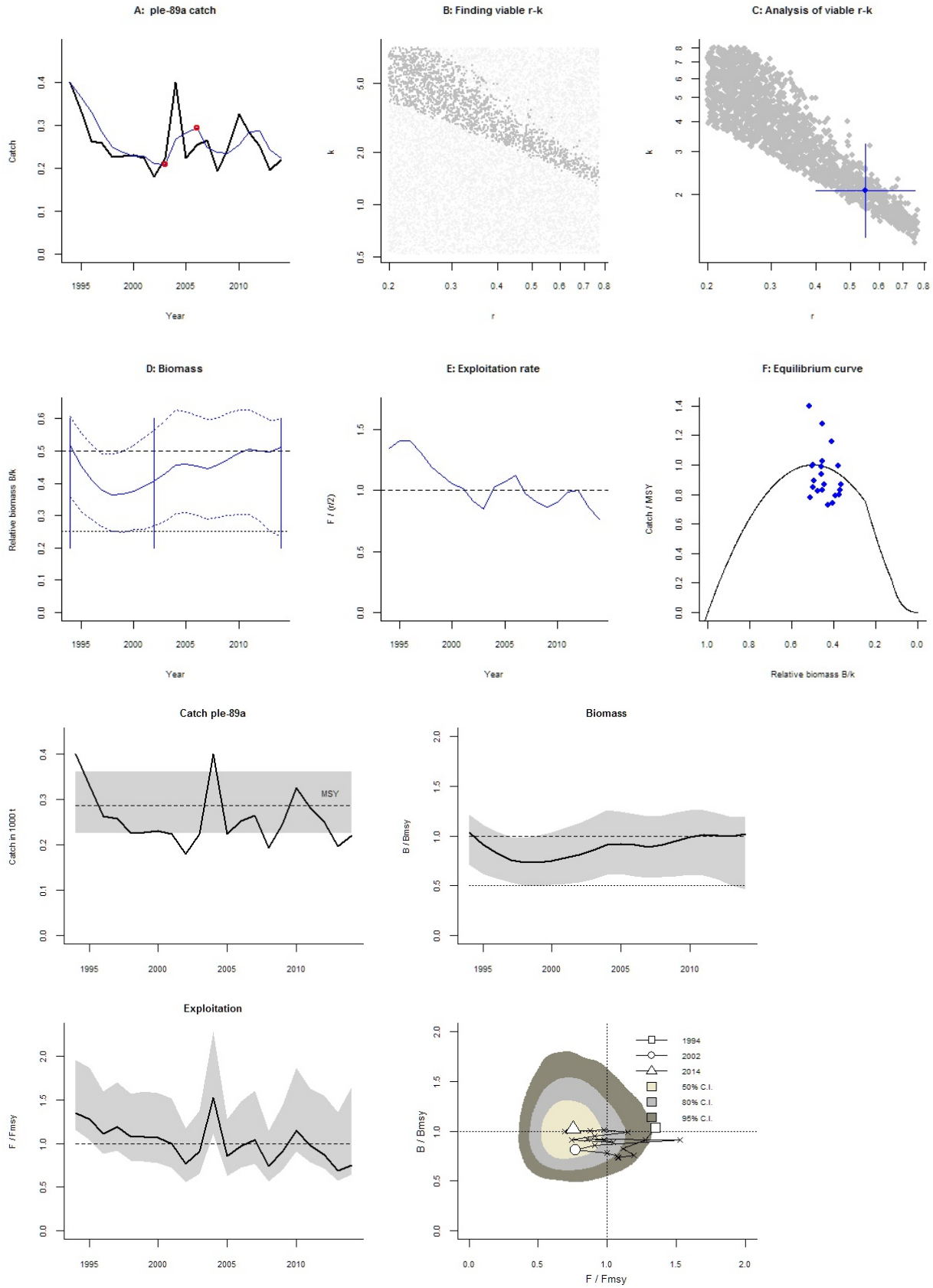

A: Neph-VIIIc catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch Neph-VIIIc
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1975
1990
2013
50% C.I.
80% C.I.
95% C.I.

Species: *Pleuronectes platessa* , stock: ple-89a
Plaice in Subarea VIII and Division IXa (Bay of Biscay, Atlantic Iberian Waters)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/ple-89a.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1994 - 2014 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2002 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.2 - 0.77 expert, , prior range for k = 0.518 - 7.98

Results of CMSY analysis with altogether 5135 viable trajectories for 1865 r-k pairs
r = 0.549 , 95% CL = 0.399 - 0.754 , k = 2.08 , 95% CL = 1.34 - 3.22
MSY = 0.286 , 95% CL = 0.226 - 0.361
Relative biomass last year = 0.511 k, 2.5th = 0.233 , 97.5th = 0.597
Exploitation F/(r/2) in last year = 0.761

Results for Management (based on CMSY analysis)
Fmsy = 0.274 , 95% CL = 0.2 - 0.377 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.274 , 95% CL = 0.2 - 0.377 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.286 , 95% CL = 0.226 - 0.361
Bmsy = 1.04 , 95% CL = 0.672 - 1.61
Biomass in last year = 1.06 , 2.5th perc = 0.486 , 97.5 perc = 1.24
B/Bmsy in last year = 1.02 , 2.5th perc = 0.467 , 97.5 perc = 1.19
Fishing mortality in last year = 0.207 , 2.5th perc = 0.177 , 97.5 perc = 0.453
F/Fmsy = 0.753 , 2.5th perc = 0.644 , 97.5 perc = 1.65

Stock status and exploitation in 2014
Biomass = 1.06 , B/Bmsy = 1.02 , fishing mortality F = 0.207 , F/Fmsy = 0.753
Comment: OK (RF 27.09.16) r updated

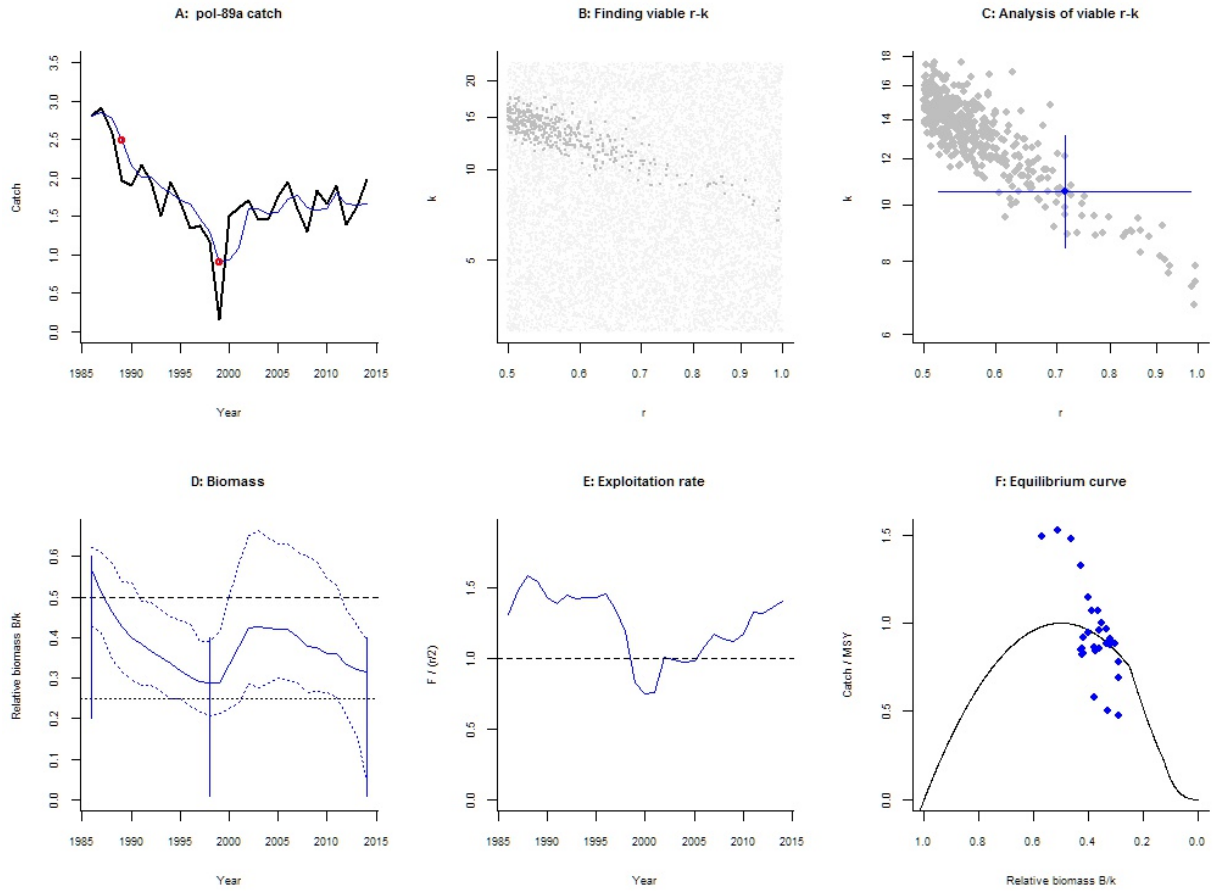

A: ple-89a catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch ple-89a
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1994
2002
2014
50% C.I.
80% C.I.
95% C.I.

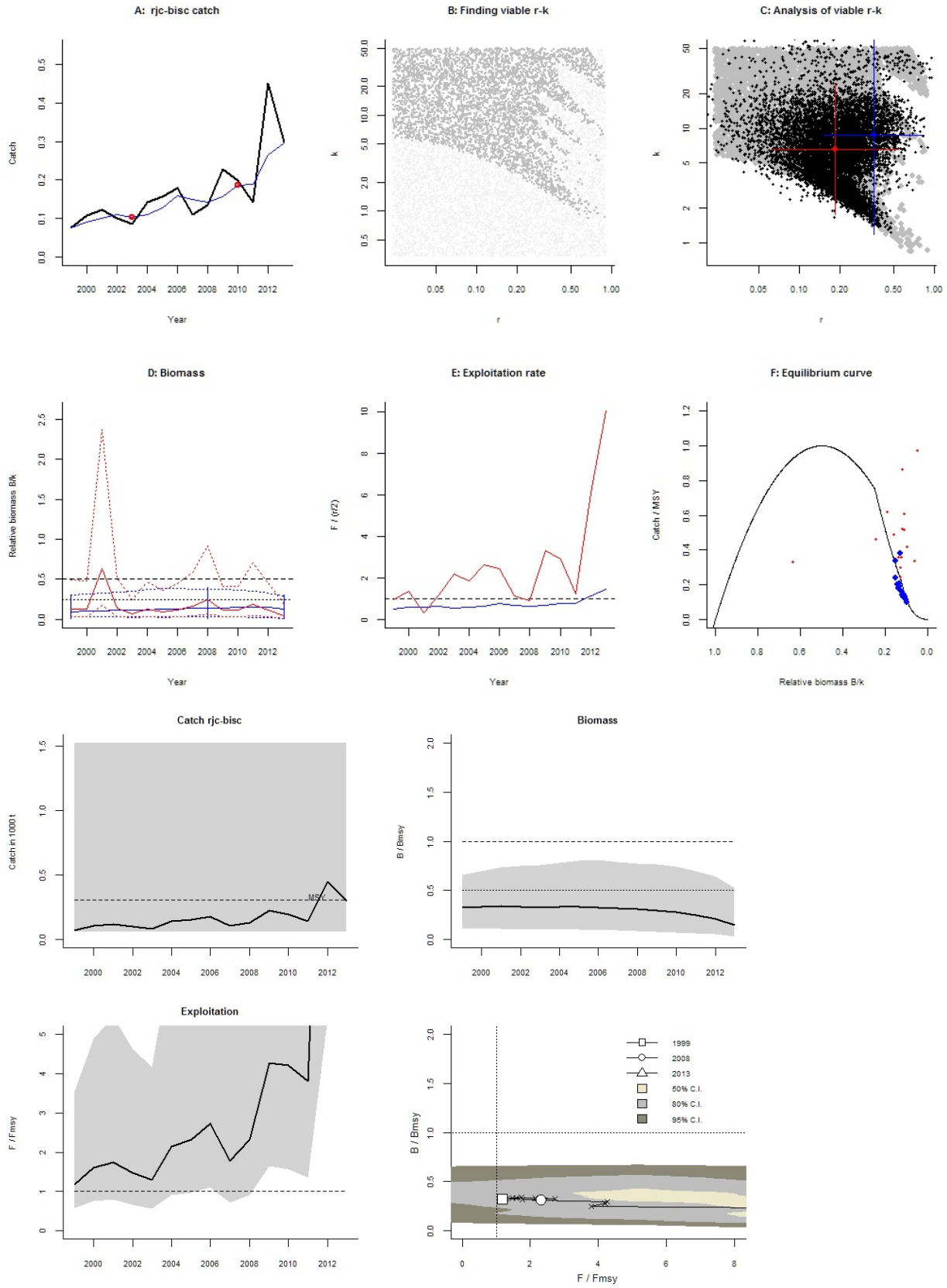
Species: *Pollachius pollachius* , stock: pol-89a
Pollack in Subarea VIII and Division IXa (Bay of Biscay, Atlantic Iberian Waters)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/pol-89a.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1986 - 2014 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 1998 default
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.5 - 1 expert, , prior range for k = 2.86 - 22.9

Results of CMSY analysis with altogether 424 viable trajectories for 409 r-k pairs
r = 0.714 , 95% CL = 0.519 - 0.982 , k = 10.5 , 95% CL = 8.43 - 13.2
MSY = 1.88 , 95% CL = 1.57 - 2.26
Relative biomass last year = 0.315 k, 2.5th = 0.0485 , 97.5th = 0.395
Exploitation F/(r/2) in last year = 1.41

Results for Management (based on CMSY analysis)
Fmsy = 0.357 , 95% CL = 0.259 - 0.491 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.357 , 95% CL = 0.259 - 0.491 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1.88 , 95% CL = 1.57 - 2.26
Bmsy = 5.27 , 95% CL = 4.22 - 6.58
Biomass in last year = 3.32 , 2.5th perc = 0.511 , 97.5 perc = 4.16
B/Bmsy in last year = 0.63 , 2.5th perc = 0.0971 , 97.5 perc = 0.79
Fishing mortality in last year = 0.597 , 2.5th perc = 0.477 , 97.5 perc = 3.88
F/Fmsy = 1.67 , 2.5th perc = 1.34 , 97.5 perc = 10.9

Stock status and exploitation in 2014
Biomass = 3.32 , B/Bmsy = 0.63 , fishing mortality F = 0.597 , F/Fmsy = 1.67
Comment: OK (RF 27.09.16)


A: pol-89a 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


A: rjc-bisc 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 rjc-bisc
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1999
2008
2013
50% C.I.
80% C.I.
95% C.I.

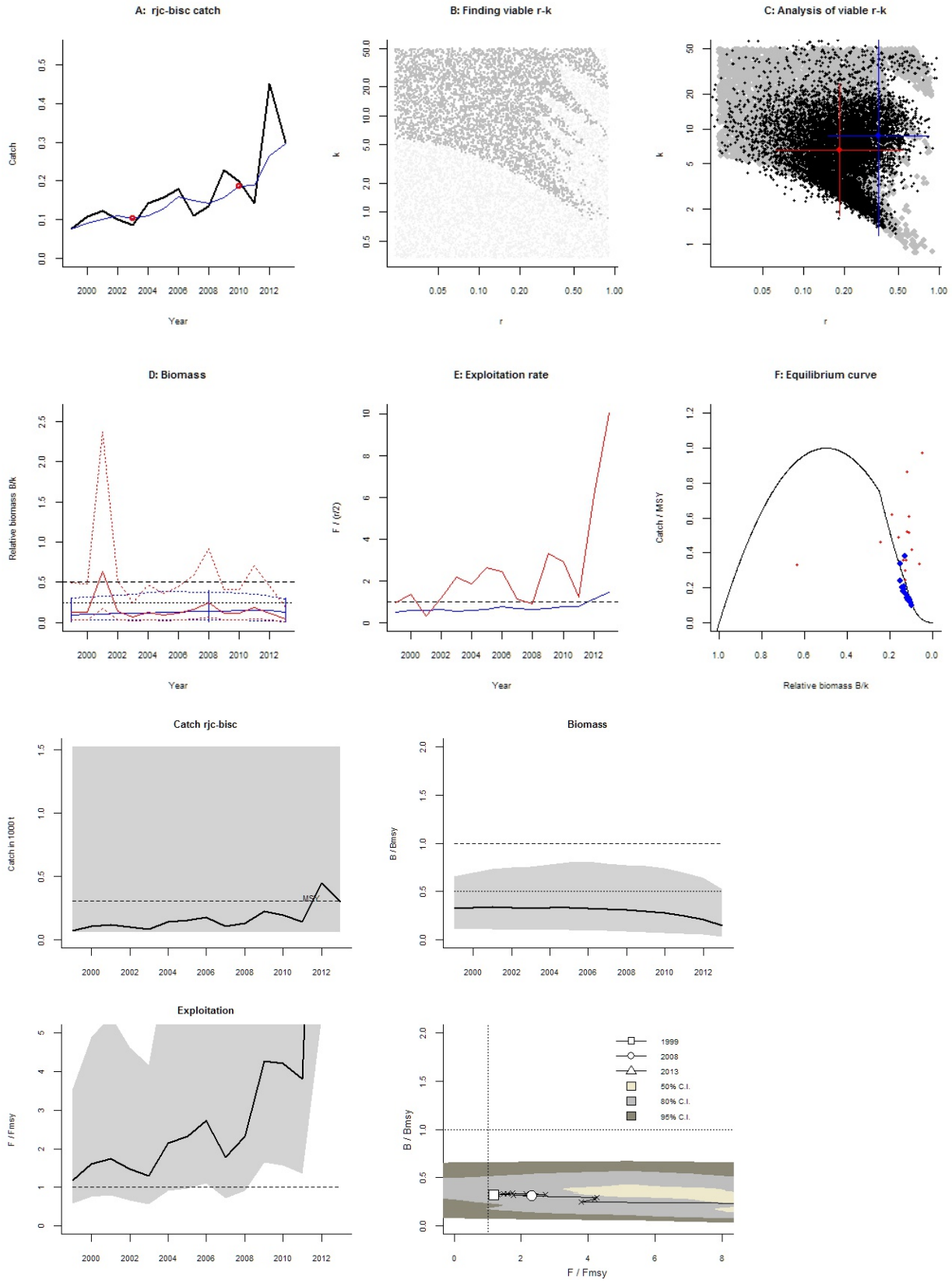
Species: *Raja clavata* , stock: rjc-bisc
Thornback ray (Raja clavata) in Subarea VIII (Bay of Biscay and Cantabrian Sea)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2014/2014/rjc-bisc.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1999 - 2013 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.3 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2008 expert
Prior final relative biomass = 0.01 - 0.3 expert
Prior range for r = 0.024 - 0.9 expert, , prior range for k = 0.33 - 49.6
Prior range of q = 0.000418 - 0.00512

Results of CMSY analysis with altogether 12941 viable trajectories for 4456 r-k pairs
r = 0.359 , 95% CL = 0.153 - 0.844 , k = 8.74 , 95% CL = 1.17 - 65.1
MSY = 0.784 , 95% CL = 0.0819 - 7.5
Relative biomass last year = 0.129 k, 2.5th = 0.0121 , 97.5th = 0.294
Exploitation F/(r/2) in last year = 1.47

Results from Bayesian Schaefer model using catch & CPUE
r = 0.186 , 95% CL = 0.0631 - 0.547 , k = 6.57 , 95% CL = 1.77 - 24.5
MSY = 0.305 , 95% CL = 0.061 - 1.53
Relative biomass in last year = 0.0734 k, 2.5th perc = 0.0178 , 97.5th perc = 0.264
Exploitation F/(r/2) in last year = 6.67
q = 0.000917 , lcl = 0.000577 , ucl = 0.00146

Results for Management (based on BSM analysis)
Fmsy = 0.0928 , 95% CL = 0.0315 - 0.273 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0273 , 95% CL = 0.00926 - 0.0803 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.305 , 95% CL = 0.061 - 1.53
Bmsy = 3.29 , 95% CL = 0.883 - 12.2
Biomass in last year = 0.483 , 2.5th perc = 0.117 , 97.5 perc = 1.74
B/Bmsy in last year = 0.147 , 2.5th perc = 0.0357 , 97.5 perc = 0.528
Fishing mortality in last year = 0.62 , 2.5th perc = 0.172 , 97.5 perc = 2.55
F/Fmsy = 22.7 , 2.5th perc = 6.32 , 97.5 perc = 93.5

Stock status and exploitation in 2014
Biomass = , B/Bmsy = , fishing mortality F = , F/Fmsy =
Comment: OK (RF 27.09.16)


A: rjc-bisc 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 rjc-bisc
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1999
2008
2013
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

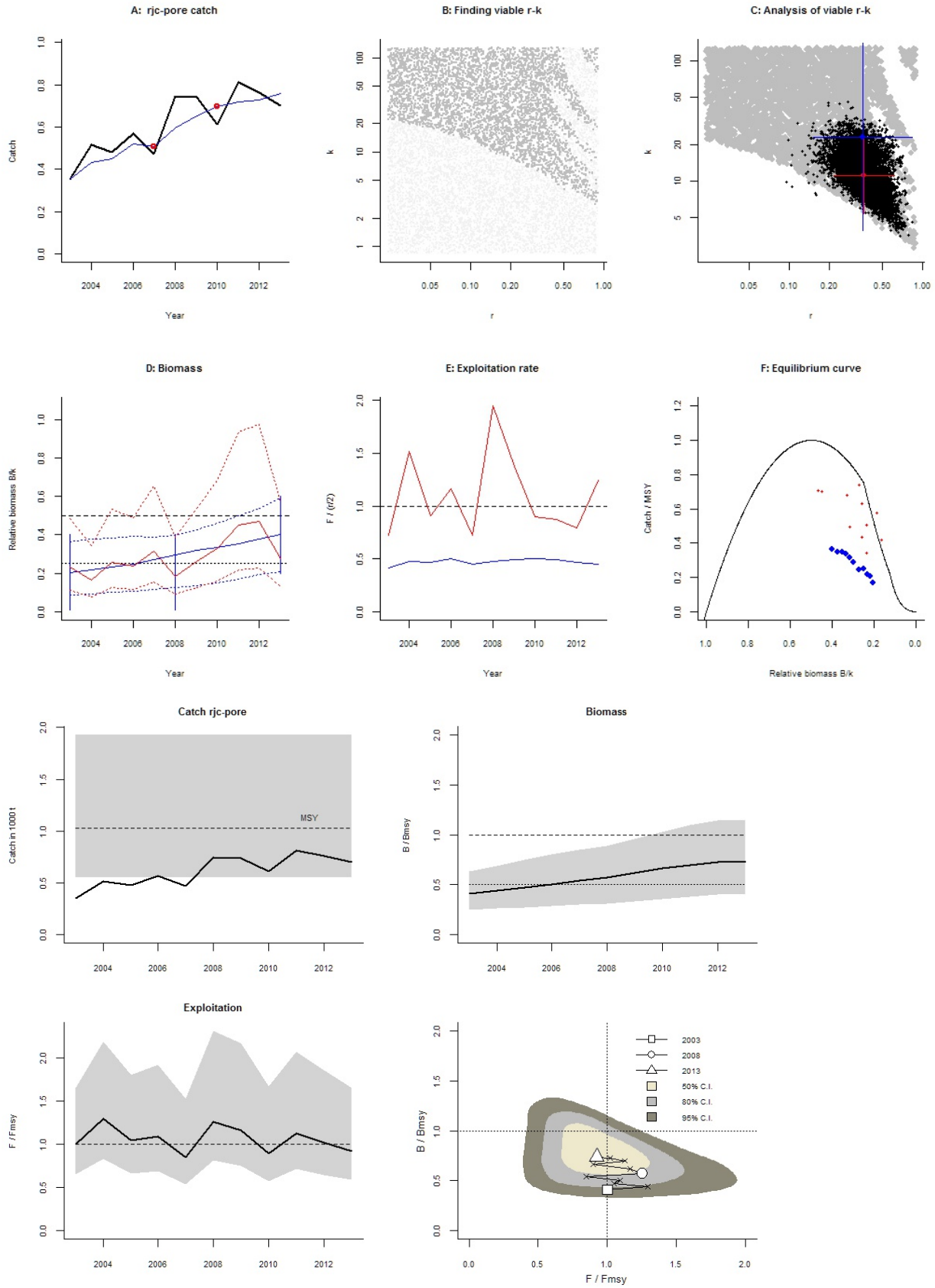
Species: *Raja clavata* , stock: rjc-pore
Thornback ray (Raja clavata) in Division IXa (west of Galicia, Portugal, and Gulf of Cadiz)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2014/2014/rjc-pore.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 2003 - 2013 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2008 expert
Prior final relative biomass = 0.2 - 0.6 expert
Prior range for r = 0.024 - 0.9 expert, , prior range for k = 0.841 - 126
Prior range of q = 0.000157 - 0.00193

Results of CMSY analysis with altogether 11320 viable trajectories for 4359 r-k pairs
r = 0.359 , 95% CL = 0.153 - 0.844 , k = 23.3 , 95% CL = 3.89 - 139
MSY = 2.09 , 95% CL = 0.335 - 13
Relative biomass last year = 0.402 k, 2.5th = 0.208 , 97.5th = 0.59
Exploitation F/(r/2) in last year = 0.452

Results from Bayesian Schaefer model using catch & CPUE
r = 0.366 , 95% CL = 0.216 - 0.62 , k = 11.3 , 95% CL = 5.43 - 23.3
MSY = 1.03 , 95% CL = 0.55 - 1.93
Relative biomass in last year = 0.369 k, 2.5th perc = 0.207 , 97.5th perc = 0.575
Exploitation F/(r/2) in last year = 0.924
q = 0.000383 , lcl = 0.000226 , ucl = 0.000649

Results for Management (based on BSM analysis)
Fmsy = 0.183 , 95% CL = 0.108 - 0.31 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.183 , 95% CL = 0.108 - 0.31 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1.03 , 95% CL = 0.55 - 1.93
Bmsy = 5.63 , 95% CL = 2.71 - 11.7
Biomass in last year = 4.15 , 2.5th perc = 2.33 , 97.5 perc = 6.47
B/Bmsy in last year = 0.738 , 2.5th perc = 0.414 , 97.5 perc = 1.15
Fishing mortality in last year = 0.169 , 2.5th perc = 0.109 , 97.5 perc = 0.302
F/Fmsy = 0.924 , 2.5th perc = 0.593 , 97.5 perc = 1.65

Stock status and exploitation in 2014
Biomass = , B/Bmsy = , fishing mortality F = , F/Fmsy =
Comment: OK (RF 27.09.16)


A: rjc-pore 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 rjc-pore
Catch in 1000t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
2003
2008
2013
50% C.I.
80% C.I.
95% C.I.

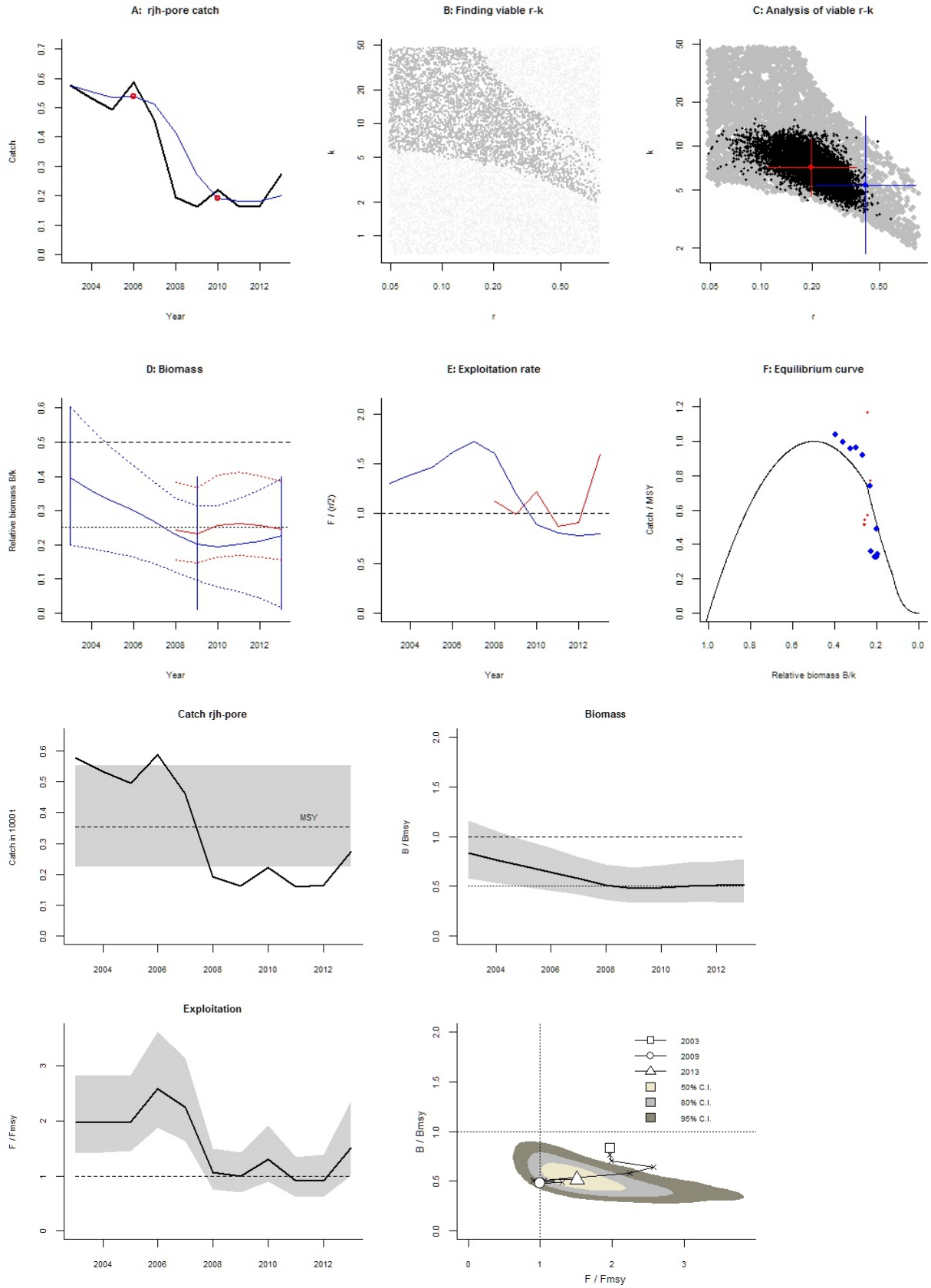
Species: *Raja brachyura* , stock: rjh-pore
Blond ray in Division IXa
Source: Report of WKLIFE IV, ICES CM 2014/ACOM:54
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 2003 - 2013 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2009 default
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.049 - 0.85 expert, , prior range for k = 0.681 - 47.2
Prior range of q = 0.00635 - 0.0529

Results of CMSY analysis with altogether 13435 viable trajectories for 3777 r-k pairs
r = 0.412 , 95% CL = 0.209 - 0.81 , k = 5.42 , 95% CL = 1.82 - 16.1
MSY = 0.558 , 95% CL = 0.248 - 1.26
Relative biomass last year = 0.226 k, 2.5th = 0.0173 , 97.5th = 0.394
Exploitation F/(r/2) in last year = 0.795

Results from Bayesian Schaefer model using catch & CPUE
r = 0.198 , 95% CL = 0.108 - 0.363 , k = 7.11 , 95% CL = 4.54 - 11.1
MSY = 0.352 , 95% CL = 0.225 - 0.553
Relative biomass in last year = 0.258 k, 2.5th perc = 0.165 , 97.5th perc = 0.386
Exploitation F/(r/2) in last year = 1.51
q = 0.0133 , lcl = 0.00875 , ucl = 0.0201

Results for Management (based on BSM analysis)
Fmsy = 0.0991 , 95% CL = 0.0541 - 0.181 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.0991 , 95% CL = 0.0541 - 0.181 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.352 , 95% CL = 0.225 - 0.553
Bmsy = 3.56 , 95% CL = 2.27 - 5.57
Biomass in last year = 1.84 , 2.5th perc = 1.18 , 97.5 perc = 2.75
B/Bmsy in last year = 0.516 , 2.5th perc = 0.331 , 97.5 perc = 0.773
Fishing mortality in last year = 0.15 , 2.5th perc = 0.1 , 97.5 perc = 0.234
F/Fmsy = 1.51 , 2.5th perc = 1.01 , 97.5 perc = 2.36

Stock status and exploitation in 2014
Biomass = , B/Bmsy = , fishing mortality F = , F/Fmsy =
Comment: OK (RF 27.09.16)


A: rjh-pore 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 rjh-pore
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
2003
2009
2013
50% C.I.
80% C.I.
95% C.I.

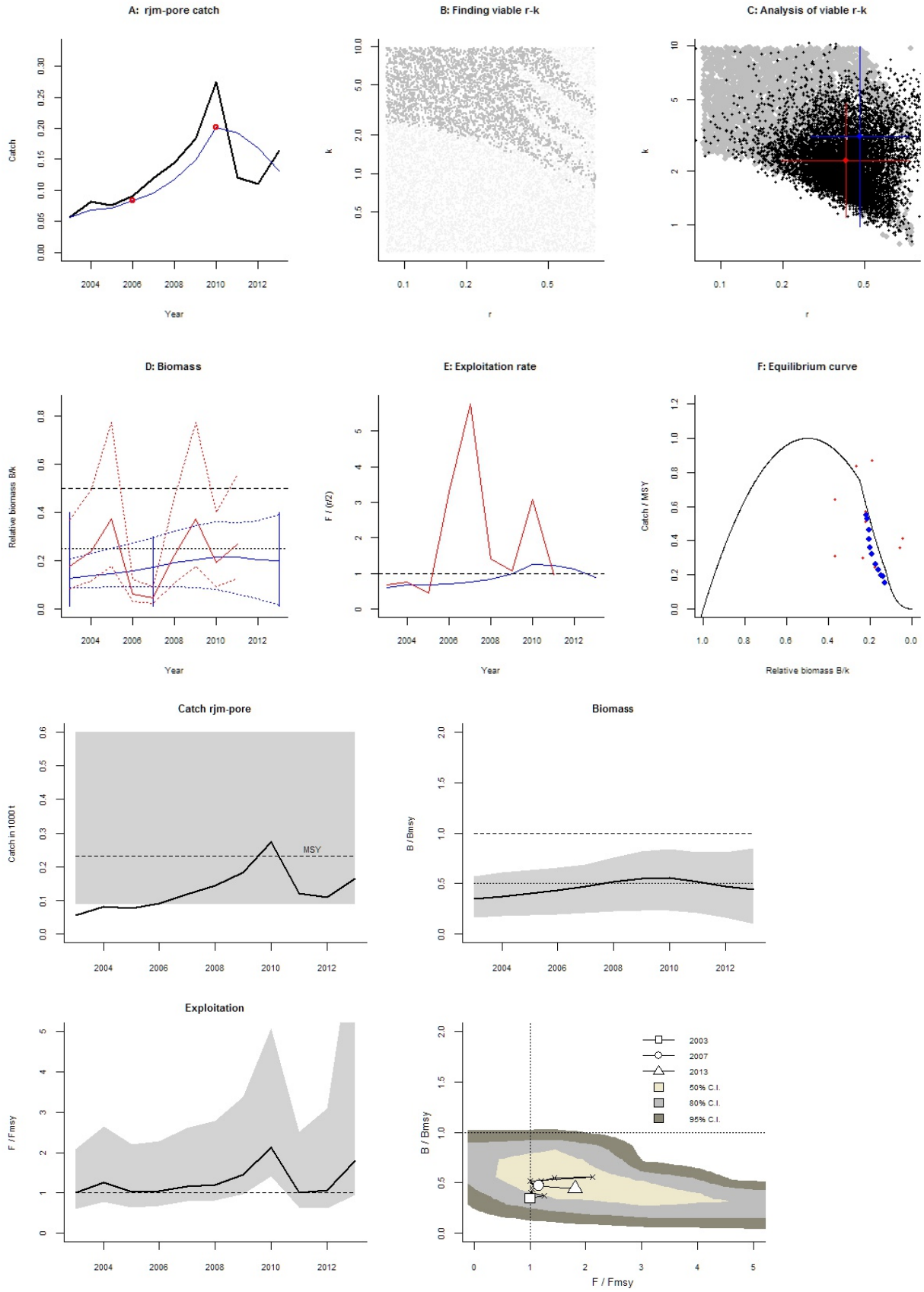
Species: *Raja montagui* , stock: rjm-pore
Spotted ray (Raja montagui) in Division IXa (west of Galicia, Portugal, and Gulf of Cadiz)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2014/2014/rjm-pore.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 2003 - 2013 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.3 in year 2007 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.082 - 0.85 expert, , prior range for k = 0.237 - 9.8
Prior range of q = 0.000142 - 0.000912

Results of CMSY analysis with altogether 5589 viable trajectories for 3385 r-k pairs
r = 0.472 , 95% CL = 0.272 - 0.82 , k = 3.1 , 95% CL = 0.974 - 9.89
MSY = 0.366 , 95% CL = 0.111 - 1.21
Relative biomass last year = 0.201 k, 2.5th = 0.0155 , 97.5th = 0.393
Exploitation F/(r/2) in last year = 0.894

Results from Bayesian Schaefer model using catch & CPUE
r = 0.404 , 95% CL = 0.197 - 0.832 , k = 2.29 , 95% CL = 1.1 - 4.76
MSY = 0.231 , 95% CL = 0.089 - 0.601
Relative biomass in last year = 0.222 k, 2.5th perc = 0.0522 , 97.5th perc = 0.424
Exploitation F/(r/2) in last year = 1.6
q = 0.000294 , lcl = 0.000197 , ucl = 0.000439

Results for Management (based on BSM analysis)
Fmsy = 0.202 , 95% CL = 0.0983 - 0.416 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.18 , 95% CL = 0.0873 - 0.37 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.231 , 95% CL = 0.089 - 0.601
Bmsy = 1.14 , 95% CL = 0.55 - 2.38
Biomass in last year = 0.508 , 2.5th perc = 0.119 , 97.5 perc = 0.969
B/Bmsy in last year = 0.444 , 2.5th perc = 0.104 , 97.5 perc = 0.848
Fishing mortality in last year = 0.324 , 2.5th perc = 0.17 , 97.5 perc = 1.38
F/Fmsy = 1.81 , 2.5th perc = 0.947 , 97.5 perc = 7.68

Stock status and exploitation in 2014
Biomass = , B/Bmsy = , fishing mortality F = , F/Fmsy =
Comment: OK (RF 27.09.16)


A: rjm-pore 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 rjm-pore
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
2003
2007
2013
50% C.I.
80% C.I.
95% C.I.

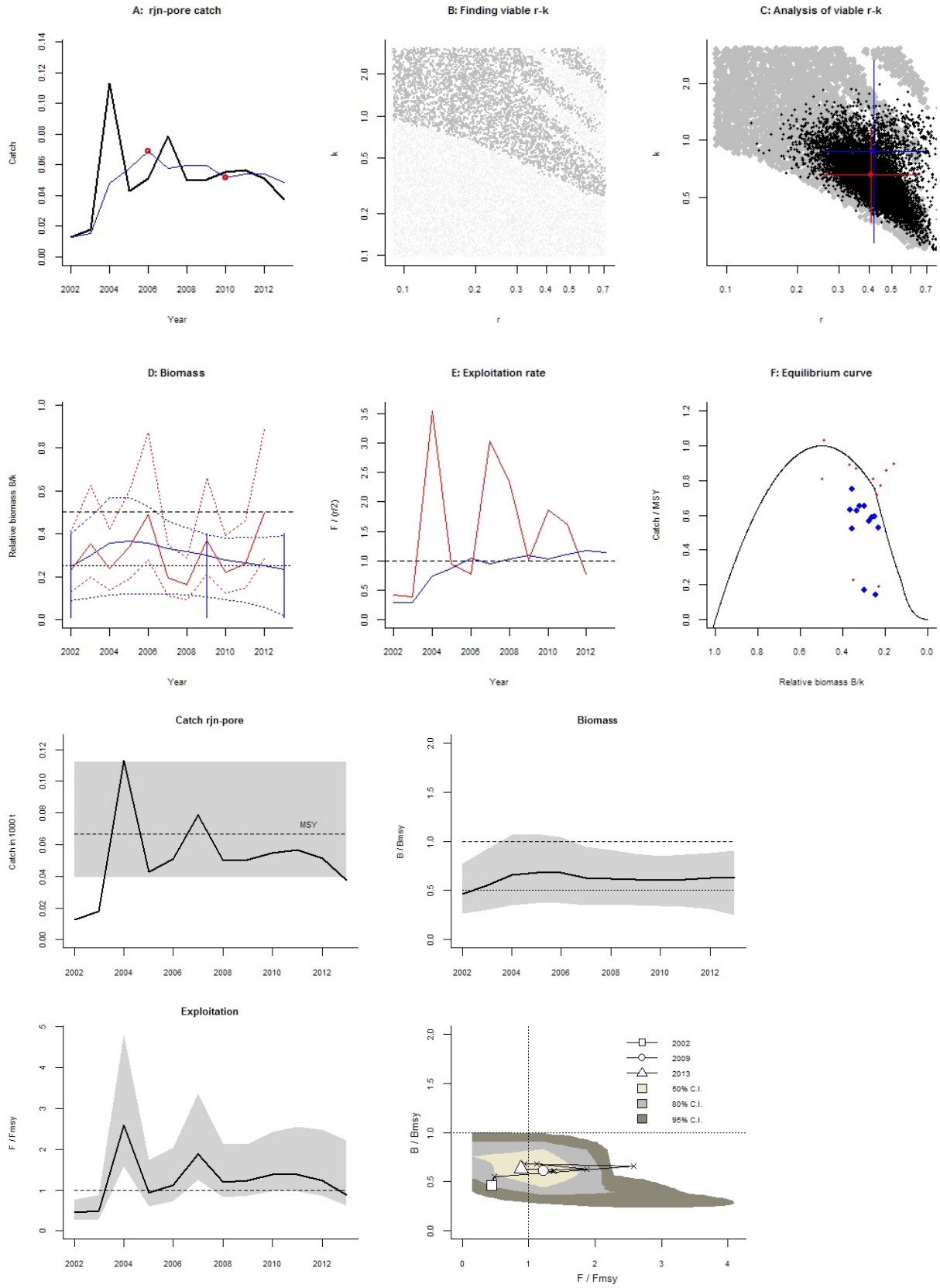
Species: *Leucoraja naevus* , stock: rjn-pore
Cuckoo ray in Division IXa (west of Galicia, Portugal, and Gulf of Cadiz)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2014/2014/rjn-pore.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 2002 - 2013 , abundance = CPUE
Prior initial relative biomass = 0.01 - 0.4 expert
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 = 0.09 - 0.71 expert, , prior range for k = 0.097 - 3.06
Prior range of q = 0.00375 - 0.0211

Results of CMSY analysis with altogether 9565 viable trajectories for 3916 r-k pairs
r = 0.421 , 95% CL = 0.258 - 0.687 , k = 0.87 , 95% CL = 0.287 - 2.64
MSY = 0.0916 , 95% CL = 0.0272 - 0.308
Relative biomass last year = 0.232 k, 2.5th = 0.0185 , 97.5th = 0.391
Exploitation F/(r/2) in last year = 1.14

Results from Bayesian Schaefer model using catch & CPUE
r = 0.409 , 95% CL = 0.255 - 0.655 , k = 0.653 , 95% CL = 0.368 - 1.16
MSY = 0.0667 , 95% CL = 0.0396 - 0.112
Relative biomass in last year = 0.315 k, 2.5th perc = 0.127 , 97.5th perc = 0.451
Exploitation F/(r/2) in last year = 0.887
q = 0.00738 , lcl = 0.00513 , ucl = 0.0106

Results for Management (based on BSM analysis)
Fmsy = 0.204 , 95% CL = 0.128 - 0.327 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.204 , 95% CL = 0.128 - 0.327 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.0667 , 95% CL = 0.0396 - 0.112
Bmsy = 0.327 , 95% CL = 0.184 - 0.58
Biomass in last year = 0.206 , 2.5th perc = 0.0827 , 97.5 perc = 0.295
B/Bmsy in last year = 0.631 , 2.5th perc = 0.253 , 97.5 perc = 0.903
Fishing mortality in last year = 0.181 , 2.5th perc = 0.126 , 97.5 perc = 0.451
F/Fmsy = 0.887 , 2.5th perc = 0.619 , 97.5 perc = 2.21

Stock status and exploitation in 2014
Biomass = , B/Bmsy = , fishing mortality F = , F/Fmsy =
Comment: OK (RF 27.09.16)


A: rjn-pore 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 rjn-pore
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
2002
2009
2013
50% C.I.
80% C.I.
95% C.I.

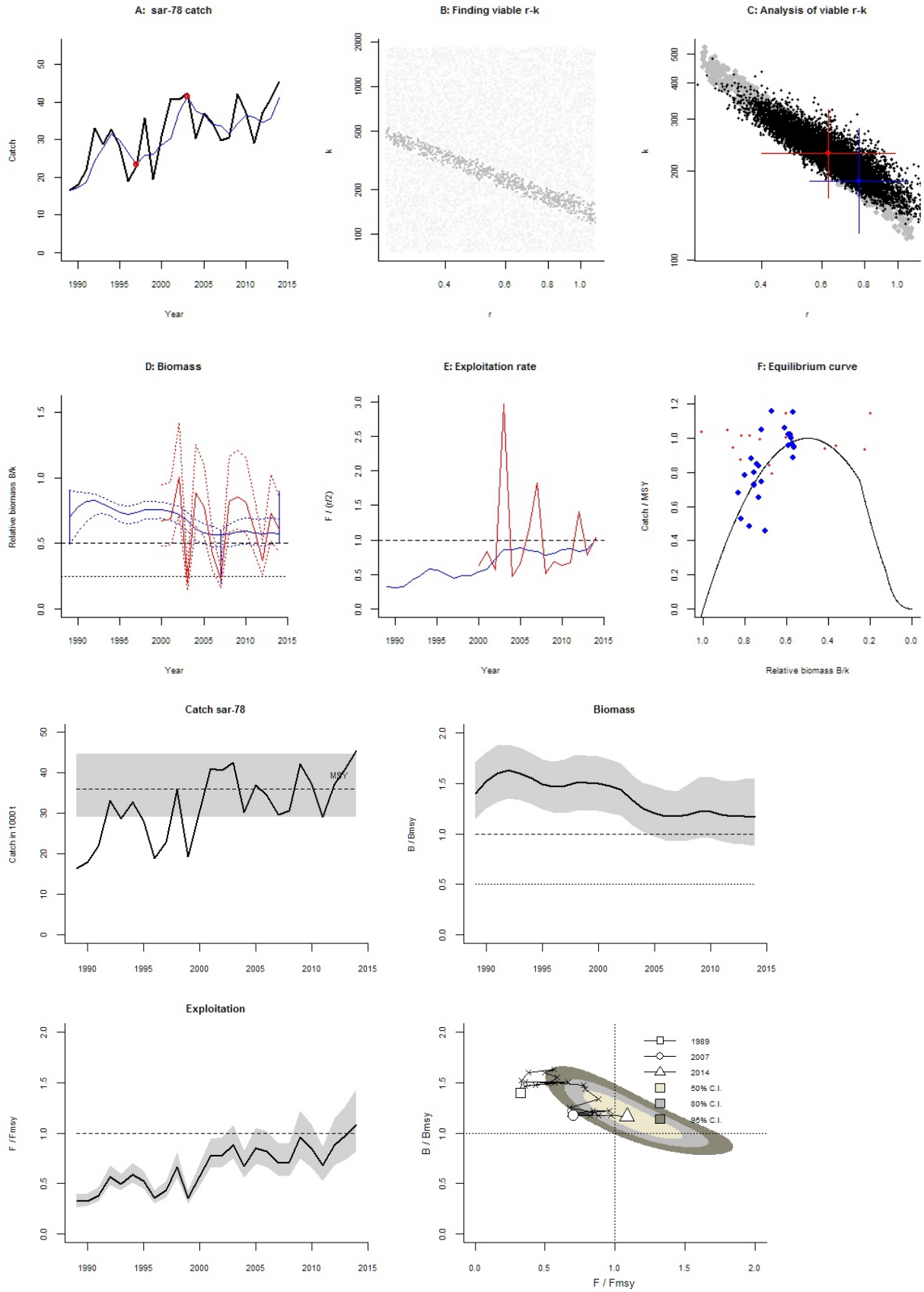
Species: *Sardina pilchardus* , stock: sar-78
Sardine in Divisions VIIIa,b,d and Subarea VII
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/sar-78.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1989 - 2014 , abundance = CPUE
Prior initial relative biomass = 0.5 - 0.9 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 2007 expert
Prior final relative biomass = 0.5 - 0.9 expert
Prior range for r = 0.27 - 1.1 expert, , prior range for k = 75 - 1836
Prior range of q = 1.39 - 5.63

Results of CMSY analysis with altogether 4196 viable trajectories for 750 r-k pairs
r = 0.771 , 95% CL = 0.553 - 1.08 , k = 185 , 95% CL = 123 - 279
MSY = 35.7 , 95% CL = 30.6 - 41.6
Relative biomass last year = 0.571 k, 2.5th = 0.504 , 97.5th = 0.688
Exploitation F/(r/2) in last year = 1.01

Results from Bayesian Schaefer model using catch & CPUE
r = 0.628 , 95% CL = 0.401 - 0.985 , k = 229 , 95% CL = 163 - 323
MSY = 36 , 95% CL = 29 - 44.5
Relative biomass in last year = 0.581 k, 2.5th perc = 0.439 , 97.5th perc = 0.771
Exploitation F/(r/2) in last year = 1.08
q = 2.44 , lcl = 1.81 , ucl = 3.3

Results for Management (based on BSM analysis)
Fmsy = 0.314 , 95% CL = 0.2 - 0.493 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.314 , 95% CL = 0.2 - 0.493 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 36 , 95% CL = 29 - 44.5
Bmsy = 115 , 95% CL = 81.3 - 161
Biomass in last year = 133 , 2.5th perc = 101 , 97.5 perc = 177
B/Bmsy in last year = 1.16 , 2.5th perc = 0.879 , 97.5 perc = 1.54
Fishing mortality in last year = 0.34 , 2.5th perc = 0.257 , 97.5 perc = 0.45
F/Fmsy = 1.08 , 2.5th perc = 0.817 , 97.5 perc = 1.43

Stock status and exploitation in 2014
Biomass = 133 , B/Bmsy = 1.16 , fishing mortality F = 0.34 , F/Fmsy = 1.08
Comment: OK (RF 27.09.16)


A: sar-78 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 sar-78
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1989
2007
2014
50% C.I.
80% C.I.
95% C.I.

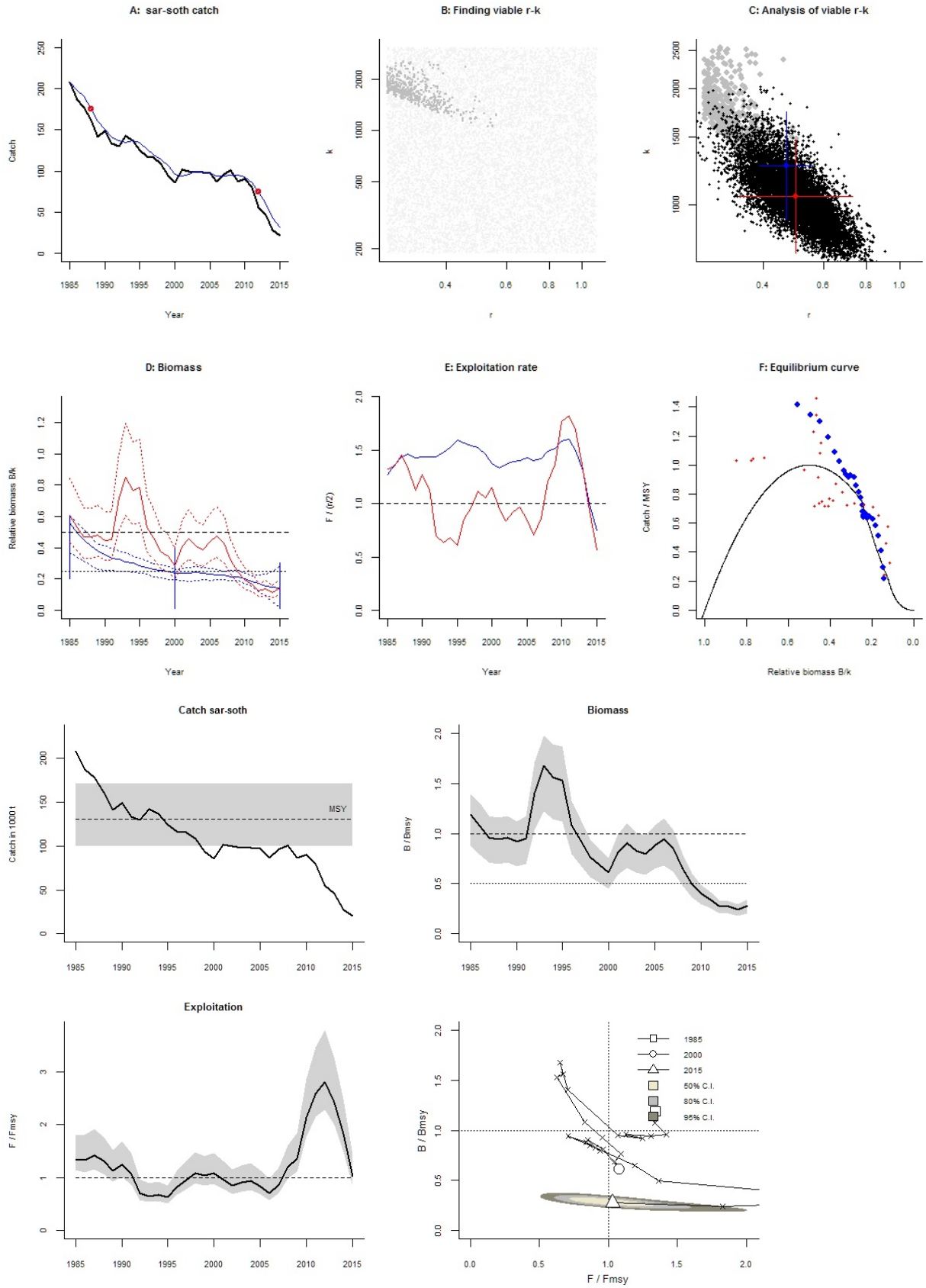
Species: *Sardina pilchardus* , stock: sar-soth
Sardine in Divisions VIIIc and IXa
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/sar-soth.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1985 - 2015 , abundance = CPUE
Prior initial 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 = 0.27 - 1.1 expert, , prior range for k = 189 - 3081
Prior range of q = 0.727 - 2.94

Results of CMSY analysis with altogether 490 viable trajectories for 479 r-k pairs
r = 0.466 , 95% CL = 0.39 - 0.557 , k = 1262 , 95% CL = 917 - 1735
MSY = 147 , 95% CL = 112 - 194
Relative biomass last year = 0.143 k, 2.5th = 0.016 , 97.5th = 0.286
Exploitation F/(r/2) in last year = 0.75

Results from Bayesian Schaefer model using catch & CPUE
r = 0.496 , 95% CL = 0.339 - 0.727 , k = 1053 , 95% CL = 752 - 1475
MSY = 131 , 95% CL = 99.7 - 171
Relative biomass in last year = 0.14 k, 2.5th perc = 0.101 , 97.5th perc = 0.172
Exploitation F/(r/2) in last year = 0.576
q = 1.12 , lcl = 0.873 , ucl = 1.43

Results for Management (based on BSM analysis)
Fmsy = 0.248 , 95% CL = 0.169 - 0.364 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.139 , 95% CL = 0.0946 - 0.203 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 131 , 95% CL = 99.7 - 171
Bmsy = 526 , 95% CL = 376 - 737
Biomass in last year = 147 , 2.5th perc = 106 , 97.5 perc = 181
B/Bmsy in last year = 0.279 , 2.5th perc = 0.202 , 97.5 perc = 0.345
Fishing mortality in last year = 0.143 , 2.5th perc = 0.116 , 97.5 perc = 0.198
F/Fmsy = 1.03 , 2.5th perc = 0.835 , 97.5 perc = 1.43

Stock status and exploitation in 2014
Biomass = 127 , B/Bmsy = 0.242 , fishing mortality F = 0.22 , F/Fmsy = 1.83
Comment: OK (RF 27.09.16)


A: sar-soth 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 sar-soth
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1985
2000
2015
50% C.I.
80% C.I.
95% C.I.

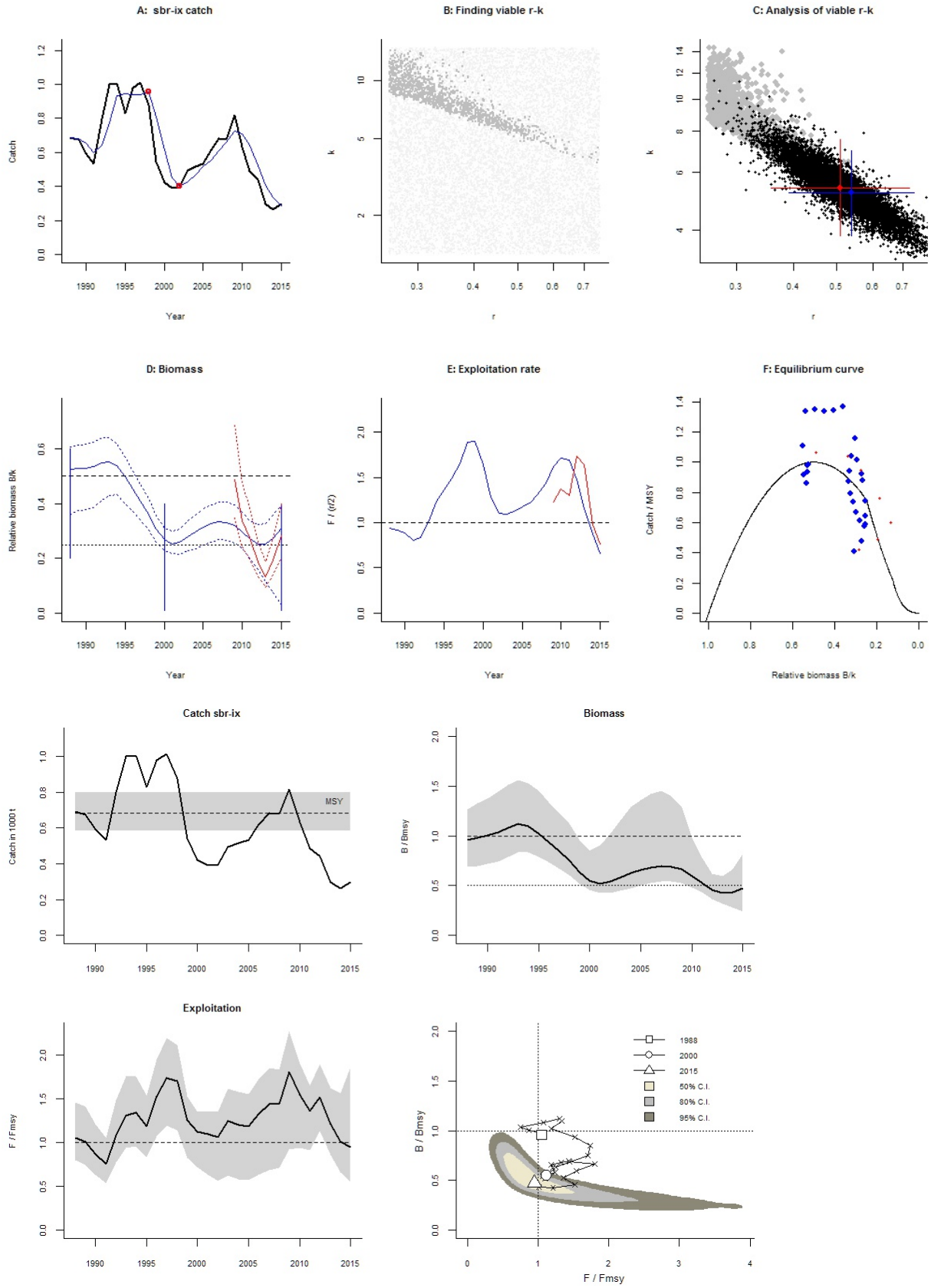
Species: *Pagellus bogaraveo* , stock: sbr-ix
Red (=blackspot) seabream in Subarea 9 (Atlantic Iberian waters)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/sbr-ix.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1988 - 2015 , abundance = 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 = 0.01 - 0.4 expert
Prior range for r = 0.26 - 0.76 expert, , prior range for k = 1.26 - 14.7
Prior range of q = 0.0122 - 0.0417

Results of CMSY analysis with altogether 1998 viable trajectories for 1275 r-k pairs
r = 0.539 , 95% CL = 0.392 - 0.741 , k = 5.19 , 95% CL = 3.85 - 6.99
MSY = 0.7 , 95% CL = 0.612 - 0.799
Relative biomass last year = 0.308 k, 2.5th = 0.0293 , 97.5th = 0.396
Exploitation F/(r/2) in last year = 0.661

Results from Bayesian Schaefer model using catch & CPUE
r = 0.508 , 95% CL = 0.358 - 0.722 , k = 5.38 , 95% CL = 3.84 - 7.54
MSY = 0.683 , 95% CL = 0.586 - 0.797
Relative biomass in last year = 0.238 k, 2.5th perc = 0.122 , 97.5th perc = 0.409
Exploitation F/(r/2) in last year = 0.907
q = 0.021 , lcl = 0.0163 , ucl = 0.027

Results for Management (based on BSM analysis)
Fmsy = 0.254 , 95% CL = 0.179 - 0.361 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.242 , 95% CL = 0.17 - 0.344 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 0.683 , 95% CL = 0.586 - 0.797
Bmsy = 2.69 , 95% CL = 1.92 - 3.77
Biomass in last year = 1.28 , 2.5th perc = 0.654 , 97.5 perc = 2.2
B/Bmsy in last year = 0.476 , 2.5th perc = 0.243 , 97.5 perc = 0.819
Fishing mortality in last year = 0.23 , 2.5th perc = 0.134 , 97.5 perc = 0.451
F/Fmsy = 0.952 , 2.5th perc = 0.554 , 97.5 perc = 1.86

Stock status and exploitation in 2014
Biomass = 1.17 , B/Bmsy = 0.435 , fishing mortality F = 0.224 , F/Fmsy = 1.01
Comment: OK (RF 27.09.16)

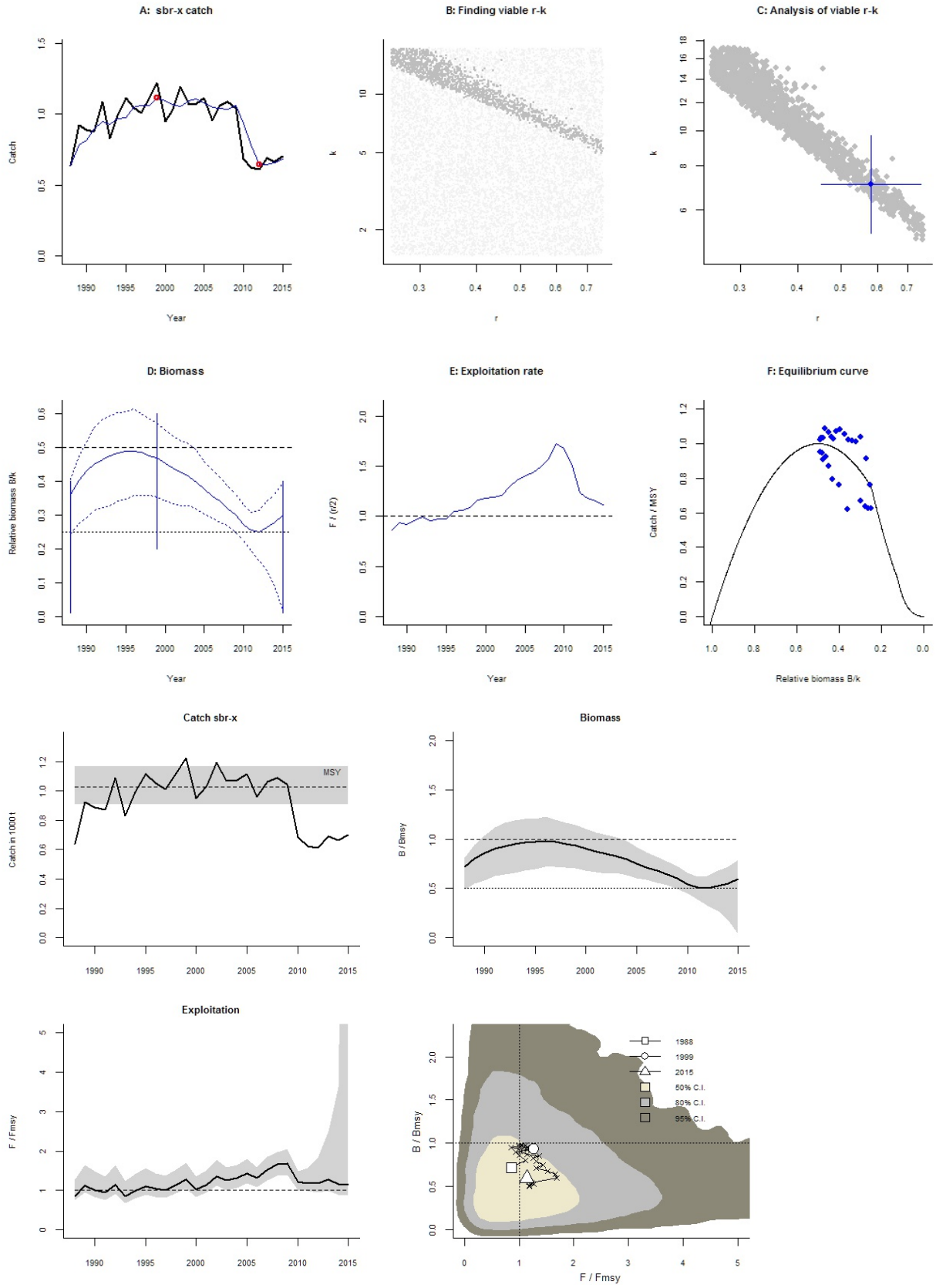

A: sbr-ix catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch sbr-ix
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1988
2000
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

Species: *Pagellus bogaraveo* , stock: sbr-x
Red (=blackspot) seabream (Pagellus bogaraveo) in Subarea 10 (Azores grounds)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/sbr-x.pdf
Region: Northeast Atlantic , Azores
Catch data used from years 1988 - 2015 , abundance = None
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.2 - 0.6 in year 1999 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.26 - 0.76 expert, , prior range for k = 1.47 - 17.2

Results of CMSY analysis with altogether 2007 viable trajectories for 1439 r-k pairs
r = 0.581 , 95% CL = 0.451 - 0.749 , k = 7.07 , 95% CL = 5.15 - 9.72
MSY = 1.03 , 95% CL = 0.907 - 1.16
Relative biomass last year = 0.299 k, 2.5th = 0.0194 , 97.5th = 0.394
Exploitation F/(r/2) in last year = 1.11

Results for Management (based on CMSY analysis)
Fmsy = 0.291 , 95% CL = 0.225 - 0.375 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.291 , 95% CL = 0.225 - 0.375 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1.03 , 95% CL = 0.907 - 1.16
Bmsy = 3.54 , 95% CL = 2.57 - 4.86
Biomass in last year = 2.12 , 2.5th perc = 0.137 , 97.5 perc = 2.79
B/Bmsy in last year = 0.598 , 2.5th perc = 0.0388 , 97.5 perc = 0.789
Fishing mortality in last year = 0.331 , 2.5th perc = 0.251 , 97.5 perc = 5.1
F/Fmsy = 1.14 , 2.5th perc = 0.865 , 97.5 perc = 17.6

Stock status and exploitation in 2014
Biomass = 1.96 , B/Bmsy = 0.553 , fishing mortality F = 0.339 , F/Fmsy = 1.17
Comment: OK (RF 27.09.16)

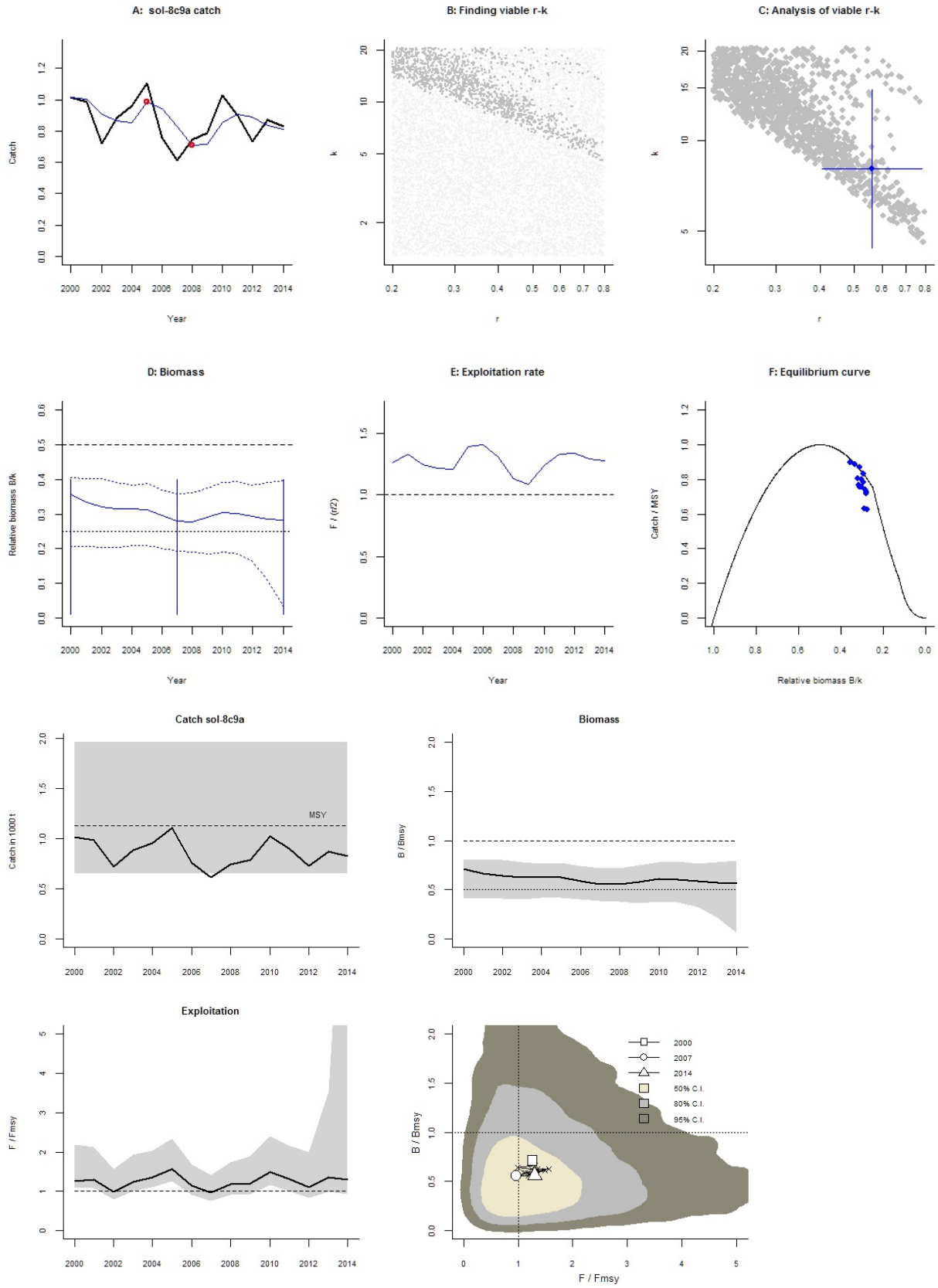

A: sbr-x catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch sbr-x
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1988
1999
2015
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy

Species: *Solea* spp , stock: sol-8c9a
Sole (Solea solea, S. senegalensis, and Pegusa lascaris) in ICES areas Divisions VIIIc and IXa (Cantabrian Sea, Atlantic Iberian Waters)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/sol-8c9a.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 2000 - 2014 , abundance = None
Prior initial relative biomass = 0.01 - 0.4 expert
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2007 default
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.2 - 0.8 default , prior range for k = 1.27 - 20.3

Results of CMSY analysis with altogether 2180 viable trajectories for 1338 r-k pairs
r = 0.561 , 95% CL = 0.405 - 0.777 , k = 8.06 , 95% CL = 4.39 - 14.8
MSY = 1.13 , 95% CL = 0.651 - 1.96
Relative biomass last year = 0.282 k, 2.5th = 0.0318 , 97.5th = 0.396
Exploitation F/(r/2) in last year = 1.27

Results for Management (based on CMSY analysis)
Fmsy = 0.281 , 95% CL = 0.203 - 0.389 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.281 , 95% CL = 0.203 - 0.389 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 1.13 , 95% CL = 0.651 - 1.96
Bmsy = 4.03 , 95% CL = 2.2 - 7.39
Biomass in last year = 2.27 , 2.5th perc = 0.256 , 97.5 perc = 3.19
B/Bmsy in last year = 0.563 , 2.5th perc = 0.0637 , 97.5 perc = 0.793
Fishing mortality in last year = 0.365 , 2.5th perc = 0.26 , 97.5 perc = 3.23
F/Fmsy = 1.3 , 2.5th perc = 0.925 , 97.5 perc = 11.5

Stock status and exploitation in 2014
Biomass = 2.27 , B/Bmsy = 0.563 , fishing mortality F = 0.365 , F/Fmsy = 1.3
Comment: OK (RF 27.09.16)


A: sol-8c9a 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 sol-8c9a
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.

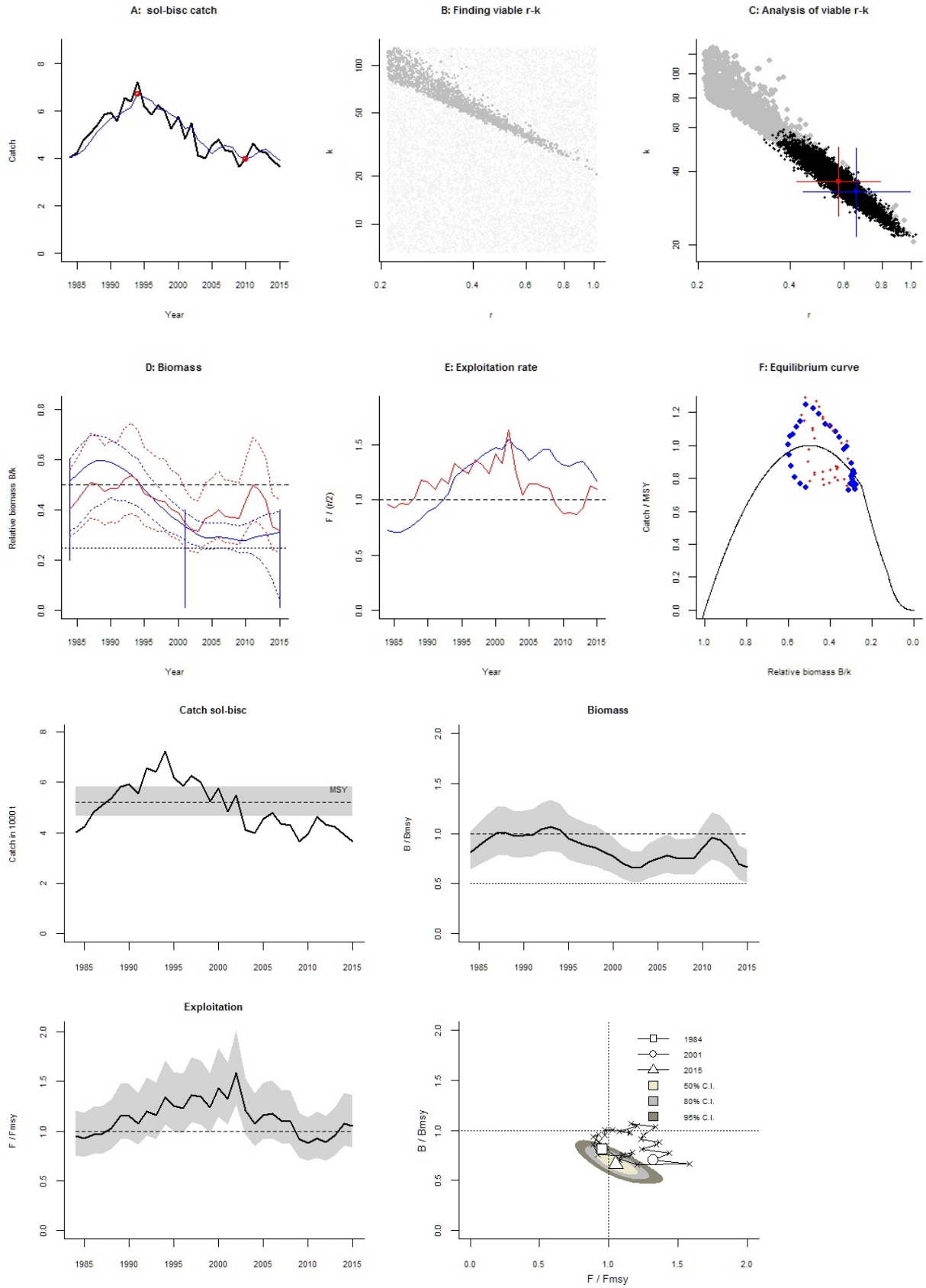
Species: *Solea solea* , stock: sol-bisc
Sole in Divisions VIIIa,b (Bay of Biscay)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/sol-bisc.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1984 - 2015 , abundance = CPUE
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2001 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.21 - 1 expert, , prior range for k = 6.6 - 128
Prior range of q = 0.545 - 2.4

Results of CMSY analysis with altogether 3111 viable trajectories for 1853 r-k pairs
r = 0.66 , 95% CL = 0.44 - 0.991 , k = 32.8 , 95% CL = 21.6 - 49.8
MSY = 5.41 , 95% CL = 4.89 - 5.99
Relative biomass last year = 0.31 k, 2.5th = 0.0391 , 97.5th = 0.396
Exploitation F/(r/2) in last year = 1.17

Results from Bayesian Schaefer model using catch & CPUE
r = 0.577 , 95% CL = 0.421 - 0.792 , k = 36.2 , 95% CL = 26.1 - 50.1
MSY = 5.22 , 95% CL = 4.67 - 5.84
Relative biomass in last year = 0.332 k, 2.5th perc = 0.256 , 97.5th perc = 0.42
Exploitation F/(r/2) in last year = 1.05
q = 0.843 , lcl = 0.638 , ucl = 1.11

Results for Management (based on BSM analysis)
Fmsy = 0.289 , 95% CL = 0.21 - 0.396 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.289 , 95% CL = 0.21 - 0.396 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 5.22 , 95% CL = 4.67 - 5.84
Bmsy = 18.1 , 95% CL = 13 - 25.1
Biomass in last year = 12 , 2.5th perc = 9.26 , 97.5 perc = 15.2
B/Bmsy in last year = 0.665 , 2.5th perc = 0.512 , 97.5 perc = 0.84
Fishing mortality in last year = 0.303 , 2.5th perc = 0.24 , 97.5 perc = 0.393
F/Fmsy = 1.05 , 2.5th perc = 0.831 , 97.5 perc = 1.36

Stock status and exploitation in 2014
Biomass = 12.7 , B/Bmsy = 0.7 , fishing mortality F = 0.31 , F/Fmsy = 1.08
Comment: OK (RF 27.09.16)

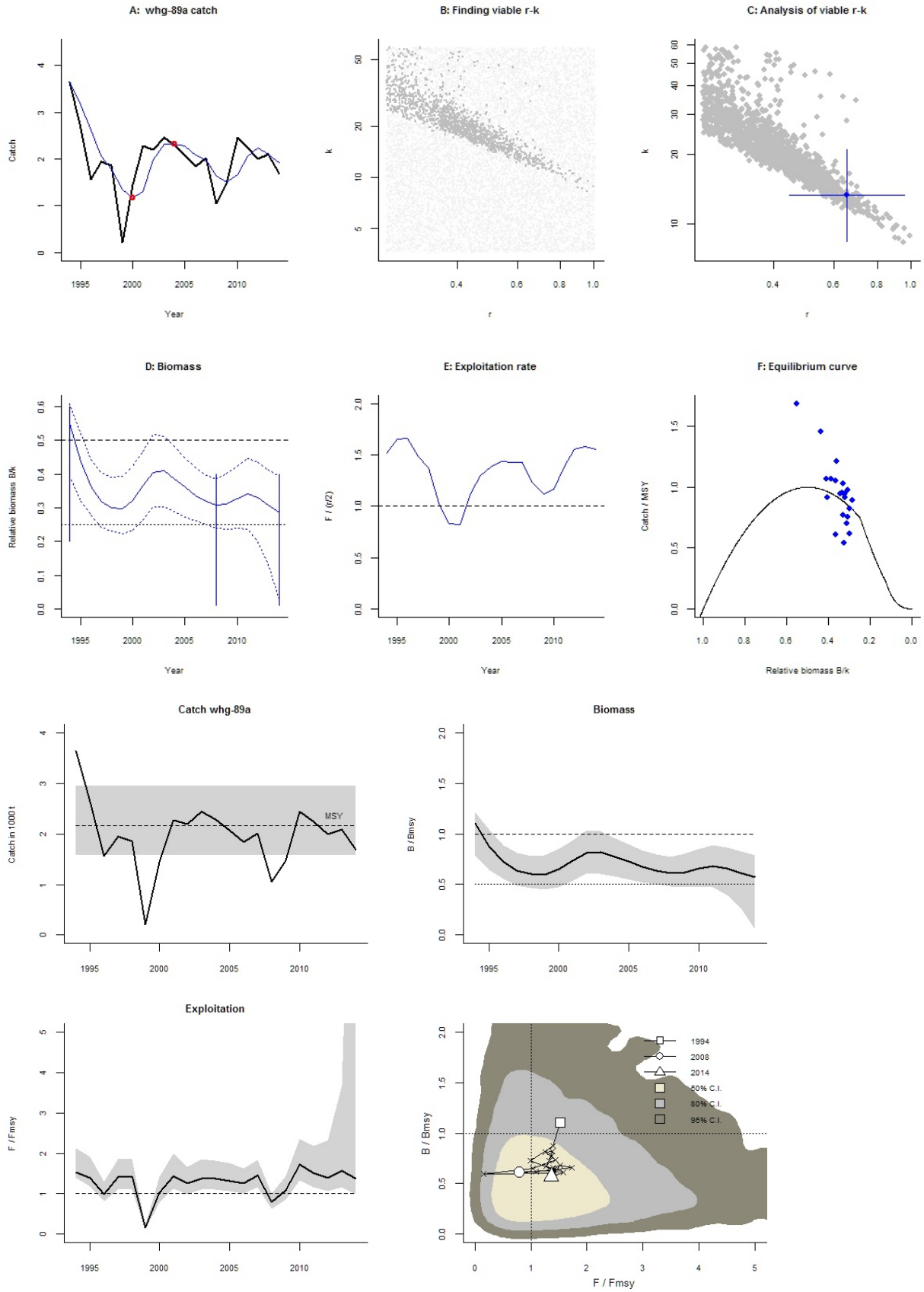

A: sol-bisc catch
Catch
Year
B: Finding viable r-k
k
r
C: Analysis of viable r-k
k
r
D: Biomass
Relative biomass B/k
Year
E: Exploitation rate
F / (r/2)
Year
F: Equilibrium curve
Catch / MSY
Relative biomass B/k
Catch sol-bisc
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
B / Bmsy
F / Fmsy
1984
2001
2015
50% C.I.
80% C.I.
95% C.I.

Species: *Merlangius merlangus* , stock: whg-89a
Whiting in Subarea VIII and Division IXa (Bay of Biscay, Atlantic Iberian Waters)
Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/whg-89a.pdf
Region: Northeast Atlantic , Bay of Biscay and Iberian coast
Catch data used from years 1994 - 2014 , abundance = None
Prior initial relative biomass = 0.2 - 0.6 default
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2008 expert
Prior final relative biomass = 0.01 - 0.4 expert
Prior range for r = 0.25 - 1 expert, , prior range for k = 3.61 - 58.4

Results of CMSY analysis with altogether 2251 viable trajectories for 1467 r-k pairs
r = 0.654 , 95% CL = 0.445 - 0.96 , k = 13.3 , 95% CL = 8.35 - 21.1
MSY = 2.17 , 95% CL = 1.59 - 2.96
Relative biomass last year = 0.286 k, 2.5th = 0.0266 , 97.5th = 0.395
Exploitation F/(r/2) in last year = 1.56

Results for Management (based on CMSY analysis)
Fmsy = 0.327 , 95% CL = 0.223 - 0.48 (if B > 1/2 Bmsy then Fmsy = 0.5 r)
Fmsy = 0.327 , 95% CL = 0.223 - 0.48 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)
MSY = 2.17 , 95% CL = 1.59 - 2.96
Bmsy = 6.63 , 95% CL = 4.18 - 10.5
Biomass in last year = 3.79 , 2.5th perc = 0.353 , 97.5 perc = 5.23
B/Bmsy in last year = 0.571 , 2.5th perc = 0.0532 , 97.5 perc = 0.79
Fishing mortality in last year = 0.446 , 2.5th perc = 0.323 , 97.5 perc = 4.79
F/Fmsy = 1.37 , 2.5th perc = 0.988 , 97.5 perc = 14.7

Stock status and exploitation in 2014
Biomass = 3.79 , B/Bmsy = 0.571 , fishing mortality F = 0.446 , F/Fmsy = 1.37
Comment: OK (RF 27.09.16)


A: whg-89a 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 whg-89a
Catch in 1000 t
MSY
Biomass
B / Bmsy
Exploitation
F / Fmsy
1994
2008
2014
50% C.I.
80% C.I.
95% C.I.
B / Bmsy
F / Fmsy