

## Appendix 2

### Detailed stock assessment reports for the Mediterranean and Black Sea

**Gulf of Lions** (analyzed with CMSY\_O\_7m.R; see Comment for data sources)

Species: *Boops boops* , stock: BOOPBOO\_LI

Bogue in Lions Gulf

Source:

Region: Mediterranean , Lions Gulf

Catch data used from years 1974 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2007 default

Prior final relative biomass = 0.01 - 0.4 , default

Prior range for  $r$  = 0.31 - 1.1 expert, , prior range for  $k$  = 0.739 - 10.5

Results of CMSY analysis with altogether 276 viable trajectories for 268 r-k pairs

$r$  = 0.522 , 95% CL = 0.424 - 0.642 ,  $k$  = 4.46 , 95% CL = 3.47 - 5.75

MSY = 0.583 , 95% CL = 0.492 - 0.69

Relative biomass last year = 0.185  $k$ , 2.5th = 0.0341 , 97.5th = 0.378

Exploitation  $F/(r/2)$  in last year = 0.841

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.261 , 95% CL = 0.212 - 0.321 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.193 , 95% CL = 0.157 - 0.238 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.583 , 95% CL = 0.492 - 0.69

$B_{msy}$  = 2.23 , 95% CL = 1.73 - 2.87

Biomass in last year = 0.826 , 2.5th perc = 0.152 , 97.5 perc = 1.69

$B/B_{msy}$  in last year = 0.37 , 2.5th perc = 0.0682 , 97.5 perc = 0.756

Fishing mortality in last year = 0.306 , 2.5th perc = 0.15 , 97.5 perc = 1.66

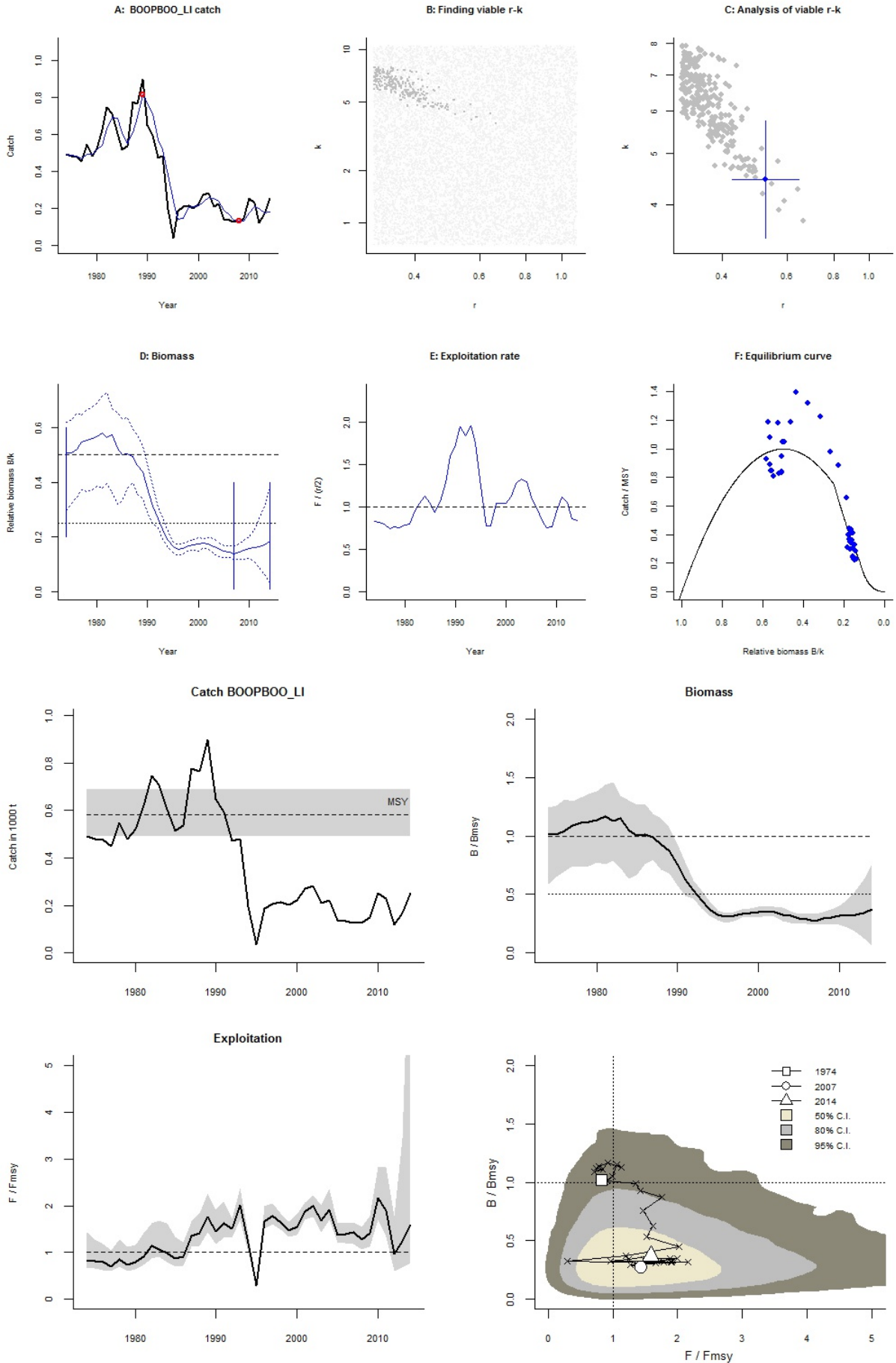
$F/F_{msy}$  = 1.59 , 2.5th perc = 0.776 , 97.5 perc = 8.61

Stock status and exploitation in 2014

Biomass = 0.826 ,  $B/B_{msy}$  = 0.37 , fishing mortality  $F$  = 0.306 ,  $F/F_{msy}$  = 1.59

Comment: Catch=landings from FishStat (Spain, France). GS OK

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Species: *Conger conger* , stock: CONGCON\_LI

Conger eel in Lions Gulf

Source:

Region: Mediterranean , Lions Gulf

Catch data used from years 1970 - 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 - 0.3 expert

Prior range for  $r$  = 0.16 - 0.46 expert, , prior range for  $k$  = 1.72 - 19.8

Results of CMSY analysis with altogether 2587 viable trajectories for 1442 r-k pairs

$r$  = 0.348 , 95% CL = 0.269 - 0.45 ,  $k$  = 6.23 , 95% CL = 4.63 - 8.39

MSY = 0.542 , 95% CL = 0.491 - 0.599

Relative biomass last year = 0.127  $k$ , 2.5th = 0.0135 , 97.5th = 0.288

Exploitation  $F/(r/2)$  in last year = 0.845

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.174 , 95% CL = 0.135 - 0.225 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0884 , 95% CL = 0.0683 - 0.114 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.542 , 95% CL = 0.491 - 0.599

$B_{msy}$  = 3.12 , 95% CL = 2.31 - 4.19

Biomass in last year = 0.791 , 2.5th perc = 0.084 , 97.5 perc = 1.79

$B/B_{msy}$  in last year = 0.254 , 2.5th perc = 0.0269 , 97.5 perc = 0.575

Fishing mortality in last year = 0.145 , 2.5th perc = 0.0642 , 97.5 perc = 1.37

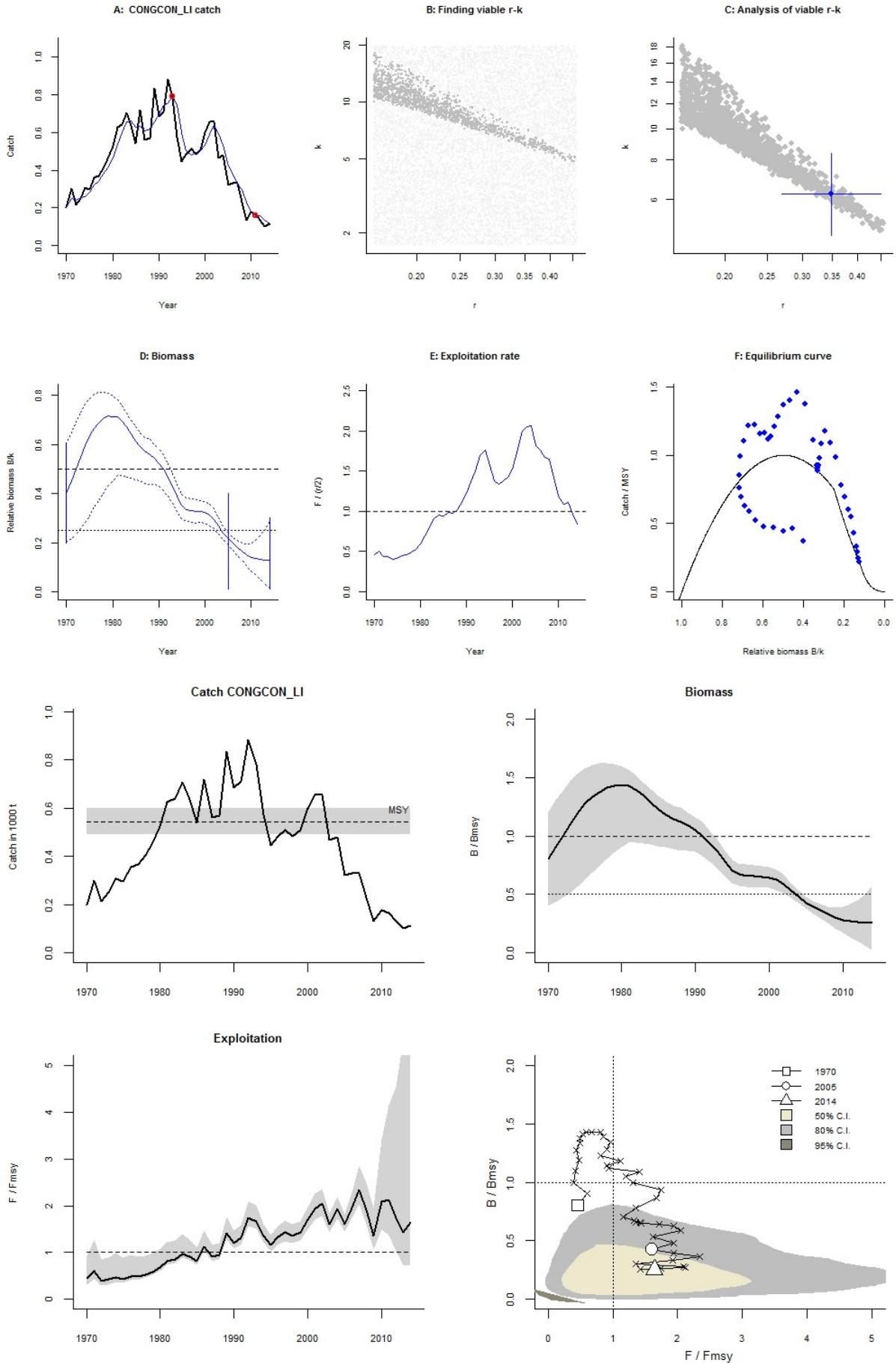
$F/F_{msy}$  = 1.65 , 2.5th perc = 0.726 , 97.5 perc = 15.5

Stock status and exploitation in 2014

Biomass = 0.791 ,  $B/B_{msy}$  = 0.254 , fishing mortality  $F$  = 0.145 ,  $F/F_{msy}$  = 1.65

Comment: Catch=landings from FishStat (Spain, France). RF int 2005 0.01-0.4, final 0.3. GS OK

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Species: *Dicentrarchus labrax* , stock: DICELAB\_LI

European seabass in Lions Gulf

Source:

Region: Mediterranean , Lions Gulf

Catch data used from years 1974 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1997 default

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.17 - 0.88 expert, , prior range for  $k$  = 0.834 - 17.3

Results of CMSY analysis with altogether 1652 viable trajectories for 1493 r-k pairs

$r$  = 0.387 , 95% CL = 0.298 - 0.502 ,  $k$  = 5.6 , 95% CL = 3.88 - 8.08

MSY = 0.542 , 95% CL = 0.441 - 0.666

Relative biomass last year = 0.121  $k$ , 2.5th = 0.0141 , 97.5th = 0.291

Exploitation  $F/(r/2)$  in last year = 1.22

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.193 , 95% CL = 0.149 - 0.251 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0933 , 95% CL = 0.0718 - 0.121 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.542 , 95% CL = 0.441 - 0.666

$B_{msy}$  = 2.8 , 95% CL = 1.94 - 4.04

Biomass in last year = 0.676 , 2.5th perc = 0.0791 , 97.5 perc = 1.63

$B/B_{msy}$  in last year = 0.241 , 2.5th perc = 0.0282 , 97.5 perc = 0.583

Fishing mortality in last year = 0.243 , 2.5th perc = 0.1 , 97.5 perc = 2.07

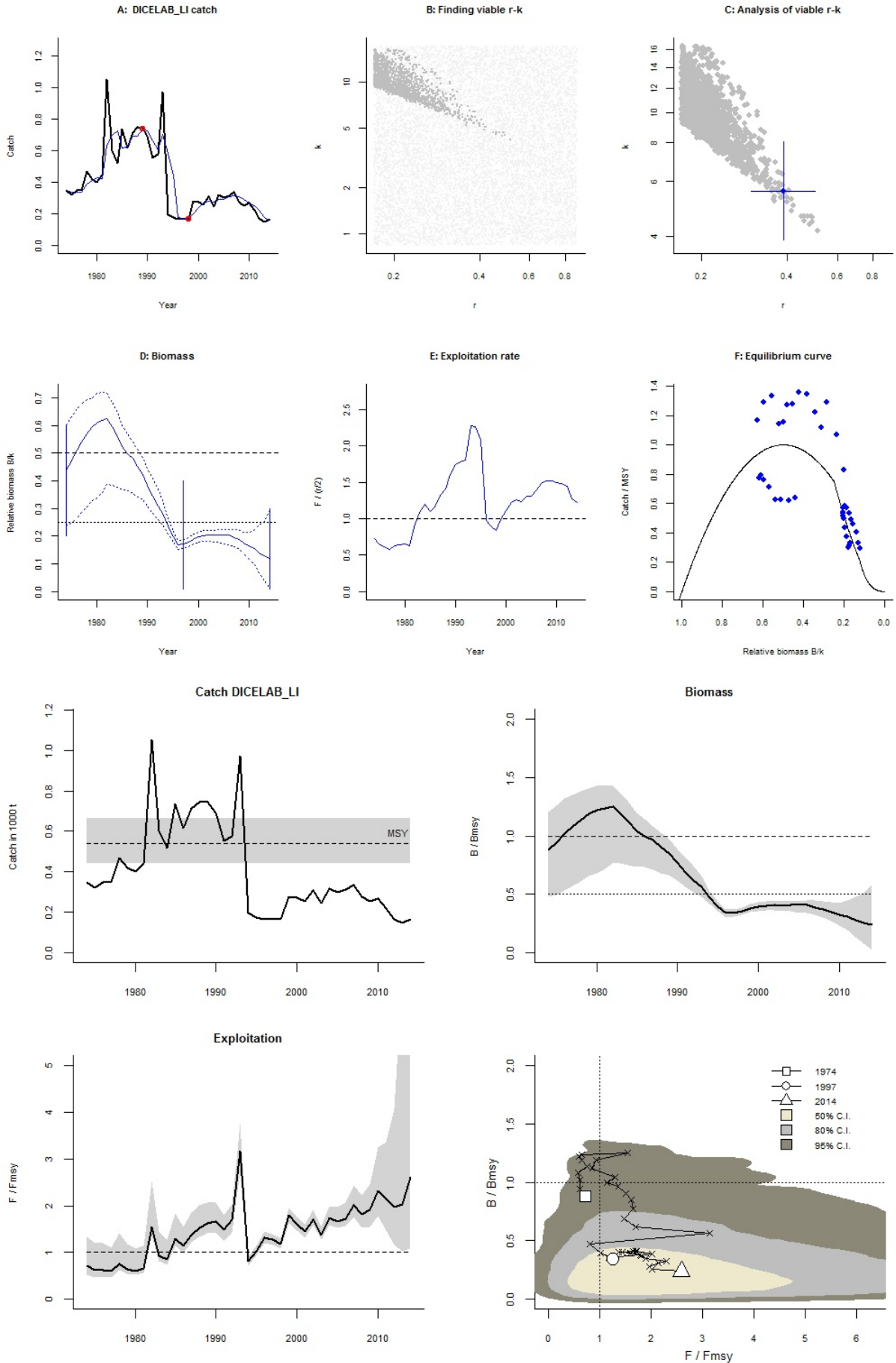
$F/F_{msy}$  = 2.6 , 2.5th perc = 1.08 , 97.5 perc = 22.2

Stock status and exploitation in 2014

Biomass = 0.676 ,  $B/B_{msy}$  = 0.241 , fishing mortality  $F$  = 0.243 ,  $F/F_{msy}$  = 2.6

Comment: Catch=landings from FishStat (Spain, France). RF final 0.3. GS OK

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Species: *Engraulis encrasicolus* , stock: ENGRENC\_LI

Anchovy in Lions Gulf

Source: Colloca et al 2013

Region: Mediterranean , Lions Gulf

Catch data used from years 1970 - 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 - 0.3 expert

Prior range for  $r$  = 0.26 - 1.2 expert, , prior range for  $k$  = 9.72 - 173

Prior range of  $q$  = 1.63 - 6.89

Results of CMSY analysis with altogether 1814 viable trajectories for 643 r-k pairs

$r$  = 0.73 , 95% CL = 0.484 - 1.1 ,  $k$  = 38.8 , 95% CL = 26.3 - 57.2

MSY = 7.08 , 95% CL = 6.28 - 7.98

Relative biomass last year = 0.132  $k$ , 2.5th = 0.0131 , 97.5th = 0.291

Exploitation  $F/(r/2)$  in last year = 1.12

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.583 , 95% CL = 0.408 - 0.832 ,  $k$  = 46.9 , 95% CL = 35.7 - 61.7

MSY = 6.83 , 95% CL = 6.08 - 7.69

Relative biomass in last year = 0.259  $k$ , 2.5th perc = 0.141 , 97.5th perc = 0.351

Exploitation  $F/(r/2)$  in last year = 0.533

$q$  = 2.68 ,  $lcl$  = 2 ,  $ucl$  = 3.59

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.291 , 95% CL = 0.204 - 0.416 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.291 , 95% CL = 0.204 - 0.416 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 6.83 , 95% CL = 6.08 - 7.69

$B_{msy}$  = 23.5 , 95% CL = 17.9 - 30.8

Biomass in last year = 12.2 , 2.5th perc = 6.6 , 97.5 perc = 16.5

$B/B_{msy}$  in last year = 0.519 , 2.5th perc = 0.281 , 97.5 perc = 0.702

Fishing mortality in last year = 0.155 , 2.5th perc = 0.115 , 97.5 perc = 0.286

$F/F_{msy}$  = 0.533 , 2.5th perc = 0.394 , 97.5 perc = 0.983

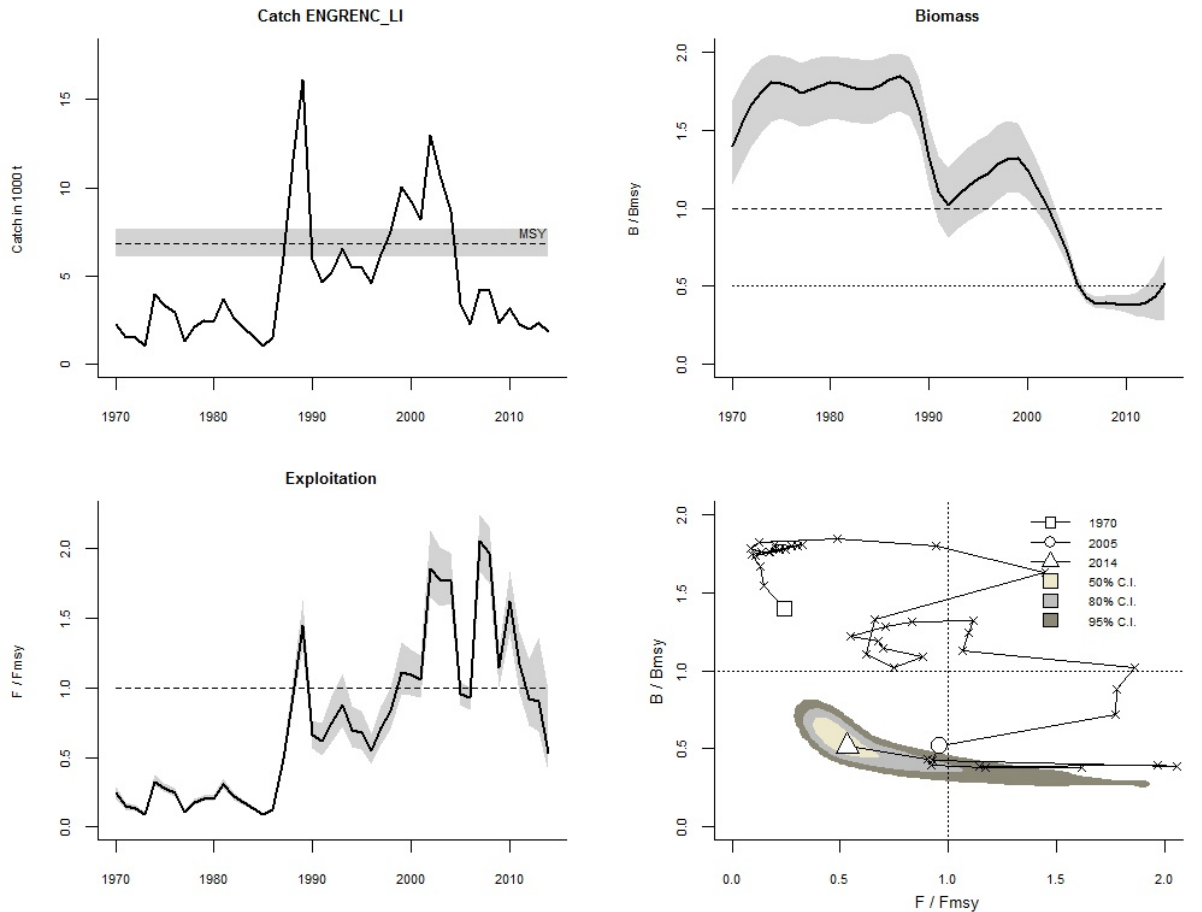
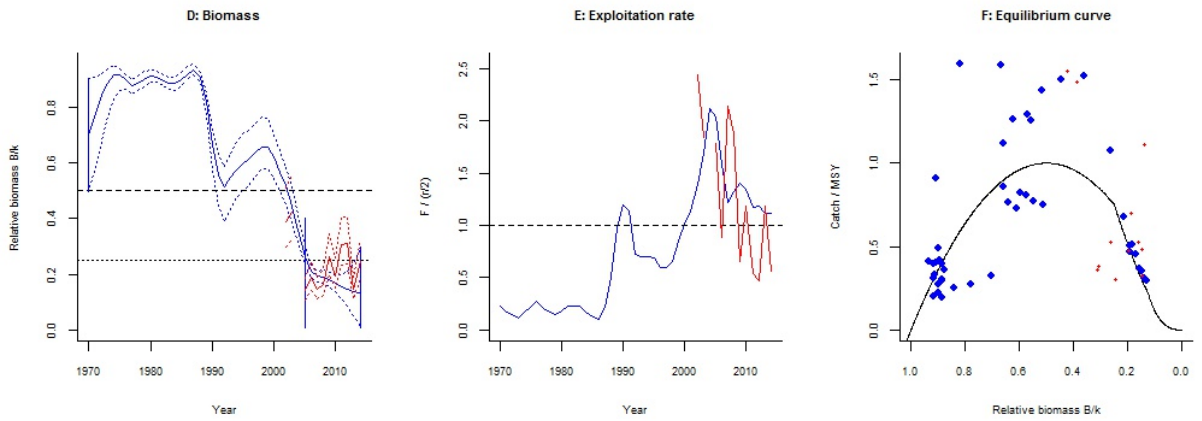
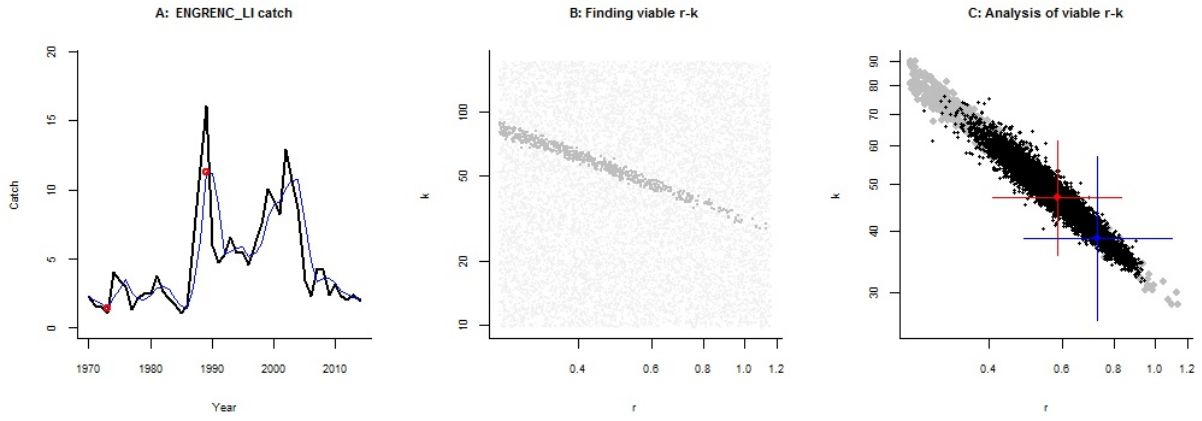
Stock status and exploitation in 2014

Biomass = 12.2 ,  $B/B_{msy}$  = 0.519 , fishing mortality  $F$  = 0.155 ,  $F/F_{msy}$  = 0.533

Comment: Catch=landings from FishStat (Spain, France), Biomass from MEDIAS for GSA7. RF 2005

0.01-0.4, final 0.3. GS OK

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Species: *Loligo vulgaris* , stock: LOLIVUL\_LI

European squid in Lions Gulf

Source:

Region: Mediterranean , Lions Gulf

Catch data used from years 1980 - 2014 , abundance = None

Prior initial relative biomass = 0.01 - 0.4 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 default

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 0.579 - 9.26

Results of CMSY analysis with altogether 801 viable trajectories for 772 r-k pairs

$r$  = 0.364 , 95% CL = 0.254 - 0.522 ,  $k$  = 4.35 , 95% CL = 2.97 - 6.36

MSY = 0.396 , 95% CL = 0.272 - 0.575

Relative biomass last year = 0.141  $k$ , 2.5th = 0.0148 , 97.5th = 0.291

Exploitation  $F/(r/2)$  in last year = 1.84

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.182 , 95% CL = 0.127 - 0.261 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.103 , 95% CL = 0.0715 - 0.147 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.396 , 95% CL = 0.272 - 0.575

$B_{msy}$  = 2.17 , 95% CL = 1.49 - 3.18

Biomass in last year = 0.612 , 2.5th perc = 0.0645 , 97.5 perc = 1.27

$B/B_{msy}$  in last year = 0.281 , 2.5th perc = 0.0297 , 97.5 perc = 0.582

Fishing mortality in last year = 0.368 , 2.5th perc = 0.178 , 97.5 perc = 3.49

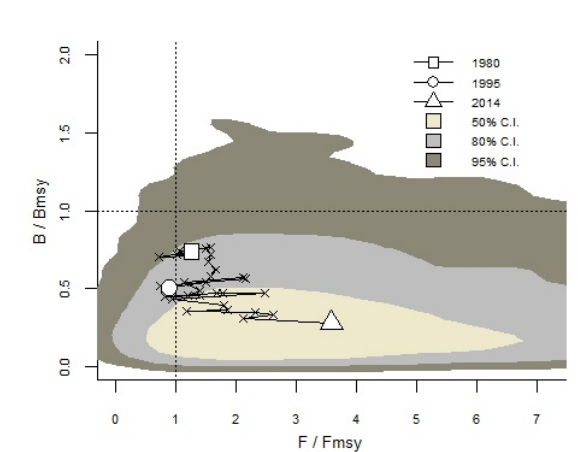
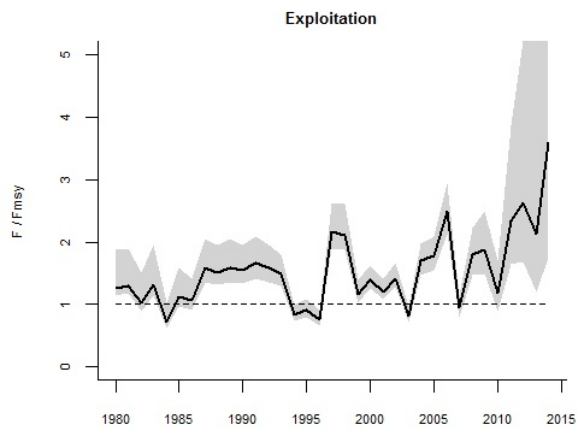
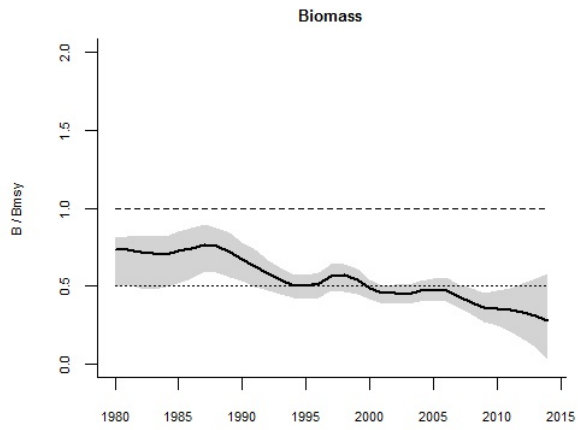
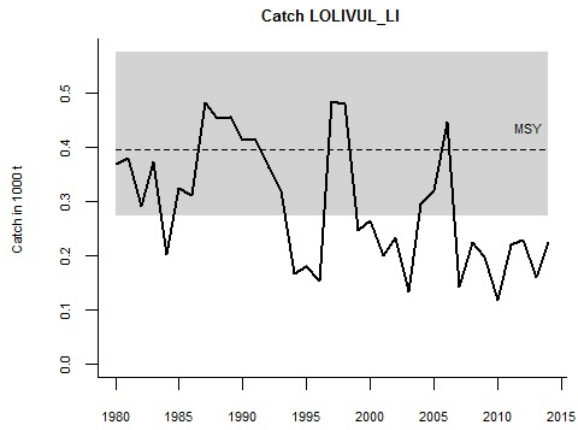
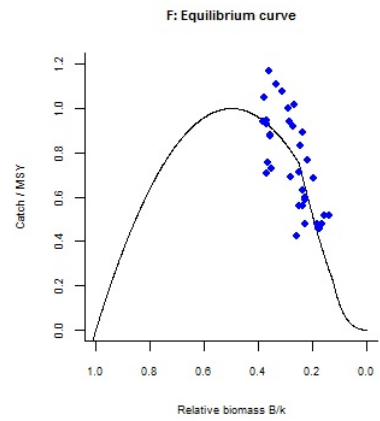
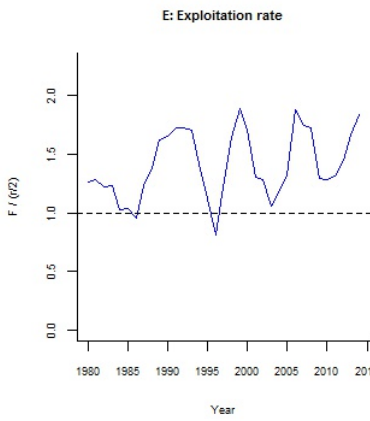
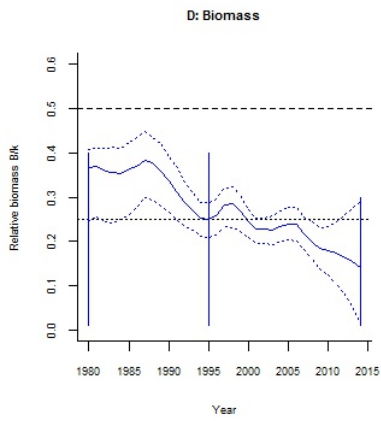
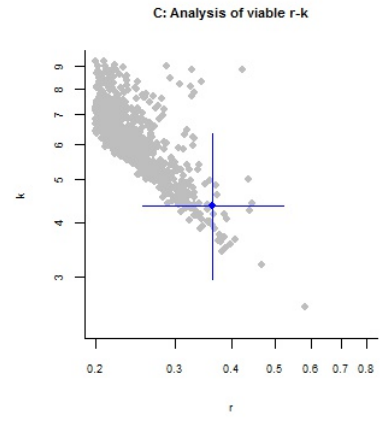
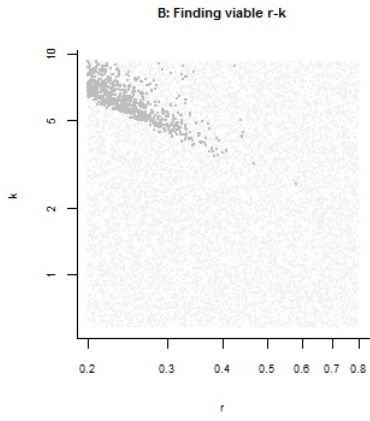
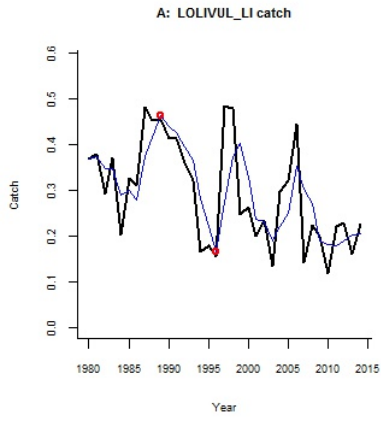
$F/F_{msy}$  = 3.59 , 2.5th perc = 1.73 , 97.5 perc = 34

Stock status and exploitation in 2014

Biomass = 0.612 ,  $B/B_{msy}$  = 0.281 , fishing mortality  $F$  = 0.368 ,  $F/F_{msy}$  = 3.59

Comment: Catch=landings from FishStat (Spain, France). RF start 1980, final 0.3. GS OK

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Species: *Merluccius merluccius* , stock: MERLMER\_LI

Hake in Lions Gulf

Source: EASME EMFF 2014, M from Colloca et al 2013

Region: Mediterranean , Lions Gulf

Catch data used from years 1970 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.01 - 0.4 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.22 - 0.95 expert , , prior range for  $k$  = 4.7 - 81.1

Prior range of  $q$  = 0.162 - 0.674

Results of CMSY analysis with altogether 2803 viable trajectories for 1836 r-k pairs

$r$  = 0.595 , 95% CL = 0.401 - 0.881 ,  $k$  = 16.4 , 95% CL = 11.4 - 23.4

MSY = 2.43 , 95% CL = 2.23 - 2.65

Relative biomass last year = 0.185  $k$ , 2.5th = 0.0212 , 97.5th = 0.297

Exploitation  $F/(r/2)$  in last year = 1.55

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.496 , 95% CL = 0.376 - 0.656 ,  $k$  = 19.2 , 95% CL = 15.1 - 24.5

MSY = 2.38 , 95% CL = 2.16 - 2.63

Relative biomass in last year = 0.185  $k$ , 2.5th perc = 0.129 , 97.5th perc = 0.264

Exploitation  $F/(r/2)$  in last year = 1.88

$q$  = 0.252 , lcl = 0.198 , ucl = 0.321

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.248 , 95% CL = 0.188 - 0.328 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.183 , 95% CL = 0.139 - 0.242 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 2.38 , 95% CL = 2.16 - 2.63

$B_{msy}$  = 9.6 , 95% CL = 7.53 - 12.2

Biomass in last year = 3.55 , 2.5th perc = 2.48 , 97.5 perc = 5.06

$B/B_{msy}$  in last year = 0.369 , 2.5th perc = 0.259 , 97.5 perc = 0.527

Fishing mortality in last year = 0.466 , 2.5th perc = 0.327 , 97.5 perc = 0.666

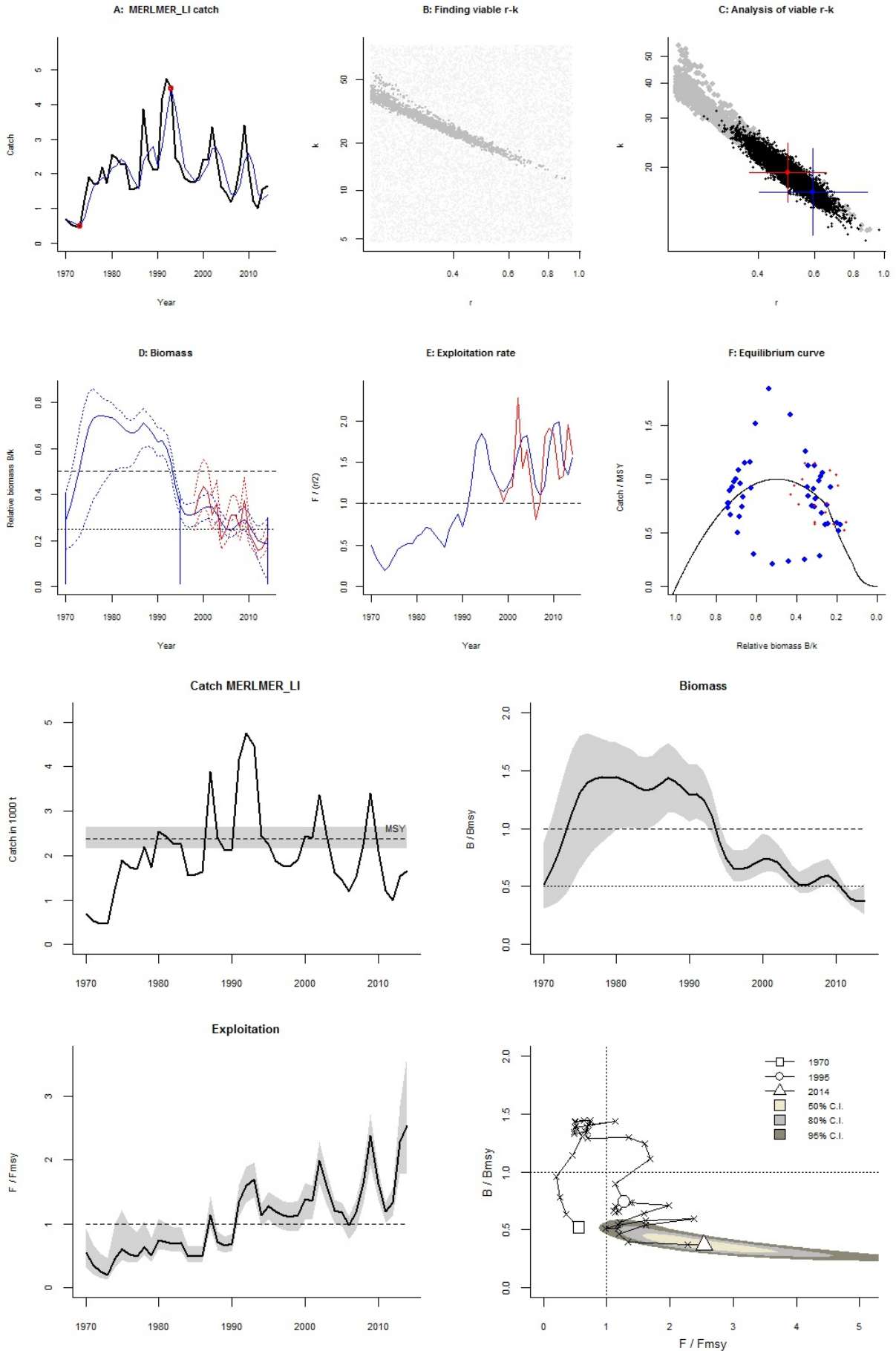
$F/F_{msy}$  = 2.54 , 2.5th perc = 1.78 , 97.5 perc = 3.63

Stock status and exploitation in 2014

Biomass = 3.55 ,  $B/B_{msy}$  = 0.369 , fishing mortality  $F$  = 0.466 ,  $F/F_{msy}$  = 2.54

Comment: Catch=landings from FishStat (Spain, France), Biomass from Medits for GSA7 (SGMED 2015, Part 1 GSA 7). RF final 0.3. GS OK

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Species: *Micromesistius poutassou* , stock: MICMPOU\_LI

Blue whiting in Lions Gulf

Source:

Region: Mediterranean , Lions Gulf

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 2010 default

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r = 0.21 - 1.1$  expert, , prior range for  $k = 0.355 - 7.38$

Results of CMSY analysis with altogether 1884 viable trajectories for 1652 r-k pairs

$r = 0.719$  , 95% CL = 0.491 - 1.05 ,  $k = 1.47$  , 95% CL = 0.605 - 3.58

MSY = 0.265 , 95% CL = 0.105 - 0.664

Relative biomass last year = 0.115  $k$  , 2.5th = 0.019 , 97.5th = 0.279

Exploitation  $F/(r/2)$  in last year = 1.62

Results for Management (based on CMSY analysis)

$F_{msy} = 0.359$  , 95% CL = 0.246 - 0.526 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.166$  , 95% CL = 0.113 - 0.242 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.265 , 95% CL = 0.105 - 0.664

$B_{msy} = 0.736$  , 95% CL = 0.302 - 1.79

Biomass in last year = 0.17 , 2.5th perc = 0.028 , 97.5 perc = 0.41

$B/B_{msy}$  in last year = 0.23 , 2.5th perc = 0.038 , 97.5 perc = 0.557

Fishing mortality in last year = 0.613 , 2.5th perc = 0.254 , 97.5 perc = 3.71

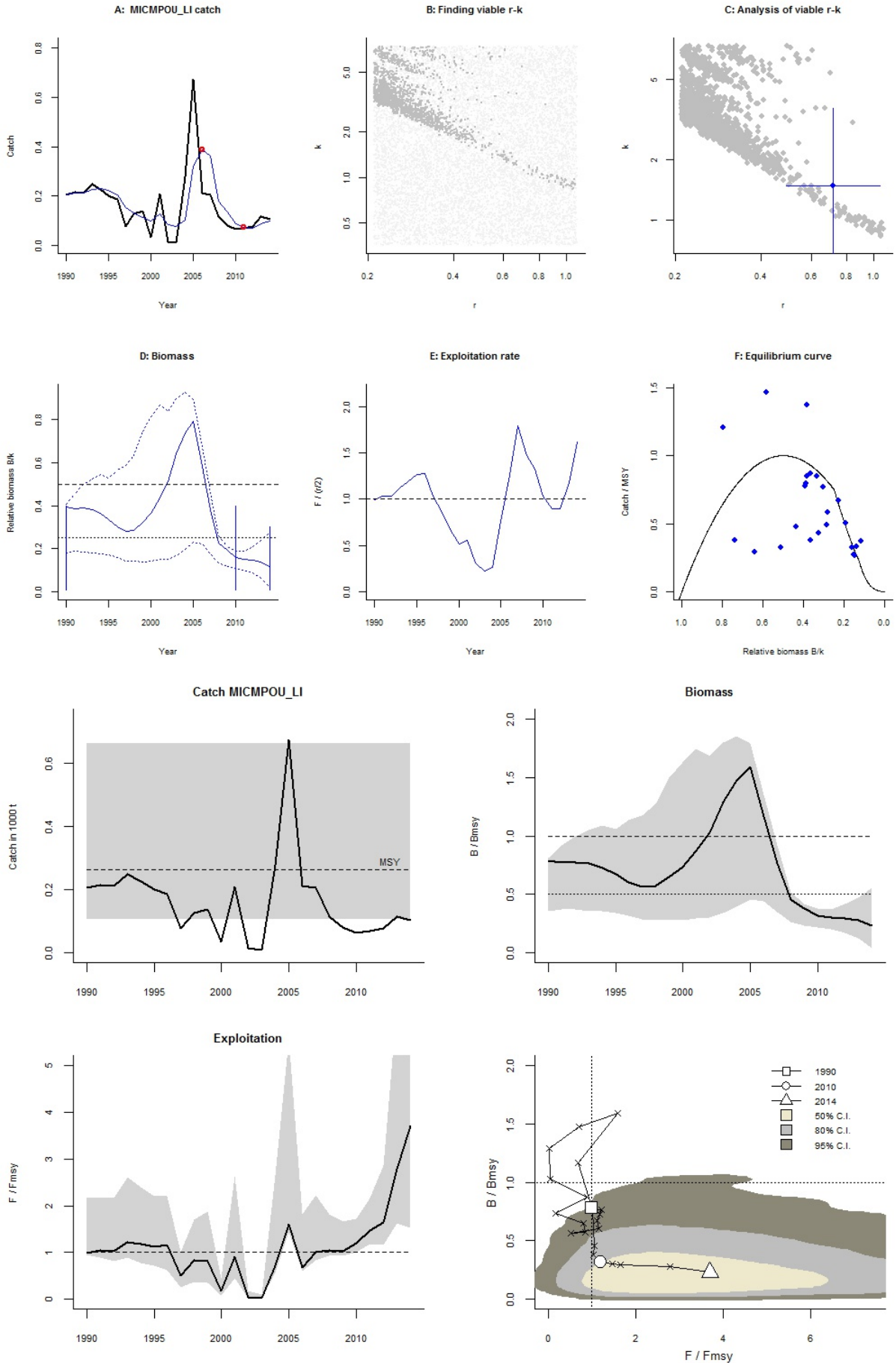
$F/F_{msy} = 3.7$  , 2.5th perc = 1.53 , 97.5 perc = 22.4

Stock status and exploitation in 2014

Biomass = 0.17 ,  $B/B_{msy} = 0.23$  , fishing mortality  $F = 0.613$  ,  $F/F_{msy} = 3.7$

Comment: Catch=landings from FishStat (Spain, France). RF final 0.3. GS OK

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Species: *Mullus spp.* , stock: MULLSPP\_LI

Red mullet and surmullet in Lions Gulf

Source:

Region: Mediterranean , Lions Gulf

Catch data used from years 1970 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1997 default

Prior final relative biomass = 0.2 - 0.6 expert

Prior range for  $r$  = 0.22 - 1.2 expert, , prior range for  $k$  = 0.38 - 8.64

Prior range of  $q$  = 0.0012 - 0.0057

Results of CMSY analysis with altogether 3675 viable trajectories for 1147 r-k pairs

$r$  = 0.497 , 95% CL = 0.35 - 0.704 ,  $k$  = 2.37 , 95% CL = 1.76 - 3.19

MSY = 0.294 , 95% CL = 0.272 - 0.319

Relative biomass last year = 0.526  $k$ , 2.5th = 0.305 , 97.5th = 0.597

Exploitation  $F/(r/2)$  in last year = 0.879

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.609 , 95% CL = 0.448 - 0.826 ,  $k$  = 2.06 , 95% CL = 1.59 - 2.67

MSY = 0.314 , 95% CL = 0.284 - 0.346

Relative biomass in last year = 0.592  $k$ , 2.5th perc = 0.317 , 97.5th perc = 0.729

Exploitation  $F/(r/2)$  in last year = 0.951

$q$  = 0.00176 , lcl = 0.0013 , ucl = 0.00239

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.304 , 95% CL = 0.224 - 0.413 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.304 , 95% CL = 0.224 - 0.413 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.314 , 95% CL = 0.284 - 0.346

$B_{msy}$  = 1.03 , 95% CL = 0.797 - 1.33

Biomass in last year = 1.22 , 2.5th perc = 0.653 , 97.5 perc = 1.5

$B/B_{msy}$  in last year = 1.18 , 2.5th perc = 0.633 , 97.5 perc = 1.46

Fishing mortality in last year = 0.289 , 2.5th perc = 0.235 , 97.5 perc = 0.541

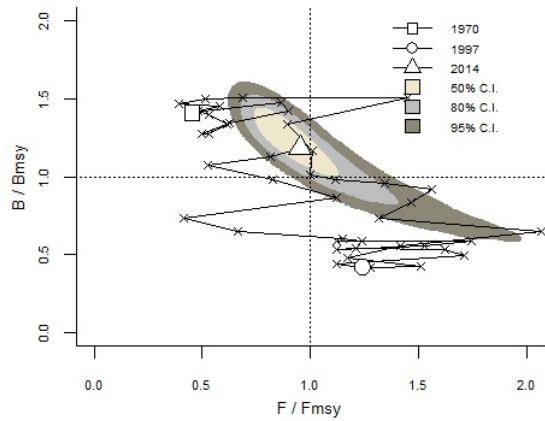
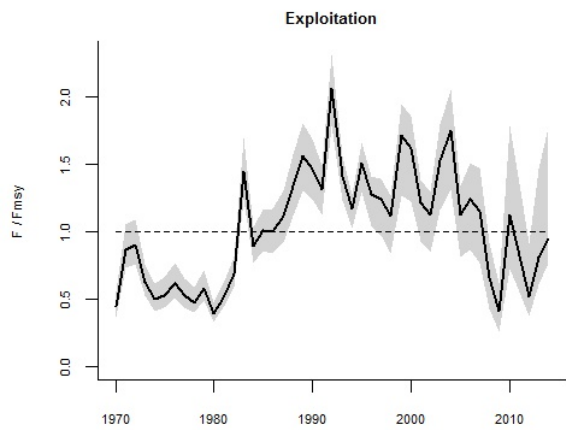
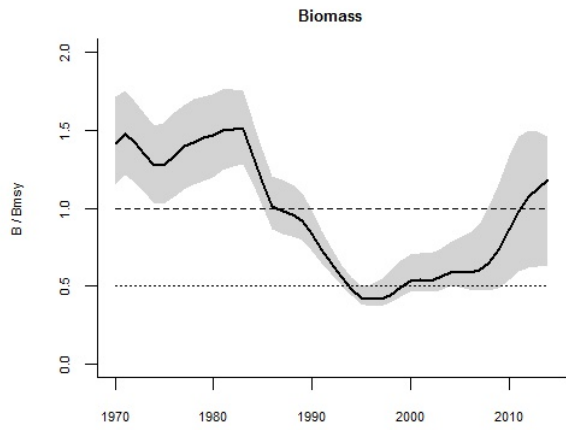
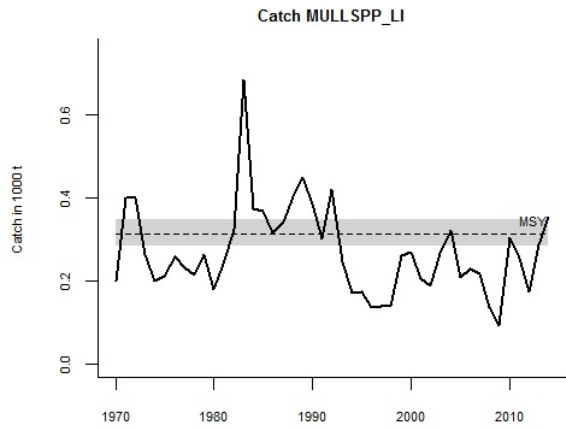
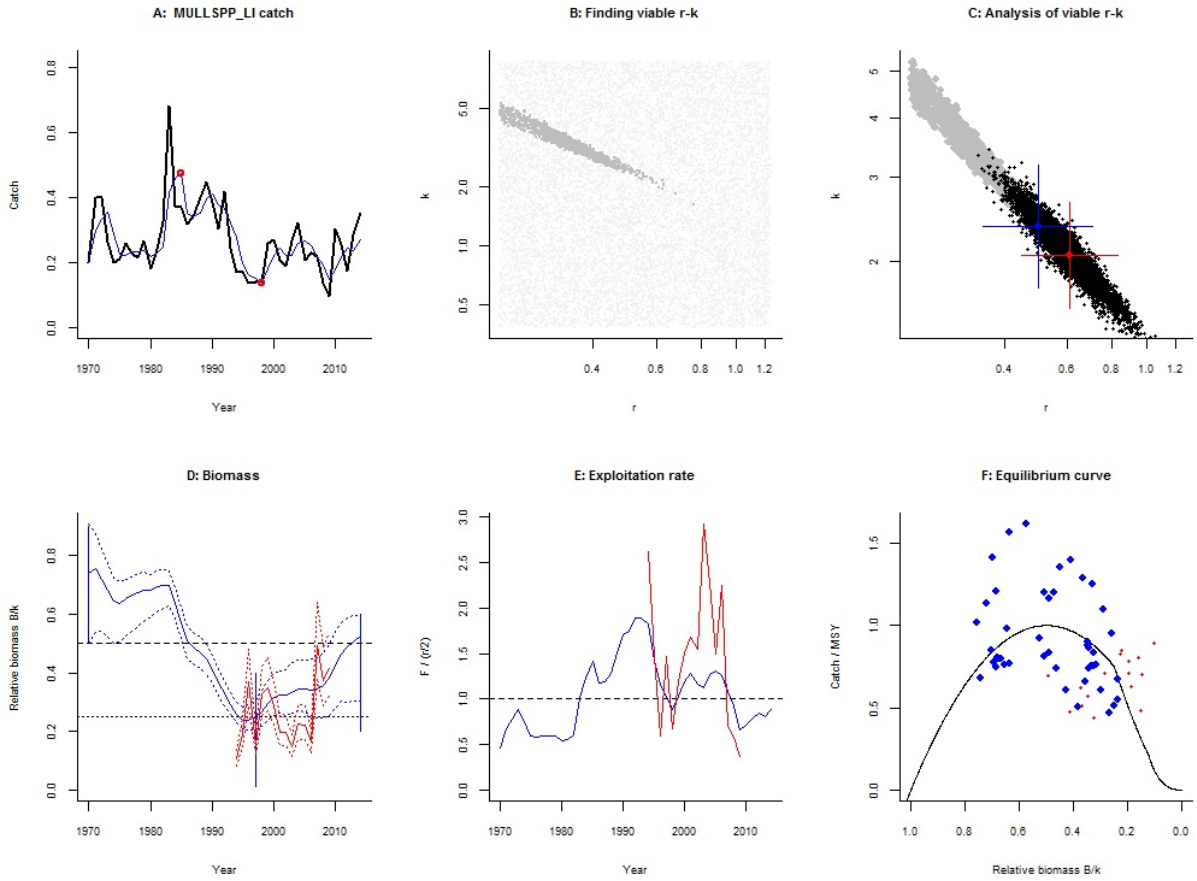
$F/F_{msy}$  = 0.951 , 2.5th perc = 0.771 , 97.5 perc = 1.78

Stock status and exploitation in 2014

Biomass = 1.22 ,  $B/B_{msy}$  = 1.18 , fishing mortality  $F$  = 0.289 ,  $F/F_{msy}$  = 0.951

Comment: Catch=landings from FishStat (Spain, France), Biomass from Medits for *Mullus barbatus* for GSA7. GS OK

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Species: *Nephrops norvegicus* , stock: NEPRNOR\_LI

Norway lobster in Lions Gulf

Source:

Region: Mediterranean , Lions Gulf

Catch data used from years 1987 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.01 - 0.4 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 0.163 - 2.6

Prior range of  $q$  = 0.0664 - 0.266

Results of CMSY analysis with altogether 1637 viable trajectories for 1612 r-k pairs

$r$  = 0.48 , 95% CL = 0.305 - 0.753 ,  $k$  = 1.64 , 95% CL = 0.859 - 3.15

MSY = 0.197 , 95% CL = 0.0948 - 0.41

Relative biomass last year = 0.131  $k$  , 2.5th = 0.0139 , 97.5th = 0.382

Exploitation  $F/(r/2)$  in last year = 0.588

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.499 , 95% CL = 0.337 - 0.74 ,  $k$  = 0.757 , 95% CL = 0.536 - 1.07

MSY = 0.0945 , 95% CL = 0.0601 - 0.148

Relative biomass in last year = 0.249  $k$  , 2.5th perc = 0.0205 , 97.5th perc = 0.474

Exploitation  $F/(r/2)$  in last year = 0.573

$q$  = 0.1 , lcl = 0.0752 , ucl = 0.133

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.25 , 95% CL = 0.168 - 0.37 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.249 , 95% CL = 0.168 - 0.369 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.0945 , 95% CL = 0.0601 - 0.148

$B_{msy}$  = 0.378 , 95% CL = 0.268 - 0.534

Biomass in last year = 0.189 , 2.5th perc = 0.0155 , 97.5 perc = 0.359

$B/B_{msy}$  in last year = 0.499 , 2.5th perc = 0.041 , 97.5 perc = 0.948

Fishing mortality in last year = 0.143 , 2.5th perc = 0.0753 , 97.5 perc = 1.74

$F/F_{msy}$  = 0.574 , 2.5th perc = 0.302 , 97.5 perc = 6.99

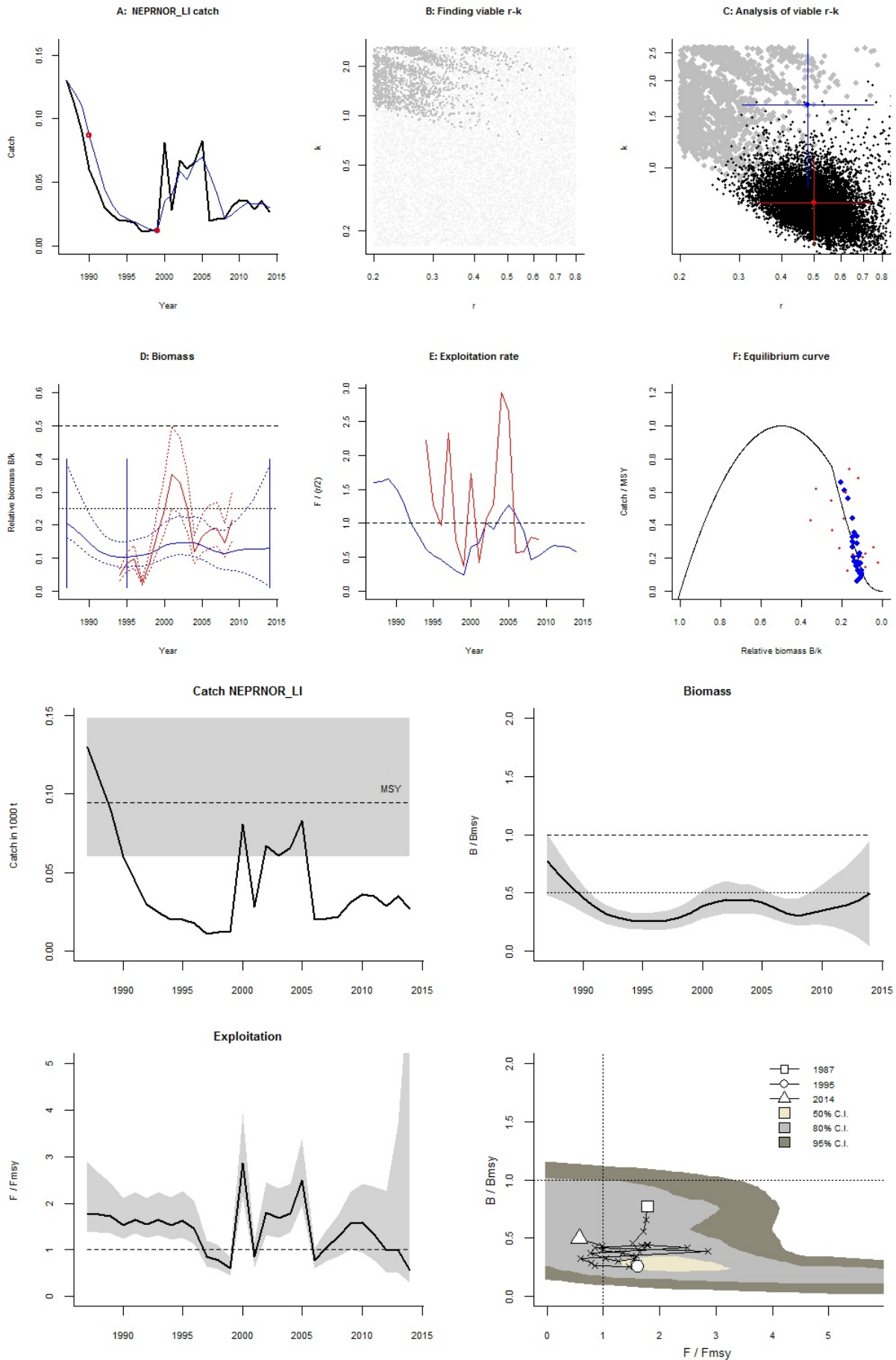
Stock status and exploitation in 2014

Biomass = 0.189 ,  $B/B_{msy}$  = 0.499 , fishing mortality  $F$  = 0.143 ,  $F/F_{msy}$  = 0.574

Comment: Catch=landings from FishStat (Spain, France), Biomass from Medits for GSA7. RF final 0.3.

GS OK final 0.4

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Species: *Octopus vulgaris* , stock: OCTOVUL\_LI

Common octopus in Lions Gulf

Source:

Region: Mediterranean , Lions Gulf

Catch data used from years 1974 - 2014 , abundance = None

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.3 - 0.7 in year 1995 expert

Prior final relative biomass = 0.2 - 0.6 expert

Prior range for  $r$  = 0.4 - 1 expert, , prior range for  $k$  = 1.73 - 17.3

Results of CMSY analysis with altogether 6884 viable trajectories for 1111 r-k pairs

$r$  = 0.793 , 95% CL = 0.639 - 0.984 ,  $k$  = 6.8 , 95% CL = 5.09 - 9.08

MSY = 1.35 , 95% CL = 1.17 - 1.55

Relative biomass last year = 0.414  $k$ , 2.5th = 0.214 , 97.5th = 0.585

Exploitation  $F/(r/2)$  in last year = 1.42

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.396 , 95% CL = 0.319 - 0.492 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.396 , 95% CL = 0.319 - 0.492 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.35 , 95% CL = 1.17 - 1.55

$B_{msy}$  = 3.4 , 95% CL = 2.55 - 4.54

Biomass in last year = 2.81 , 2.5th perc = 1.46 , 97.5 perc = 3.98

$B/B_{msy}$  in last year = 0.827 , 2.5th perc = 0.428 , 97.5 perc = 1.17

Fishing mortality in last year = 0.523 , 2.5th perc = 0.37 , 97.5 perc = 1.01

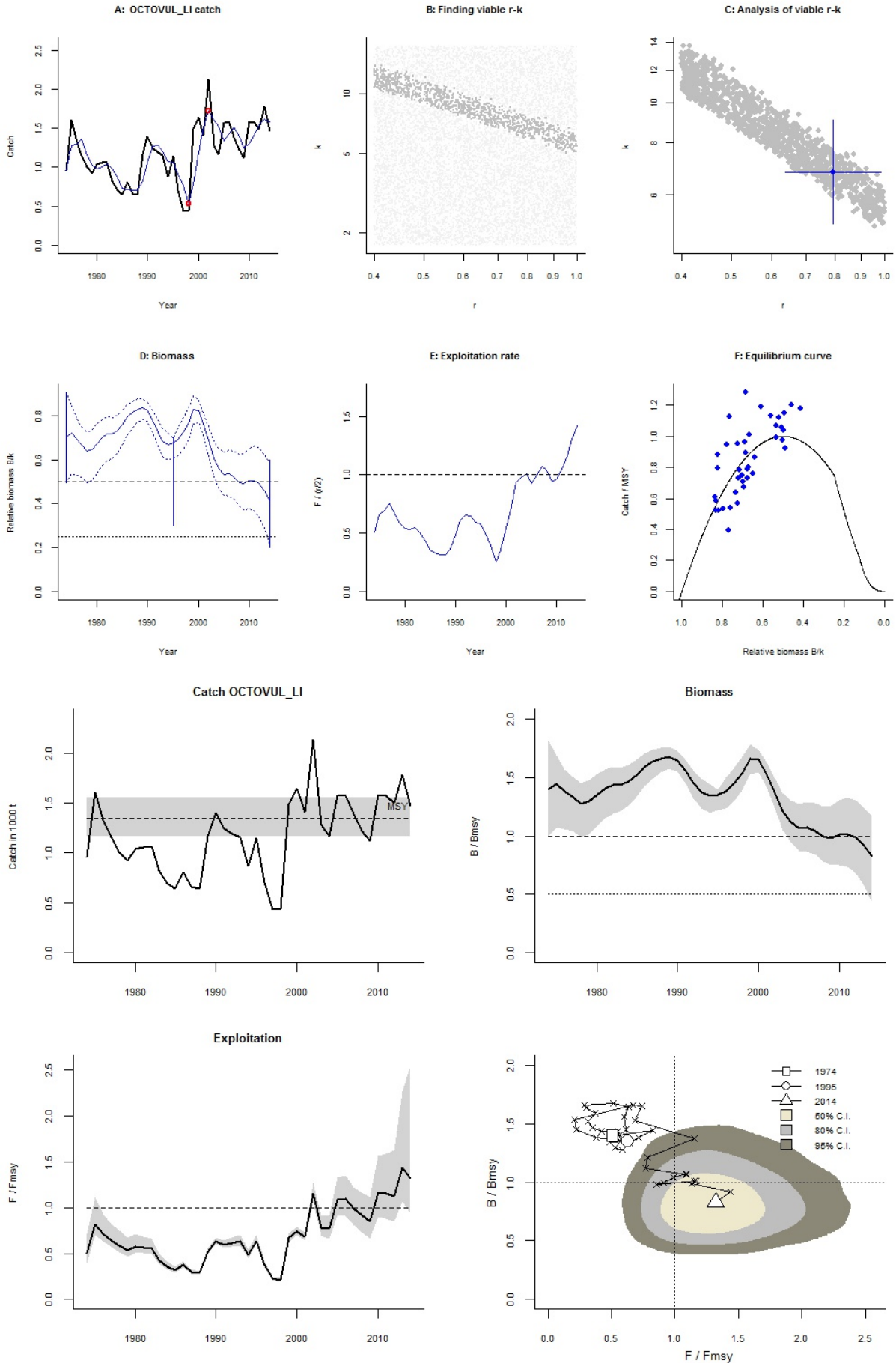
$F/F_{msy}$  = 1.32 , 2.5th perc = 0.934 , 97.5 perc = 2.55

Stock status and exploitation in 2014

Biomass = 2.81 ,  $B/B_{msy}$  = 0.827 , fishing mortality  $F$  = 0.523 ,  $F/F_{msy}$  = 1.32

Comment: Catch=landings from FishStat (France). GS OK

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Species: *Pagellus erythrinus* , stock: PAGEERY\_LI

Common pandora in Lions Gulf

Source:

Region: Mediterranean , Lions Gulf

Catch data used from years 1973 - 2014 , abundance = None

Prior initial relative biomass = 0.01 - 0.4 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1996 default

Prior final relative biomass = 0.01 - 0.4 , default

Prior range for  $r$  = 0.22 - 0.97 expert, , prior range for  $k$  = 0.639 - 11.3

Results of CMSY analysis with altogether 405 viable trajectories for 394 r-k pairs

$r$  = 0.382 , 95% CL = 0.32 - 0.456 ,  $k$  = 4.7 , 95% CL = 2.88 - 7.66

MSY = 0.449 , 95% CL = 0.244 - 0.826

Relative biomass last year = 0.162  $k$ , 2.5th = 0.0455 , 97.5th = 0.379

Exploitation  $F/(r/2)$  in last year = 0.965

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.191 , 95% CL = 0.16 - 0.228 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.124 , 95% CL = 0.103 - 0.148 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.449 , 95% CL = 0.244 - 0.826

$B_{msy}$  = 2.35 , 95% CL = 1.44 - 3.83

Biomass in last year = 0.76 , 2.5th perc = 0.214 , 97.5 perc = 1.78

$B/B_{msy}$  in last year = 0.323 , 2.5th perc = 0.0911 , 97.5 perc = 0.758

Fishing mortality in last year = 0.23 , 2.5th perc = 0.0982 , 97.5 perc = 0.818

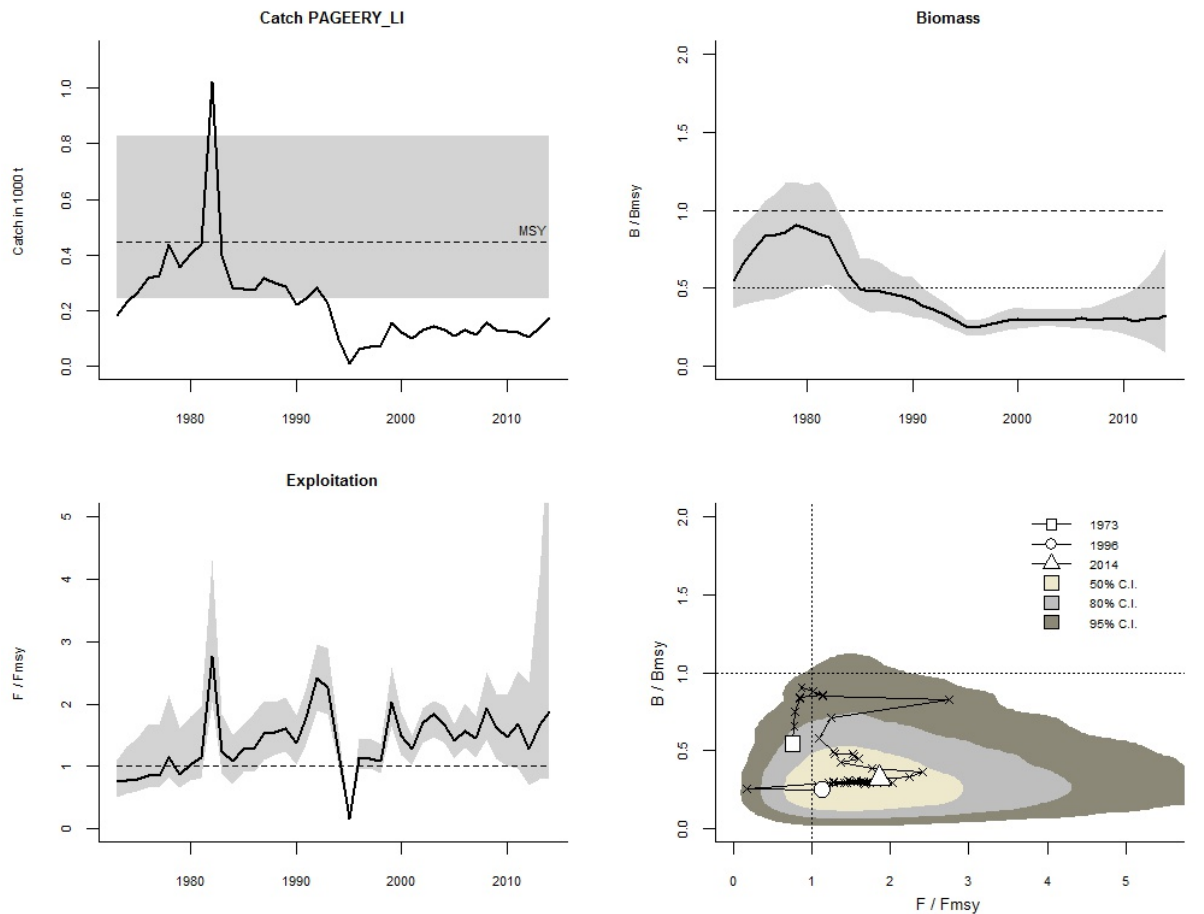
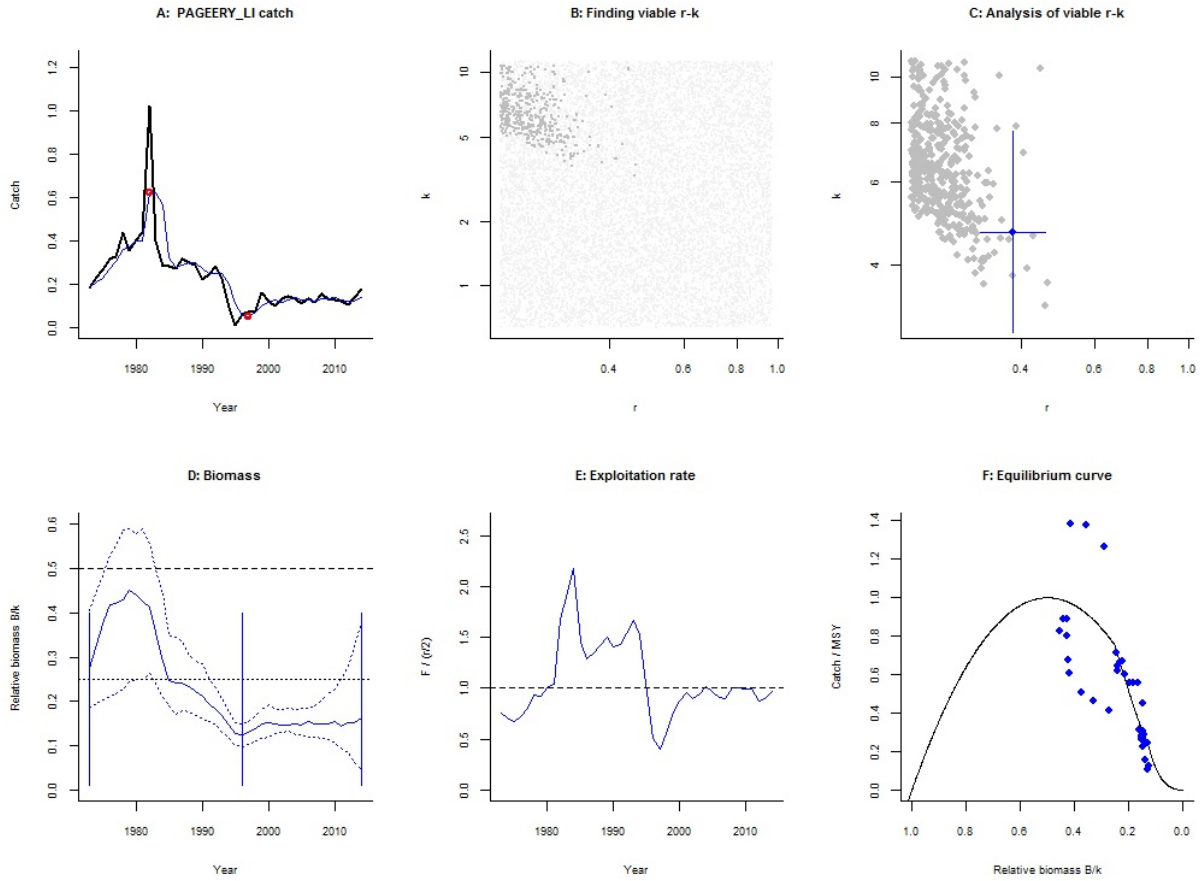
$F/F_{msy}$  = 1.87 , 2.5th perc = 0.795 , 97.5 perc = 6.62

Stock status and exploitation in 2014

Biomass = 0.76 ,  $B/B_{msy}$  = 0.323 , fishing mortality  $F$  = 0.23 ,  $F/F_{msy}$  = 1.87

Comment: Catch=landings from FishStat (Spain, France). GS OK

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Species: *Sardina pilchardus* , stock: SARDPIL\_LI

Sardine in Lions Gulf

Source:

Region: Mediterranean , Lions Gulf

Catch data used from years 1970 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1997 expert

Prior final relative biomass = 0.01 - 0.2 expert

Prior range for  $r$  = 0.27 - 1.1 expert, , prior range for  $k$  = 20.3 - 331

Prior range of  $q$  = 3.02 - 12.2

Results of CMSY analysis with altogether 426 viable trajectories for 403 r-k pairs

$r$  = 0.494 , 95% CL = 0.35 - 0.699 ,  $k$  = 126 , 95% CL = 97.3 - 163

MSY = 15.6 , 95% CL = 14 - 17.3

Relative biomass last year = 0.1  $k$ , 2.5th = 0.0143 , 97.5th = 0.198

Exploitation  $F/(r/2)$  in last year = 0.317

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.628 , 95% CL = 0.448 - 0.88 ,  $k$  = 104 , 95% CL = 77.1 - 140

MSY = 16.3 , 95% CL = 14.7 - 18

Relative biomass in last year = 0.158  $k$ , 2.5th perc = 0.0815 , 97.5th perc = 0.224

Exploitation  $F/(r/2)$  in last year = 0.161

$q$  = 4.46 , lcl = 3.38 , ucl = 5.88

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.314 , 95% CL = 0.224 - 0.44 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.198 , 95% CL = 0.141 - 0.277 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 16.3 , 95% CL = 14.7 - 18

$B_{msy}$  = 51.9 , 95% CL = 38.5 - 69.8

Biomass in last year = 16.4 , 2.5th perc = 8.45 , 97.5 perc = 23.3

$B/B_{msy}$  in last year = 0.315 , 2.5th perc = 0.163 , 97.5 perc = 0.449

Fishing mortality in last year = 0.0505 , 2.5th perc = 0.0355 , 97.5 perc = 0.0977

$F/F_{msy}$  = 0.255 , 2.5th perc = 0.179 , 97.5 perc = 0.493

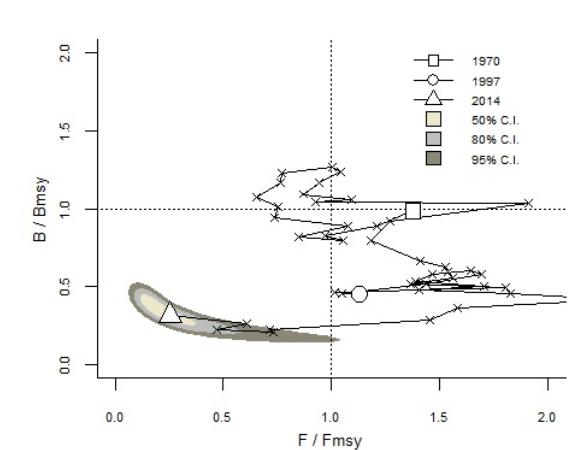
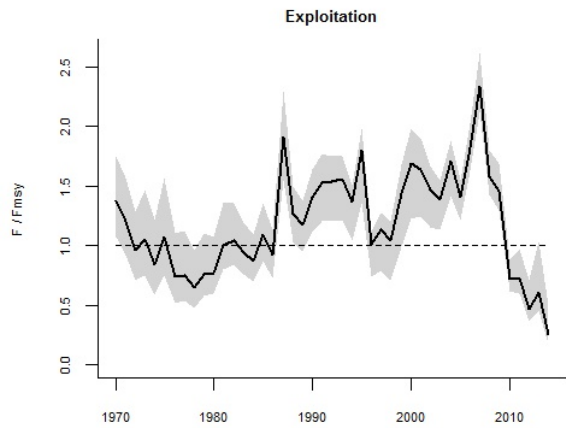
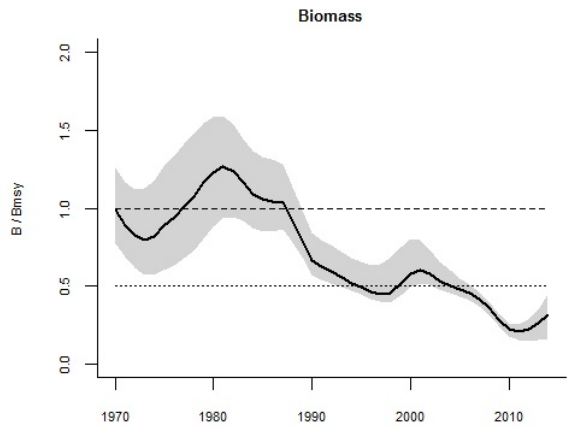
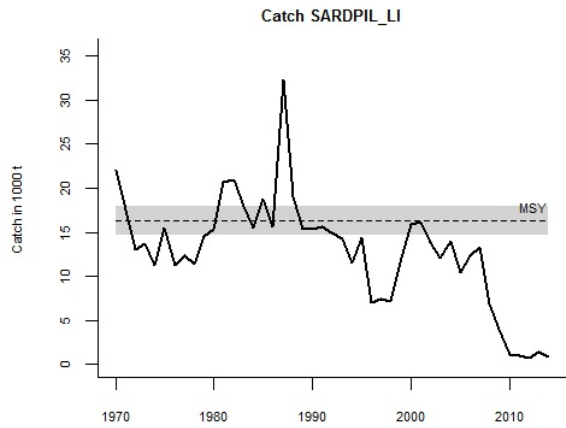
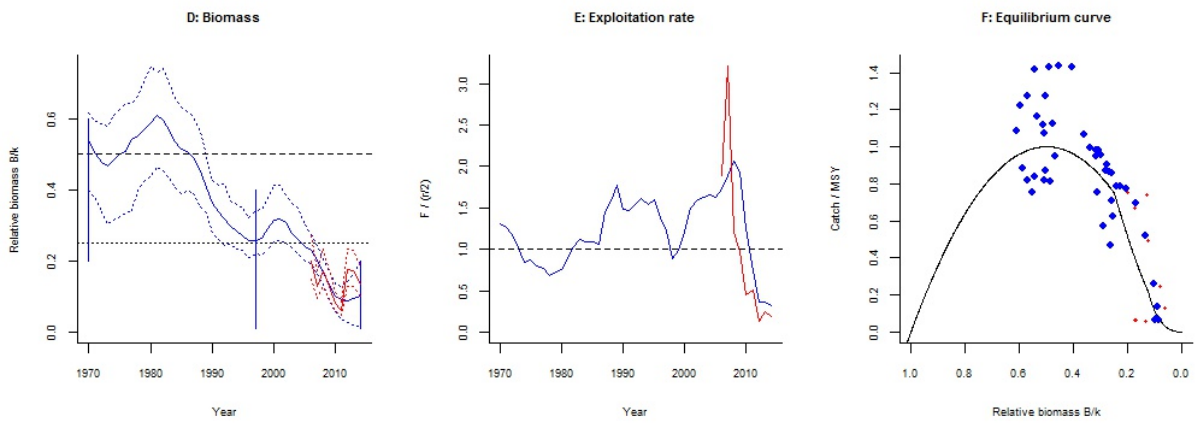
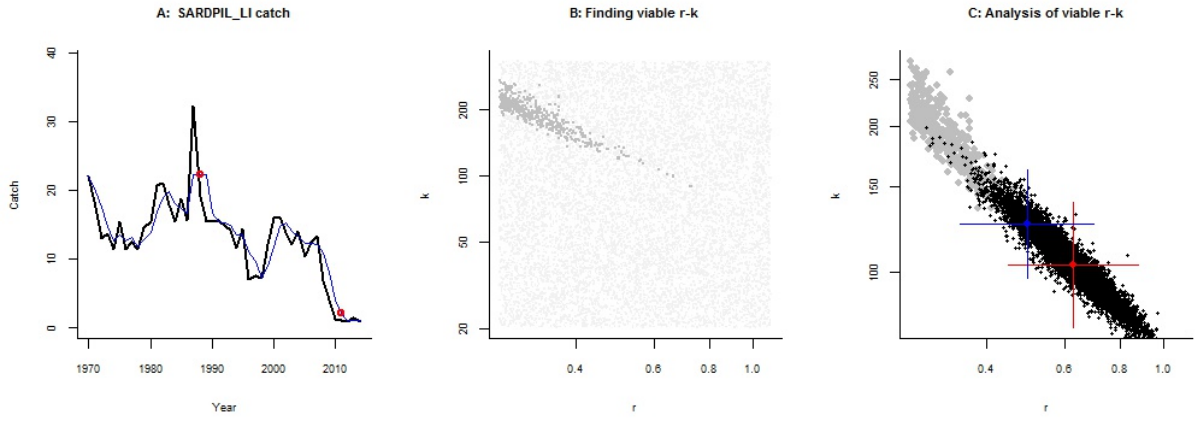
Stock status and exploitation in 2014

Biomass = 16.4 ,  $B/B_{msy}$  = 0.315 , fishing mortality  $F$  = 0.0505 ,  $F/F_{msy}$  = 0.255

Comment: Catch=landings from FishStat (Spain, France), Biomass from MEDIAS for GSA7. RF int 1997

0.01-0.4, final 0.2. GS OK

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Species: *Scomber scombrus* , stock: SCOMSCO\_LI

Atlantic mackerel in Lions Gulf

Source:

Region: Mediterranean , Lions Gulf

Catch data used from years 1970 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.1 - 0.5 in year 2005 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.23 - 1 expert, , prior range for  $k$  = 2.32 - 40.3

Results of CMSY analysis with altogether 1141 viable trajectories for 831 r-k pairs

$r$  = 0.628 , 95% CL = 0.405 - 0.975 ,  $k$  = 8.26 , 95% CL = 5.48 - 12.4

MSY = 1.3 , 95% CL = 1.17 - 1.43

Relative biomass last year = 0.207  $k$ , 2.5th = 0.0185 , 97.5th = 0.392

Exploitation  $F/(r/2)$  in last year = 1.36

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.314 , 95% CL = 0.202 - 0.487 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.26 , 95% CL = 0.168 - 0.404 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.3 , 95% CL = 1.17 - 1.43

$B_{msy}$  = 4.13 , 95% CL = 2.74 - 6.22

Biomass in last year = 1.71 , 2.5th perc = 0.153 , 97.5 perc = 3.24

$B/B_{msy}$  in last year = 0.414 , 2.5th perc = 0.037 , 97.5 perc = 0.785

Fishing mortality in last year = 0.432 , 2.5th perc = 0.228 , 97.5 perc = 4.84

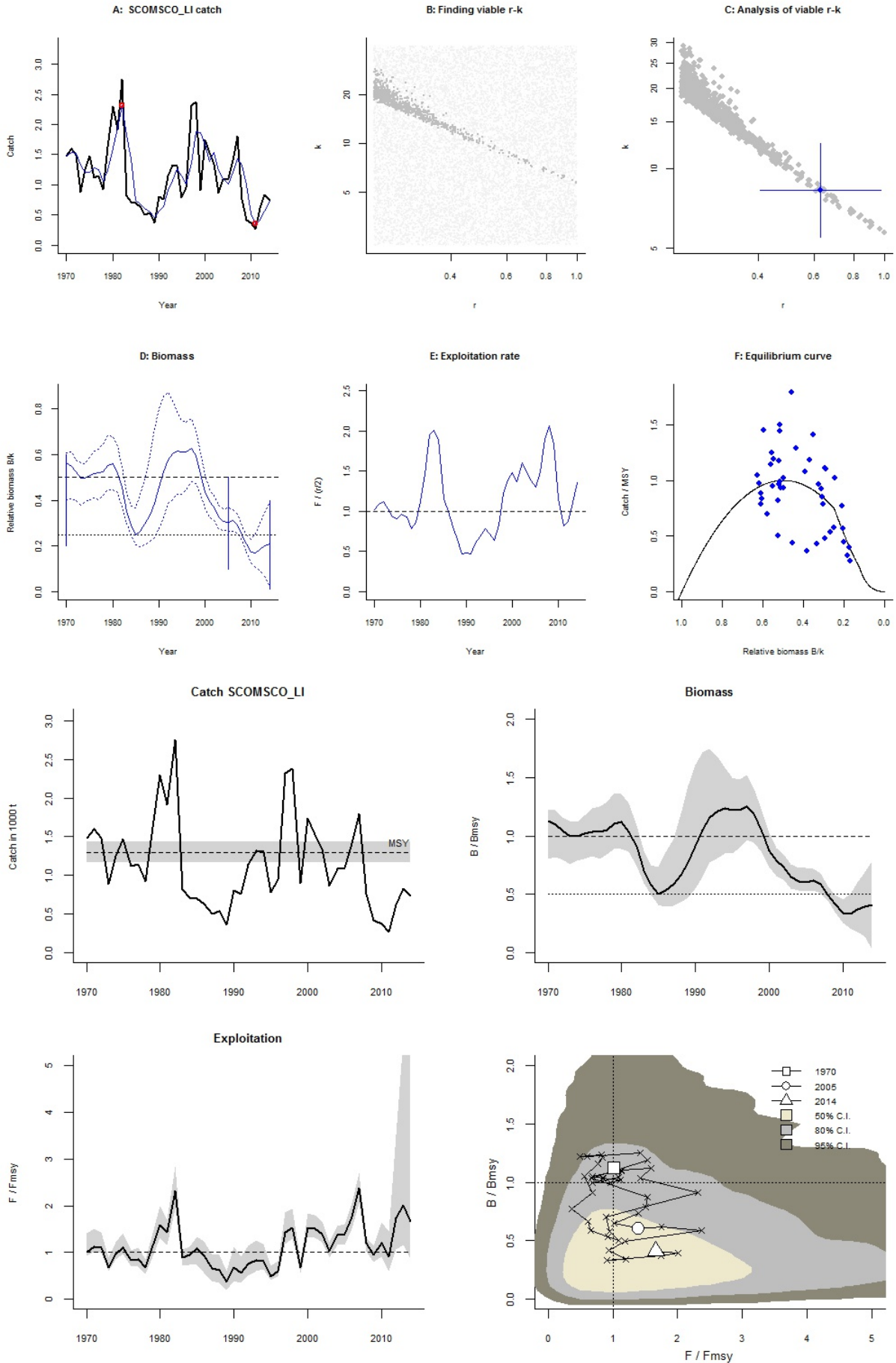
$F/F_{msy}$  = 1.66 , 2.5th perc = 0.877 , 97.5 perc = 18.6

Stock status and exploitation in 2014

Biomass = 1.71 ,  $B/B_{msy}$  = 0.414 , fishing mortality  $F$  = 0.432 ,  $F/F_{msy}$  = 1.66

Comment: Catch=landings from FishStat (Spain, France). RF 2005 0.1-0.5, final 0.01-0.4. GS OK

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Species: *Sepia officinalis* , stock: SEPIOFF\_LI

Common cuttlefish in Lions Gulf

Source:

Region: Mediterranean , Lions Gulf

Catch data used from years 1973 - 2014 , abundance = None

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  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 0.43 - 6.88

Results of CMSY analysis with altogether 591 viable trajectories for 560 r-k pairs

$r$  = 0.343 , 95% CL = 0.218 - 0.541 ,  $k$  = 2.94 , 95% CL = 2.14 - 4.04

MSY = 0.252 , 95% CL = 0.189 - 0.336

Relative biomass last year = 0.19  $k$ , 2.5th = 0.015 , 97.5th = 0.394

Exploitation  $F/(r/2)$  in last year = 1.12

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.172 , 95% CL = 0.109 - 0.27 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.13 , 95% CL = 0.0828 - 0.206 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.252 , 95% CL = 0.189 - 0.336

$B_{msy}$  = 1.47 , 95% CL = 1.07 - 2.02

Biomass in last year = 0.56 , 2.5th perc = 0.044 , 97.5 perc = 1.16

$B/B_{msy}$  in last year = 0.38 , 2.5th perc = 0.0299 , 97.5 perc = 0.788

Fishing mortality in last year = 0.214 , 2.5th perc = 0.103 , 97.5 perc = 2.73

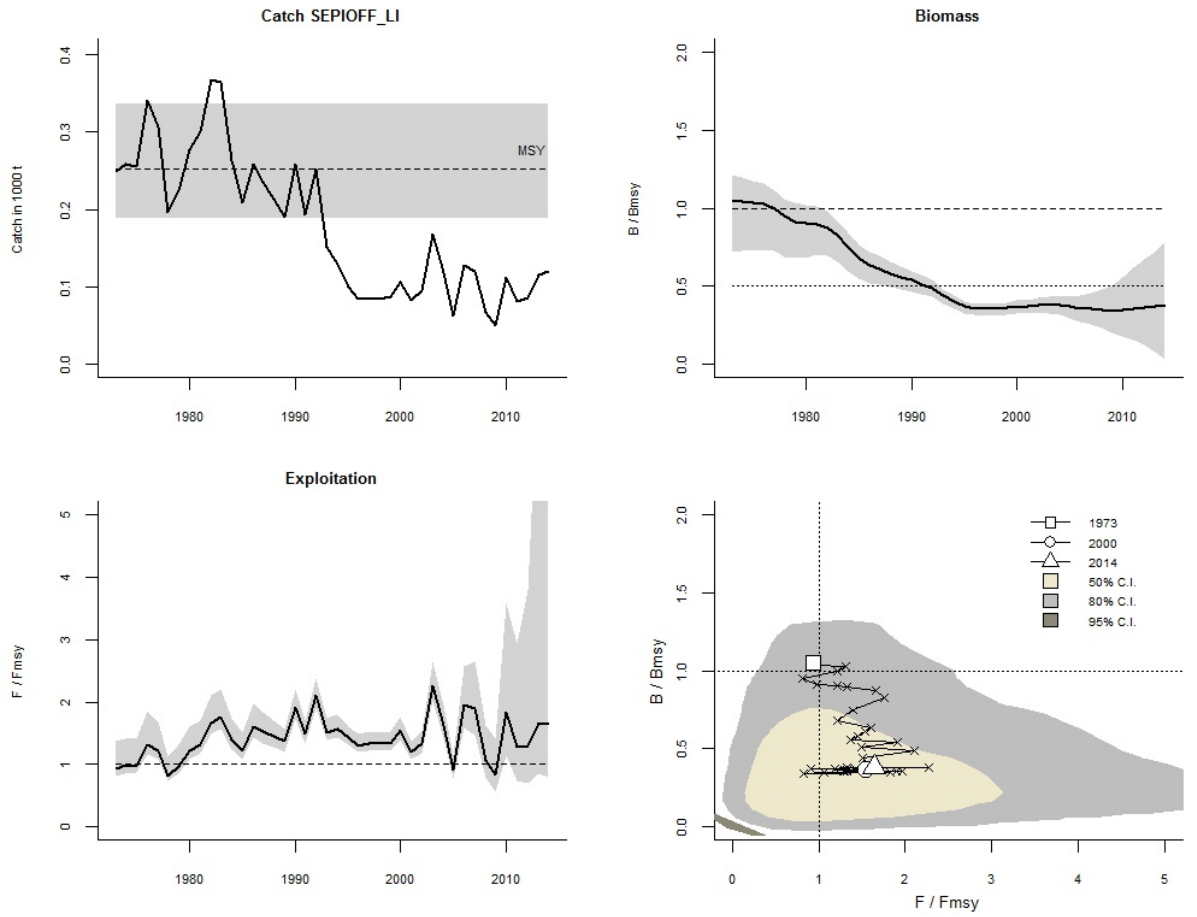
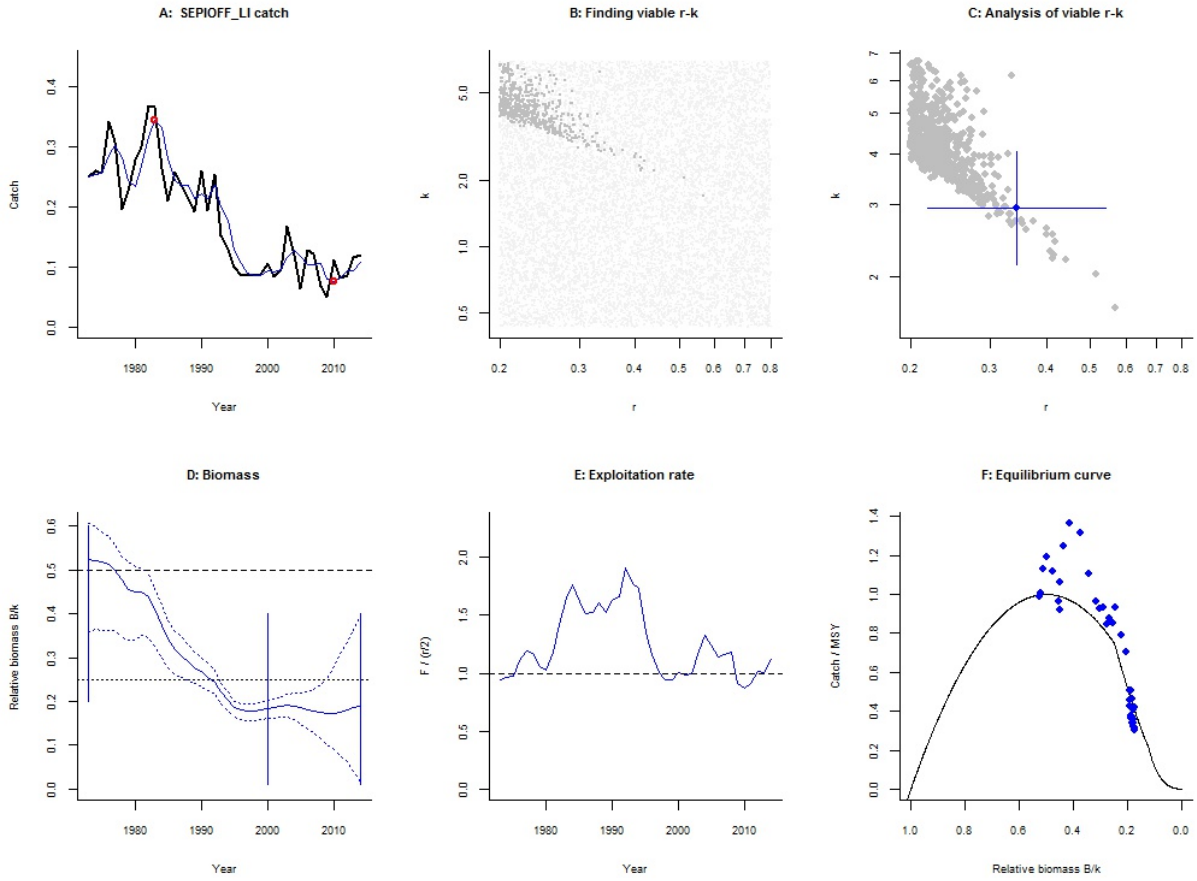
$F/F_{msy}$  = 1.64 , 2.5th perc = 0.793 , 97.5 perc = 20.9

Stock status and exploitation in 2014

Biomass = 0.56 ,  $B/B_{msy}$  = 0.38 , fishing mortality  $F$  = 0.214 ,  $F/F_{msy}$  = 1.64

Comment: Catch=landings from FishStat (France). GS OK

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Species: *Solea solea* , stock: SOLEVUL\_LI

Common sole in Lions Gulf

Source:

Region: Mediterranean , Lions Gulf

Catch data used from years 1970 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2009 default

Prior final relative biomass = 0.01 - 0.4 , default

Prior range for  $r$  = 0.21 - 1 expert , , prior range for  $k$  = 0.931 - 18.1

Results of CMSY analysis with altogether 315 viable trajectories for 304 r-k pairs

$r$  = 0.313 , 95% CL = 0.274 - 0.356 ,  $k$  = 6.71 , 95% CL = 4.89 - 9.22

MSY = 0.525 , 95% CL = 0.364 - 0.756

Relative biomass last year = 0.15  $k$  , 2.5th = 0.0142 , 97.5th = 0.394

Exploitation  $F/(r/2)$  in last year = 0.785

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.156 , 95% CL = 0.137 - 0.178 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0938 , 95% CL = 0.0823 - 0.107 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.525 , 95% CL = 0.364 - 0.756

$B_{msy}$  = 3.36 , 95% CL = 2.45 - 4.61

Biomass in last year = 1.01 , 2.5th perc = 0.0951 , 97.5 perc = 2.64

$B/B_{msy}$  in last year = 0.3 , 2.5th perc = 0.0283 , 97.5 perc = 0.788

Fishing mortality in last year = 0.129 , 2.5th perc = 0.0492 , 97.5 perc = 1.37

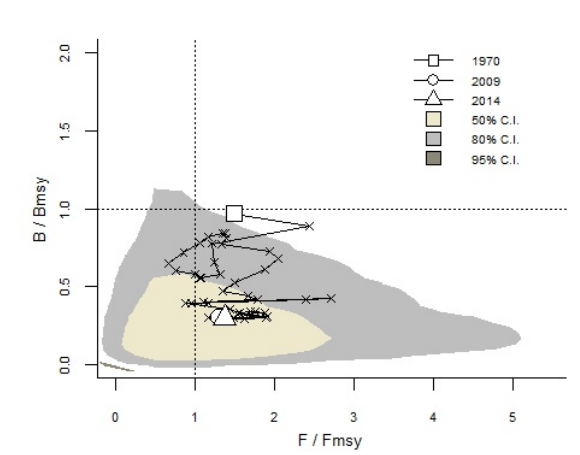
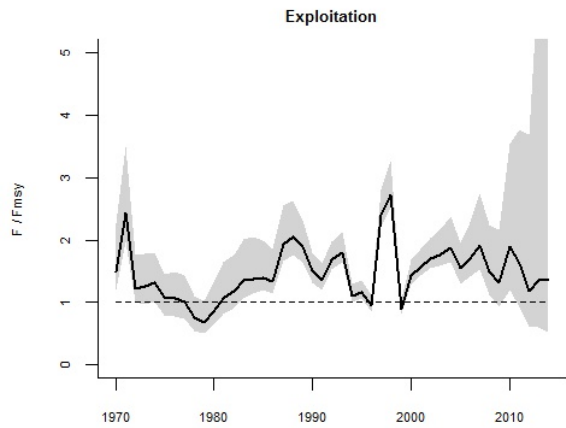
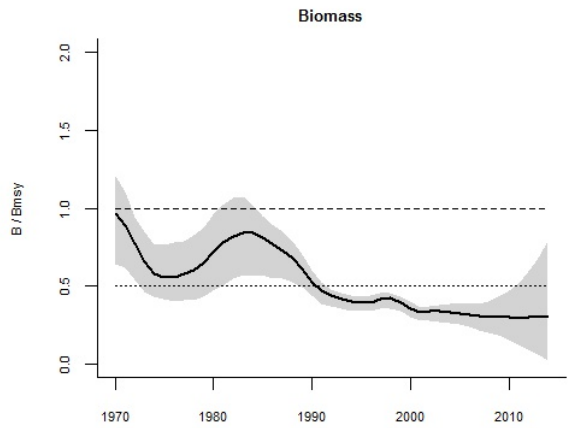
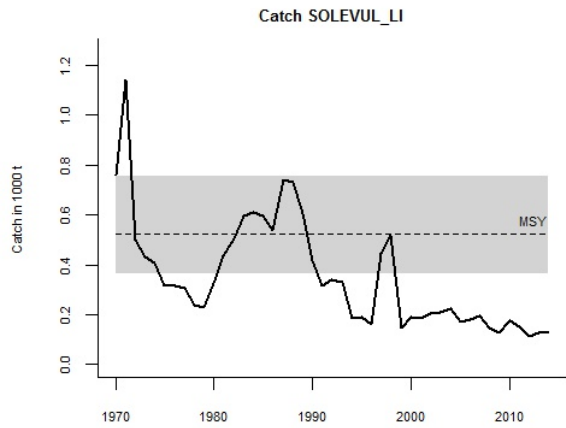
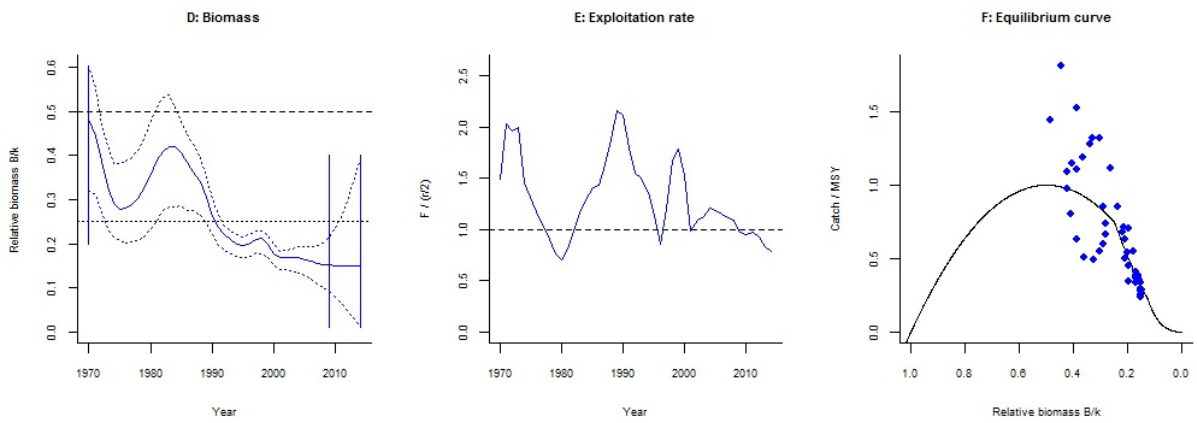
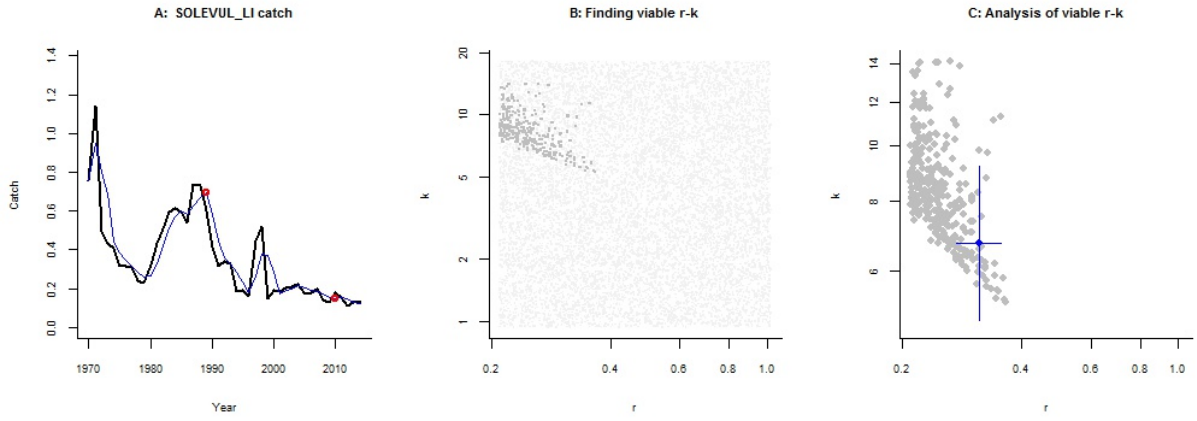
$F/F_{msy}$  = 1.38 , 2.5th perc = 0.524 , 97.5 perc = 14.6

Stock status and exploitation in 2014

Biomass = 1.01 ,  $B/B_{msy}$  = 0.3 , fishing mortality  $F$  = 0.129 ,  $F/F_{msy}$  = 1.38

Comment: Catch=landings from FishStat (Spain, France). GS OK

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Species: *Trisopterus minutus* , stock: TRISMIN\_LI

Poor cod in Lions Gulf

Source:

Region: Mediterranean , Lions Gulf

Catch data used from years 1972 - 2014 , abundance = None

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1997 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.37 - 1.6 expert, , prior range for  $k$  = 0.81 - 13.9

Results of CMSY analysis with altogether 575 viable trajectories for 495 r-k pairs

$r$  = 0.592 , 95% CL = 0.488 - 0.717 ,  $k$  = 6.06 , 95% CL = 5.09 - 7.22

MSY = 0.897 , 95% CL = 0.842 - 0.955

Relative biomass last year = 0.32  $k$ , 2.5th = 0.0246 , 97.5th = 0.395

Exploitation  $F/(r/2)$  in last year = 1.09

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.296 , 95% CL = 0.244 - 0.359 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.296 , 95% CL = 0.244 - 0.359 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.897 , 95% CL = 0.842 - 0.955

$B_{msy}$  = 3.03 , 95% CL = 2.55 - 3.61

Biomass in last year = 1.94 , 2.5th perc = 0.149 , 97.5 perc = 2.39

$B/B_{msy}$  in last year = 0.639 , 2.5th perc = 0.0493 , 97.5 perc = 0.789

Fishing mortality in last year = 0.339 , 2.5th perc = 0.274 , 97.5 perc = 4.39

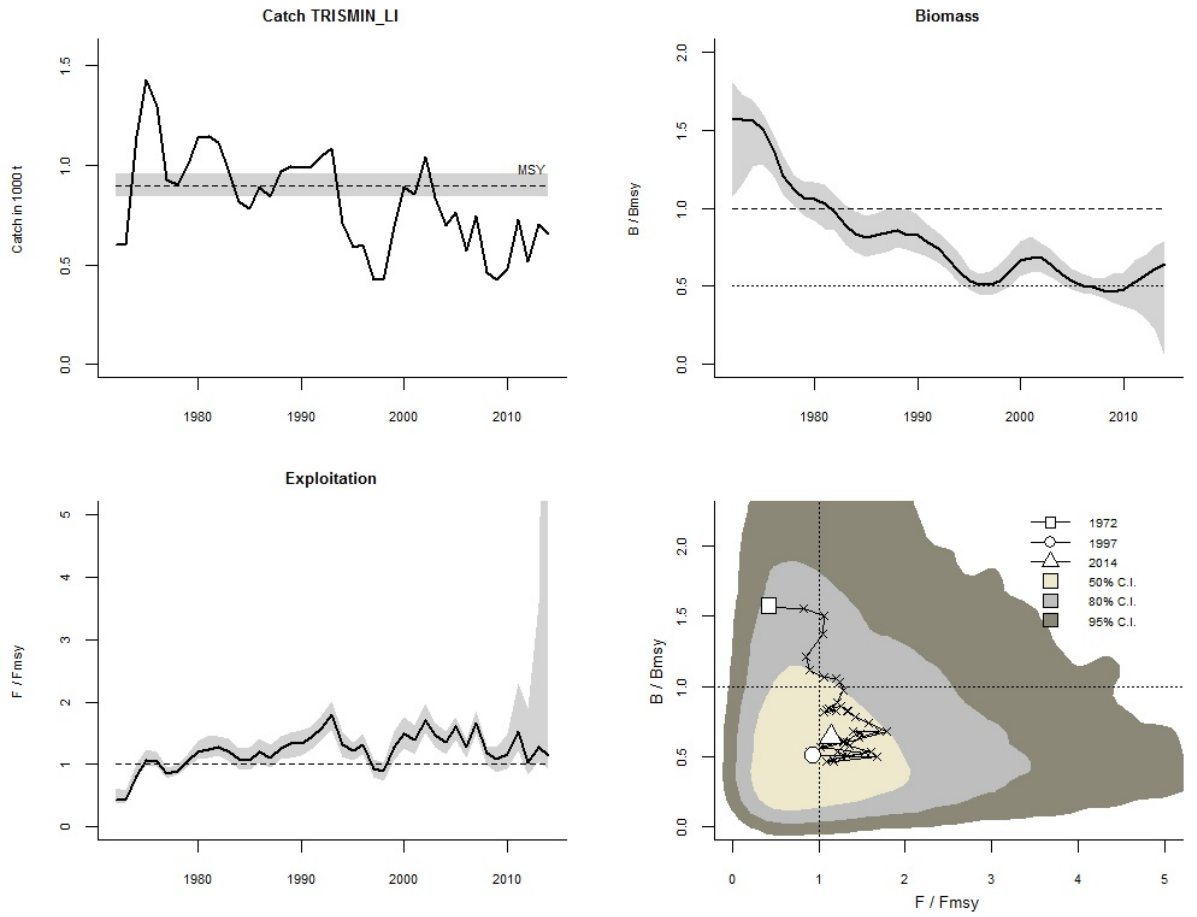
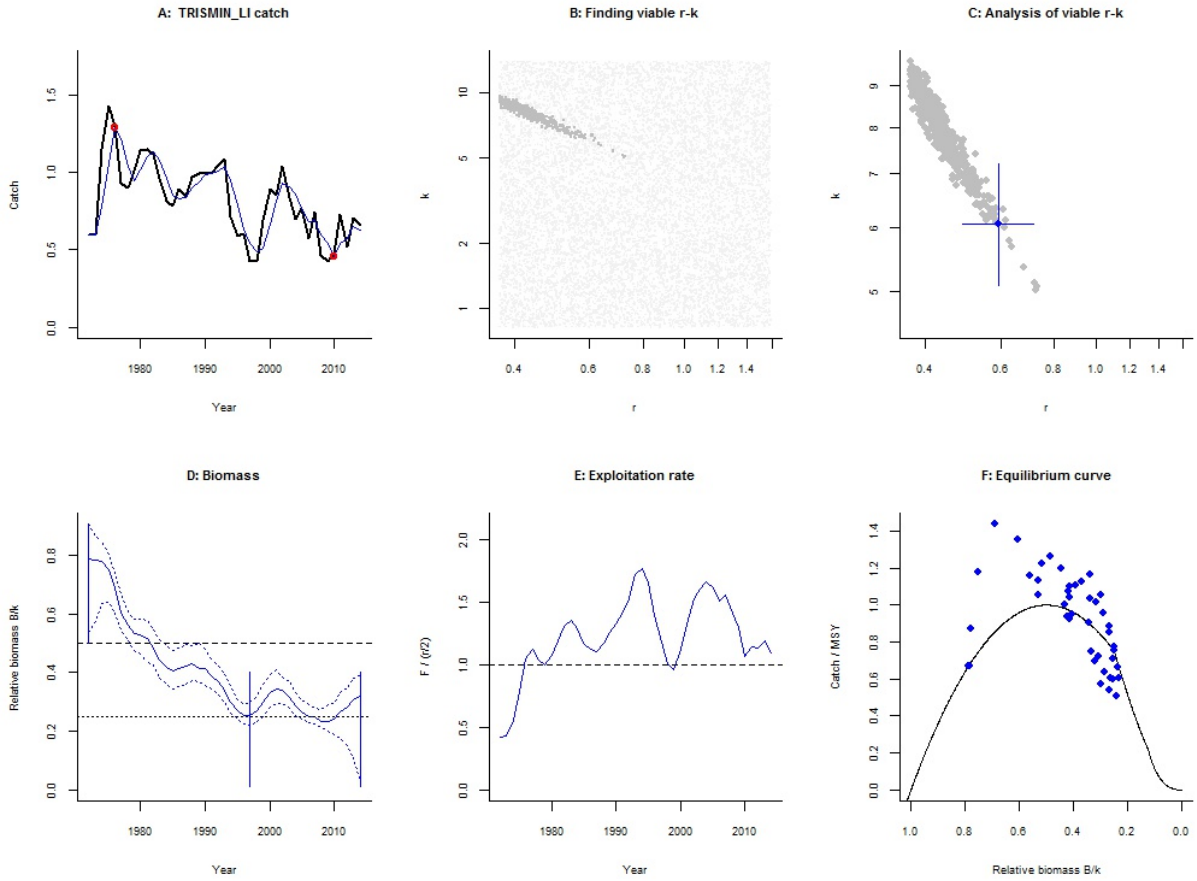
$F/F_{msy}$  = 1.14 , 2.5th perc = 0.927 , 97.5 perc = 14.8

Stock status and exploitation in 2014

Biomass = 1.94 ,  $B/B_{msy}$  = 0.639 , fishing mortality  $F$  = 0.339 ,  $F/F_{msy}$  = 1.14

Comment: Catch=landings from FishStat (Spain, France). RF int 1997 0.01-0.4, final 0.01-0.4. GS OK

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**Balearic Sea** (analyzed with CMSY\_O\_7m.R; see Comment for data sources)

Species: *Aristeomorpha foliacea* , stock: ARISFOL\_BA

Giant red shrimp in Balearic

Source:

Region: Mediterranean , Balearic

Catch data used from years 1999 - 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 - 0.3 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 0.125 - 2

Prior range of  $q$  = 0.000786 - 0.00314

Results of CMSY analysis with altogether 1879 viable trajectories for 939 r-k pairs

$r$  = 0.499 , 95% CL = 0.338 - 0.737 ,  $k$  = 0.307 , 95% CL = 0.202 - 0.466

MSY = 0.0383 , 95% CL = 0.0301 - 0.0488

Relative biomass last year = 0.145  $k$  , 2.5th = 0.0147 , 97.5th = 0.295

Exploitation  $F/(r/2)$  in last year = 1.14

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.312 , 95% CL = 0.183 - 0.533 ,  $k$  = 0.422 , 95% CL = 0.302 - 0.589

MSY = 0.0329 , 95% CL = 0.0245 - 0.0443

Relative biomass in last year = 0.19  $k$  , 2.5th perc = 0.0117 , 97.5th perc = 0.356

Exploitation  $F/(r/2)$  in last year = 0.797

$q$  = 0.00144 , lcl = 0.00102 , ucl = 0.00203

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.25 , 95% CL = 0.169 - 0.369 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.144 , 95% CL = 0.0977 - 0.213 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.0383 , 95% CL = 0.0301 - 0.0488

$B_{msy}$  = 0.153 , 95% CL = 0.101 - 0.233

Biomass in last year = 0.0443 , 2.5th perc = 0.00452 , 97.5 perc = 0.0906

$B/B_{msy}$  in last year = 0.289 , 2.5th perc = 0.0295 , 97.5 perc = 0.59

Fishing mortality in last year = 0.225 , 2.5th perc = 0.11 , 97.5 perc = 2.21

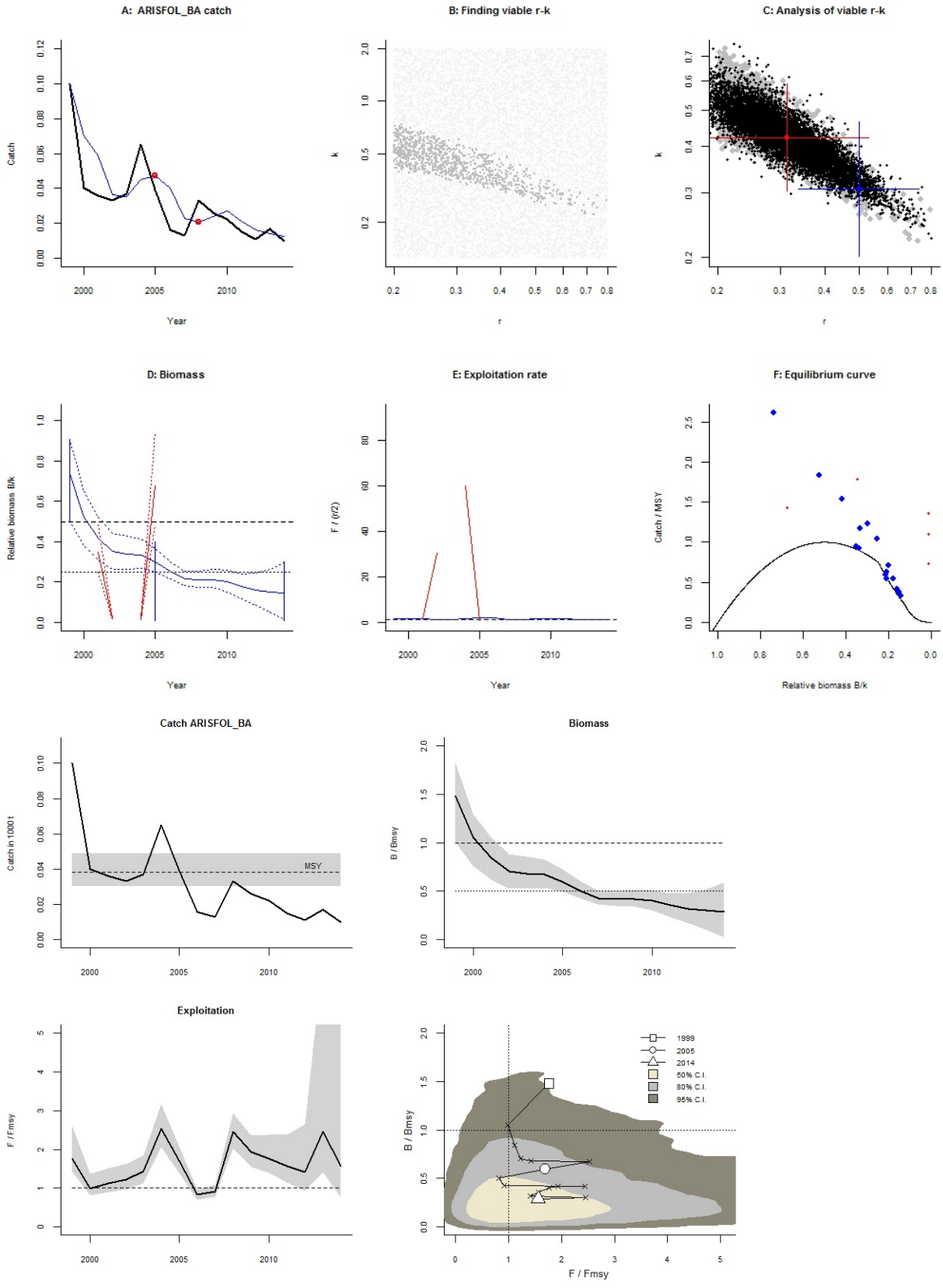
$F/F_{msy}$  = 1.56 , 2.5th perc = 0.766 , 97.5 perc = 15.3

Stock status and exploitation in 2014

Biomass = 0.0443 ,  $B/B_{msy}$  = 0.289 , fishing mortality  $F$  = 0.225 ,  $F/F_{msy}$  = 1.56

Comment: Catch=landings from FishStat (Spain), Biomass from Medits for GSAs 1-6. RF final 0.3; GS suggests to use CMSY; RF OK 12.10.16

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Species: *Aristeus antennatus* , stock: ARITANT\_BA

Blue and red shrimp in Balearic

Source: excel

Region: Mediterranean , Balearic

Catch data used from years 1970 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.01 - 0.4 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 4.03 - 64.5

Prior range of  $q$  = 0.000273 - 0.00109

Results of CMSY analysis with altogether 1625 viable trajectories for 1068 r-k pairs

$r$  = 0.563 , 95% CL = 0.403 - 0.785 ,  $k$  = 13.2 , 95% CL = 9.07 - 19.2

MSY = 1.85 , 95% CL = 1.71 - 2.01

Relative biomass last year = 0.257  $k$  , 2.5th = 0.0277 , 97.5th = 0.392

Exploitation  $F/(r/2)$  in last year = 1.8

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.594 , 95% CL = 0.398 - 0.888 ,  $k$  = 12.6 , 95% CL = 8.8 - 18.1

MSY = 1.87 , 95% CL = 1.73 - 2.04

Relative biomass in last year = 0.294  $k$  , 2.5th perc = 0.138 , 97.5th perc = 0.455

Exploitation  $F/(r/2)$  in last year = 1.48

$q$  = 0.000421 , lcl = 0.000312 , ucl = 0.000569

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.281 , 95% CL = 0.202 - 0.393 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.281 , 95% CL = 0.202 - 0.393 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.85 , 95% CL = 1.71 - 2.01

$B_{msy}$  = 6.59 , 95% CL = 4.54 - 9.58

Biomass in last year = 3.39 , 2.5th perc = 0.366 , 97.5 perc = 5.17

$B/B_{msy}$  in last year = 0.514 , 2.5th perc = 0.0555 , 97.5 perc = 0.784

Fishing mortality in last year = 0.481 , 2.5th perc = 0.315 , 97.5 perc = 4.46

$F/F_{msy}$  = 1.71 , 2.5th perc = 1.12 , 97.5 perc = 15.8

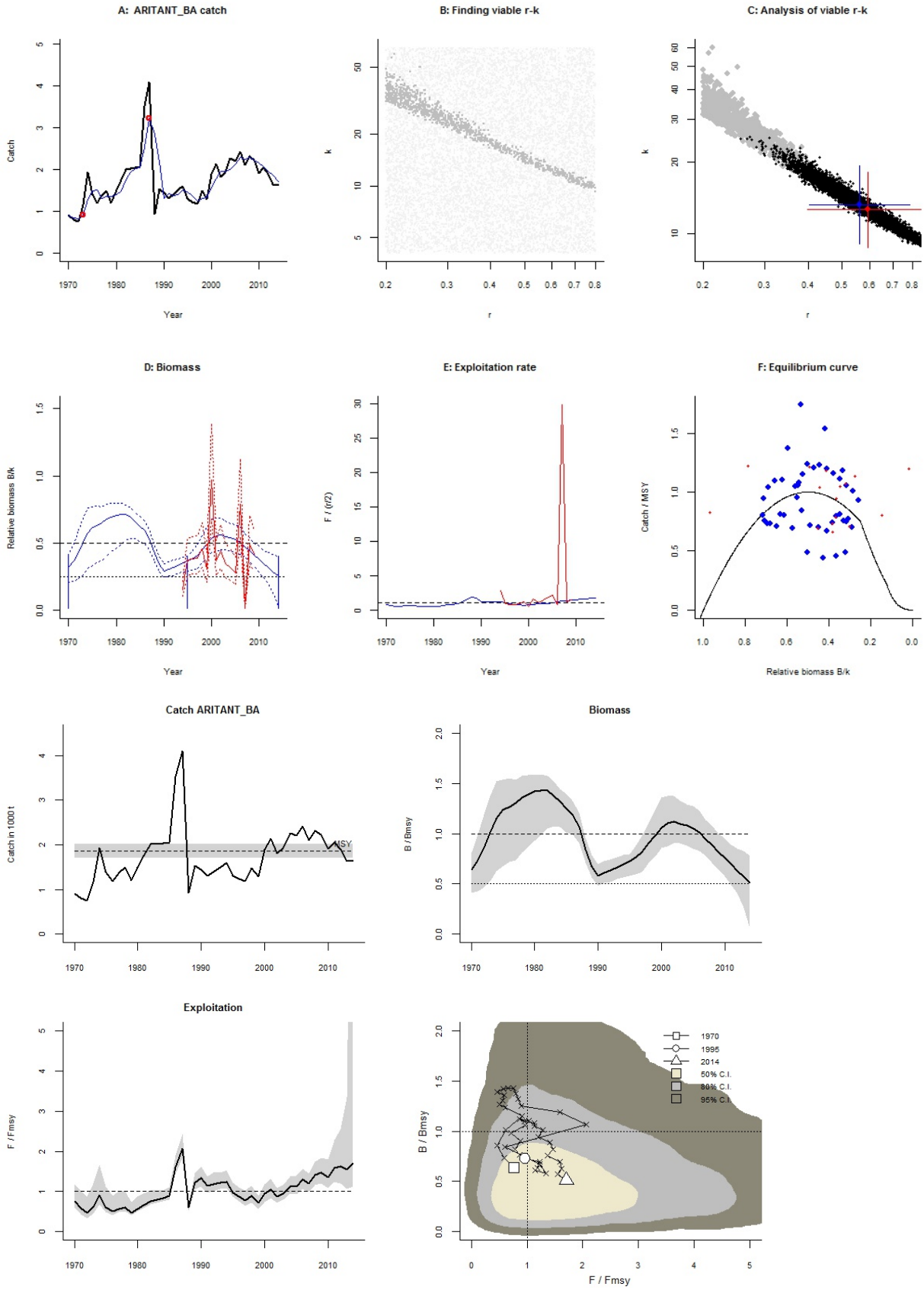
Stock status and exploitation in 2014

Biomass = 3.39 ,  $B/B_{msy}$  = 0.514 , fishing mortality  $F$  = 0.481 ,  $F/F_{msy}$  = 1.71

Comment: Catch=landings from FishStat (Spain, Algeria), Biomass from Medits for GSAs 1-6. GS:

Results look ok. However, the depth range of the species is far below 1000 m where the fishery cannot operate, so probably the biomass exploited is just a portion of the real biomass.

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Species: *Boops boops* , stock: BOOPBOO\_BA

Bogue in Balearic

Source:

Region: Mediterranean , Balearic

Catch data used from years 1974 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1992 expert

Prior final relative biomass = 0.1 - 0.5 expert

Prior range for  $r$  = 0.31 - 1.1 expert, , prior range for  $k$  = 10.6 - 151

Results of CMSY analysis with altogether 1391 viable trajectories for 1265 r-k pairs

$r$  = 0.628 , 95% CL = 0.446 - 0.885 ,  $k$  = 52.8 , 95% CL = 39.6 - 70.5

MSY = 8.3 , 95% CL = 7.3 - 9.43

Relative biomass last year = 0.27  $k$ , 2.5th = 0.112 , 97.5th = 0.476

Exploitation  $F/(r/2)$  in last year = 1.67

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.314 , 95% CL = 0.223 - 0.443 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.314 , 95% CL = 0.223 - 0.443 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 8.3 , 95% CL = 7.3 - 9.43

$B_{msy}$  = 26.4 , 95% CL = 19.8 - 35.3

Biomass in last year = 14.2 , 2.5th perc = 5.93 , 97.5 perc = 25.1

$B/B_{msy}$  in last year = 0.539 , 2.5th perc = 0.224 , 97.5 perc = 0.951

Fishing mortality in last year = 0.464 , 2.5th perc = 0.263 , 97.5 perc = 1.12

$F/F_{msy}$  = 1.48 , 2.5th perc = 0.838 , 97.5 perc = 3.55

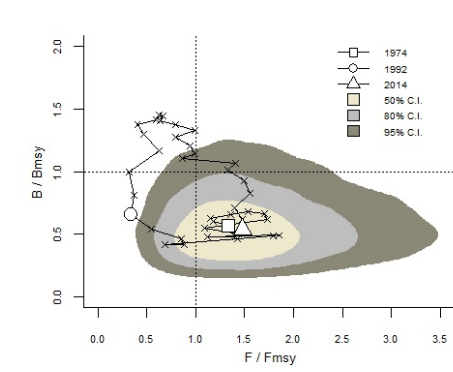
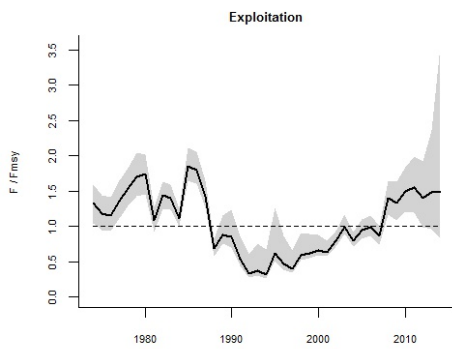
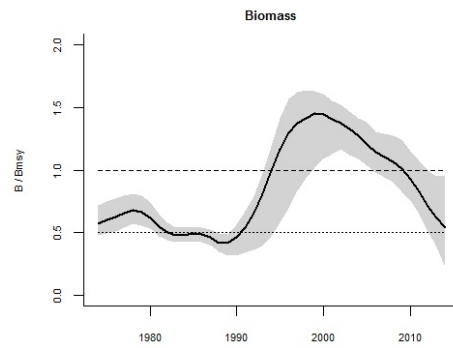
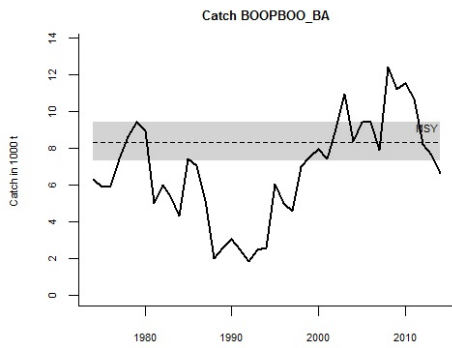
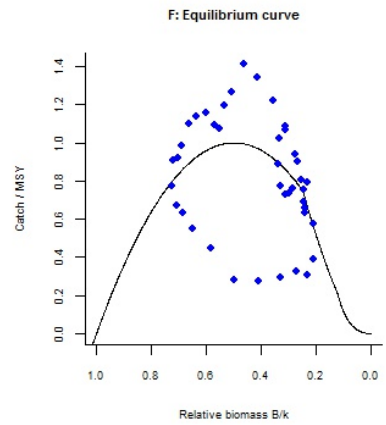
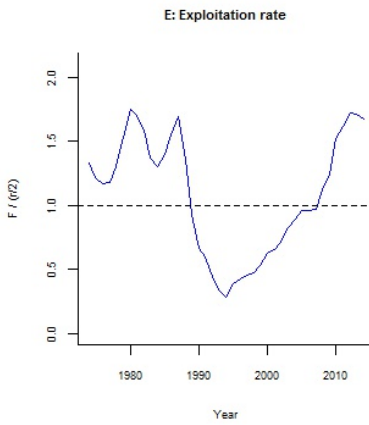
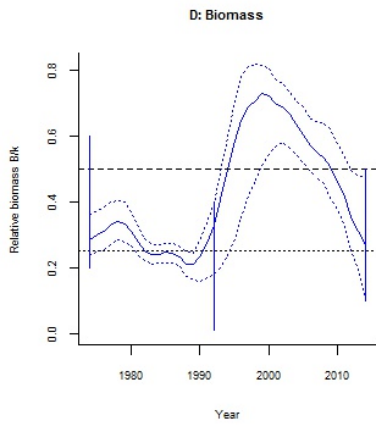
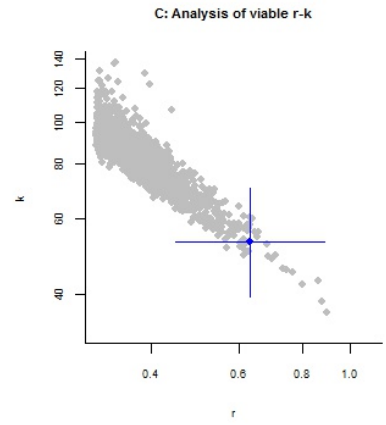
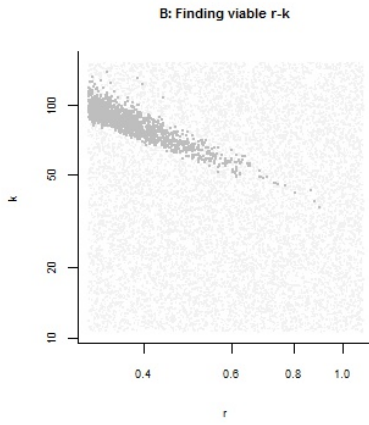
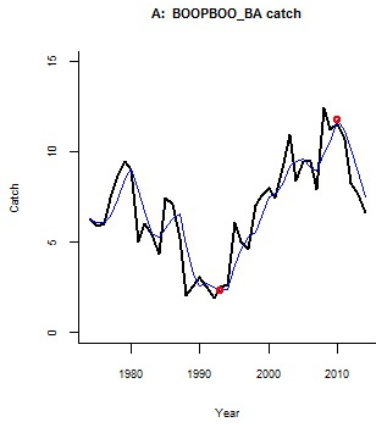
Stock status and exploitation in 2014

Biomass = 14.2 ,  $B/B_{msy}$  = 0.539 , fishing mortality  $F$  = 0.464 ,  $F/F_{msy}$  = 1.48

Comment: Catch=landings from FishStat (Algeria, Spain, Morocco). RF int 1992 0.01-0.4, final 0.1-0.5.

GS OK

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Species: *Conger conger* , stock: CONGCON\_BA

Conger eel in Balearic

Source:

Region: Mediterranean , Balearic

Catch data used from years 1980 - 2014 , 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  $r$  = 0.16 - 0.46 expert , , prior range for  $k$  = 1.74 - 20

Results of CMSY analysis with altogether 1307 viable trajectories for 624 r-k pairs

$r$  = 0.352 , 95% CL = 0.272 - 0.455 ,  $k$  = 6.43 , 95% CL = 4.79 - 8.65

MSY = 0.566 , 95% CL = 0.514 - 0.622

Relative biomass last year = 0.101  $k$  , 2.5th = 0.0136 , 97.5th = 0.194

Exploitation  $F/(r/2)$  in last year = 1.21

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.176 , 95% CL = 0.136 - 0.227 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0708 , 95% CL = 0.0547 - 0.0915 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.566 , 95% CL = 0.514 - 0.622

$B_{msy}$  = 3.22 , 95% CL = 2.39 - 4.32

Biomass in last year = 0.647 , 2.5th perc = 0.0873 , 97.5 perc = 1.25

$B/B_{msy}$  in last year = 0.201 , 2.5th perc = 0.0271 , 97.5 perc = 0.388

Fishing mortality in last year = 0.202 , 2.5th perc = 0.105 , 97.5 perc = 1.5

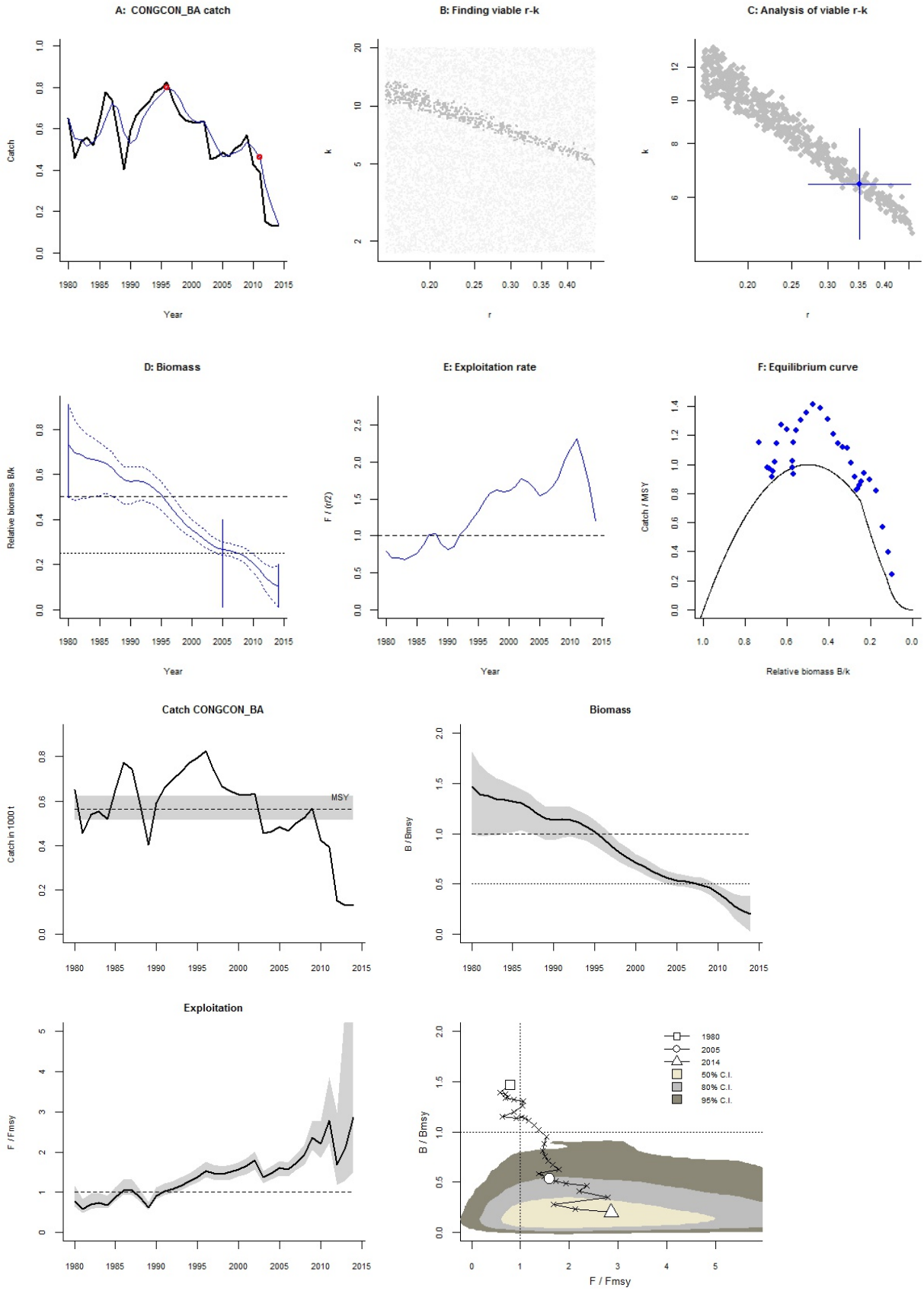
$F/F_{msy}$  = 2.86 , 2.5th perc = 1.48 , 97.5 perc = 21.2

Stock status and exploitation in 2014

Biomass = 0.647 ,  $B/B_{msy}$  = 0.201 , fishing mortality  $F$  = 0.202 ,  $F/F_{msy}$  = 2.86

Comment: Catch=landings from FishStat (Algeria, Spain, Morocco). RF int 2005 0.01-0.4, final 0.2. GS  
OK

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Species: *Engraulis encrasicolus* , stock: ENGRENC\_BA

Anchovy in Balearic

Source: excel

Region: Mediterranean , Balearic

Catch data used from years 1970 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.01 - 0.4 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.26 - 1.2 expert, , prior range for  $k$  = 49.2 - 878

Prior range of  $q$  = 0.372 - 1.57

Results of CMSY analysis with altogether 113 viable trajectories for 113 r-k pairs

$r$  = 0.387 , 95% CL = 0.299 - 0.5 ,  $k$  = 343 , 95% CL = 283 - 415

MSY = 33.1 , 95% CL = 28.8 - 38.2

Relative biomass last year = 0.278  $k$ , 2.5th = 0.0199 , 97.5th = 0.395

Exploitation  $F/(r/2)$  in last year = 1.02

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.608 , 95% CL = 0.399 - 0.928 ,  $k$  = 232 , 95% CL = 169 - 317

MSY = 35.3 , 95% CL = 29.6 - 42.1

Relative biomass in last year = 0.255  $k$ , 2.5th perc = 0.0931 , 97.5th perc = 0.45

Exploitation  $F/(r/2)$  in last year = 1.23

$q$  = 0.511 ,  $lcl$  = 0.366 ,  $ucl$  = 0.715

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.193 , 95% CL = 0.15 - 0.25 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.193 , 95% CL = 0.15 - 0.25 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 33.1 , 95% CL = 28.8 - 38.2

$B_{msy}$  = 171 , 95% CL = 142 - 207

Biomass in last year = 95.4 , 2.5th perc = 6.81 , 97.5 perc = 135

$B/B_{msy}$  in last year = 0.557 , 2.5th perc = 0.0398 , 97.5 perc = 0.791

Fishing mortality in last year = 0.233 , 2.5th perc = 0.164 , 97.5 perc = 3.26

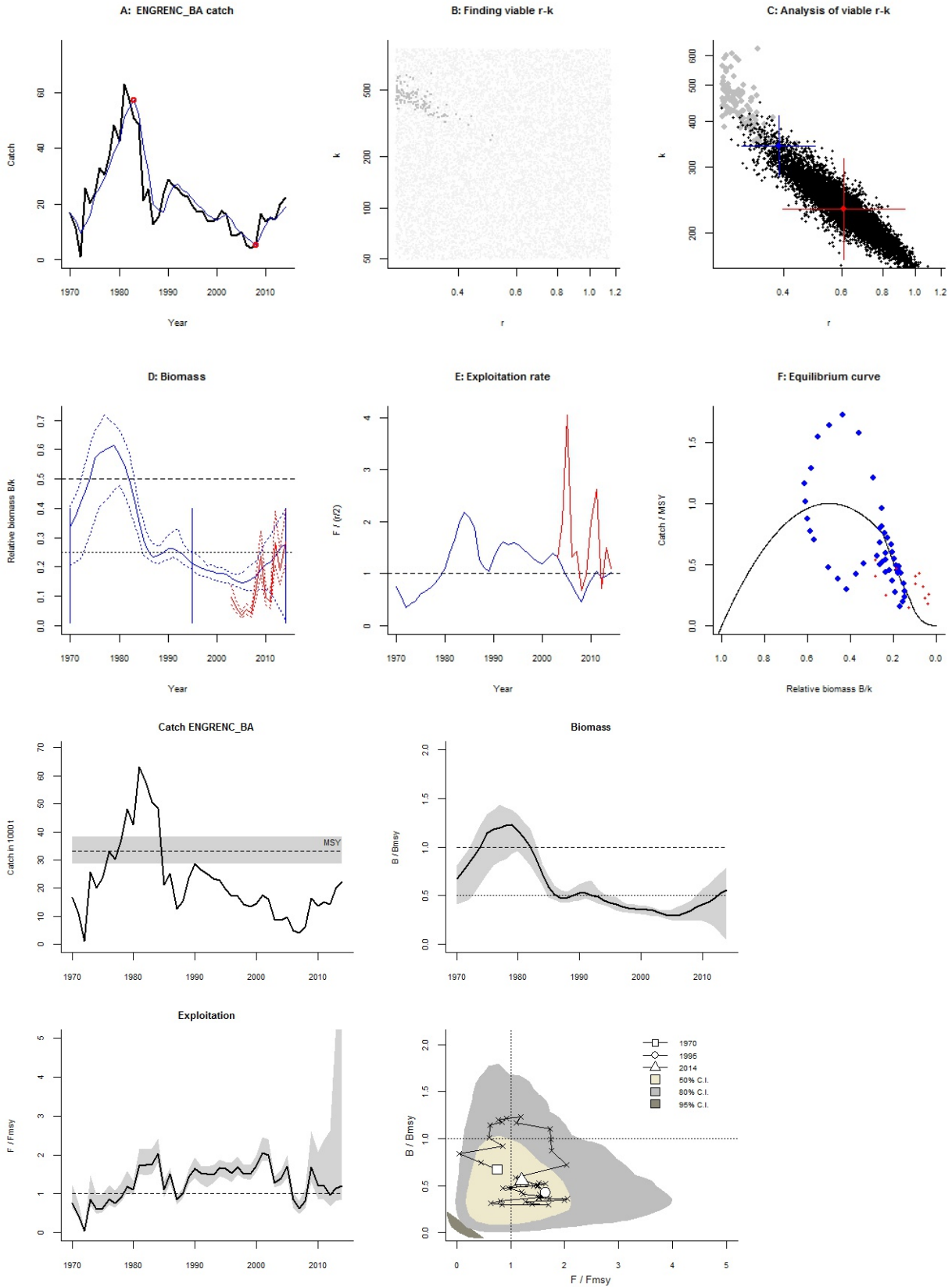
$F/F_{msy}$  = 1.2 , 2.5th perc = 0.848 , 97.5 perc = 16.9

Stock status and exploitation in 2014

Biomass = 95.4 ,  $B/B_{msy}$  = 0.557 , fishing mortality  $F$  = 0.233 ,  $F/F_{msy}$  = 1.2

Comment: Catch=landings from FishStat (Algeria, Morocco, Spain), Average Biomass from MEDIAS for GSAs 1 & 6. RF 0.01-0.4. GS: The signals from MEDIAS are quite far from catches. I would try only with catch data considering that the survey is carried out only in EU GSA and not in Algeria and Morocco. RF OK 12.10.16

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Species: *Lepidorhombus whiffiagonis* , stock: LEPIWHI\_BA

Megrim in Balearic

Source:

Region: Mediterranean , Balearic

Catch data used from years 1974 - 2014 , abundance = None

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1999 default

Prior final relative biomass = 0.01 - 0.2 expert

Prior range for  $r$  = 0.34 - 1 expert, , prior range for  $k$  = 0.178 - 2.1

Results of CMSY analysis with altogether 2198 viable trajectories for 1444 r-k pairs

$r = 0.675$  , 95% CL = 0.502 - 0.908 ,  $k = 0.67$  , 95% CL = 0.51 - 0.881

MSY = 0.113 , 95% CL = 0.101 - 0.127

Relative biomass last year = 0.113  $k$  , 2.5th = 0.0163 , 97.5th = 0.194

Exploitation  $F/(r/2)$  in last year = 0.911

Results for Management (based on CMSY analysis)

$F_{msy} = 0.338$  , 95% CL = 0.251 - 0.454 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.153$  , 95% CL = 0.114 - 0.205 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.113 , 95% CL = 0.101 - 0.127

$B_{msy} = 0.335$  , 95% CL = 0.255 - 0.441

Biomass in last year = 0.0758 , 2.5th perc = 0.0109 , 97.5 perc = 0.13

$B/B_{msy}$  in last year = 0.226 , 2.5th perc = 0.0326 , 97.5 perc = 0.388

Fishing mortality in last year = 0.251 , 2.5th perc = 0.146 , 97.5 perc = 1.74

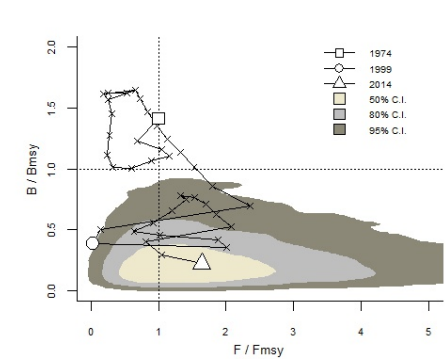
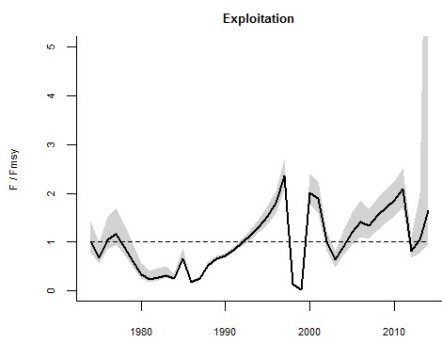
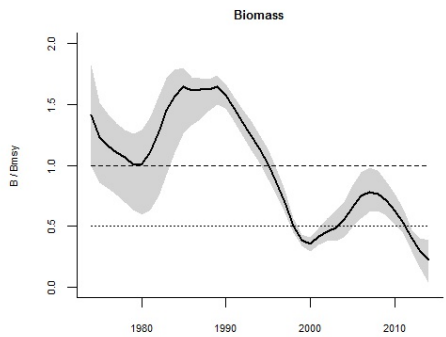
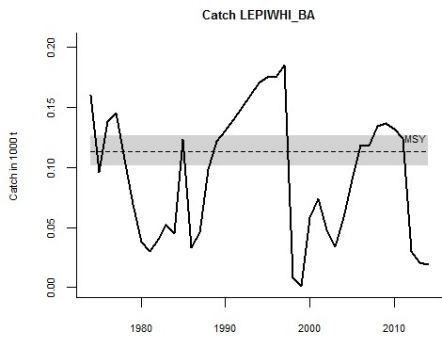
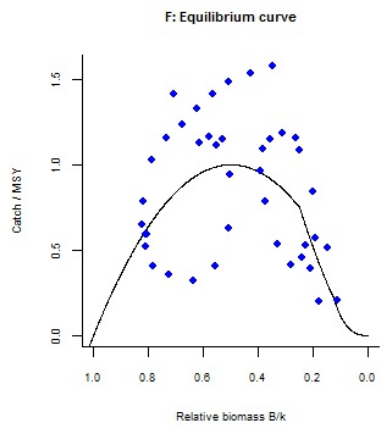
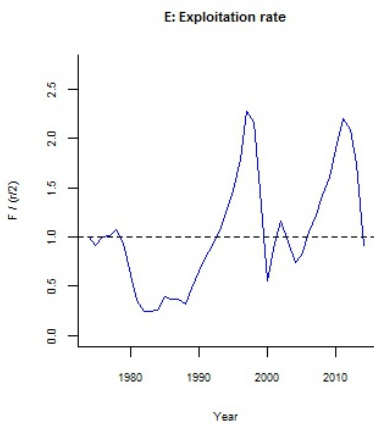
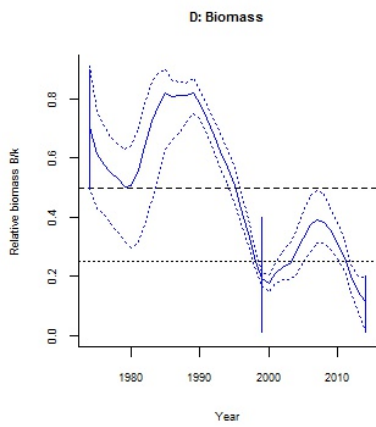
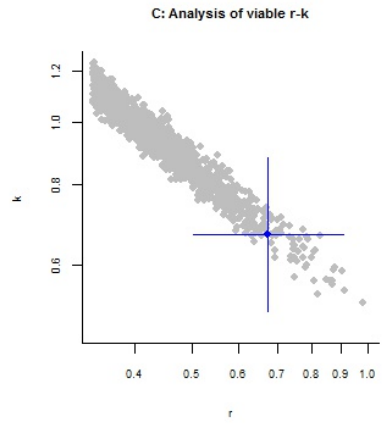
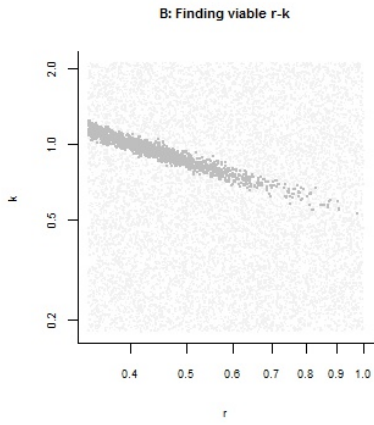
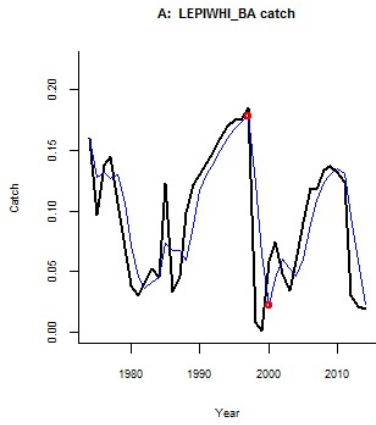
$F/F_{msy} = 1.64$  , 2.5th perc = 0.957 , 97.5 perc = 11.4

Stock status and exploitation in 2014

Biomass = 0.0758 ,  $B/B_{msy} = 0.226$  , fishing mortality  $F = 0.251$  ,  $F/F_{msy} = 1.64$

Comment: Catch=landings from FishStat (Spain). RF final 0.2. GS OK

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Species: *Loligo vulgaris* , stock: LOLIVUL\_BA

European squid in Balearic

Source:

Region: Mediterranean , Balearic

Catch data used from years 1970 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1998 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 3.2 - 51.2

Results of CMSY analysis with altogether 317 viable trajectories for 305 r-k pairs

$r = 0.31$  , 95% CL = 0.246 - 0.392 ,  $k = 16.2$  , 95% CL = 12.4 - 21.2

MSY = 1.26 , 95% CL = 1.05 - 1.51

Relative biomass last year = 0.18  $k$ , 2.5th = 0.0161 , 97.5th = 0.293

Exploitation  $F/(r/2)$  in last year = 0.913

Results for Management (based on CMSY analysis)

$F_{msy} = 0.155$  , 95% CL = 0.123 - 0.196 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.112$  , 95% CL = 0.0885 - 0.141 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.26 , 95% CL = 1.05 - 1.51

$B_{msy} = 8.12$  , 95% CL = 6.22 - 10.6

Biomass in last year = 2.93 , 2.5th perc = 0.262 , 97.5 perc = 4.76

$B/B_{msy}$  in last year = 0.36 , 2.5th perc = 0.0323 , 97.5 perc = 0.587

Fishing mortality in last year = 0.123 , 2.5th perc = 0.0758 , 97.5 perc = 1.38

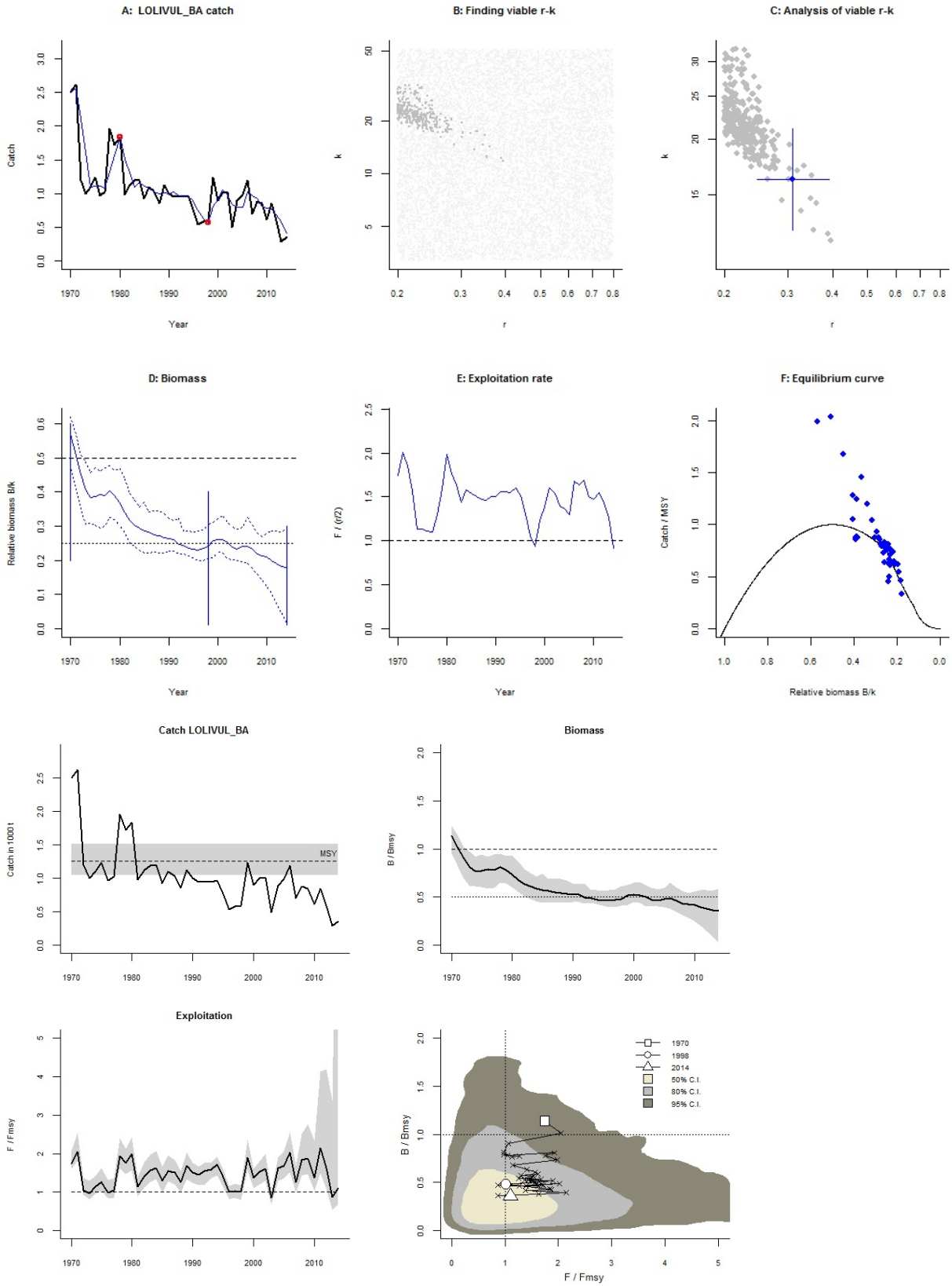
$F/F_{msy} = 1.1$  , 2.5th perc = 0.678 , 97.5 perc = 12.3

Stock status and exploitation in 2014

Biomass = 2.93 ,  $B/B_{msy} = 0.36$  , fishing mortality  $F = 0.123$  ,  $F/F_{msy} = 1.1$

Comment: Catch=landings from FishStat (Algeria, Spain).RF final 0.3. GS OK

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Species: *Merluccius merluccius* , stock: MERLMER\_BA

Hake in Balearic

Source: STECF 15-18, M from Colloca et al 2013

Region: Mediterranean , Balearic

Catch data used from years 1970 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert

Prior final relative biomass = 0.01 - 0.2 expert

Prior range for  $r$  = 0.22 - 0.95 expert, , prior range for  $k$  = 8.96 - 155

Prior range of  $q$  = 0.379 - 1.58

Results of CMSY analysis with altogether 1188 viable trajectories for 1011 r-k pairs

$r$  = 0.445 , 95% CL = 0.264 - 0.749 ,  $k$  = 51 , 95% CL = 39.2 - 66.4

MSY = 5.68 , 95% CL = 5.25 - 6.14

Relative biomass last year = 0.118  $k$ , 2.5th = 0.0152 , 97.5th = 0.195

Exploitation  $F/(r/2)$  in last year = 2.51

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.5 , 95% CL = 0.375 - 0.669 ,  $k$  = 46.4 , 95% CL = 35.6 - 60.6

MSY = 5.81 , 95% CL = 5.3 - 6.36

Relative biomass in last year = 0.198  $k$ , 2.5th perc = 0.141 , 97.5th perc = 0.242

Exploitation  $F/(r/2)$  in last year = 1.32

$q$  = 0.632 , lcl = 0.489 , ucl = 0.817

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.222 , 95% CL = 0.132 - 0.375 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.105 , 95% CL = 0.0623 - 0.177 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 5.68 , 95% CL = 5.25 - 6.14

$B_{msy}$  = 25.5 , 95% CL = 19.6 - 33.2

Biomass in last year = 6.02 , 2.5th perc = 0.773 , 97.5 perc = 9.93

$B/B_{msy}$  in last year = 0.236 , 2.5th perc = 0.0303 , 97.5 perc = 0.389

Fishing mortality in last year = 0.503 , 2.5th perc = 0.305 , 97.5 perc = 3.92

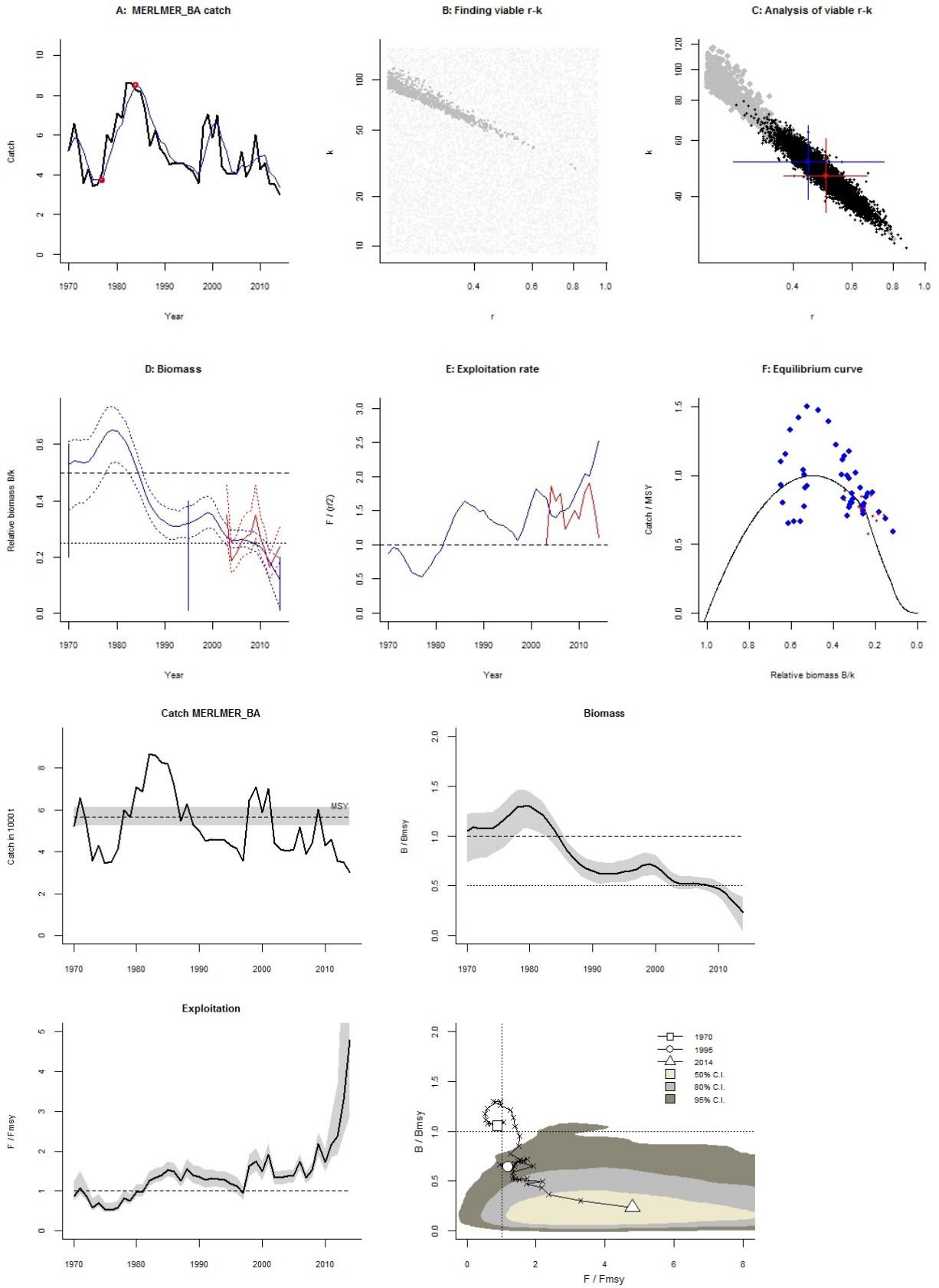
$F/F_{msy}$  = 4.79 , 2.5th perc = 2.9 , 97.5 perc = 37.3

Stock status and exploitation in 2014

Biomass = 6.02 ,  $B/B_{msy}$  = 0.236 , fishing mortality  $F$  = 0.503 ,  $F/F_{msy}$  = 4.79

Comment: Catch=landings from FishStat (Algeria, France, Morocco, Spain), Biomass from Medits for GSAs 1,5,6 (SGMED 2015, Part 1- 1,5,6,7 minus 7). GS: Results look ok and similar with the STECF assessment

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Species: *Micromesistius poutassou* , stock: MICMPOU\_BA

Blue whiting in Balearic

Source: excel

Region: Mediterranean , Balearic

Catch data used from years 1980 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2003 default

Prior final relative biomass = 0.01 - 0.2 expert

Prior range for  $r$  = 0.21 - 1.1 expert, , prior range for  $k$  = 10.1 - 210

Prior range of  $q$  = 0.00195 - 0.00886

Results of CMSY analysis with altogether 893 viable trajectories for 771 r-k pairs

$r$  = 0.363 , 95% CL = 0.292 - 0.452 ,  $k$  = 59.1 , 95% CL = 45.2 - 77.3

MSY = 5.37 , 95% CL = 4.5 - 6.41

Relative biomass last year = 0.116  $k$ , 2.5th = 0.0163 , 97.5th = 0.19

Exploitation  $F/(r/2)$  in last year = 0.974

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.38 , 95% CL = 0.252 - 0.573 ,  $k$  = 60.1 , 95% CL = 45.1 - 80

MSY = 5.71 , 95% CL = 4.57 - 7.14

Relative biomass in last year = 0.0924  $k$ , 2.5th perc = 0.0233 , 97.5th perc = 0.223

Exploitation  $F/(r/2)$  in last year = 1.16

$q$  = 0.00273 , lcl = 0.00199 , ucl = 0.00374

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.182 , 95% CL = 0.146 - 0.226 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0842 , 95% CL = 0.0677 - 0.105 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 5.37 , 95% CL = 4.5 - 6.41

$B_{msy}$  = 29.6 , 95% CL = 22.6 - 38.7

Biomass in last year = 6.85 , 2.5th perc = 0.967 , 97.5 perc = 11.2

$B/B_{msy}$  in last year = 0.232 , 2.5th perc = 0.0327 , 97.5 perc = 0.38

Fishing mortality in last year = 0.178 , 2.5th perc = 0.109 , 97.5 perc = 1.26

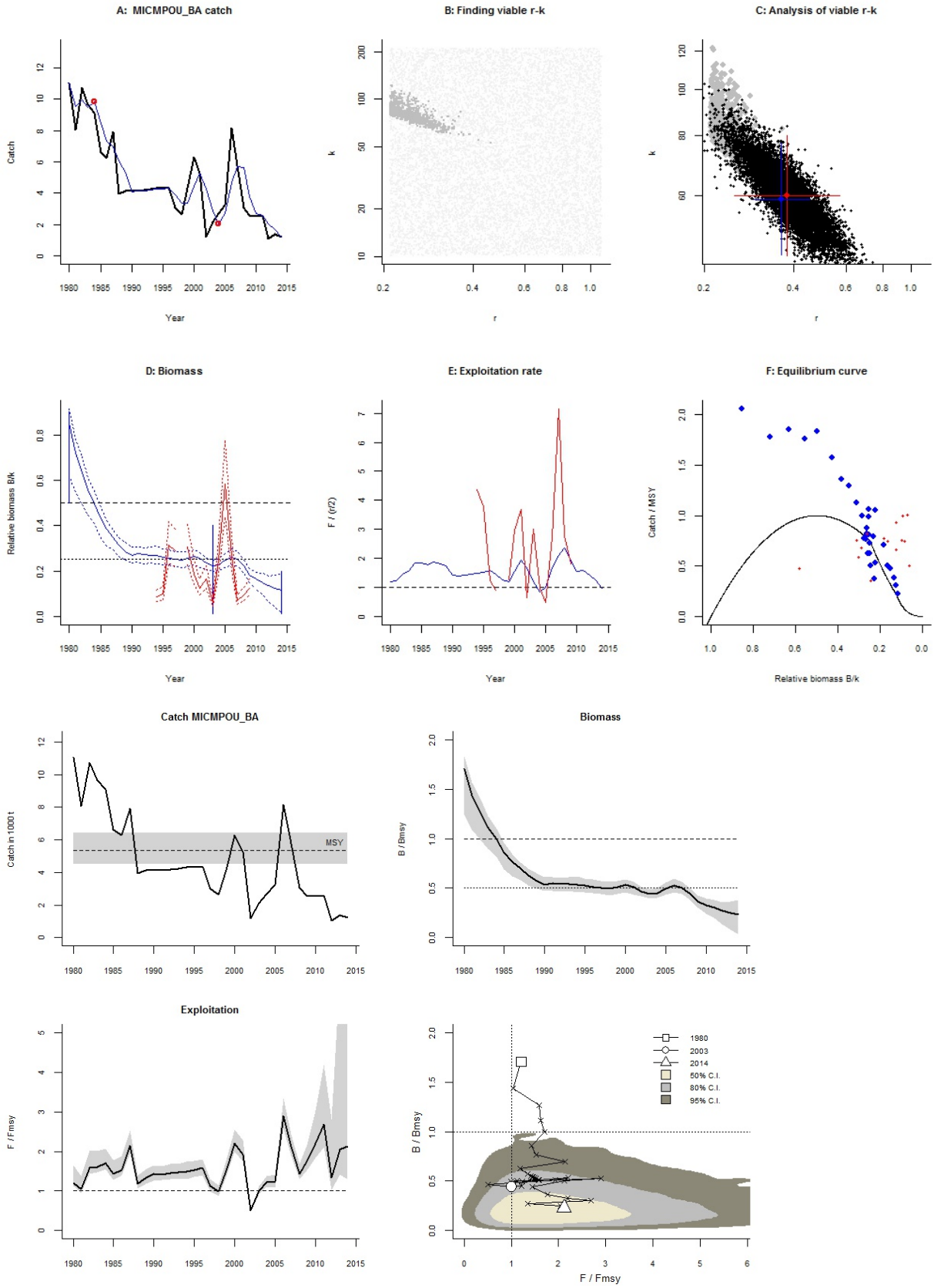
$F/F_{msy}$  = 2.12 , 2.5th perc = 1.29 , 97.5 perc = 15

Stock status and exploitation in 2014

Biomass = 6.85 ,  $B/B_{msy}$  = 0.232 , fishing mortality  $F$  = 0.178 ,  $F/F_{msy}$  = 2.12

Comment: Catch=landings from FishStat (Spain). GS: Results look ok and similar to STECF assessment

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Species: *Mullus barbatus* , stock: MULLBAR\_BA

Red mullet in Balearic

Source: Colloca et al 2013

Region: Mediterranean , Balearic

Catch data used from years 1999 - 2014 , 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 = 0.1 - 0.5 expert

Prior range for  $r$  = 0.22 - 1.2 expert, , prior range for  $k$  = 0.7 - 15.9

Prior range of  $q$  = 0.00105 - 0.00501

Results of CMSY analysis with altogether 4627 viable trajectories for 1638 r-k pairs

$r$  = 0.803 , 95% CL = 0.533 - 1.21 ,  $k$  = 3.25 , 95% CL = 1.94 - 5.44

MSY = 0.652 , 95% CL = 0.529 - 0.804

Relative biomass last year = 0.328  $k$ , 2.5th = 0.117 , 97.5th = 0.492

Exploitation  $F/(r/2)$  in last year = 1.79

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.775 , 95% CL = 0.537 - 1.12 ,  $k$  = 3.3 , 95% CL = 2.37 - 4.6

MSY = 0.64 , 95% CL = 0.543 - 0.754

Relative biomass in last year = 0.364  $k$ , 2.5th perc = 0.228 , 97.5th perc = 0.541

Exploitation  $F/(r/2)$  in last year = 1.36

$q$  = 0.00145 , lcl = 0.00105 , ucl = 0.002

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.401 , 95% CL = 0.267 - 0.604 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.401 , 95% CL = 0.267 - 0.604 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.652 , 95% CL = 0.529 - 0.804

$B_{msy}$  = 1.63 , 95% CL = 0.971 - 2.72

Biomass in last year = 1.07 , 2.5th perc = 0.38 , 97.5 perc = 1.6

$B/B_{msy}$  in last year = 0.656 , 2.5th perc = 0.233 , 97.5 perc = 0.985

Fishing mortality in last year = 0.595 , 2.5th perc = 0.396 , 97.5 perc = 1.67

$F/F_{msy}$  = 1.48 , 2.5th perc = 0.987 , 97.5 perc = 4.16

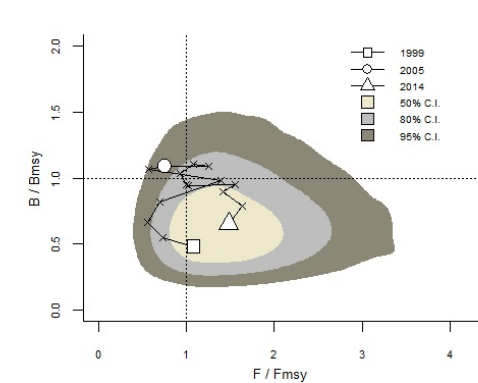
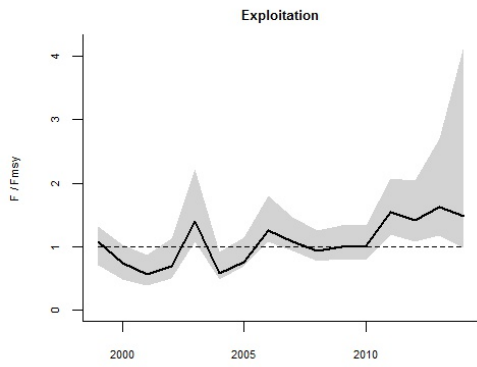
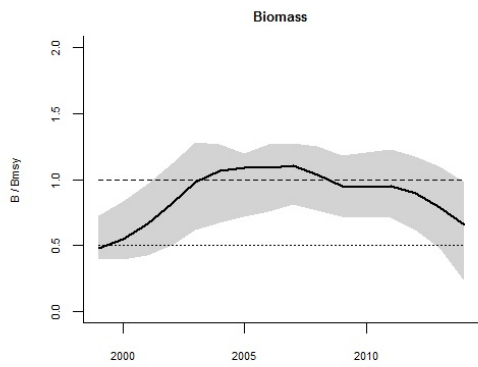
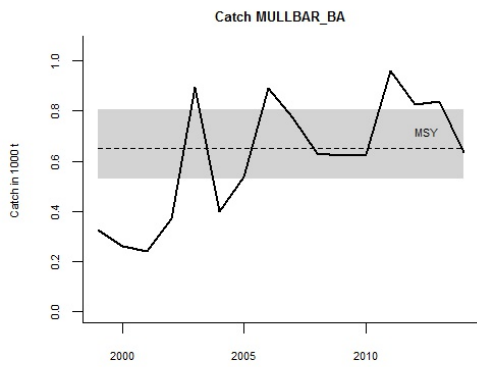
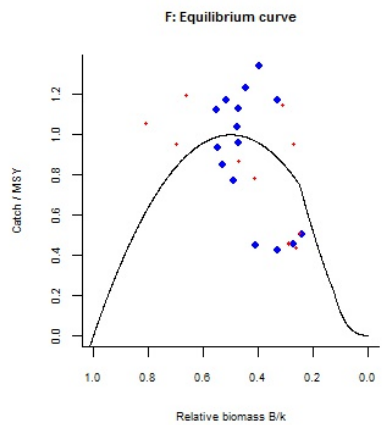
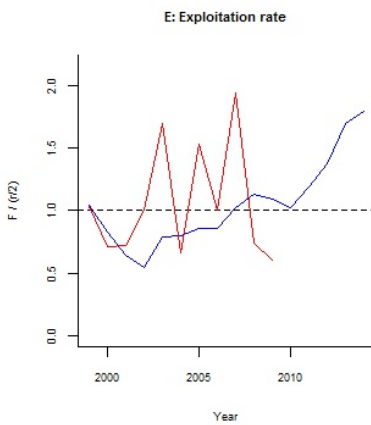
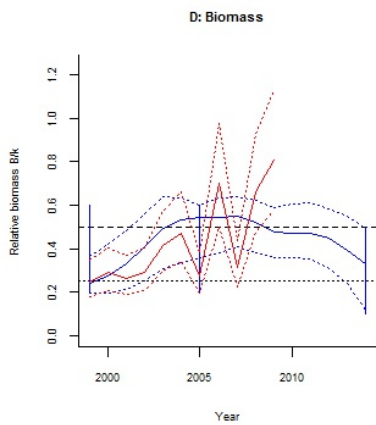
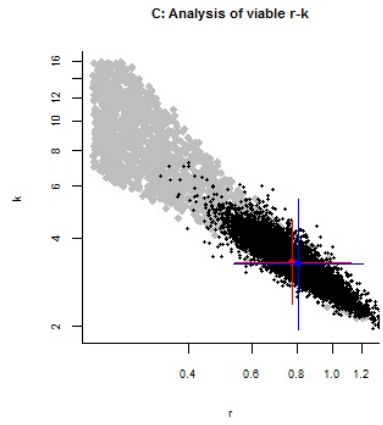
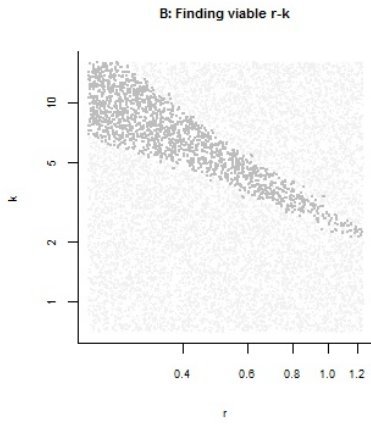
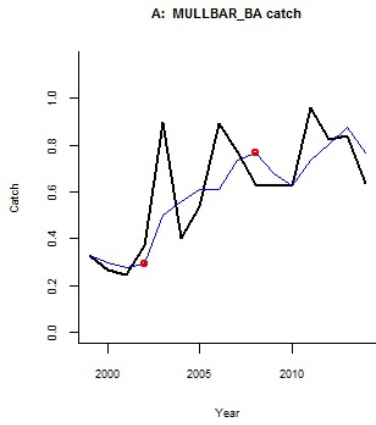
Stock status and exploitation in 2014

Biomass = 1.07 ,  $B/B_{msy}$  = 0.656 , fishing mortality  $F$  = 0.595 ,  $F/F_{msy}$  = 1.48

Comment: Catch=landings from FishStat (Spain), Biomass from Medits for GSAs 1-6. RF final 0.1-0.5.

GS OK

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Species: *Mullus surmuletus* , stock: MULLSUR\_BA

Surmulet in Balearic

Source: Colloca et al 2013

Region: Mediterranean , Balearic

Catch data used from years 1999 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2010 default

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.46 - 1.6 expert, , prior range for  $k$  = 0.42 - 5.77

Prior range of  $q$  = 0.00168 - 0.00624

Results of CMSY analysis with altogether 2540 viable trajectories for 1526  $r$ - $k$  pairs

$r$  = 1.16 , 95% CL = 0.865 - 1.55 ,  $k$  = 1.92 , 95% CL = 1.34 - 2.76

MSY = 0.557 , 95% CL = 0.484 - 0.641

Relative biomass last year = 0.155  $k$ , 2.5th = 0.0199 , 97.5th = 0.294

Exploitation  $F/(r/2)$  in last year = 1.28

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 1.01 , 95% CL = 0.802 - 1.28 ,  $k$  = 2.24 , 95% CL = 1.75 - 2.87

MSY = 0.567 , 95% CL = 0.509 - 0.631

Relative biomass in last year = 0.245  $k$ , 2.5th perc = 0.0913 , 97.5th perc = 0.366

Exploitation  $F/(r/2)$  in last year = 0.829

$q$  = 0.00269 , lcl = 0.00206 , ucl = 0.0035

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.579 , 95% CL = 0.433 - 0.776 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.358 , 95% CL = 0.268 - 0.48 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.557 , 95% CL = 0.484 - 0.641

$B_{msy}$  = 0.961 , 95% CL = 0.668 - 1.38

Biomass in last year = 0.297 , 2.5th perc = 0.0383 , 97.5 perc = 0.566

$B/B_{msy}$  in last year = 0.309 , 2.5th perc = 0.0398 , 97.5 perc = 0.589

Fishing mortality in last year = 0.774 , 2.5th perc = 0.407 , 97.5 perc = 6.01

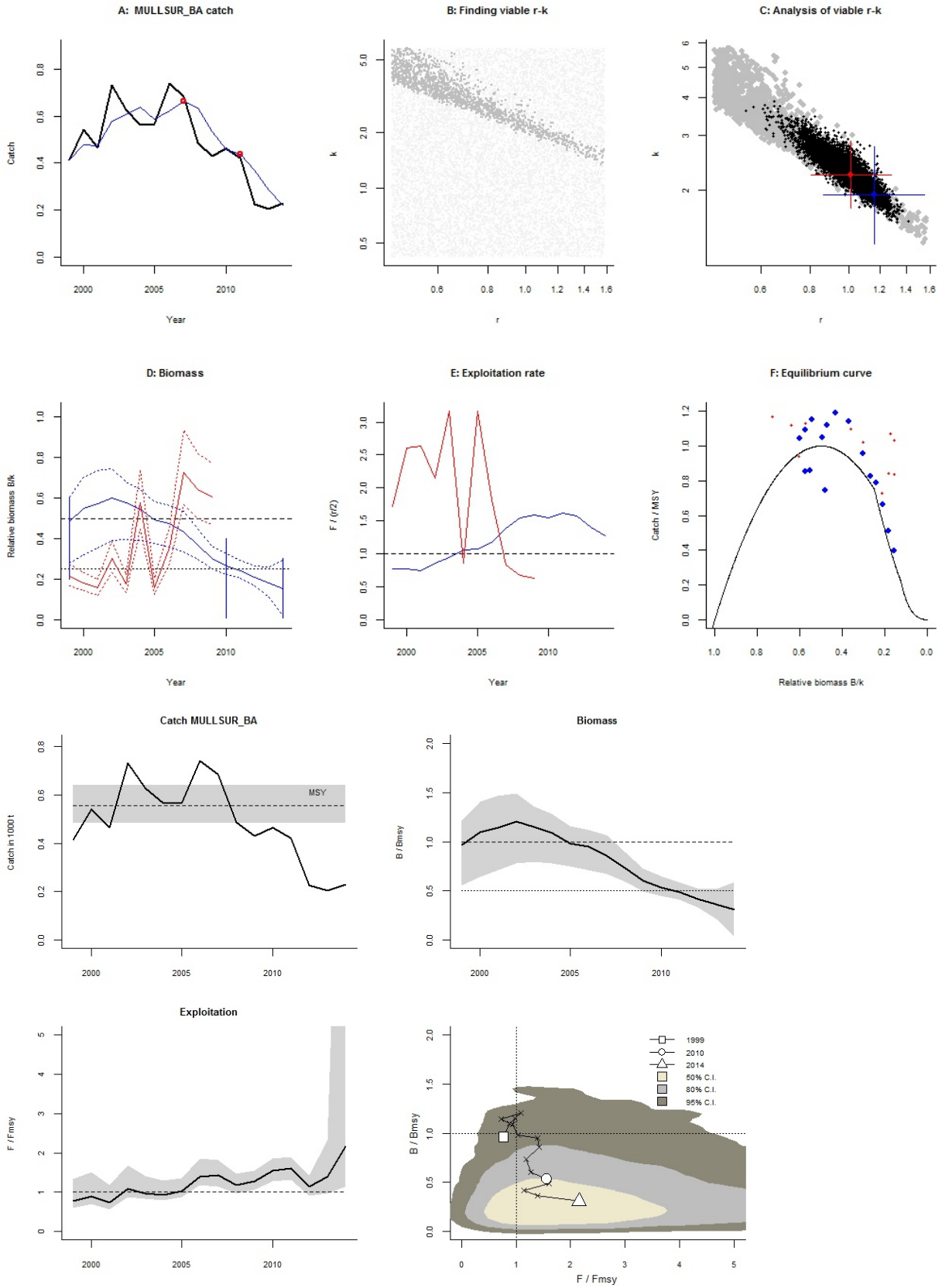
$F/F_{msy}$  = 2.16 , 2.5th perc = 1.13 , 97.5 perc = 16.8

Stock status and exploitation in 2014

Biomass = 0.297 ,  $B/B_{msy}$  = 0.309 , fishing mortality  $F$  = 0.774 ,  $F/F_{msy}$  = 2.16

Comment: Catch=landings from FishStat (Spain). RF final 0.3. GS OK

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Species: *Nephrops norvegicus* , stock: NEPRNOR\_BA  
Norway lobster in Balearic  
Source: excel  
Region: Mediterranean , Balearic  
Catch data used from years 1970 - 2014 , abundance = CPUE  
Prior initial relative biomass = 0.01 - 0.4 expert  
Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert  
Prior final relative biomass = 0.01 - 0.4 expert  
Prior range for r = 0.2 - 0.8 default , prior range for k = 1.01 - 16.2  
Prior range of q = 0.00167 - 0.00669

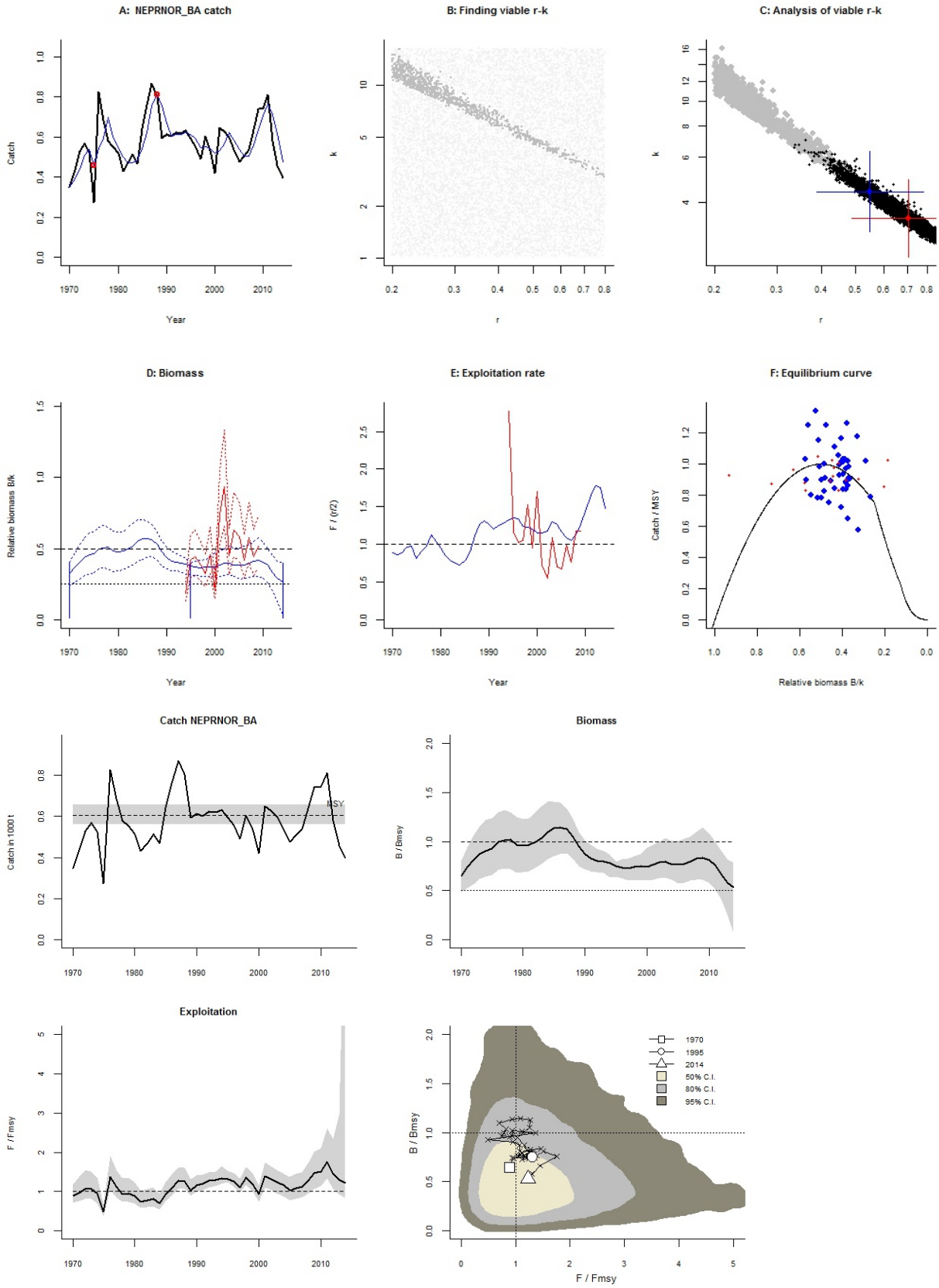
Results of CMSY analysis with altogether 1173 viable trajectories for 879 r-k pairs  
r = 0.55 , 95% CL = 0.388 - 0.78 , k = 4.4 , 95% CL = 3.05 - 6.34  
MSY = 0.605 , 95% CL = 0.559 - 0.655  
Relative biomass last year = 0.267 k, 2.5th = 0.0343 , 97.5th = 0.395  
Exploitation F/(r/2) in last year = 1.48

Results from Bayesian Schaefer model using catch & CPUE  
r = 0.707 , 95% CL = 0.489 - 1.02 , k = 3.45 , 95% CL = 2.43 - 4.9  
MSY = 0.609 , 95% CL = 0.569 - 0.652  
Relative biomass in last year = 0.393 k, 2.5th perc = 0.184 , 97.5th perc = 0.492  
Exploitation F/(r/2) in last year = 0.83  
q = 0.00285 , lcl = 0.00217 , ucl = 0.00374

Results for Management (based on CMSY analysis)  
Fmsy = 0.275 , 95% CL = 0.194 - 0.39 (if B > 1/2 Bmsy then Fmsy = 0.5 r)  
Fmsy = 0.275 , 95% CL = 0.194 - 0.39 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)  
MSY = 0.605 , 95% CL = 0.559 - 0.655  
Bmsy = 2.2 , 95% CL = 1.52 - 3.17  
Biomass in last year = 1.17 , 2.5th perc = 0.151 , 97.5 perc = 1.74  
B/Bmsy in last year = 0.534 , 2.5th perc = 0.0687 , 97.5 perc = 0.789  
Fishing mortality in last year = 0.338 , 2.5th perc = 0.229 , 97.5 perc = 2.63  
F/Fmsy = 1.23 , 2.5th perc = 0.832 , 97.5 perc = 9.56

Stock status and exploitation in 2014  
Biomass = 1.17 , B/Bmsy = 0.534 , fishing mortality F = 0.338 , F/Fmsy = 1.23  
Comment: Catch=landings from FishStat (Algeria, Spain, Morocco), Biomass from Medits for GSAs 1-6.  
GS OK

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Species: *Pagellus erythrinus* , stock: PAGEERY\_BA

Common pandora in Balearic

Source:

Region: Mediterranean , Balearic

Catch data used from years 1995 - 2014 , 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 = 0.2 - 0.6 expert

Prior range for  $r$  = 0.22 - 0.97 expert, , prior range for  $k$  = 2.48 - 43.8

Prior range of  $q$  = 0.000283 - 0.00119

Results of CMSY analysis with altogether 6697 viable trajectories for 1745 r-k pairs

$r$  = 0.67 , 95% CL = 0.472 - 0.953 ,  $k$  = 12.4 , 95% CL = 7.77 - 19.9

MSY = 2.08 , 95% CL = 1.65 - 2.63

Relative biomass last year = 0.473  $k$ , 2.5th = 0.217 , 97.5th = 0.596

Exploitation  $F/(r/2)$  in last year = 0.993

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.992 , 95% CL = 0.707 - 1.39 ,  $k$  = 9.5 , 95% CL = 6.98 - 12.9

MSY = 2.36 , 95% CL = 2.01 - 2.76

Relative biomass in last year = 0.638  $k$ , 2.5th perc = 0.48 , 97.5th perc = 0.736

Exploitation  $F/(r/2)$  in last year = 0.603

$q$  = 0.000443 , lcl = 0.000331 , ucl = 0.000593

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.335 , 95% CL = 0.236 - 0.476 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.335 , 95% CL = 0.236 - 0.476 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 2.08 , 95% CL = 1.65 - 2.63

$B_{msy}$  = 6.22 , 95% CL = 3.89 - 9.95

Biomass in last year = 5.88 , 2.5th perc = 2.69 , 97.5 perc = 7.41

$B/B_{msy}$  in last year = 0.946 , 2.5th perc = 0.433 , 97.5 perc = 1.19

Fishing mortality in last year = 0.308 , 2.5th perc = 0.244 , 97.5 perc = 0.672

$F/F_{msy}$  = 0.918 , 2.5th perc = 0.729 , 97.5 perc = 2.01

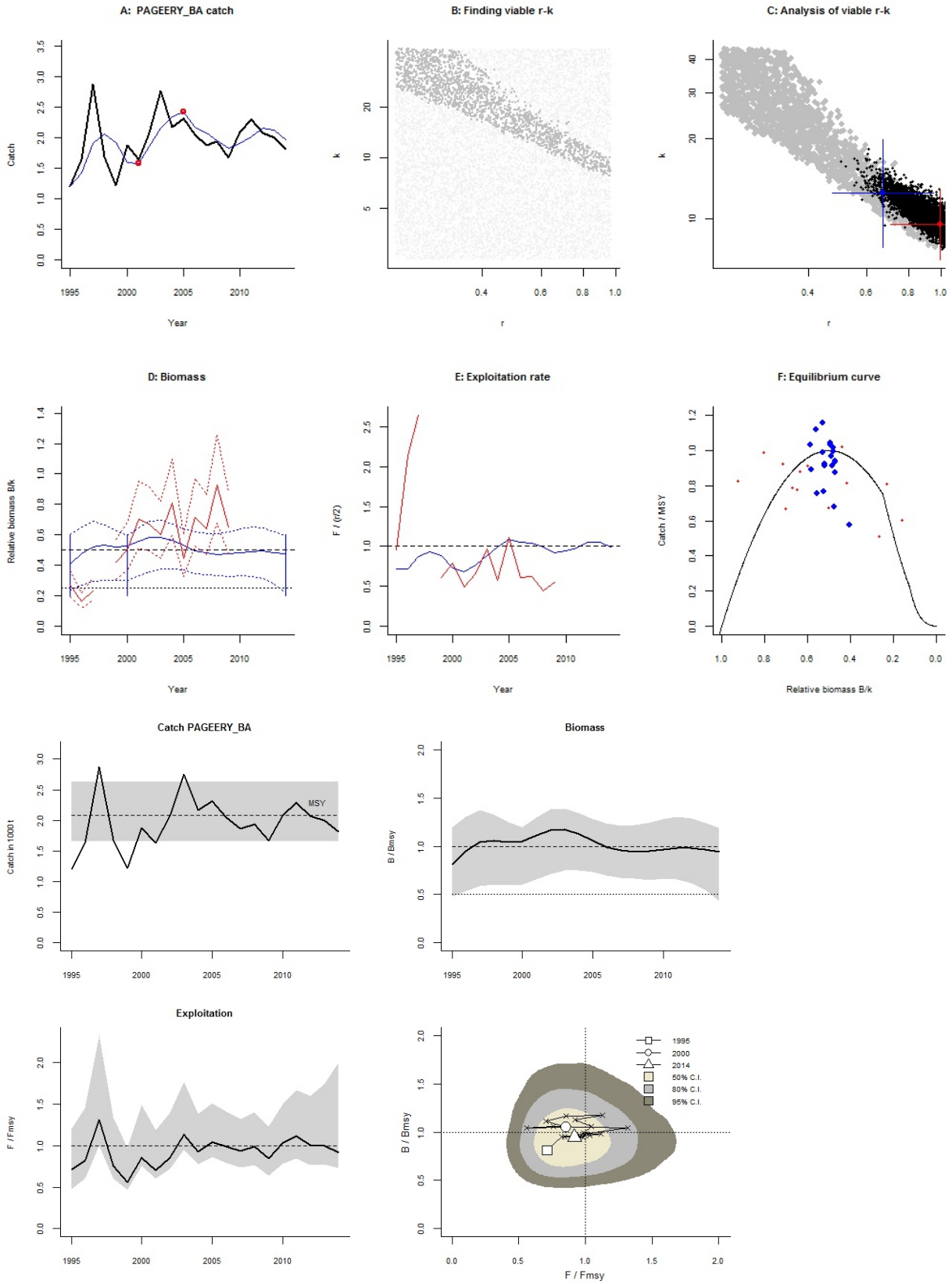
Stock status and exploitation in 2014

Biomass = 5.88 ,  $B/B_{msy}$  = 0.946 , fishing mortality  $F$  = 0.308 ,  $F/F_{msy}$  = 0.918

Comment: Catch=landings from FishStat (Algeria, Spain, Morocco).

GS OK

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Species: *Parapenaeus longirostris* , stock: PAPELON\_BA

Pink shrimp in Balearic

Source: excel

Region: Mediterranean , Balearic

Catch data used from years 1970 - 2014 , 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 - 0.3 expert

Prior range for  $r$  = 0.6 - 1.5 default , prior range for  $k$  = 2.49 - 24.9

Prior range of  $q$  = 4.85e-05 - 0.000154

Results of CMSY analysis with altogether 207 viable trajectories for 205 r-k pairs

$r$  = 0.946 , 95% CL = 0.685 - 1.31 ,  $k$  = 10.5 , 95% CL = 8.21 - 13.4

MSY = 2.48 , 95% CL = 2.11 - 2.91

Relative biomass last year = 0.125  $k$  , 2.5th = 0.0142 , 97.5th = 0.287

Exploitation  $F/(r/2)$  in last year = 1.85

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.931 , 95% CL = 0.761 - 1.14 ,  $k$  = 10.4 , 95% CL = 8.71 - 12.3

MSY = 2.41 , 95% CL = 2.26 - 2.56

Relative biomass in last year = 0.239  $k$  , 2.5th perc = 0.122 , 97.5th perc = 0.357

Exploitation  $F/(r/2)$  in last year = 0.906

$q$  = 7.3e-05 , lcl = 5.58e-05 , ucl = 9.55e-05

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.473 , 95% CL = 0.342 - 0.654 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.236 , 95% CL = 0.171 - 0.326 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 2.48 , 95% CL = 2.11 - 2.91

$B_{msy}$  = 5.24 , 95% CL = 4.11 - 6.7

Biomass in last year = 1.31 , 2.5th perc = 0.149 , 97.5 perc = 3

$B/B_{msy}$  in last year = 0.249 , 2.5th perc = 0.0284 , 97.5 perc = 0.573

Fishing mortality in last year = 0.797 , 2.5th perc = 0.347 , 97.5 perc = 7

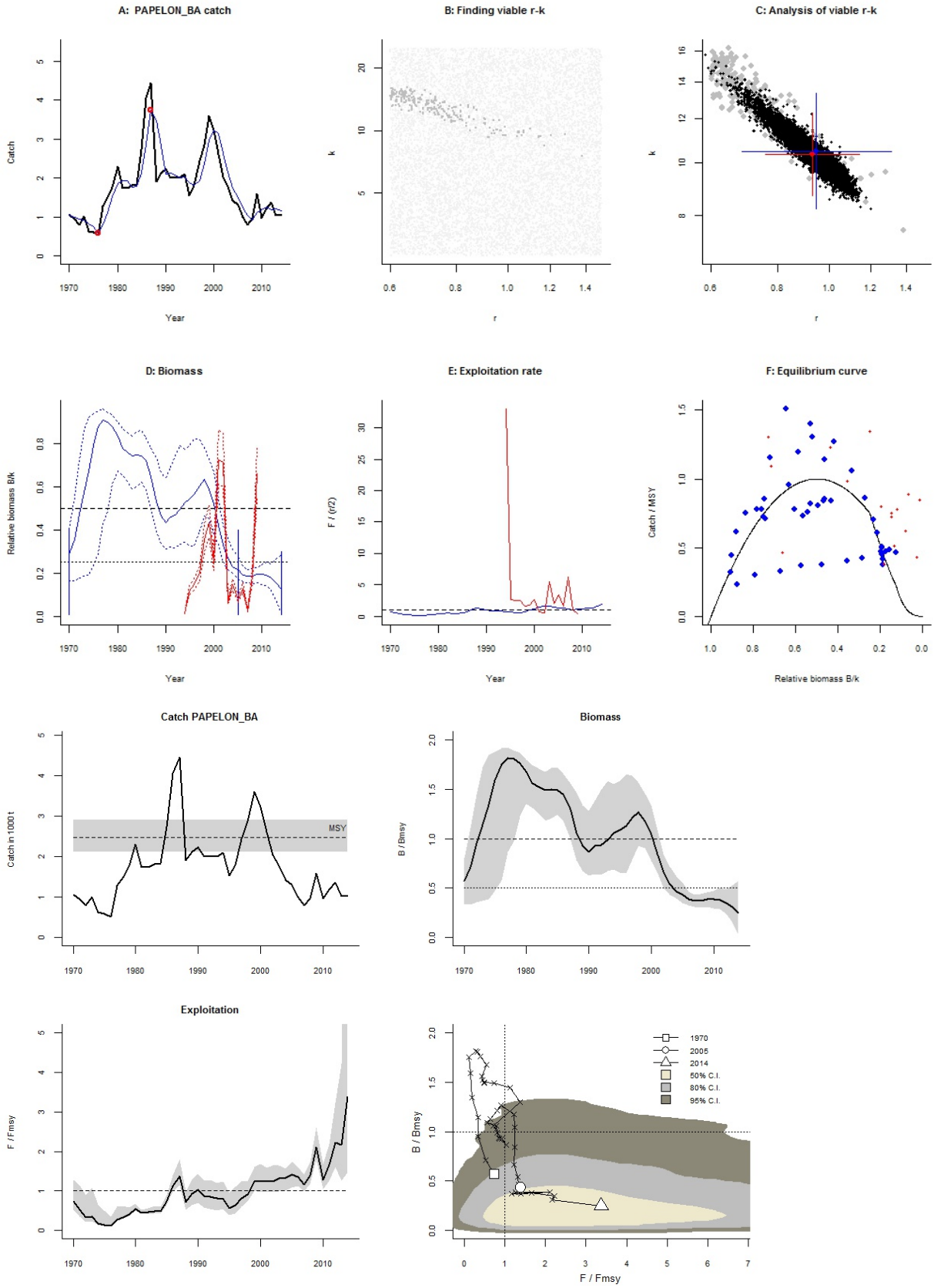
$F/F_{msy}$  = 3.38 , 2.5th perc = 1.47 , 97.5 perc = 29.7

Stock status and exploitation in 2014

Biomass = 1.31 ,  $B/B_{msy}$  = 0.249 , fishing mortality  $F$  = 0.797 ,  $F/F_{msy}$  = 3.38

Comment: Catch=landings from FishStat (Algeria, Spain), Biomass from Medits for GSAs 1-6. RF int 2005 0.01-0.4, final 0.3. GS OK

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Species: *Phycis blennoides* , stock: PHYCBLE\_BA

Greater forkbeard in Balearic

Source:

Region: Mediterranean , Balearic

Catch data used from years 1974 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1997 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.28 - 0.76 expert , , prior range for  $k$  = 1.03 - 11.2

Results of CMSY analysis with altogether 335 viable trajectories for 331 r-k pairs

$r$  = 0.419 , 95% CL = 0.334 - 0.526 ,  $k$  = 5.15 , 95% CL = 4 - 6.63

MSY = 0.54 , 95% CL = 0.423 - 0.688

Relative biomass last year = 0.222  $k$ , 2.5th = 0.0246 , 97.5th = 0.295

Exploitation  $F/(r/2)$  in last year = 1.23

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.209 , 95% CL = 0.167 - 0.263 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.186 , 95% CL = 0.148 - 0.234 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.54 , 95% CL = 0.423 - 0.688

$B_{msy}$  = 2.58 , 95% CL = 2 - 3.32

Biomass in last year = 1.15 , 2.5th perc = 0.127 , 97.5 perc = 1.52

$B/B_{msy}$  in last year = 0.445 , 2.5th perc = 0.0491 , 97.5 perc = 0.59

Fishing mortality in last year = 0.222 , 2.5th perc = 0.167 , 97.5 perc = 2.01

$F/F_{msy}$  = 1.19 , 2.5th perc = 0.898 , 97.5 perc = 10.8

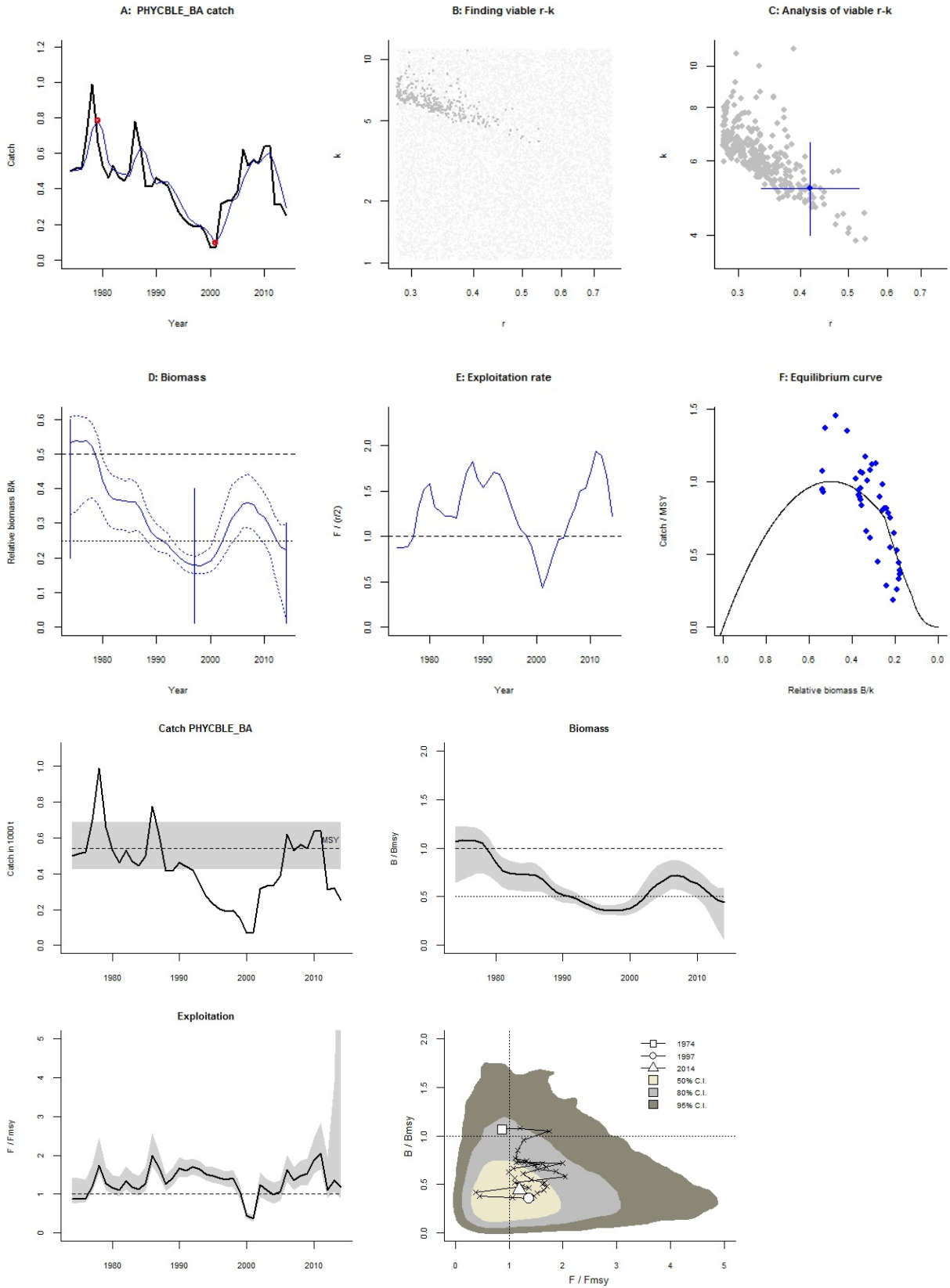
Stock status and exploitation in 2014

Biomass = 1.15 ,  $B/B_{msy}$  = 0.445 , fishing mortality  $F$  = 0.222 ,  $F/F_{msy}$  = 1.19

Comment: Catch=landings from FishStat (Algeria, Spain, Morocco). RF final 0.3

GS OK

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Species: *Sardina pilchardus* , stock: SARDPIL\_BA

Sardine in Balearic

Source: excel

Region: Mediterranean , Balearic

Catch data used from years 1990 - 2014 , 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 = 0.01 - 0.4 expert

Prior range for r = 0.27 - 1.1 expert, , prior range for k = 123 - 2001

Prior range of q = 0.0696 - 0.281

Results of CMSY analysis with altogether 2843 viable trajectories for 1952 r-k pairs

r = 0.715 , 95% CL = 0.483 - 1.06 , k = 638 , 95% CL = 437 - 931

MSY = 114 , 95% CL = 99.6 - 131

Relative biomass last year = 0.275 k, 2.5th = 0.0234 , 97.5th = 0.396

Exploitation  $F/(r/2)$  in last year = 0.982

Results from Bayesian Schaefer model using catch & CPUE

r = 0.653 , 95% CL = 0.448 - 0.951 , k = 704 , 95% CL = 493 - 1007

MSY = 115 , 95% CL = 101 - 131

Relative biomass in last year = 0.181 k, 2.5th perc = 0.0879 , 97.5th perc = 0.438

Exploitation  $F/(r/2)$  in last year = 1.59

q = 0.121 , lcl = 0.0899 , ucl = 0.163

Results for Management (based on CMSY analysis)

Fmsy = 0.358 , 95% CL = 0.242 - 0.53 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

Fmsy = 0.358 , 95% CL = 0.242 - 0.53 (r and Fmsy are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 114 , 95% CL = 99.6 - 131

Bmsy = 319 , 95% CL = 219 - 466

Biomass in last year = 175 , 2.5th perc = 14.9 , 97.5 perc = 253

B/Bmsy in last year = 0.549 , 2.5th perc = 0.0468 , 97.5 perc = 0.793

Fishing mortality in last year = 0.377 , 2.5th perc = 0.262 , 97.5 perc = 4.43

$F/F_{msy}$  = 1.06 , 2.5th perc = 0.731 , 97.5 perc = 12.4

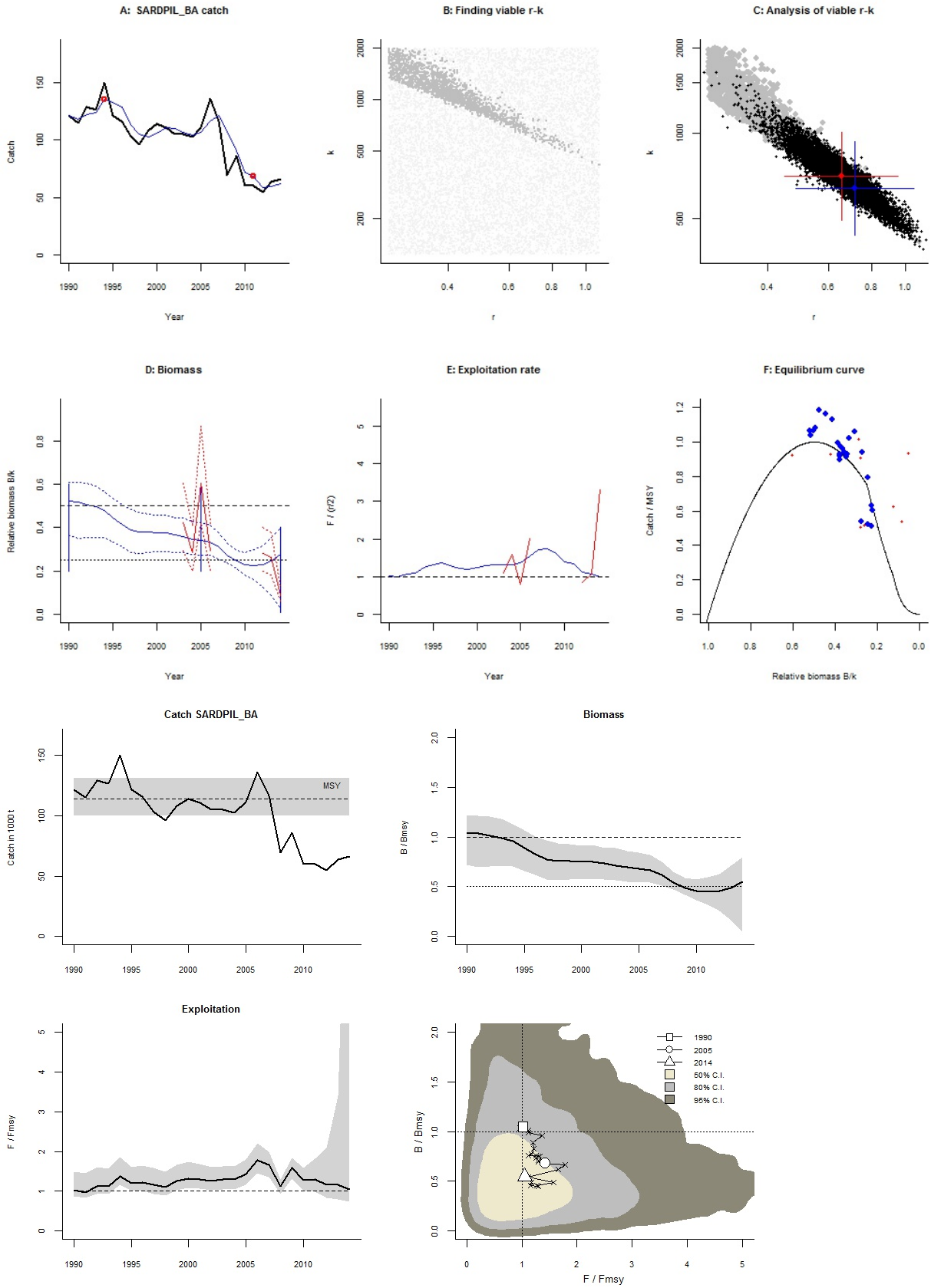
Stock status and exploitation in 2014

Biomass = 175 , B/Bmsy = 0.549 , fishing mortality  $F$  = 0.377 ,  $F/F_{msy}$  = 1.06

Comment: Catch=landings from FishStat (Spain, Morocco, Algeria, France), Average Biomass from MEDIAS for GSAs 1 & 6. RF start 1990 0.2-0.6, int 2005 0.2-0.6, final 0.4.

GS OK

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Species: *Sardinella aurita* , stock: SARIAUR\_BA

Round sardinella in Balearic

Source:

Region: Mediterranean , Balearic

Catch data used from years 1982 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2010 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.24 - 1.3 expert, , prior range for  $k$  = 30.5 - 641

Results of CMSY analysis with altogether 2021 viable trajectories for 457 r-k pairs

$r$  = 0.795 , 95% CL = 0.533 - 1.19 ,  $k$  = 128 , 95% CL = 82.1 - 201

MSY = 25.5 , 95% CL = 22.3 - 29.1

Relative biomass last year = 0.222  $k$ , 2.5th = 0.0259 , 97.5th = 0.296

Exploitation  $F/(r/2)$  in last year = 1.67

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.397 , 95% CL = 0.266 - 0.593 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.353 , 95% CL = 0.236 - 0.526 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 25.5 , 95% CL = 22.3 - 29.1

$B_{msy}$  = 64.2 , 95% CL = 41 - 100

Biomass in last year = 28.5 , 2.5th perc = 3.32 , 97.5 perc = 38

$B/B_{msy}$  in last year = 0.444 , 2.5th perc = 0.0518 , 97.5 perc = 0.593

Fishing mortality in last year = 0.567 , 2.5th perc = 0.425 , 97.5 perc = 4.86

$F/F_{msy}$  = 1.61 , 2.5th perc = 1.2 , 97.5 perc = 13.8

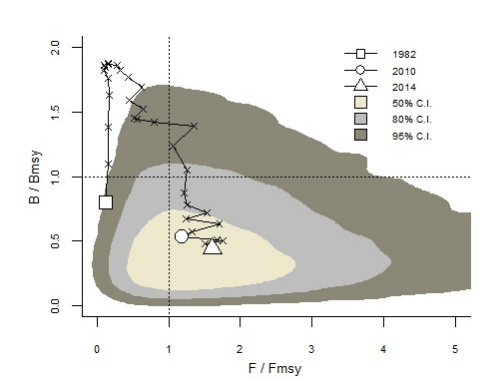
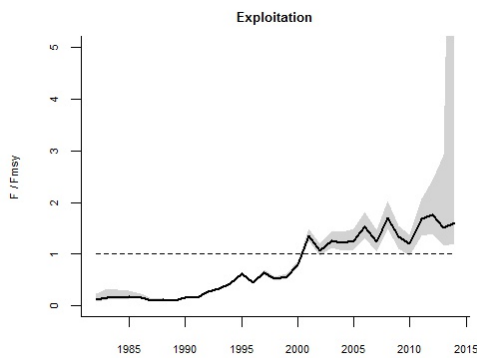
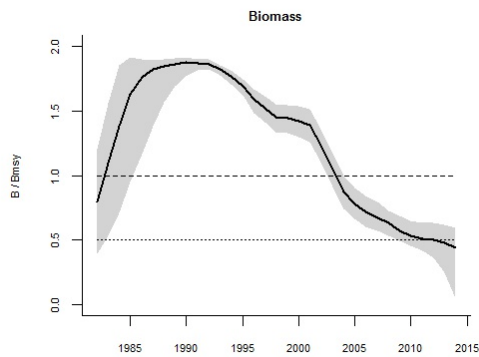
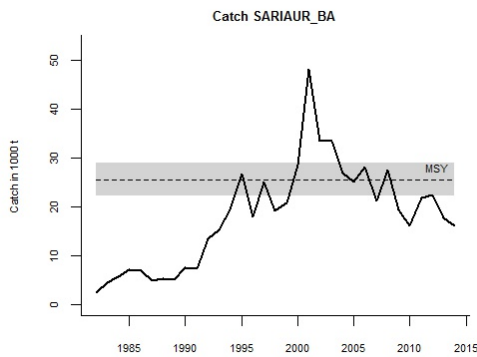
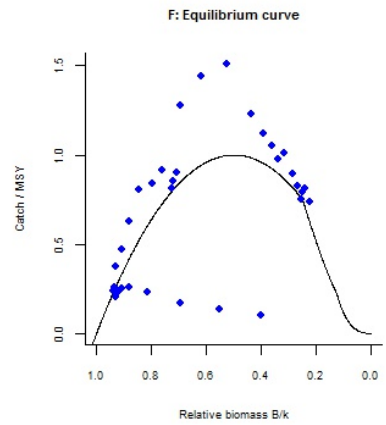
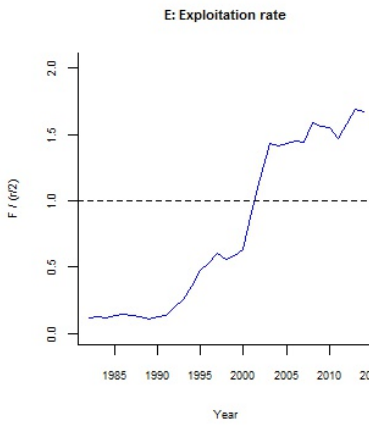
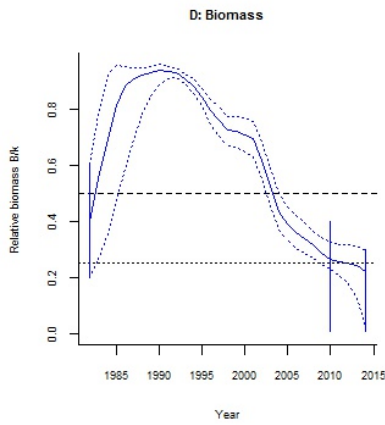
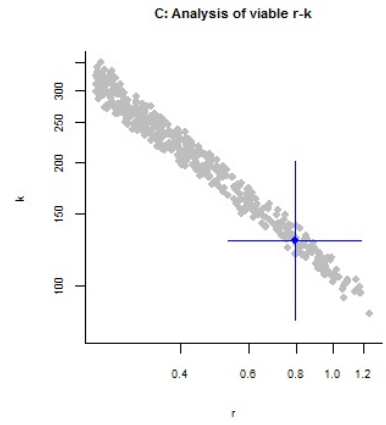
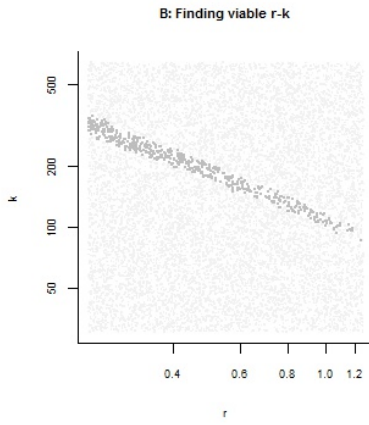
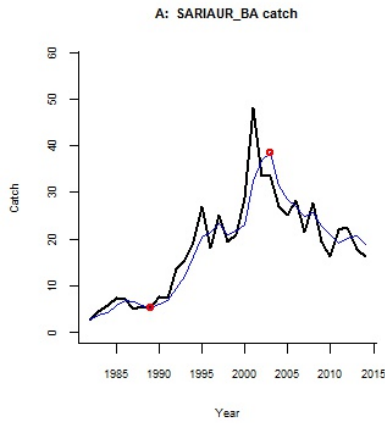
Stock status and exploitation in 2014

Biomass = 28.5 ,  $B/B_{msy}$  = 0.444 , fishing mortality  $F$  = 0.567 ,  $F/F_{msy}$  = 1.61

Comment: Catch=landings from FishStat (Algeria, Spain, Morocco). RF int 2010 0.01-0.4, final 0.01-0.3.

GS OK

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Species: *Scomber colias* , stock: SCOMPNE\_BA

Atlantic chub mackerel in Balearic

Source:

Region: Mediterranean , Balearic

Catch data used from years 1970 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.5 - 0.9 in year 2004 default

Prior final relative biomass = 0.01 - 0.4 , default

Prior range for  $r$  = 0.31 - 1.2 expert, , prior range for  $k$  = 5.9 - 89

Results of CMSY analysis with altogether 1859 viable trajectories for 563 r-k pairs

$r$  = 0.789 , 95% CL = 0.546 - 1.14 ,  $k$  = 16.2 , 95% CL = 10.5 - 24.9

MSY = 3.19 , 95% CL = 2.51 - 4.07

Relative biomass last year = 0.181  $k$ , 2.5th = 0.0166 , 97.5th = 0.394

Exploitation  $F/(r/2)$  in last year = 1.65

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.394 , 95% CL = 0.273 - 0.569 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.285 , 95% CL = 0.198 - 0.412 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 3.19 , 95% CL = 2.51 - 4.07

$B_{msy}$  = 8.1 , 95% CL = 5.26 - 12.5

Biomass in last year = 2.93 , 2.5th perc = 0.269 , 97.5 perc = 6.37

$B/B_{msy}$  in last year = 0.362 , 2.5th perc = 0.0332 , 97.5 perc = 0.787

Fishing mortality in last year = 0.813 , 2.5th perc = 0.374 , 97.5 perc = 8.87

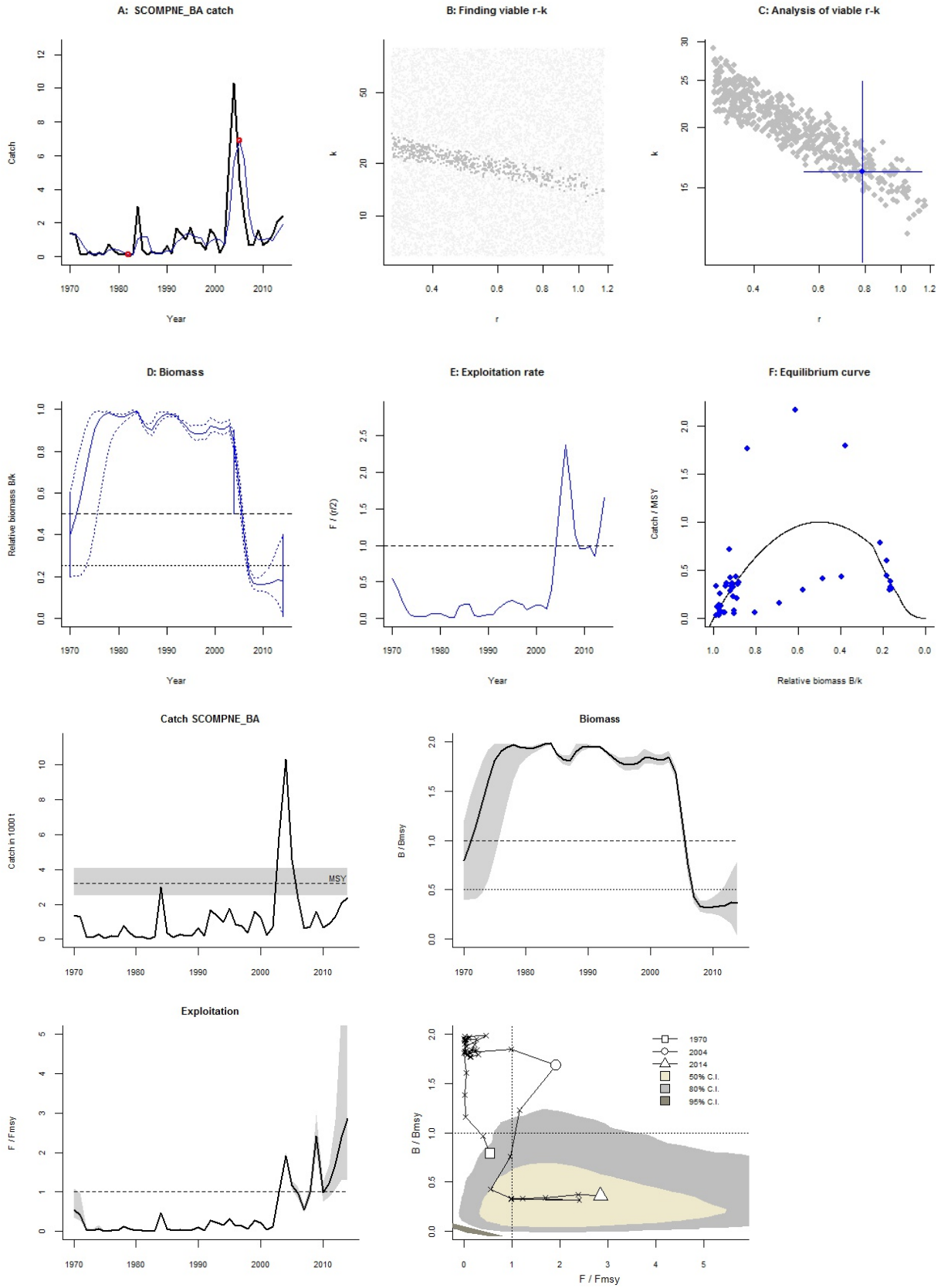
$F/F_{msy}$  = 2.85 , 2.5th perc = 1.31 , 97.5 perc = 31.1

Stock status and exploitation in 2014

Biomass = 2.93 ,  $B/B_{msy}$  = 0.362 , fishing mortality  $F$  = 0.813 ,  $F/F_{msy}$  = 2.85

Comment: Catch=landings from FishStat (Spain, Morocco). GS OK

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Species: *Scomber scombrus* , stock: SCOMSCO\_BA

Atlantic mackerel in Balearic

Source:

Region: Mediterranean , Balearic

Catch data used from years 1970 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.2 - 0.6 in year 2005 default

Prior final relative biomass = 0.1 - 0.5 expert

Prior range for  $r$  = 0.23 - 1 expert, , prior range for  $k$  = 9.84 - 171

Prior range of  $q$  = 3.98e-05 - 0.000166

Results of CMSY analysis with altogether 2724 viable trajectories for 1465 r-k pairs

$r$  = 0.377 , 95% CL = 0.231 - 0.616 ,  $k$  = 57 , 95% CL = 44.4 - 73.4

MSY = 5.38 , 95% CL = 4.47 - 6.48

Relative biomass last year = 0.162  $k$ , 2.5th = 0.103 , 97.5th = 0.331

Exploitation  $F/(r/2)$  in last year = 1.56

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.628 , 95% CL = 0.366 - 1.08 ,  $k$  = 39.1 , 95% CL = 27 - 56.7

MSY = 6.14 , 95% CL = 4.88 - 7.72

Relative biomass in last year = 0.349  $k$ , 2.5th perc = 0.103 , 97.5th perc = 0.572

Exploitation  $F/(r/2)$  in last year = 0.363

$q$  = 5.59e-05 , lcl = 4.05e-05 , ucl = 7.71e-05

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.189 , 95% CL = 0.115 - 0.308 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.122 , 95% CL = 0.0748 - 0.2 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 5.38 , 95% CL = 4.47 - 6.48

$B_{msy}$  = 28.5 , 95% CL = 22.2 - 36.7

Biomass in last year = 9.24 , 2.5th perc = 5.88 , 97.5 perc = 18.9

$B/B_{msy}$  in last year = 0.324 , 2.5th perc = 0.206 , 97.5 perc = 0.661

Fishing mortality in last year = 0.168 , 2.5th perc = 0.0824 , 97.5 perc = 0.264

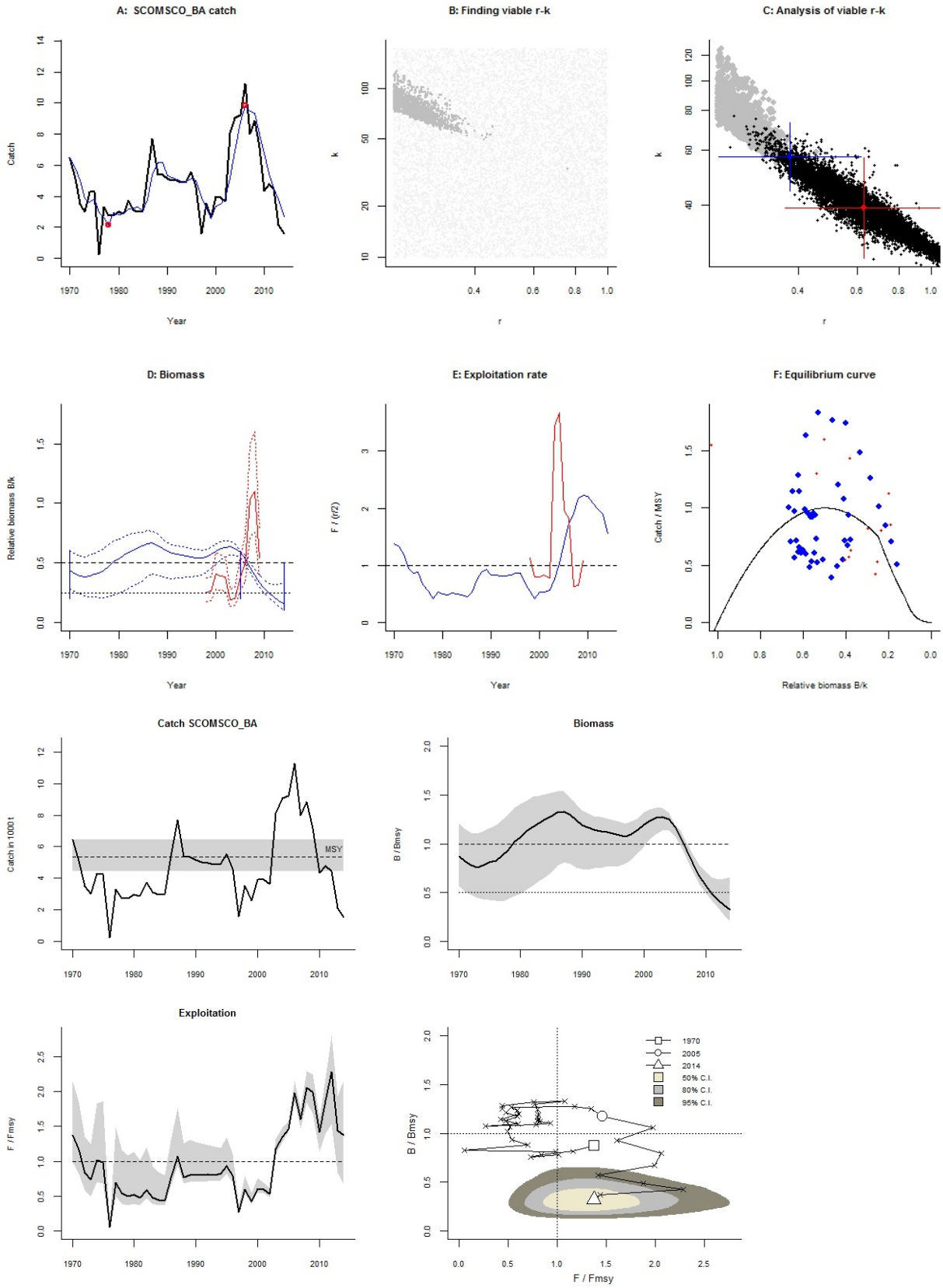
$F/F_{msy}$  = 1.38 , 2.5th perc = 0.674 , 97.5 perc = 2.16

Stock status and exploitation in 2014

Biomass = 9.24 ,  $B/B_{msy}$  = 0.324 , fishing mortality  $F$  = 0.168 ,  $F/F_{msy}$  = 1.38

Comment: Catch=landings from FishStat (Algeria, France, Spain). RF final 0.1-0.5. GS OK

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Species: *Sepia officinalis* , stock: SEPIOFF\_BA

Common cuttlefish in Balearic

Source:

Region: Mediterranean , Balearic

Catch data used from years 1989 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2010 default

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 0.699 - 11.2

Results of CMSY analysis with altogether 1030 viable trajectories for 678 r-k pairs

$r$  = 0.512 , 95% CL = 0.333 - 0.786 ,  $k$  = 3.37 , 95% CL = 2.24 - 5.08

MSY = 0.432 , 95% CL = 0.354 - 0.525

Relative biomass last year = 0.172  $k$  , 2.5th = 0.0258 , 97.5th = 0.295

Exploitation  $F/(r/2)$  in last year = 1.75

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.256 , 95% CL = 0.166 - 0.393 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.176 , 95% CL = 0.114 - 0.27 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.432 , 95% CL = 0.354 - 0.525

$B_{msy}$  = 1.69 , 95% CL = 1.12 - 2.54

Biomass in last year = 0.579 , 2.5th perc = 0.0871 , 97.5 perc = 0.995

$B/B_{msy}$  in last year = 0.343 , 2.5th perc = 0.0516 , 97.5 perc = 0.59

Fishing mortality in last year = 0.467 , 2.5th perc = 0.271 , 97.5 perc = 3.1

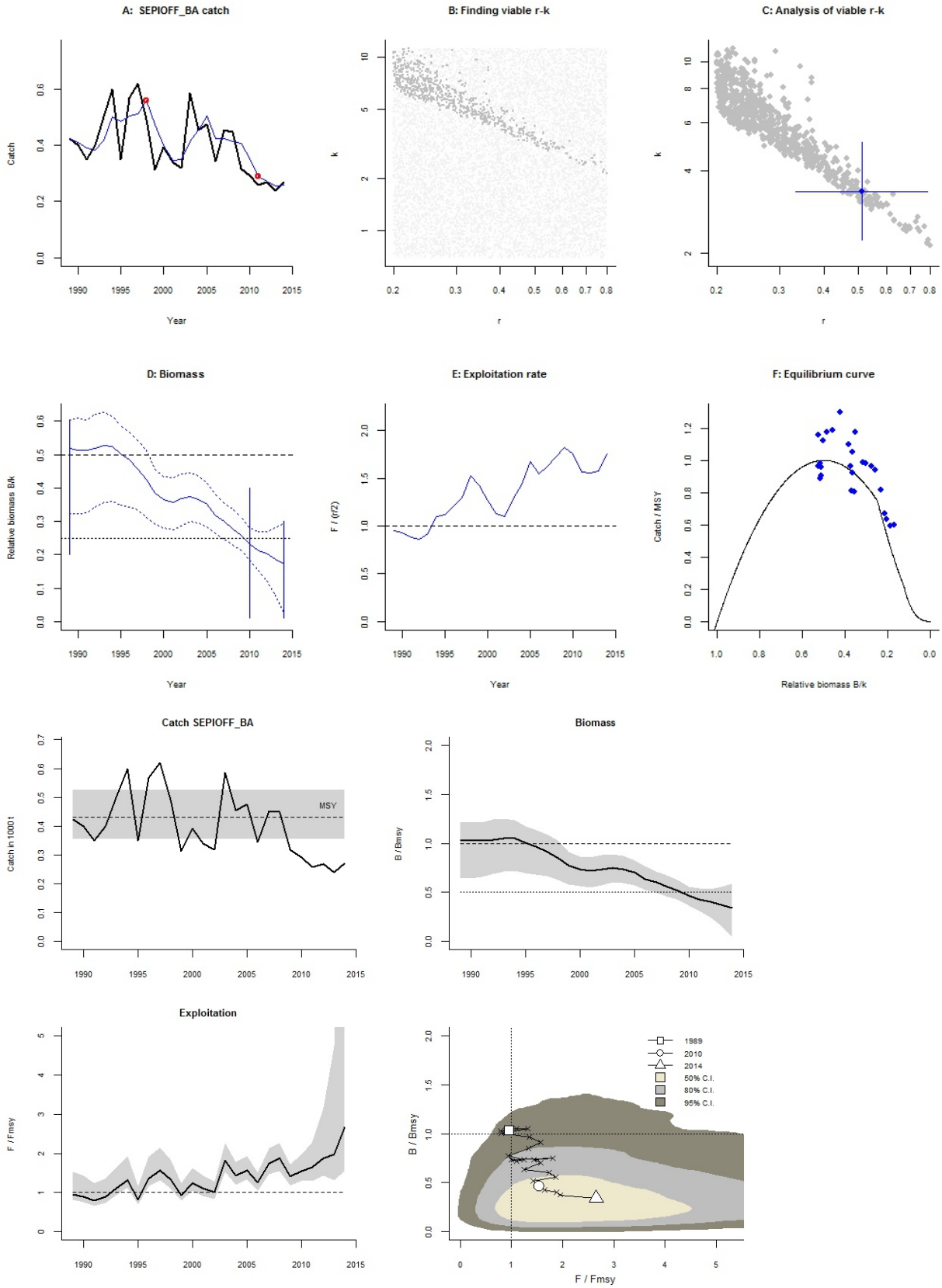
$F/F_{msy}$  = 2.66 , 2.5th perc = 1.54 , 97.5 perc = 17.7

Stock status and exploitation in 2014

Biomass = 0.579 ,  $B/B_{msy}$  = 0.343 , fishing mortality  $F$  = 0.467 ,  $F/F_{msy}$  = 2.66

Comment: Catch=landings from FishStat (Algeria). RF final 0.01-0.3. GS OK

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Species: *Solea solea* , stock: SOLEVUL\_BA

Common sole in Balearic

Source:

Region: Mediterranean , Balearic

Catch data used from years 1970 - 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 - 0.3 expert

Prior range for  $r$  = 0.21 - 1 expert, , prior range for  $k$  = 1.16 - 22.6

Prior range of  $q$  = 0.000266 - 0.00117

Results of CMSY analysis with altogether 1299 viable trajectories for 1071  $r$ - $k$  pairs

$r$  = 0.461 , 95% CL = 0.271 - 0.784 ,  $k$  = 8.41 , 95% CL = 6.23 - 11.4

MSY = 0.969 , 95% CL = 0.88 - 1.07

Relative biomass last year = 0.135  $k$ , 2.5th = 0.0117 , 97.5th = 0.289

Exploitation  $F/(r/2)$  in last year = 1.21

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.483 , 95% CL = 0.332 - 0.702 ,  $k$  = 8 , 95% CL = 5.8 - 11

MSY = 0.965 , 95% CL = 0.857 - 1.09

Relative biomass in last year = 0.219  $k$ , 2.5th perc = 0.0505 , 97.5th perc = 0.363

Exploitation  $F/(r/2)$  in last year = 0.73

$q$  = 0.000444 ,  $lcl$  = 0.000326 ,  $ucl$  = 0.000605

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.23 , 95% CL = 0.135 - 0.392 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.124 , 95% CL = 0.0728 - 0.211 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.969 , 95% CL = 0.88 - 1.07

$B_{msy}$  = 4.21 , 95% CL = 3.11 - 5.69

Biomass in last year = 1.13 , 2.5th perc = 0.0983 , 97.5 perc = 2.43

$B/B_{msy}$  in last year = 0.269 , 2.5th perc = 0.0234 , 97.5 perc = 0.578

Fishing mortality in last year = 0.272 , 2.5th perc = 0.127 , 97.5 perc = 3.13

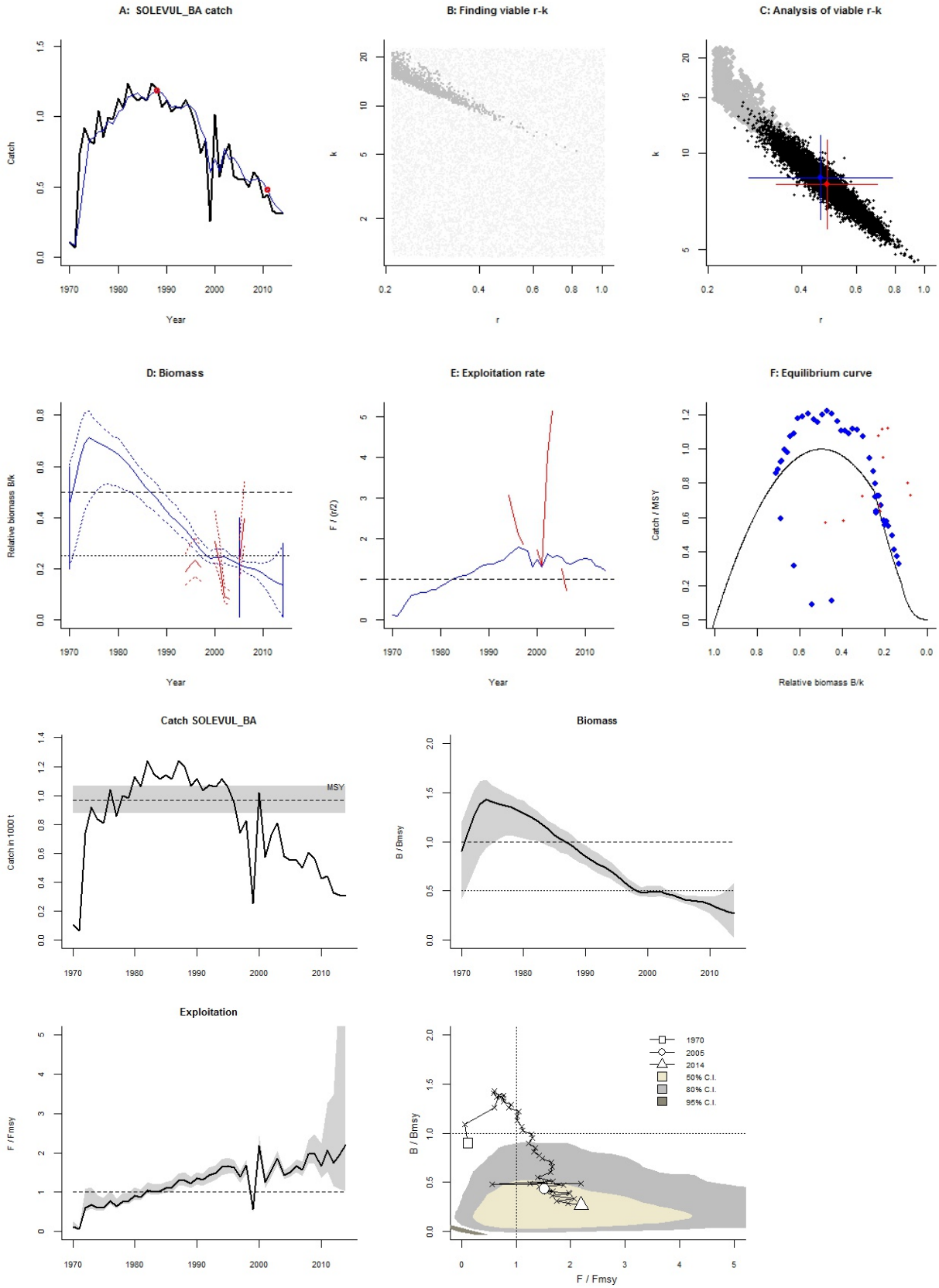
$F/F_{msy}$  = 2.19 , 2.5th perc = 1.02 , 97.5 perc = 25.3

Stock status and exploitation in 2014

Biomass = 1.13 ,  $B/B_{msy}$  = 0.269 , fishing mortality  $F$  = 0.272 ,  $F/F_{msy}$  = 2.19

Comment: Catch=landings from FishStat (Algeria, Spain, Morocco). RF int 2005 0.01-0.4, final 0.3. GS  
OK

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Species: *Trisopterus minutus* , stock: TRISLUS\_BA

Pouting in Balearic

Source:

Region: Mediterranean , Balearic

Catch data used from years 1996 - 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  $r$  = 0.37 - 1.6 expert, , prior range for  $k$  = 0.245 - 4.22

Prior range of  $q$  = 0.00409 - 0.017

Results of CMSY analysis with altogether 2017 viable trajectories for 1477 r-k pairs

$r$  = 0.741 , 95% CL = 0.496 - 1.11 ,  $k$  = 1.35 , 95% CL = 0.995 - 1.82

MSY = 0.249 , 95% CL = 0.212 - 0.294

Relative biomass last year = 0.271  $k$ , 2.5th = 0.0224 , 97.5th = 0.397

Exploitation  $F/(r/2)$  in last year = 1.48

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.666 , 95% CL = 0.426 - 1.04 ,  $k$  = 1.46 , 95% CL = 1.08 - 1.96

MSY = 0.243 , 95% CL = 0.198 - 0.297

Relative biomass in last year = 0.358  $k$ , 2.5th perc = 0.135 , 97.5th perc = 0.488

Exploitation  $F/(r/2)$  in last year = 0.834

$q$  = 0.00683 , lcl = 0.00495 , ucl = 0.00943

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.37 , 95% CL = 0.248 - 0.553 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.37 , 95% CL = 0.248 - 0.553 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.249 , 95% CL = 0.212 - 0.294

$B_{msy}$  = 0.673 , 95% CL = 0.498 - 0.911

Biomass in last year = 0.364 , 2.5th perc = 0.0302 , 97.5 perc = 0.534

$B/B_{msy}$  in last year = 0.541 , 2.5th perc = 0.0448 , 97.5 perc = 0.793

Fishing mortality in last year = 0.398 , 2.5th perc = 0.272 , 97.5 perc = 4.81

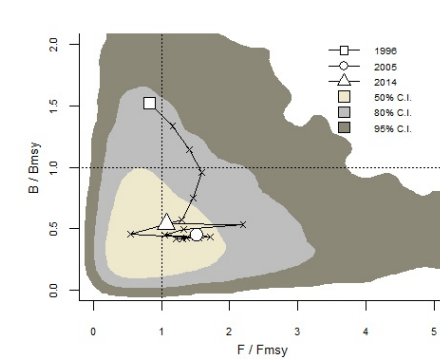
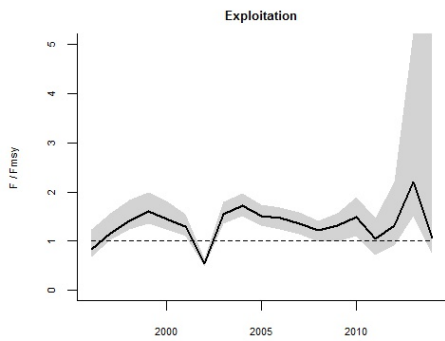
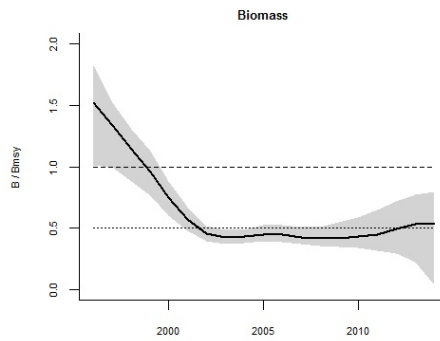
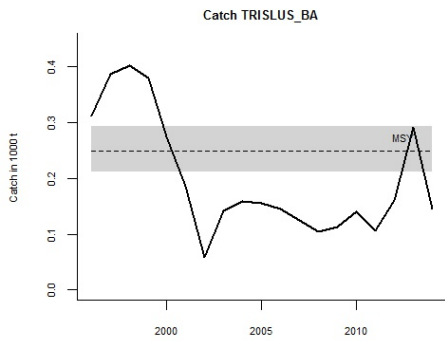
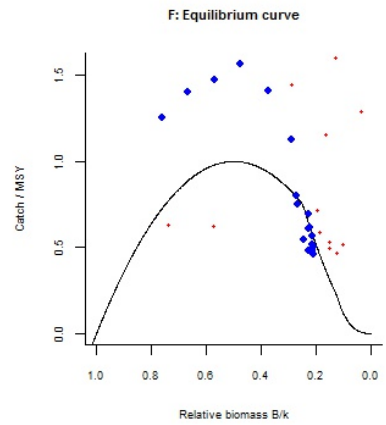
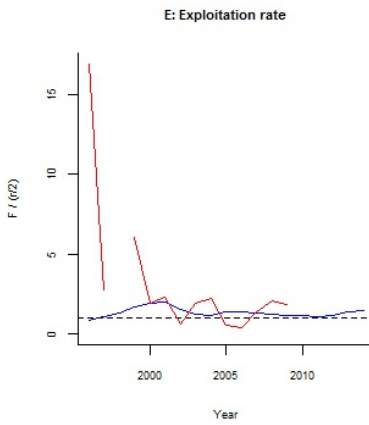
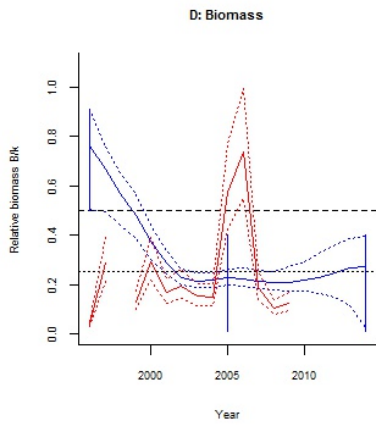
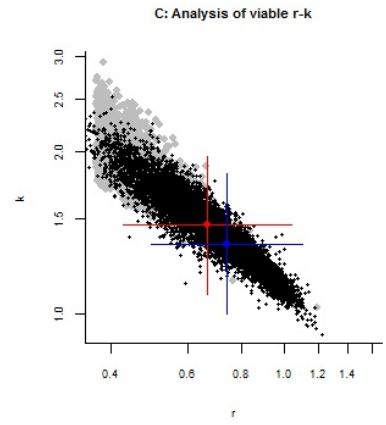
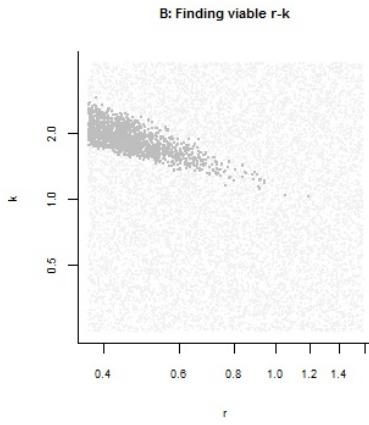
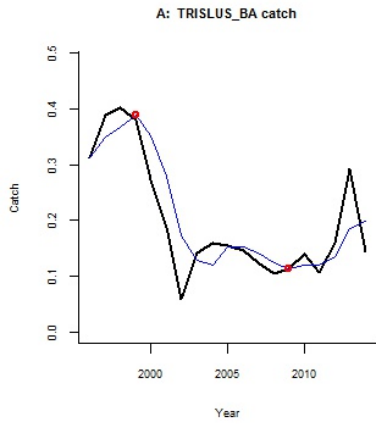
$F/F_{msy}$  = 1.07 , 2.5th perc = 0.733 , 97.5 perc = 13

Stock status and exploitation in 2014

Biomass = 0.364 ,  $B/B_{msy}$  = 0.541 , fishing mortality  $F$  = 0.398 ,  $F/F_{msy}$  = 1.07

Comment: Catch=landings from FishStat (Spain, Morocco). GS OK

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**Sardinia** (analyzed with CMSY\_O\_7l.R; see Comment for data sources)

Species: *Belone belone* , stock: BELOBEL\_SA

Garfish in Sardinia

Source:

Region: Mediterranean , Sardinia

Catch data used from years 1982 - 2014 , abundance = None

Prior initial relative biomass = 0.5 - 0.9 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  $r$  = 0.19 - 1 expert, , prior range for  $k$  = 0.391 - 8.22

Results of CMSY analysis with altogether 1772 viable trajectories for 1419 r-k pairs

$r = 0.434$  , 95% CL = 0.311 - 0.605 ,  $k = 2$  , 95% CL = 1.41 - 2.84

MSY = 0.217 , 95% CL = 0.187 - 0.252

Relative biomass last year = 0.0942  $k$ , 2.5th = 0.0125 , 97.5th = 0.267

Exploitation  $F/(r/2)$  in last year = 0.684

Results for Management (based on CMSY analysis)

$F_{msy} = 0.217$  , 95% CL = 0.156 - 0.302 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.0817$  , 95% CL = 0.0586 - 0.114 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.217 , 95% CL = 0.187 - 0.252

$B_{msy} = 1$  , 95% CL = 0.707 - 1.42

Biomass in last year = 0.189 , 2.5th perc = 0.025 , 97.5 perc = 0.534

$B/B_{msy}$  in last year = 0.188 , 2.5th perc = 0.0249 , 97.5 perc = 0.534

Fishing mortality in last year = 0.148 , 2.5th perc = 0.0524 , 97.5 perc = 1.12

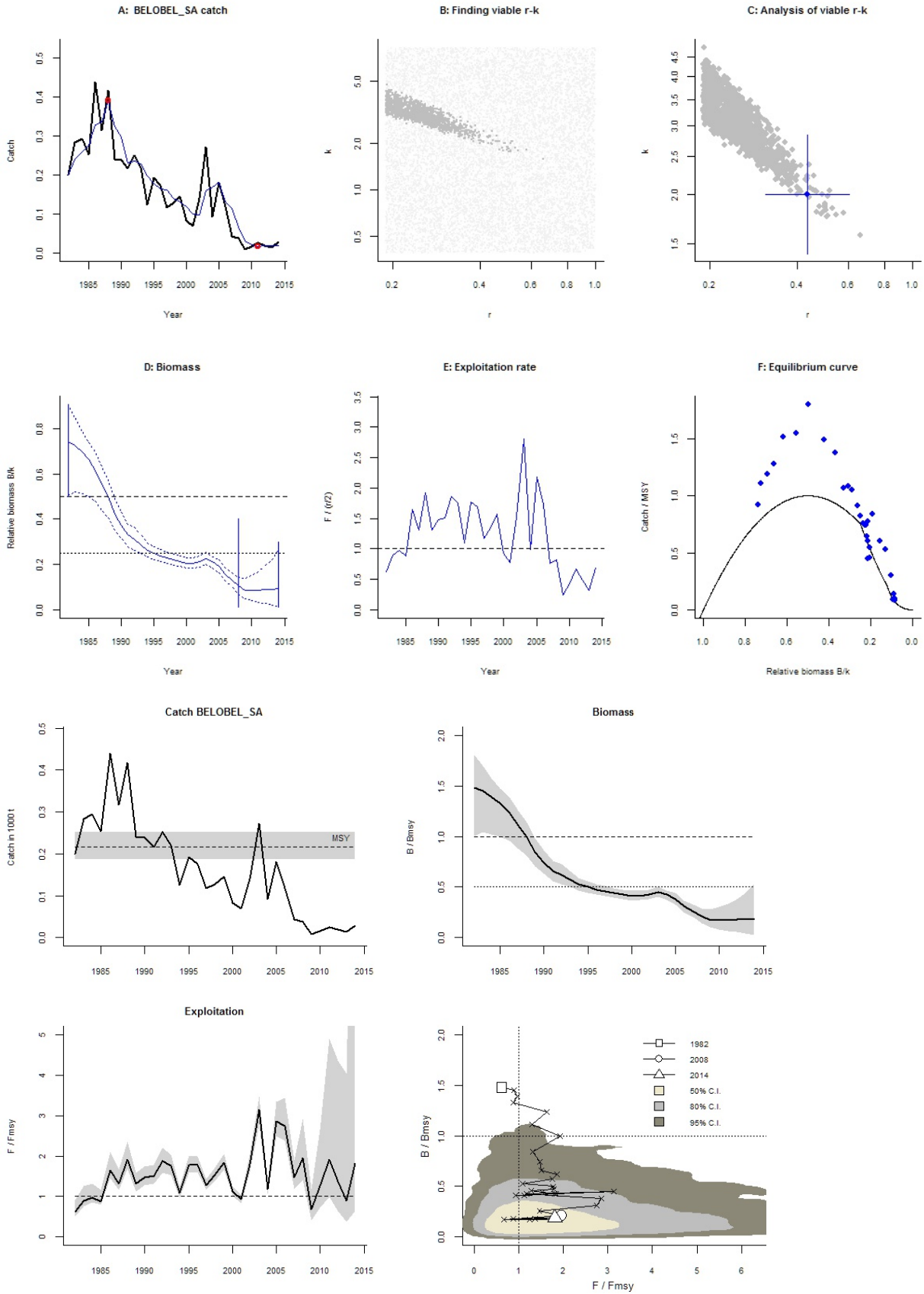
$F/F_{msy} = 1.82$  , 2.5th perc = 0.641 , 97.5 perc = 13.7

Stock status and exploitation in 2014

Biomass = 0.189 ,  $B/B_{msy} = 0.188$  , fishing mortality  $F = 0.148$  ,  $F/F_{msy} = 1.82$

Comment: Catch=landings from FishStat (Tunisia, Italy). RF int 2008 0.01-0.4, final 0.3

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Species: *Boops boops* , stock: BOOPBOO\_SA

Bogue in Sardinia

Source:

Region: Mediterranean , Sardinia

Catch data used from years 1980 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.31 - 1.1 expert, , prior range for  $k$  = 2.89 - 41.1

Results of CMSY analysis with altogether 1130 viable trajectories for 996 r-k pairs

$r$  = 0.595 , 95% CL = 0.384 - 0.922 ,  $k$  = 17.4 , 95% CL = 13.4 - 22.7

MSY = 2.59 , 95% CL = 2.36 - 2.85

Relative biomass last year = 0.143  $k$ , 2.5th = 0.0173 , 97.5th = 0.297

Exploitation  $F/(r/2)$  in last year = 1.88

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.297 , 95% CL = 0.192 - 0.461 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.171 , 95% CL = 0.11 - 0.264 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 2.59 , 95% CL = 2.36 - 2.85

$B_{msy}$  = 8.72 , 95% CL = 6.71 - 11.3

Biomass in last year = 2.5 , 2.5th perc = 0.303 , 97.5 perc = 5.18

$B/B_{msy}$  in last year = 0.287 , 2.5th perc = 0.0347 , 97.5 perc = 0.594

Fishing mortality in last year = 0.558 , 2.5th perc = 0.27 , 97.5 perc = 4.62

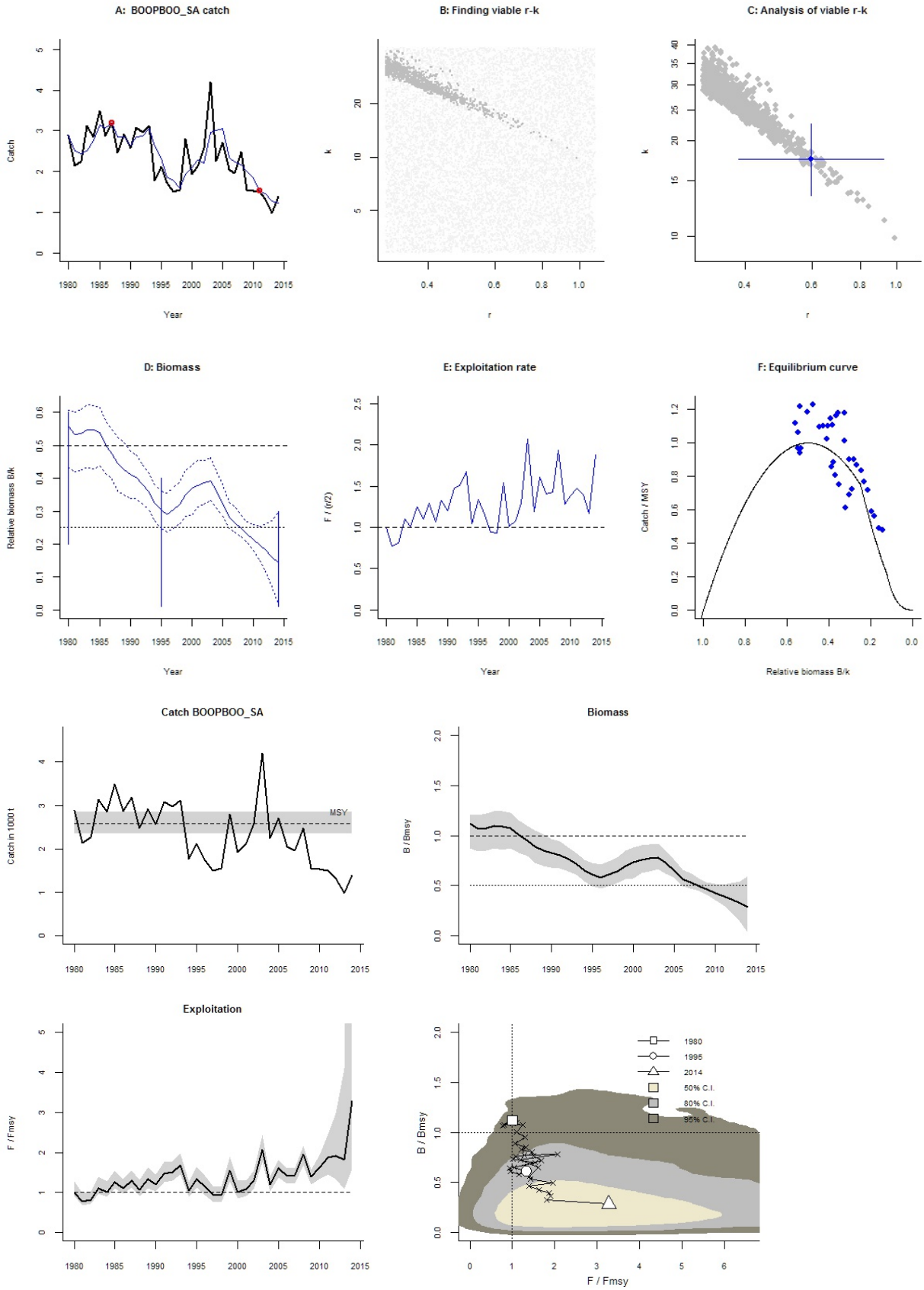
$F/F_{msy}$  = 3.27 , 2.5th perc = 1.58 , 97.5 perc = 27.1

Stock status and exploitation in 2014

Biomass = 2.5 ,  $B/B_{msy}$  = 0.287 , fishing mortality  $F$  = 0.558 ,  $F/F_{msy}$  = 3.27

Comment: Catch=landings from FishStat (Tunisia, Italy, France). RF final 0.3

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Species: *Chamelea gallina* , stock: CHAMGAL\_SA

Striped venus in Sardinia

Source:

Region: Mediterranean , Sardinia

Catch data used from years 1995 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2007 expert

Prior final relative biomass = 0.01 - 0.1 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 2.96 - 47.4

Results of CMSY analysis with altogether 2638 viable trajectories for 2158 r-k pairs

$r$  = 0.554 , 95% CL = 0.391 - 0.785 ,  $k$  = 14.6 , 95% CL = 8.34 - 25.6

MSY = 2.02 , 95% CL = 1.28 - 3.19

Relative biomass last year = 0.0462  $k$ , 2.5th = 0.0119 , 97.5th = 0.0953

Exploitation  $F/(r/2)$  in last year = 0.0589

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.277 , 95% CL = 0.196 - 0.393 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0512 , 95% CL = 0.0361 - 0.0725 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 2.02 , 95% CL = 1.28 - 3.19

$B_{msy}$  = 7.3 , 95% CL = 4.17 - 12.8

Biomass in last year = 0.674 , 2.5th perc = 0.174 , 97.5 perc = 1.39

$B/B_{msy}$  in last year = 0.0924 , 2.5th perc = 0.0238 , 97.5 perc = 0.191

Fishing mortality in last year = 0.0163 , 2.5th perc = 0.00791 , 97.5 perc = 0.0634

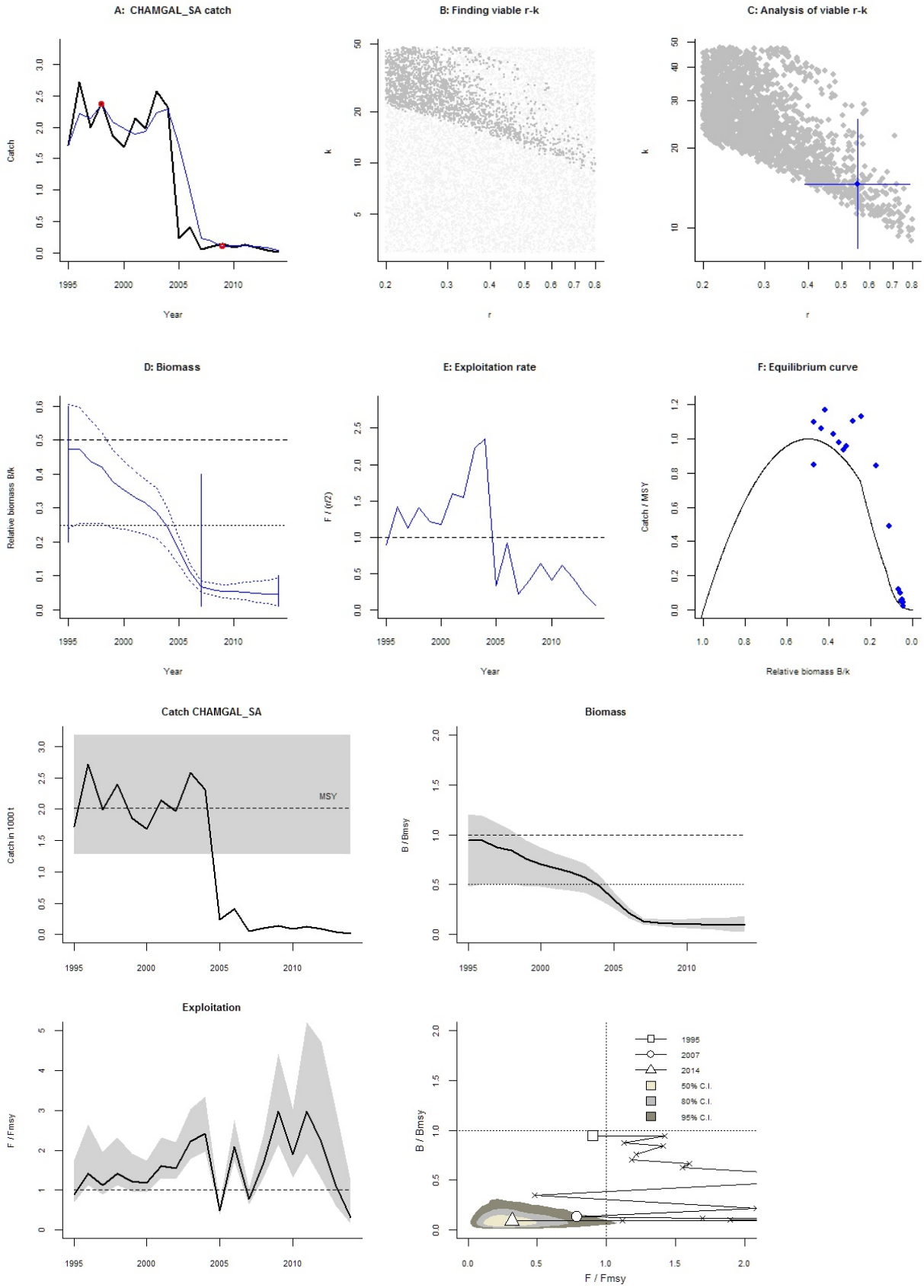
$F/F_{msy}$  = 0.319 , 2.5th perc = 0.154 , 97.5 perc = 1.24

Stock status and exploitation in 2014

Biomass = 0.674 ,  $B/B_{msy}$  = 0.0924 , fishing mortality  $F$  = 0.0163 ,  $F/F_{msy}$  = 0.319

Comment: Catch=landings from FishStat (Italy). RF start 1995 0.2-0.6, int 2007 0.01-0.4, final 0.1

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Species: *Coryphaena hippurus* , stock: CORYHIP\_SA

Common dolphinfish in Sardinia

Source:

Region: Mediterranean , Sardinia

Catch data used from years 1986 - 2014 , 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 - 0.3 expert

Prior range for  $r$  = 0.39 - 1.5 expert, , prior range for  $k$  = 0.735 - 11.6

Results of CMSY analysis with altogether 5487 viable trajectories for 927 r-k pairs

$r$  = 1.09 , 95% CL = 0.788 - 1.52 ,  $k$  = 3.16 , 95% CL = 2.09 - 4.78

MSY = 0.866 , 95% CL = 0.732 - 1.02

Relative biomass last year = 0.19  $k$ , 2.5th = 0.0194 , 97.5th = 0.296

Exploitation  $F/(r/2)$  in last year = 1.36

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.547 , 95% CL = 0.394 - 0.759 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.417 , 95% CL = 0.3 - 0.578 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.866 , 95% CL = 0.732 - 1.02

$B_{msy}$  = 1.58 , 95% CL = 1.05 - 2.39

Biomass in last year = 0.602 , 2.5th perc = 0.0614 , 97.5 perc = 0.937

$B/B_{msy}$  in last year = 0.381 , 2.5th perc = 0.0388 , 97.5 perc = 0.592

Fishing mortality in last year = 0.746 , 2.5th perc = 0.479 , 97.5 perc = 7.31

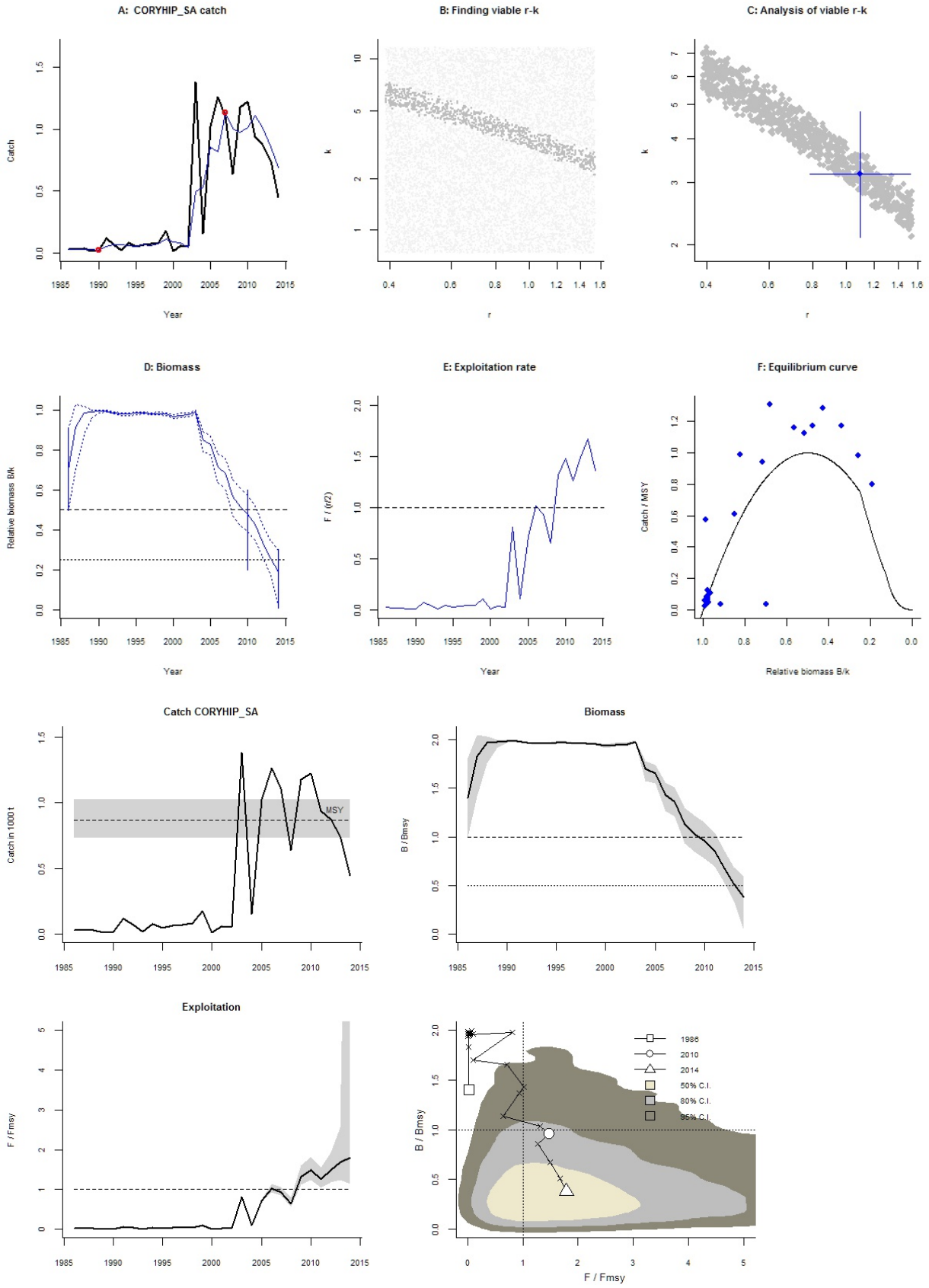
$F/F_{msy}$  = 1.79 , 2.5th perc = 1.15 , 97.5 perc = 17.6

Stock status and exploitation in 2014

Biomass = 0.602 ,  $B/B_{msy}$  = 0.381 , fishing mortality  $F$  = 0.746 ,  $F/F_{msy}$  = 1.79

Comment: Catch=landings from FishStat (Italy, Tunisia). RF start 0.5-0.9, int 2010 0.2-0.6, final 0.01-0.3

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Species: *Dentex dentex* , stock: DENTDEN\_SA

Common dentex in Sardinia

Source:

Region: Mediterranean , Sardinia

Catch data used from years 1990 - 2014 , abundance = None

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  $r$  = 0.15 - 0.73 expert, , prior range for  $k$  = 2.65 - 51.6

Results of CMSY analysis with altogether 1793 viable trajectories for 1700  $r$ - $k$  pairs

$r$  = 0.432 , 95% CL = 0.268 - 0.696 ,  $k$  = 15.1 , 95% CL = 7.11 - 31.9

MSY = 1.63 , 95% CL = 0.716 - 3.69

Relative biomass last year = 0.0963  $k$ , 2.5th = 0.012 , 97.5th = 0.289

Exploitation  $F/(r/2)$  in last year = 0.476

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.216 , 95% CL = 0.134 - 0.348 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0832 , 95% CL = 0.0516 - 0.134 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.63 , 95% CL = 0.716 - 3.69

$B_{msy}$  = 7.53 , 95% CL = 3.56 - 16

Biomass in last year = 1.45 , 2.5th perc = 0.181 , 97.5 perc = 4.36

$B/B_{msy}$  in last year = 0.193 , 2.5th perc = 0.024 , 97.5 perc = 0.579

Fishing mortality in last year = 0.103 , 2.5th perc = 0.0342 , 97.5 perc = 0.823

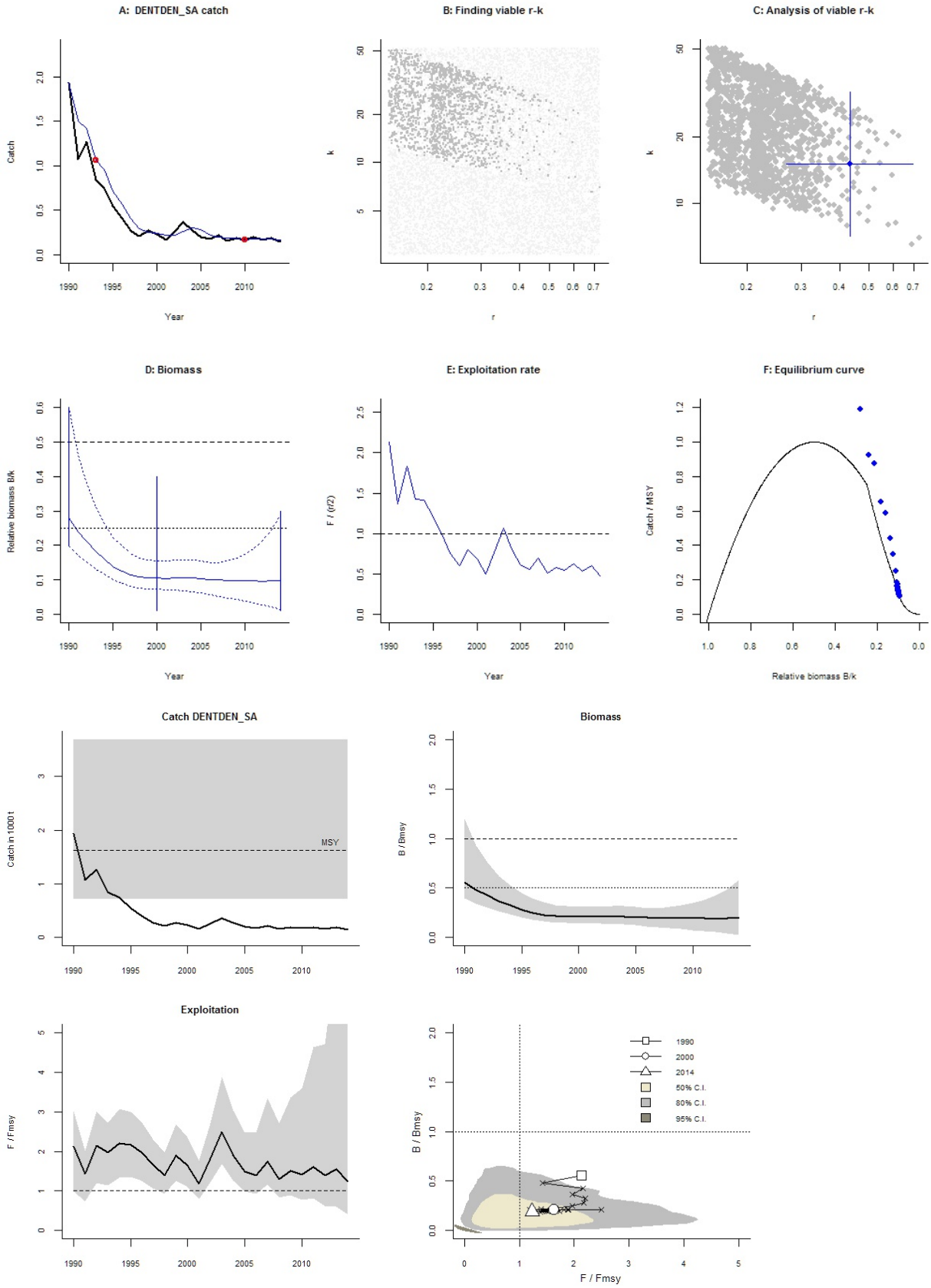
$F/F_{msy}$  = 1.23 , 2.5th perc = 0.411 , 97.5 perc = 9.9

Stock status and exploitation in 2014

Biomass = 1.45 ,  $B/B_{msy}$  = 0.193 , fishing mortality  $F$  = 0.103 ,  $F/F_{msy}$  = 1.23

Comment: Catch=landings from FishStat (Tunisia, Italy, France). RF start 1990 0.2-0.6, int 2000 0.01-0.4, final 0.3

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Species: *Engraulis encrasicolus* , stock: ENGRENC\_SA

Anchovy in Sardinia

Source: excel

Region: Mediterranean , Sardinia

Catch data used from years 1985 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2007 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.26 - 1.2 expert, , prior range for  $k$  = 13.7 - 244

Prior range of  $q$  = 0.00136 - 0.00576

Results of CMSY analysis with altogether 2037 viable trajectories for 1683 r-k pairs

$r$  = 0.522 , 95% CL = 0.401 - 0.68 ,  $k$  = 69.3 , 95% CL = 43.7 - 110

MSY = 9.04 , 95% CL = 5.58 - 14.6

Relative biomass last year = 0.141  $k$ , 2.5th = 0.0134 , 97.5th = 0.294

Exploitation  $F/(r/2)$  in last year = 2.97

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.541 , 95% CL = 0.355 - 0.824 ,  $k$  = 70.7 , 95% CL = 50.5 - 99

MSY = 9.56 , 95% CL = 7.32 - 12.5

Relative biomass in last year = 0.242  $k$ , 2.5th perc = 0.142 , 97.5th perc = 0.346

Exploitation  $F/(r/2)$  in last year = 1.64

$q$  = 0.00194 , lcl = 0.00138 , ucl = 0.00274

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.271 , 95% CL = 0.178 - 0.412 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.262 , 95% CL = 0.172 - 0.399 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 9.56 , 95% CL = 7.32 - 12.5

$B_{msy}$  = 35.4 , 95% CL = 25.2 - 49.5

Biomass in last year = 17.1 , 2.5th perc = 10 , 97.5 perc = 24.5

$B/B_{msy}$  in last year = 0.484 , 2.5th perc = 0.284 , 97.5 perc = 0.692

Fishing mortality in last year = 0.442 , 2.5th perc = 0.31 , 97.5 perc = 0.754

$F/F_{msy}$  = 1.69 , 2.5th perc = 1.18 , 97.5 perc = 2.88

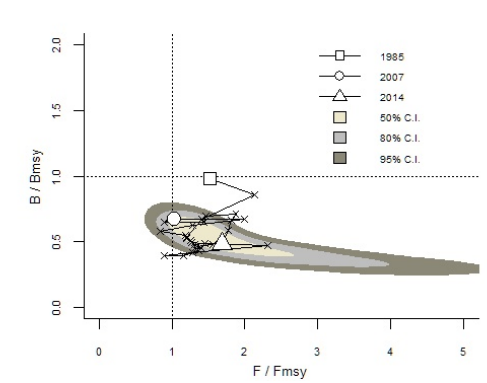
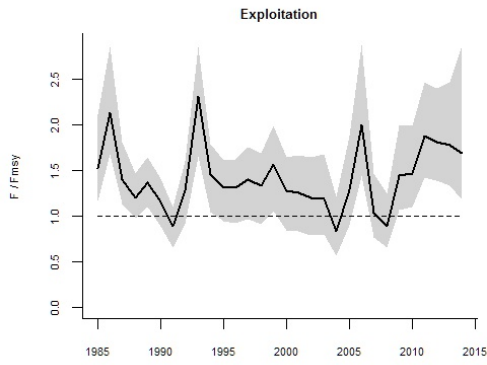
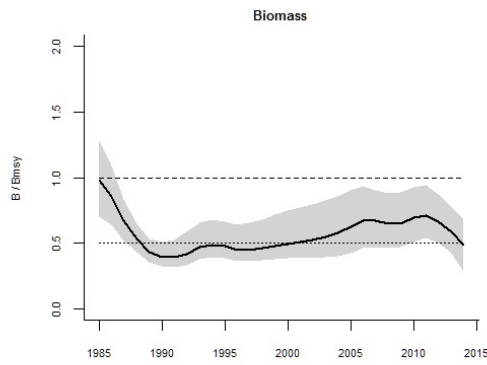
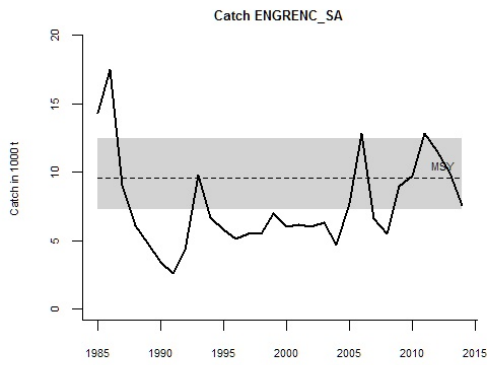
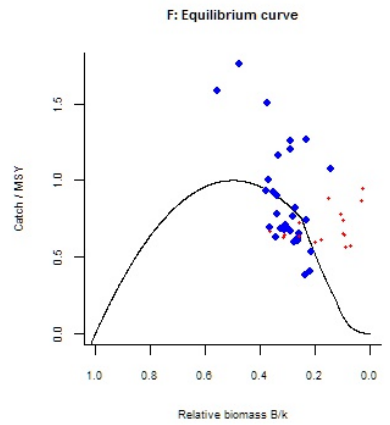
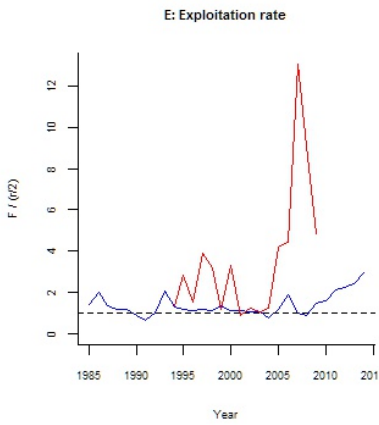
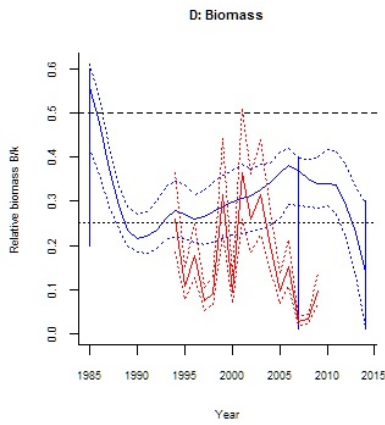
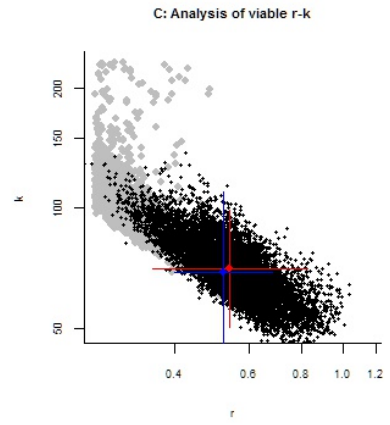
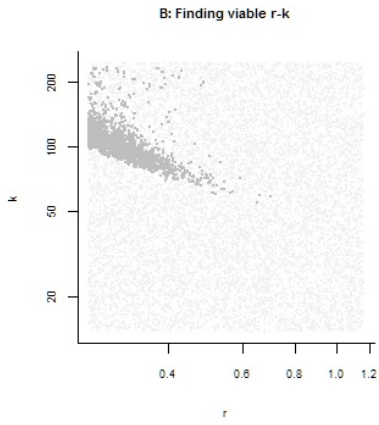
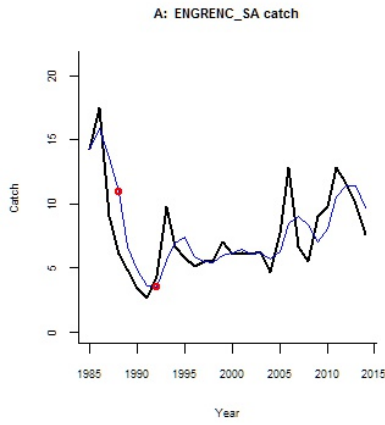
Stock status and exploitation in 2014

Biomass = 17.1 ,  $B/B_{msy}$  = 0.484 , fishing mortality  $F$  = 0.442 ,  $F/F_{msy}$  = 1.69

Comment: Catch=landings from FishStat (Tunisia, Italy, France), Biomass from MEDIAS for GSAs 8-10.

RF int 2007 0.01-0.4

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Species: *Epinephelus marginatus* , stock: EPINGUA\_SA

Dusky grouper in Sardinia

Source:

Region: Mediterranean , Sardinia

Catch data used from years 1970 - 2014 , abundance = None

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  $r$  = 0.11 - 0.57 expert, , prior range for  $k$  = 0.825 - 17.1

Results of CMSY analysis with altogether 2940 viable trajectories for 2284 r-k pairs

$r$  = 0.364 , 95% CL = 0.244 - 0.543 ,  $k$  = 3.05 , 95% CL = 1.87 - 4.96

MSY = 0.277 , 95% CL = 0.224 - 0.343

Relative biomass last year = 0.0956  $k$ , 2.5th = 0.0151 , 97.5th = 0.292

Exploitation  $F/(r/2)$  in last year = 0.905

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.182 , 95% CL = 0.122 - 0.272 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0697 , 95% CL = 0.0467 - 0.104 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.277 , 95% CL = 0.224 - 0.343

$B_{msy}$  = 1.52 , 95% CL = 0.934 - 2.48

Biomass in last year = 0.291 , 2.5th perc = 0.0461 , 97.5 perc = 0.89

$B/B_{msy}$  in last year = 0.191 , 2.5th perc = 0.0302 , 97.5 perc = 0.584

Fishing mortality in last year = 0.165 , 2.5th perc = 0.0539 , 97.5 perc = 1.04

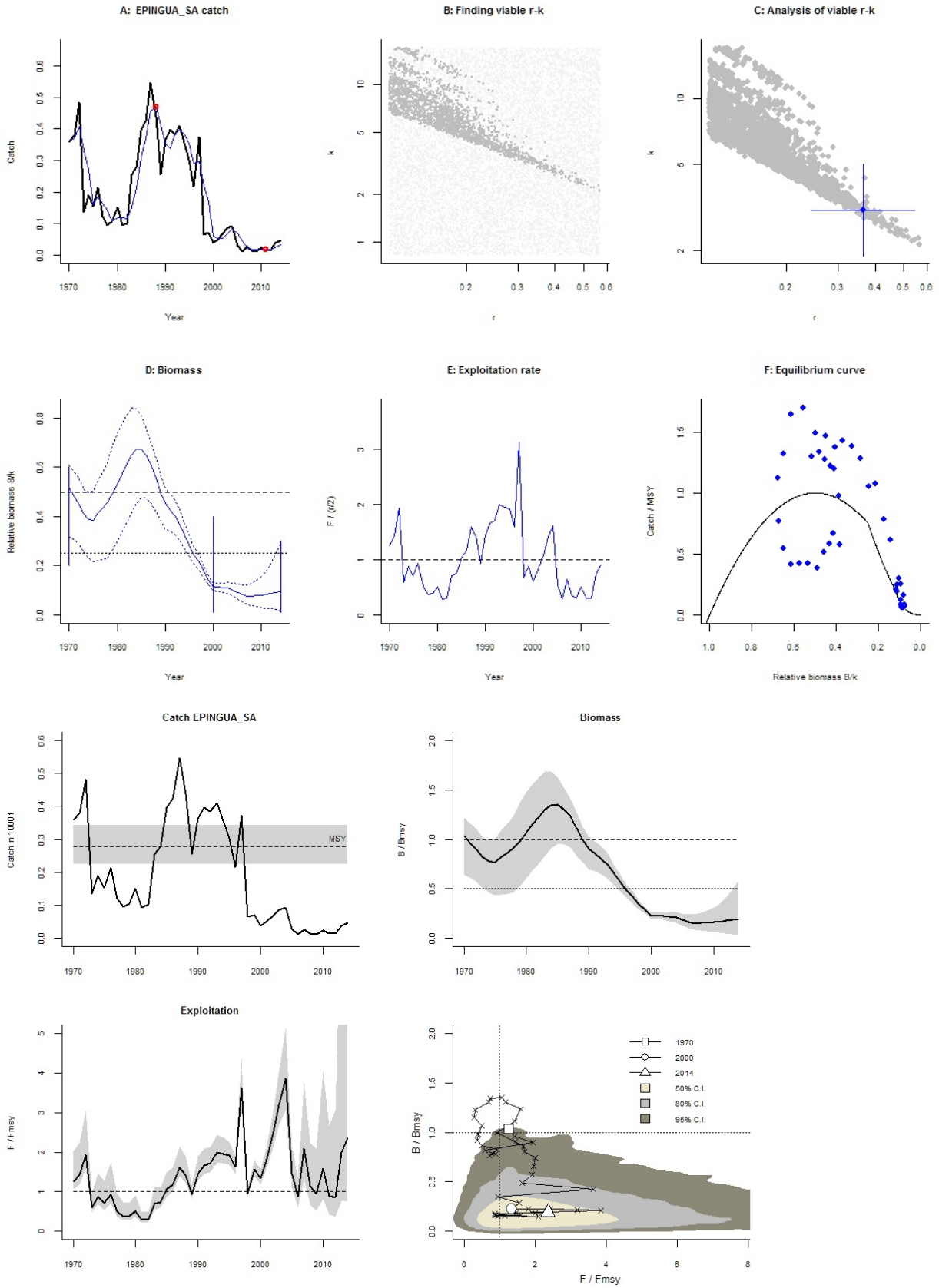
$F/F_{msy}$  = 2.37 , 2.5th perc = 0.774 , 97.5 perc = 15

Stock status and exploitation in 2014

Biomass = 0.291 ,  $B/B_{msy}$  = 0.191 , fishing mortality  $F$  = 0.165 ,  $F/F_{msy}$  = 2.37

Comment: Catch=landings from FishStat (Italy). RF int 2000 0.01-0.4, final 0.3

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Species: *Illex coindettii* , stock: ILLECOI\_SA

Shortfin squid in Sardinia

Source:

Region: Mediterranean , Sardinia

Catch data used from years 1970 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2002 default

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 1.96 - 31.4

Results of CMSY analysis with altogether 2005 viable trajectories for 1548 r-k pairs

$r$  = 0.393 , 95% CL = 0.262 - 0.589 ,  $k$  = 10.1 , 95% CL = 7.77 - 13.1

MSY = 0.99 , 95% CL = 0.903 - 1.09

Relative biomass last year = 0.294  $k$ , 2.5th = 0.0413 , 97.5th = 0.394

Exploitation  $F/(r/2)$  in last year = 1.07

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.196 , 95% CL = 0.131 - 0.295 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.196 , 95% CL = 0.131 - 0.295 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.99 , 95% CL = 0.903 - 1.09

$B_{msy}$  = 5.05 , 95% CL = 3.89 - 6.55

Biomass in last year = 2.97 , 2.5th perc = 0.417 , 97.5 perc = 3.98

$B/B_{msy}$  in last year = 0.589 , 2.5th perc = 0.0826 , 97.5 perc = 0.789

Fishing mortality in last year = 0.21 , 2.5th perc = 0.157 , 97.5 perc = 1.5

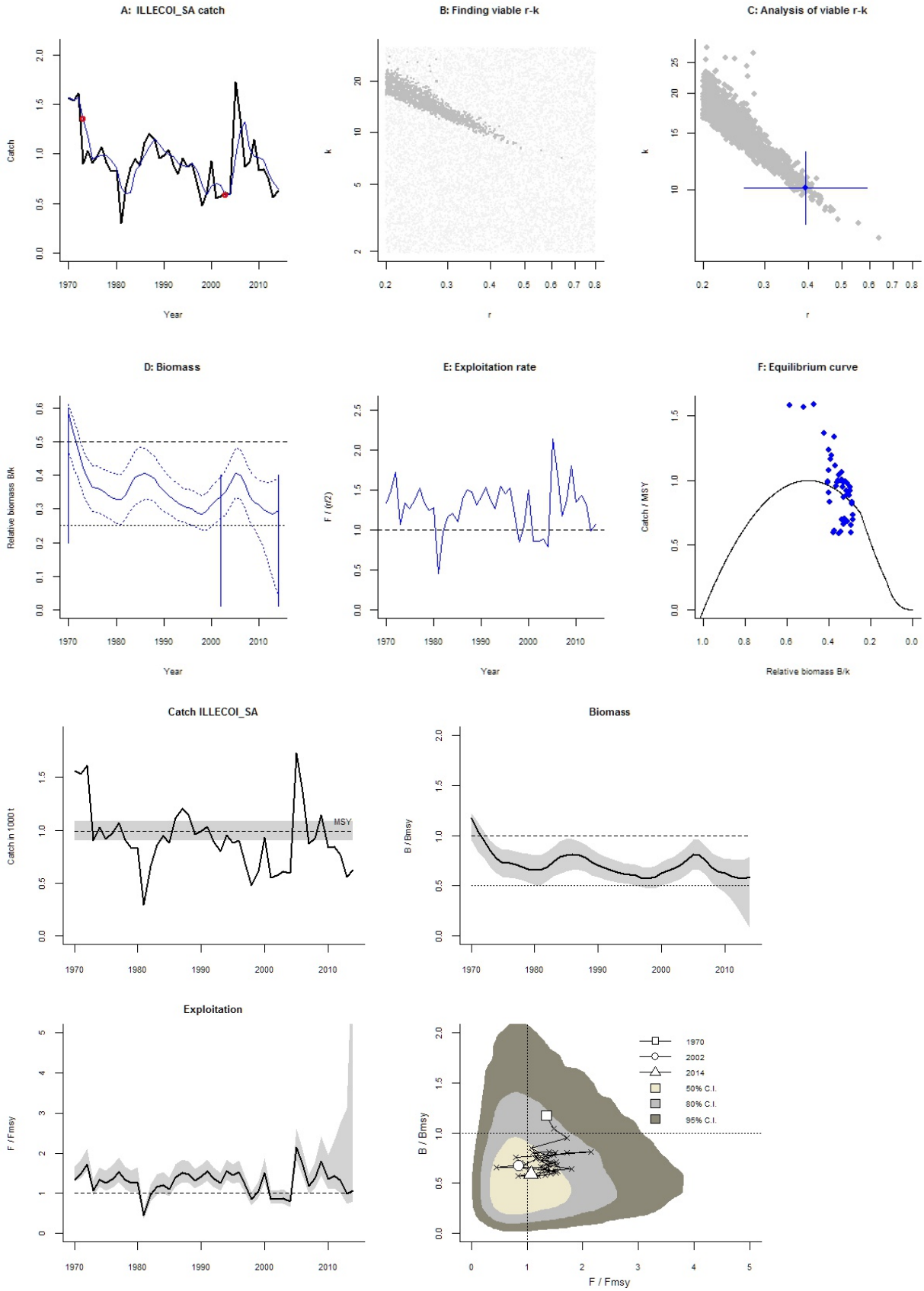
$F/F_{msy}$  = 1.07 , 2.5th perc = 0.798 , 97.5 perc = 7.63

Stock status and exploitation in 2014

Biomass = 2.97 ,  $B/B_{msy}$  = 0.589 , fishing mortality  $F$  = 0.21 ,  $F/F_{msy}$  = 1.07

Comment: Catch=landings from FishStat (Italy, France). RF final 0.01-0.4

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Species: *Loligo vulgaris* , stock: LOLIVUL\_SA

European squid in Sardinia

Source:

Region: Mediterranean , Sardinia

Catch data used from years 1970 - 2014 , abundance = None

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  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 3.13 - 50

Results of CMSY analysis with altogether 313 viable trajectories for 307 r-k pairs

$r = 0.291$  , 95% CL = 0.227 - 0.373 ,  $k = 20$  , 95% CL = 15.3 - 26

MSY = 1.45 , 95% CL = 1.09 - 1.93

Relative biomass last year = 0.158  $k$  , 2.5th = 0.0176 , 97.5th = 0.295

Exploitation  $F/(r/2)$  in last year = 1.76

Results for Management (based on CMSY analysis)

$F_{msy} = 0.145$  , 95% CL = 0.113 - 0.186 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.0918$  , 95% CL = 0.0716 - 0.118 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.45 , 95% CL = 1.09 - 1.93

$B_{msy} = 9.99$  , 95% CL = 7.66 - 13

Biomass in last year = 3.15 , 2.5th perc = 0.352 , 97.5 perc = 5.9

$B/B_{msy}$  in last year = 0.316 , 2.5th perc = 0.0353 , 97.5 perc = 0.591

Fishing mortality in last year = 0.256 , 2.5th perc = 0.137 , 97.5 perc = 2.29

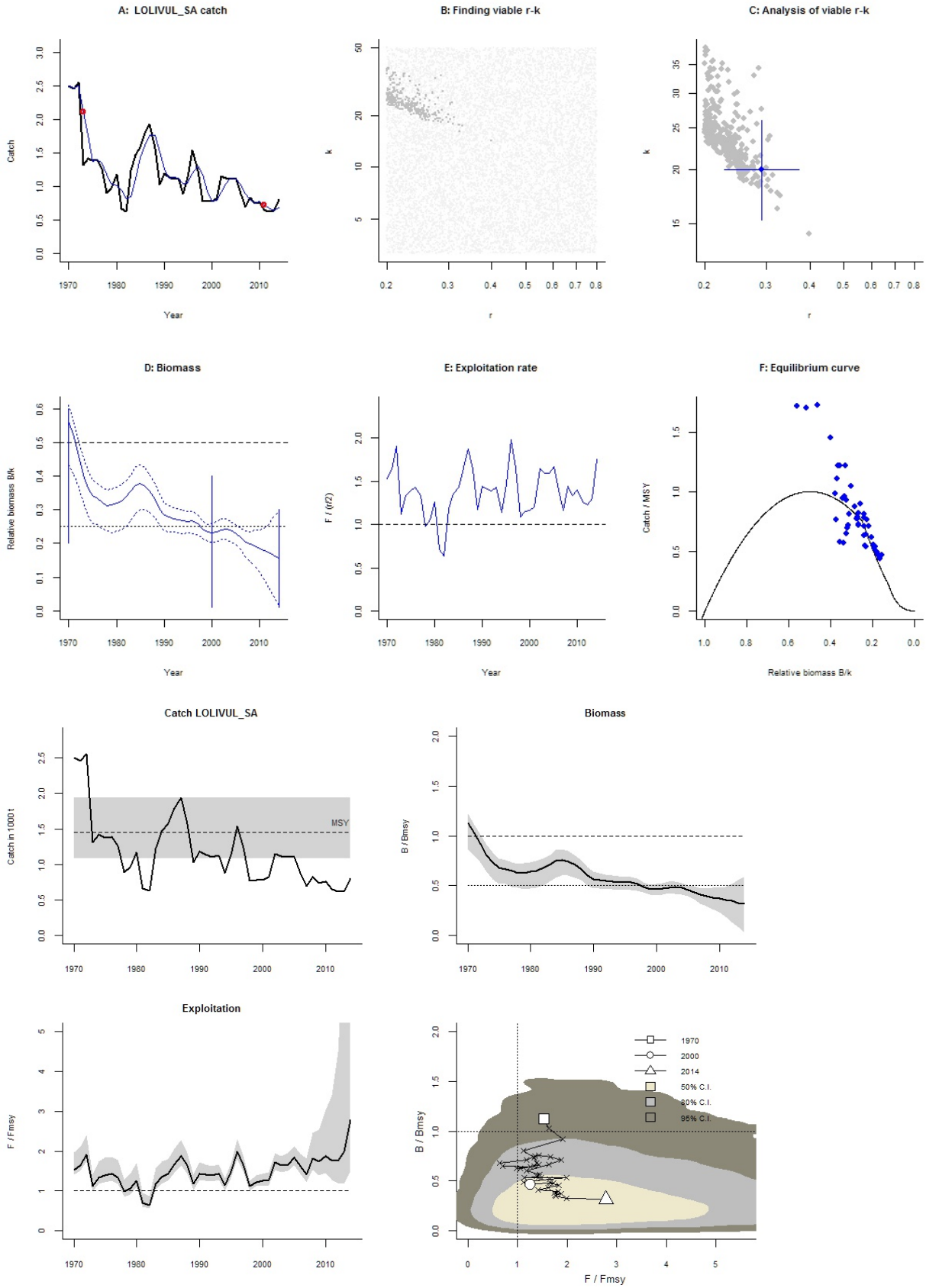
$F/F_{msy} = 2.79$  , 2.5th perc = 1.49 , 97.5 perc = 24.9

Stock status and exploitation in 2014

Biomass = 3.15 ,  $B/B_{msy} = 0.316$  , fishing mortality  $F = 0.256$  ,  $F/F_{msy} = 2.79$

Comment: Catch=landings from FishStat (Tunisia, Italy, France). RF int 2000 0.01-0.4, final 0.3

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Species: *Merluccius merluccius* , stock: MERLMER\_SA

Hake in Sardinia

Source: EASME EMFF 2014

Region: Mediterranean , Sardinia

Catch data used from years 1970 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.01 - 0.4 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.22 - 0.95 expert , , prior range for  $k$  = 8.13 - 140

Prior range of  $q$  = 0.159 - 0.662

Results of CMSY analysis with altogether 119 viable trajectories for 116 r-k pairs

$r$  = 0.333 , 95% CL = 0.281 - 0.394 ,  $k$  = 75.1 , 95% CL = 58.4 - 96.6

MSY = 6.25 , 95% CL = 5.05 - 7.73

Relative biomass last year = 0.309  $k$ , 2.5th = 0.0169 , 97.5th = 0.377

Exploitation  $F/(r/2)$  in last year = 1.16

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.454 , 95% CL = 0.328 - 0.629 ,  $k$  = 46.4 , 95% CL = 33 - 65.2

MSY = 5.27 , 95% CL = 4.39 - 6.31

Relative biomass in last year = 0.256  $k$ , 2.5th perc = 0.185 , 97.5th perc = 0.365

Exploitation  $F/(r/2)$  in last year = 1.66

$q$  = 0.237 , lcl = 0.181 , ucl = 0.309

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.227 , 95% CL = 0.164 - 0.315 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.227 , 95% CL = 0.164 - 0.315 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 5.27 , 95% CL = 4.39 - 6.31

$B_{msy}$  = 23.2 , 95% CL = 16.5 - 32.6

Biomass in last year = 11.9 , 2.5th perc = 8.56 , 97.5 perc = 16.9

$B/B_{msy}$  in last year = 0.512 , 2.5th perc = 0.369 , 97.5 perc = 0.73

Fishing mortality in last year = 0.378 , 2.5th perc = 0.265 , 97.5 perc = 0.524

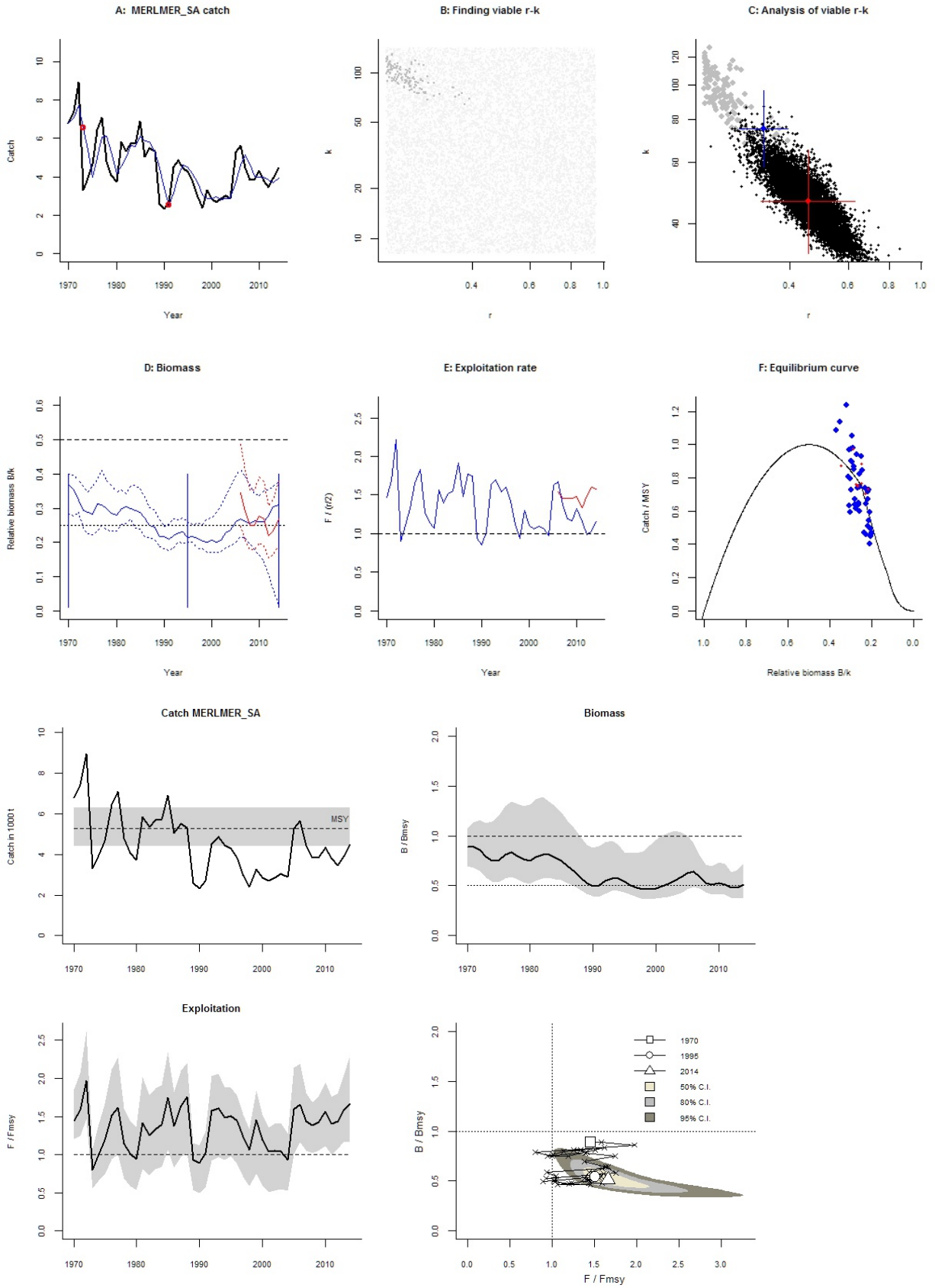
$F/F_{msy}$  = 1.66 , 2.5th perc = 1.17 , 97.5 perc = 2.31

Stock status and exploitation in 2014

Biomass = 11.9 ,  $B/B_{msy}$  = 0.512 , fishing mortality  $F$  = 0.378 ,  $F/F_{msy}$  = 1.66

Comment: Catch=landings from FishStat (Tunisia, Italy, France, Spain), Biomass from SGMED SSB for GSAs 9-11, SGMED 2015 Part 1 SSB)

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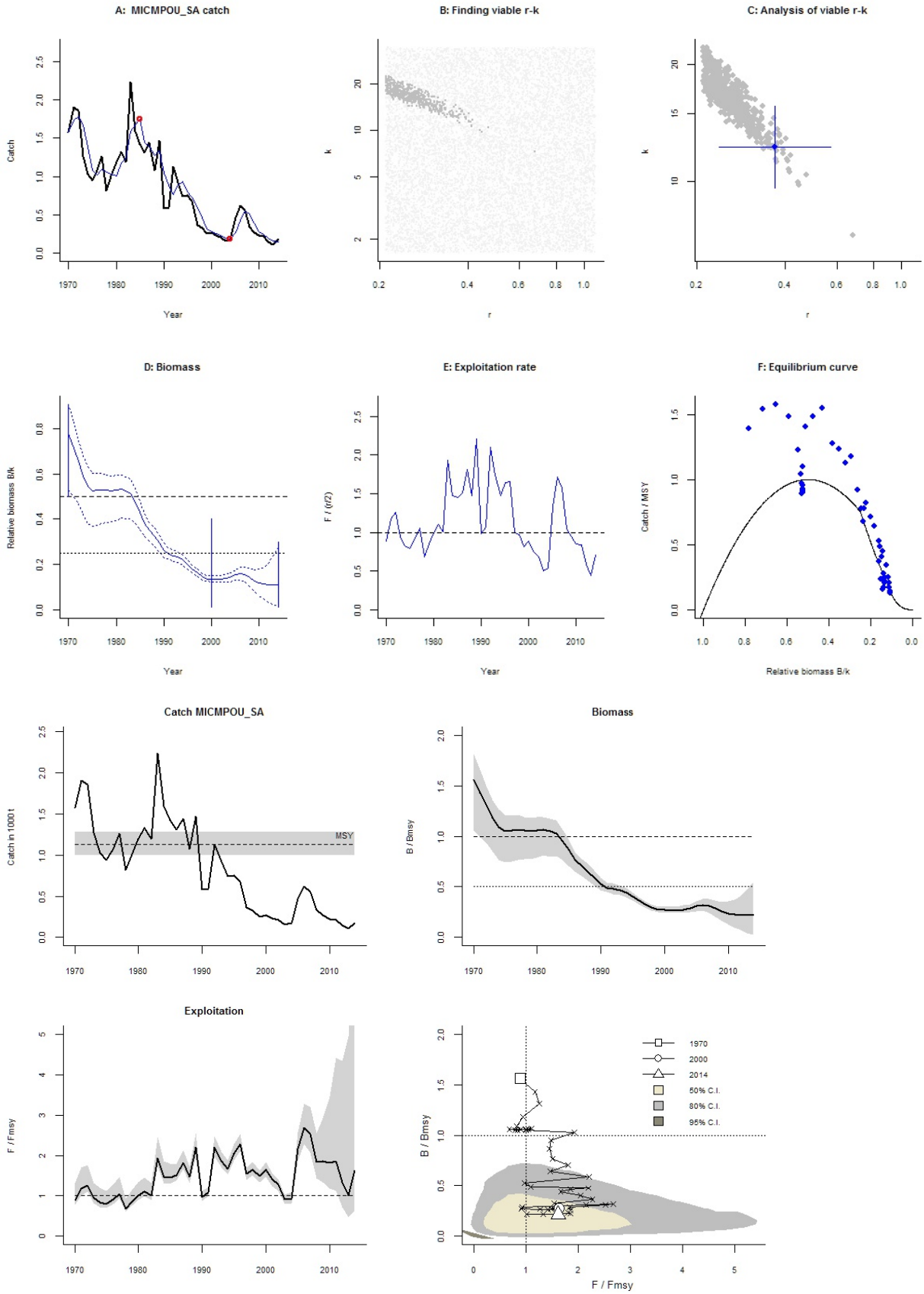
Species: *Micromesistius poutassou* , stock: MICMPOU\_SA  
Blue whiting in Sardinia  
Source: excel  
Region: Mediterranean , Sardinia  
Catch data used from years 1970 - 2014 , abundance = None  
Prior initial relative biomass = 0.5 - 0.9 expert  
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert  
Prior final relative biomass = 0.01 - 0.3 expert  
Prior range for r = 0.21 - 1.1 expert, , prior range for k = 1.63 - 33.9

Results of CMSY analysis with altogether 601 viable trajectories for 553 r-k pairs  
r = 0.368 , 95% CL = 0.237 - 0.571 , k = 12.3 , 95% CL = 9.64 - 15.7  
MSY = 1.13 , 95% CL = 0.999 - 1.28  
Relative biomass last year = 0.109 k, 2.5th = 0.0116 , 97.5th = 0.276  
Exploitation F/(r/2) in last year = 0.709

Results for Management (based on CMSY analysis)  
Fmsy = 0.184 , 95% CL = 0.119 - 0.285 (if B > 1/2 Bmsy then Fmsy = 0.5 r)  
Fmsy = 0.0804 , 95% CL = 0.0518 - 0.125 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)  
MSY = 1.13 , 95% CL = 0.999 - 1.28  
Bmsy = 6.15 , 95% CL = 4.82 - 7.84  
Biomass in last year = 1.34 , 2.5th perc = 0.143 , 97.5 perc = 3.39  
B/Bmsy in last year = 0.218 , 2.5th perc = 0.0232 , 97.5 perc = 0.552  
Fishing mortality in last year = 0.13 , 2.5th perc = 0.0516 , 97.5 perc = 1.23  
F/Fmsy = 1.62 , 2.5th perc = 0.642 , 97.5 perc = 15.3

Stock status and exploitation in 2014  
Biomass = 1.34 , B/Bmsy = 0.218 , fishing mortality F = 0.13 , F/Fmsy = 1.62  
Comment: Catch=landings from FishStat (France, Italy)

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Species: *Mullus barbatus* , stock: MULLBAR\_SA

Red mullet in Sardinia

Source: EASME EMFF 2014, M from Colloca et al 2013

Region: Mediterranean , Sardinia

Catch data used from years 1994 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.1 - 0.5 in year 2006 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.22 - 1.2 expert, , prior range for  $k$  = 1.93 - 43.9

Prior range of  $q$  = 0.00247 - 0.0118

Results of CMSY analysis with altogether 682 viable trajectories for 679 r-k pairs

$r$  = 0.261 , 95% CL = 0.247 - 0.275 ,  $k$  = 18.8 , 95% CL = 17 - 20.8

MSY = 1.22 , 95% CL = 1.11 - 1.35

Relative biomass last year = 0.0593  $k$ , 2.5th = 0.0147 , 97.5th = 0.201

Exploitation  $F/(r/2)$  in last year = 18.1

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.727 , 95% CL = 0.299 - 1.76 ,  $k$  = 8.74 , 95% CL = 4.63 - 16.5

MSY = 1.59 , 95% CL = 1.12 - 2.25

Relative biomass in last year = 0.356  $k$ , 2.5th perc = 0.177 , 97.5th perc = 0.475

Exploitation  $F/(r/2)$  in last year = 2.33

$q$  = 0.00293 , lcl = 0.00176 , ucl = 0.00488

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.363 , 95% CL = 0.15 - 0.882 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.363 , 95% CL = 0.15 - 0.882 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.59 , 95% CL = 1.12 - 2.25

$B_{msy}$  = 4.37 , 95% CL = 2.32 - 8.25

Biomass in last year = 3.11 , 2.5th perc = 1.54 , 97.5 perc = 4.15

$B/B_{msy}$  in last year = 0.711 , 2.5th perc = 0.353 , 97.5 perc = 0.95

Fishing mortality in last year = 0.846 , 2.5th perc = 0.634 , 97.5 perc = 1.7

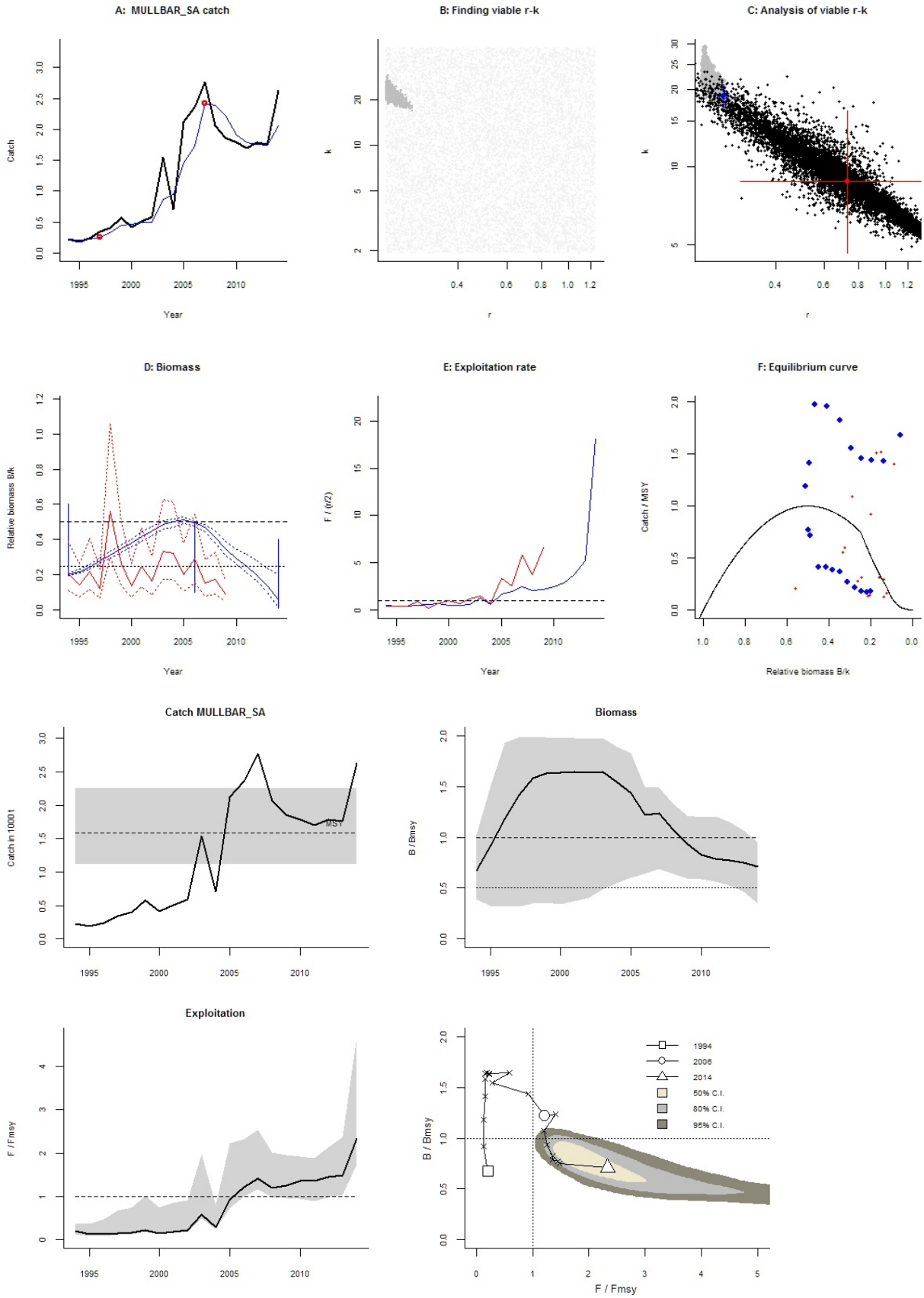
$F/F_{msy}$  = 2.33 , 2.5th perc = 1.74 , 97.5 perc = 4.69

Stock status and exploitation in 2014

Biomass = 3.11 ,  $B/B_{msy}$  = 0.711 , fishing mortality  $F$  = 0.846 ,  $F/F_{msy}$  = 2.33

Comment: Catch=landings from FishStat (Tunisia, Italy, Spain), Biomass from Medits for GSAs 8-10. RF  
int 2006 0.1-0.5

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Species: *Nephrops norvegicus* , stock: NEPRNOR\_SA

Norway lobster in Sardinia

Source: excel

Region: Mediterranean , Sardinia

Catch data used from years 1970 - 2014 , 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  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 1.32 - 21.2

Prior range of  $q$  = 0.00643 - 0.0257

Results of CMSY analysis with altogether 577 viable trajectories for 566 r-k pairs

$r$  = 0.383 , 95% CL = 0.287 - 0.511 ,  $k$  = 6.54 , 95% CL = 4.91 - 8.71

MSY = 0.626 , 95% CL = 0.538 - 0.729

Relative biomass last year = 0.0729  $k$  , 2.5th = 0.0129 , 97.5th = 0.191

Exploitation  $F/(r/2)$  in last year = 2.28

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.459 , 95% CL = 0.32 - 0.66 ,  $k$  = 5.52 , 95% CL = 3.92 - 7.78

MSY = 0.634 , 95% CL = 0.554 - 0.726

Relative biomass in last year = 0.128  $k$  , 2.5th perc = 0.0391 , 97.5th perc = 0.23

Exploitation  $F/(r/2)$  in last year = 1.28

$q$  = 0.00964 , lcl = 0.00722 , ucl = 0.0129

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.23 , 95% CL = 0.16 - 0.33 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.118 , 95% CL = 0.0819 - 0.169 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.634 , 95% CL = 0.554 - 0.726

$B_{msy}$  = 2.76 , 95% CL = 1.96 - 3.89

Biomass in last year = 0.707 , 2.5th perc = 0.216 , 97.5 perc = 1.27

$B/B_{msy}$  in last year = 0.256 , 2.5th perc = 0.0783 , 97.5 perc = 0.46

Fishing mortality in last year = 0.294 , 2.5th perc = 0.164 , 97.5 perc = 0.963

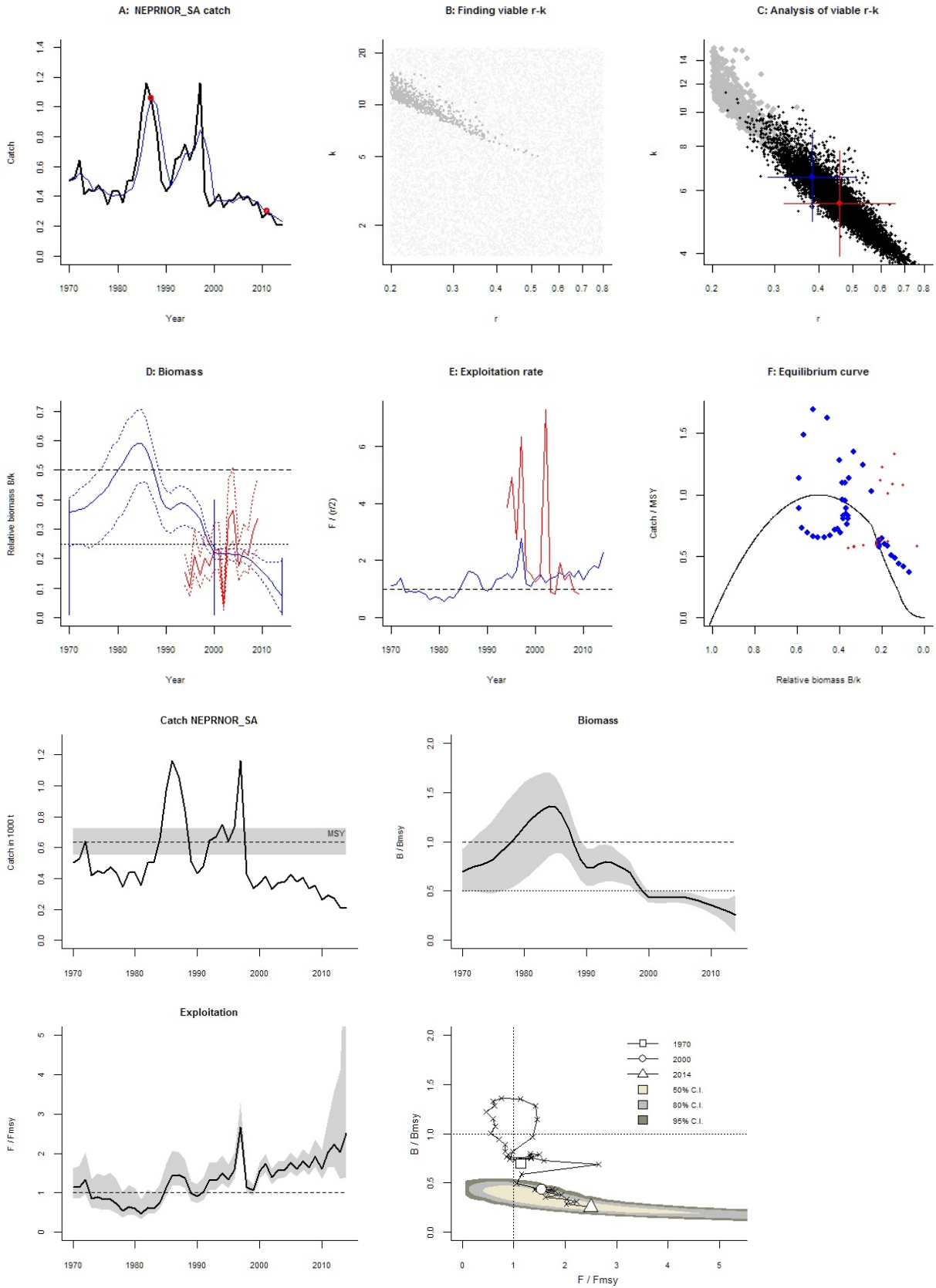
$F/F_{msy}$  = 2.5 , 2.5th perc = 1.39 , 97.5 perc = 8.19

Stock status and exploitation in 2014

Biomass = 0.707 ,  $B/B_{msy}$  = 0.256 , fishing mortality  $F$  = 0.294 ,  $F/F_{msy}$  = 2.5

Comment: Catch=landings from FishStat (Tunisia, Italy, France, Spain), Biomass from Medits for GSAs 8-10. RF int 2000 0.01-0.4

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Species: *Pagellus erythrinus* , stock: PAGEERY\_SA

Common pandora in Sardinia

Source: excel

Region: Mediterranean , Sardinia

Catch data used from years 1990 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2007 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.22 - 0.97 expert , , prior range for  $k$  = 0.93 - 16.4

Results of CMSY analysis with altogether 1812 viable trajectories for 790 r-k pairs

$r$  = 0.641 , 95% CL = 0.439 - 0.934 ,  $k$  = 2.77 , 95% CL = 1.8 - 4.26

MSY = 0.444 , 95% CL = 0.37 - 0.533

Relative biomass last year = 0.215  $k$  , 2.5th = 0.0255 , 97.5th = 0.296

Exploitation  $F/(r/2)$  in last year = 2.22

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.32 , 95% CL = 0.22 - 0.467 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.275 , 95% CL = 0.189 - 0.401 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.444 , 95% CL = 0.37 - 0.533

$B_{msy}$  = 1.39 , 95% CL = 0.901 - 2.13

Biomass in last year = 0.595 , 2.5th perc = 0.0706 , 97.5 perc = 0.819

$B/B_{msy}$  in last year = 0.429 , 2.5th perc = 0.0509 , 97.5 perc = 0.591

Fishing mortality in last year = 0.713 , 2.5th perc = 0.518 , 97.5 perc = 6.01

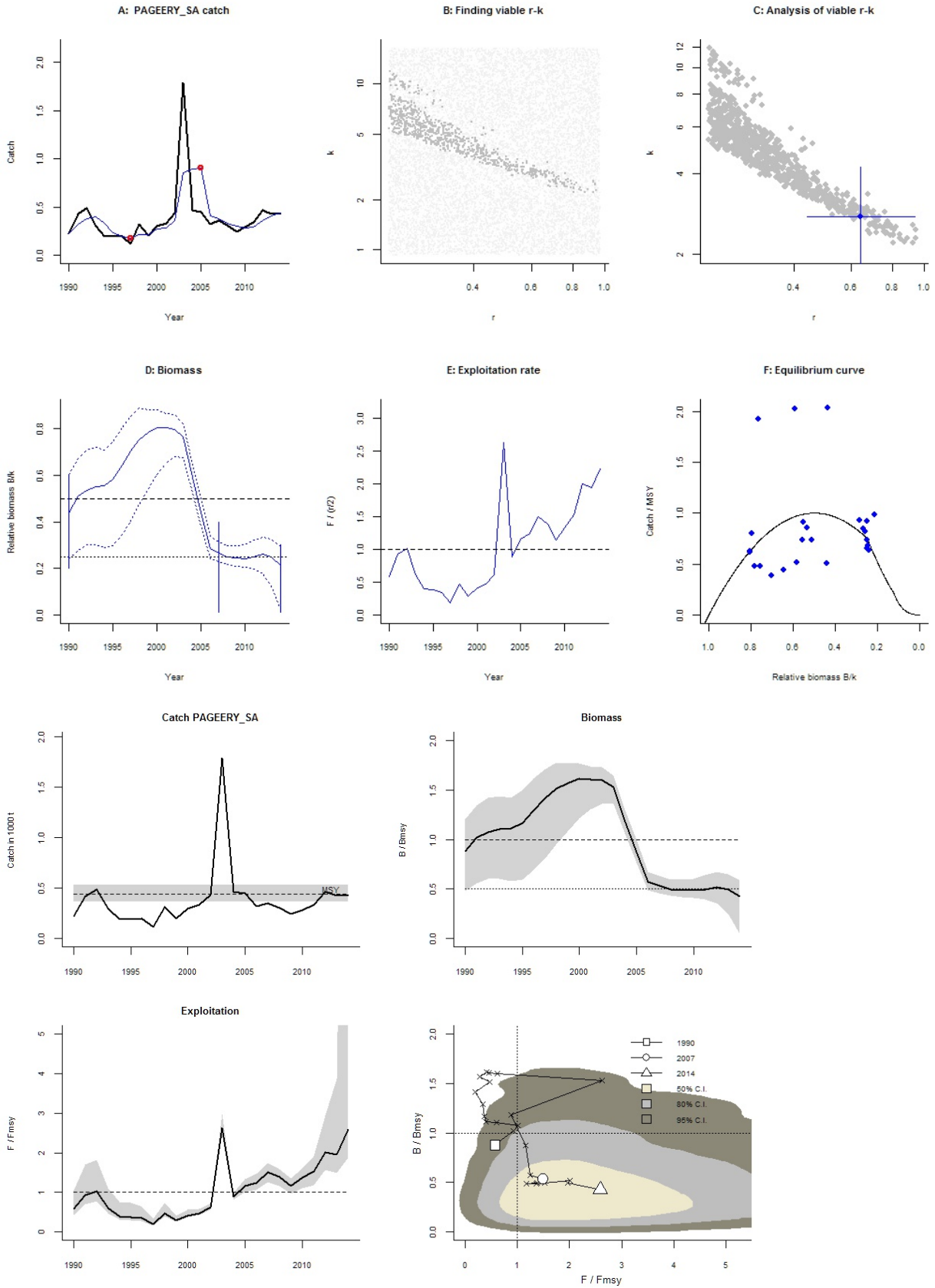
$F/F_{msy}$  = 2.59 , 2.5th perc = 1.88 , 97.5 perc = 21.8

Stock status and exploitation in 2014

Biomass = 0.595 ,  $B/B_{msy}$  = 0.429 , fishing mortality  $F$  = 0.713 ,  $F/F_{msy}$  = 2.59

Comment: Catch=landings from FishStat (France, Tunisia). RF start 1990 0.2-0.6, int 2008 0.01-0.4

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Species: *Palinurus elephas* , stock: PALIELE\_SA

Common spiny lobster in Sardinia

Source:

Region: Mediterranean , Sardinia

Catch data used from years 1970 - 2014 , abundance = None

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 = 0.01 - 0.3 expert

Prior range for  $r$  = 0.05 - 0.5 default , prior range for  $k$  = 1.43 - 57.1

Results of CMSY analysis with altogether 2559 viable trajectories for 2221 r-k pairs

$r$  = 0.176 , 95% CL = 0.113 - 0.274 ,  $k$  = 12 , 95% CL = 5.42 - 26.6

MSY = 0.528 , 95% CL = 0.239 - 1.16

Relative biomass last year = 0.109  $k$  , 2.5th = 0.0133 , 97.5th = 0.293

Exploitation  $F/(r/2)$  in last year = 0.807

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.088 , 95% CL = 0.0566 - 0.137 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0384 , 95% CL = 0.0247 - 0.0598 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.528 , 95% CL = 0.239 - 1.16

$B_{msy}$  = 6 , 95% CL = 2.71 - 13.3

Biomass in last year = 1.31 , 2.5th perc = 0.16 , 97.5 perc = 3.52

$B/B_{msy}$  in last year = 0.218 , 2.5th perc = 0.0267 , 97.5 perc = 0.586

Fishing mortality in last year = 0.071 , 2.5th perc = 0.0264 , 97.5 perc = 0.581

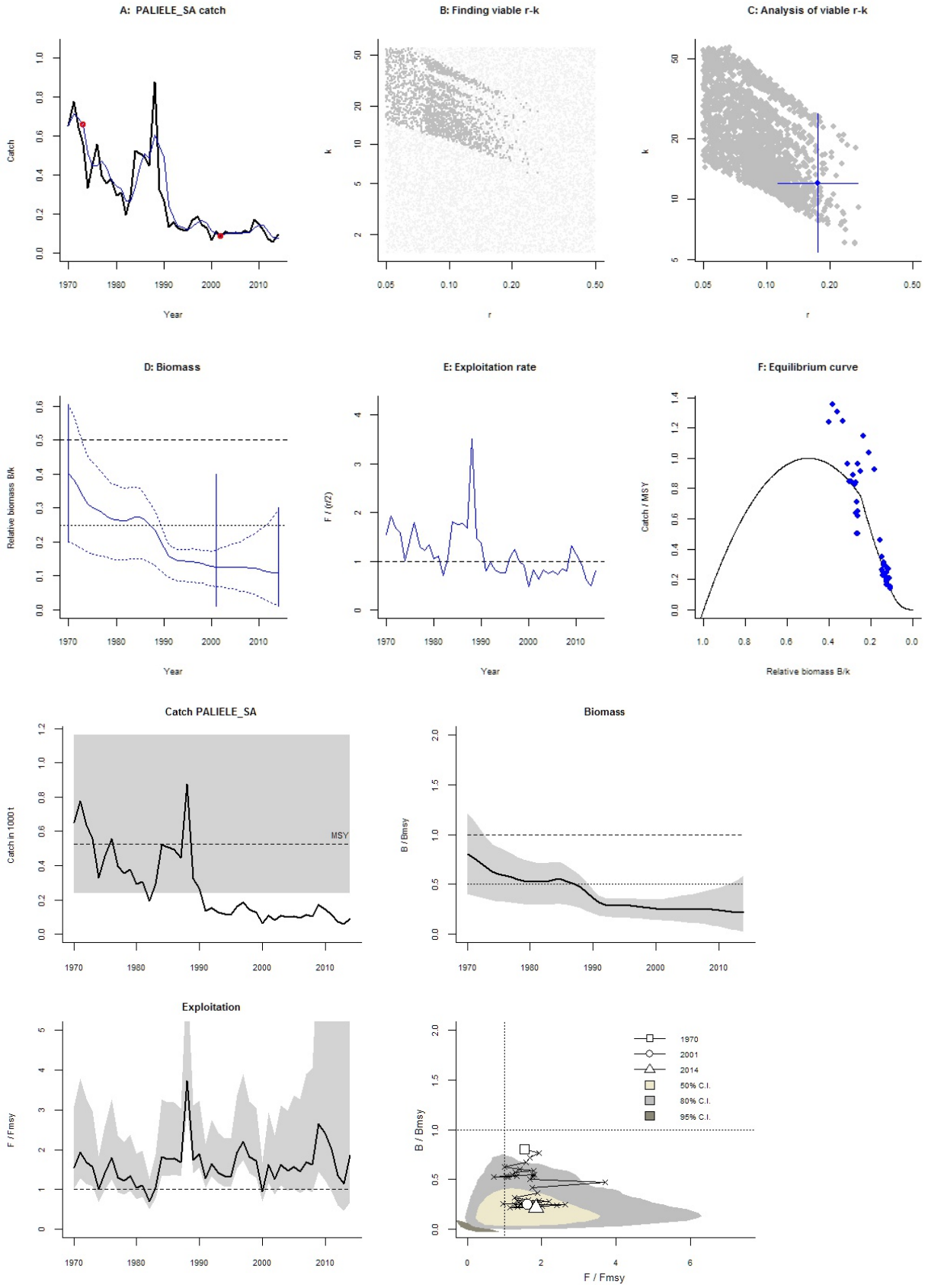
$F/F_{msy}$  = 1.85 , 2.5th perc = 0.688 , 97.5 perc = 15.1

Stock status and exploitation in 2014

Biomass = 1.31 ,  $B/B_{msy}$  = 0.218 , fishing mortality  $F$  = 0.071 ,  $F/F_{msy}$  = 1.85

Comment: Catch=landings from FishStat (Italy, France). RF final 0.3

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Species: *Parapenaeus longirostris* , stock: PAPELON\_SA

Pink shrimp in Sardinia

Source: excel

Region: Mediterranean , Sardinia

Catch data used from years 1998 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 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  $r$  = 0.6 - 1.5 default , prior range for  $k$  = 2.32 - 23.2

Prior range of  $q$  = 0.000173 - 0.000546

Results of CMSY analysis with altogether 1097 viable trajectories for 1002 r-k pairs

$r$  = 1.18 , 95% CL = 0.943 - 1.48 ,  $k$  = 8.39 , 95% CL = 6.11 - 11.5

MSY = 2.48 , 95% CL = 2.03 - 3.02

Relative biomass last year = 0.347  $k$  , 2.5th = 0.209 , 97.5th = 0.571

Exploitation  $F/(r/2)$  in last year = 1.77

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 1.07 , 95% CL = 0.858 - 1.32 ,  $k$  = 9.22 , 95% CL = 7.51 - 11.3

MSY = 2.46 , 95% CL = 2.17 - 2.78

Relative biomass in last year = 0.47  $k$  , 2.5th perc = 0.372 , 97.5th perc = 0.61

Exploitation  $F/(r/2)$  in last year = 1.32

$q$  = 0.000244 , lcl = 0.000193 , ucl = 0.000308

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.533 , 95% CL = 0.429 - 0.662 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.533 , 95% CL = 0.429 - 0.662 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 2.46 , 95% CL = 2.17 - 2.78

$B_{msy}$  = 4.61 , 95% CL = 3.75 - 5.66

Biomass in last year = 4.34 , 2.5th perc = 3.43 , 97.5 perc = 5.62

$B/B_{msy}$  in last year = 0.94 , 2.5th perc = 0.743 , 97.5 perc = 1.22

Fishing mortality in last year = 0.705 , 2.5th perc = 0.543 , 97.5 perc = 0.891

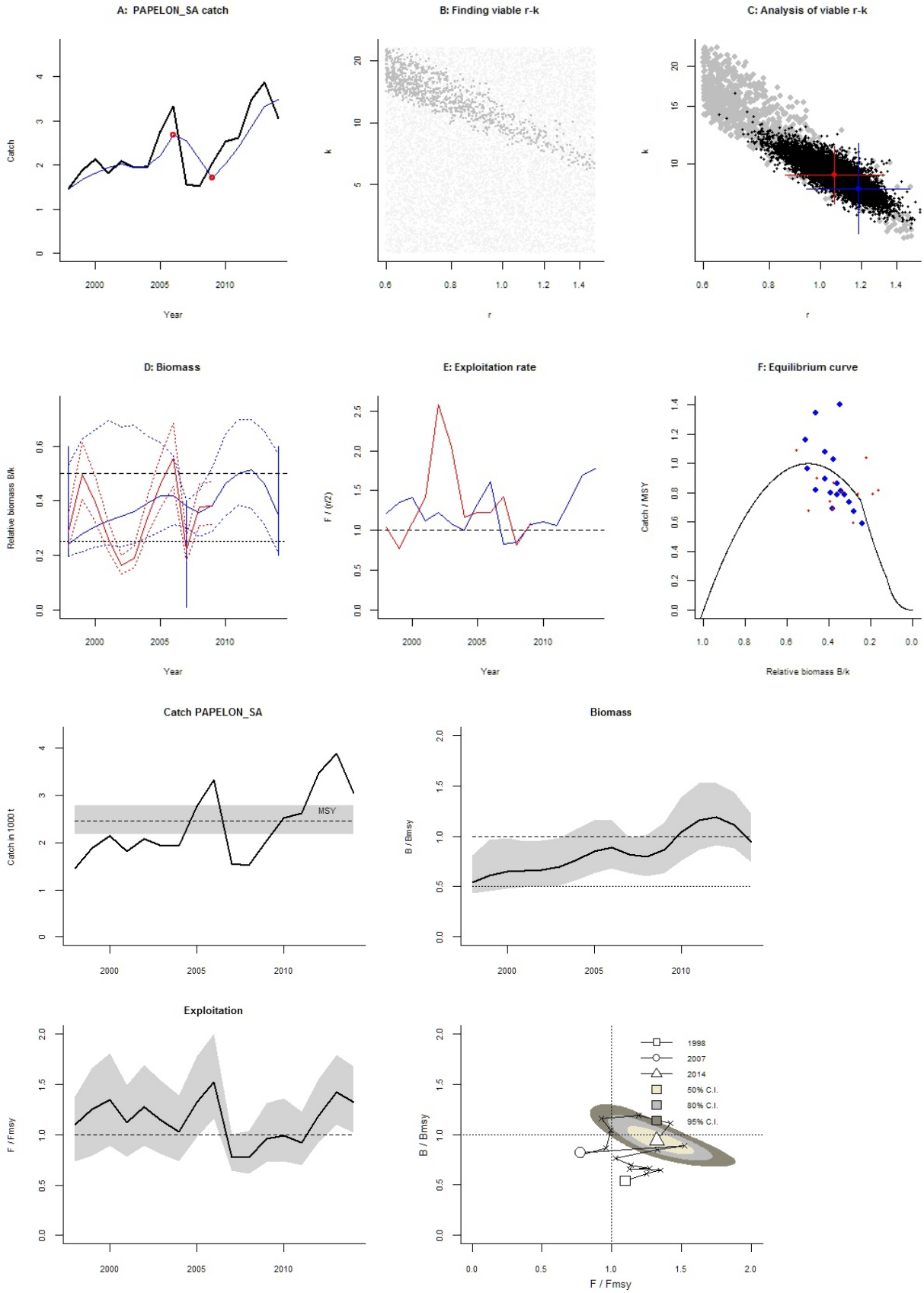
$F/F_{msy}$  = 1.32 , 2.5th perc = 1.02 , 97.5 perc = 1.67

Stock status and exploitation in 2014

Biomass = 4.34 ,  $B/B_{msy}$  = 0.94 , fishing mortality  $F$  = 0.705 ,  $F/F_{msy}$  = 1.32

Comment: Catch=landings from FishStat (Tunisia, Italy, France, Spain), Biomass from Medits for GSAs 8-10. RF start 1998 0.2-0.6, int 2007 0.01-0.4

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Species: *Sardina pilchardus* , stock: SARDPIL\_SA

Sardine in Sardinia

Source:

Region: Mediterranean , Sardinia

Catch data used from years 1974 - 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  $r$  = 0.27 - 1.1 expert, , prior range for  $k$  = 17.8 - 290

Prior range of  $q$  = 0.000664 - 0.00268

Results of CMSY analysis with altogether 155 viable trajectories for 152 r-k pairs

$r$  = 0.402 , 95% CL = 0.352 - 0.458 ,  $k$  = 116 , 95% CL = 93.3 - 143

MSY = 11.6 , 95% CL = 9.85 - 13.7

Relative biomass last year = 0.193  $k$ , 2.5th = 0.051 , 97.5th = 0.357

Exploitation  $F/(r/2)$  in last year = 1.66

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.497 , 95% CL = 0.284 - 0.869 ,  $k$  = 90.8 , 95% CL = 58 - 142

MSY = 11.3 , 95% CL = 9.16 - 13.9

Relative biomass in last year = 0.233  $k$ , 2.5th perc = 0.0835 , 97.5th perc = 0.438

Exploitation  $F/(r/2)$  in last year = 1.42

$q$  = 0.000933 , lcl = 0.000648 , ucl = 0.00134

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.248 , 95% CL = 0.142 - 0.434 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.231 , 95% CL = 0.132 - 0.404 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 11.3 , 95% CL = 9.16 - 13.9

$B_{msy}$  = 45.4 , 95% CL = 29 - 71

Biomass in last year = 21.1 , 2.5th perc = 7.58 , 97.5 perc = 39.8

$B/B_{msy}$  in last year = 0.465 , 2.5th perc = 0.167 , 97.5 perc = 0.877

Fishing mortality in last year = 0.353 , 2.5th perc = 0.187 , 97.5 perc = 0.984

$F/F_{msy}$  = 1.53 , 2.5th perc = 0.812 , 97.5 perc = 4.26

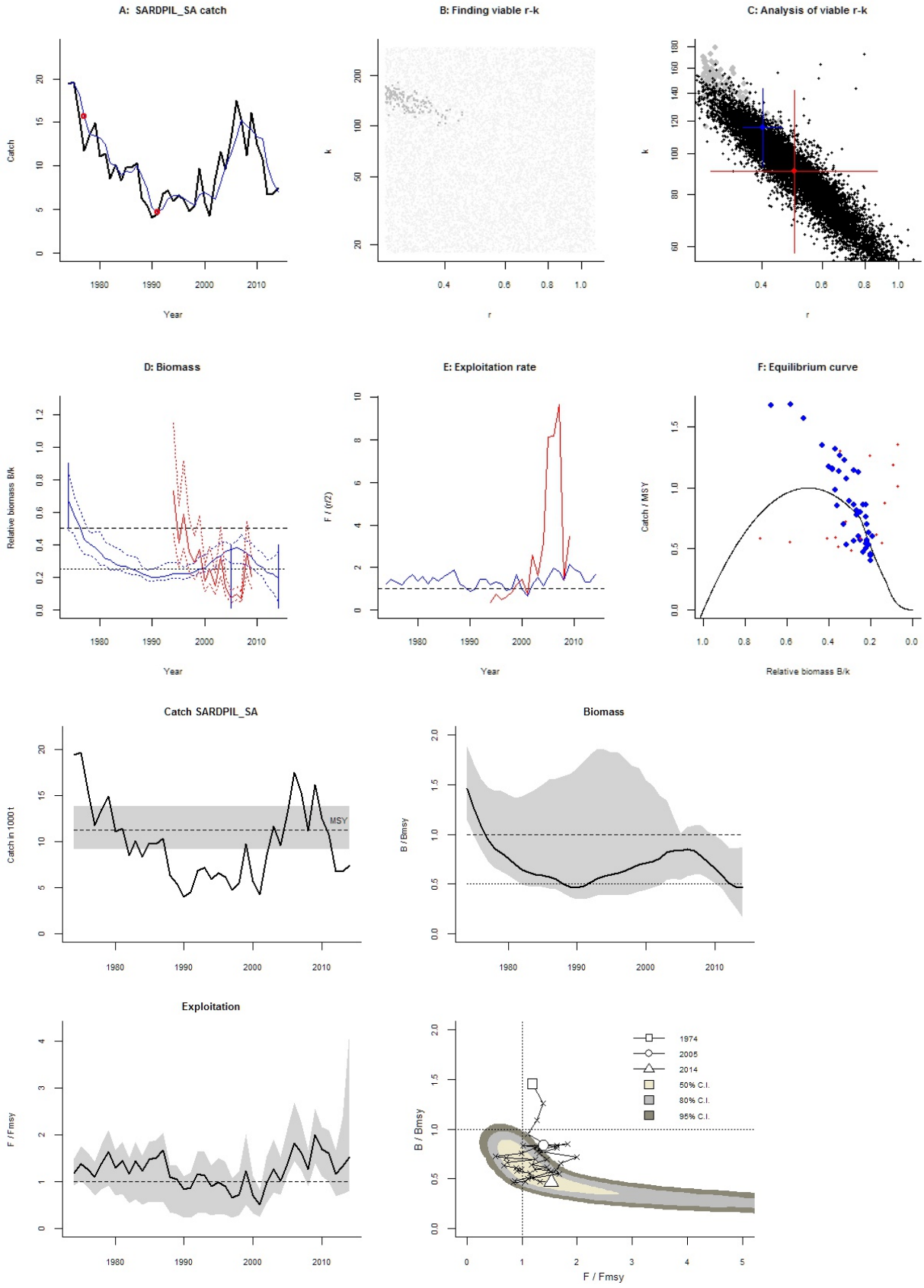
Stock status and exploitation in 2014

Biomass = 21.1 ,  $B/B_{msy}$  = 0.465 , fishing mortality  $F$  = 0.353 ,  $F/F_{msy}$  = 1.53

Comment: Catch=landings from FishStat (Tunisia, Italy, France), Biomass from MEDIAS for GSAs 8-10.

RF int 2005 0.01-0.4

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Species: *Sepia officinalis* , stock: SEPIOFF\_SA

Common cuttlefish in Sardinia

Source:

Region: Mediterranean , Sardinia

Catch data used from years 1973 - 2014 , abundance = None

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2010 expert

Prior final relative biomass = 0.1 - 0.5 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 0.749 - 12

Results of CMSY analysis with altogether 5160 viable trajectories for 818 r-k pairs

$r$  = 0.567 , 95% CL = 0.409 - 0.785 ,  $k$  = 2.44 , 95% CL = 1.63 - 3.65

MSY = 0.345 , 95% CL = 0.296 - 0.403

Relative biomass last year = 0.382  $k$ , 2.5th = 0.135 , 97.5th = 0.495

Exploitation  $F/(r/2)$  in last year = 1.21

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.283 , 95% CL = 0.205 - 0.392 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.283 , 95% CL = 0.205 - 0.392 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.345 , 95% CL = 0.296 - 0.403

$B_{msy}$  = 1.22 , 95% CL = 0.813 - 1.83

Biomass in last year = 0.93 , 2.5th perc = 0.329 , 97.5 perc = 1.21

$B/B_{msy}$  in last year = 0.764 , 2.5th perc = 0.27 , 97.5 perc = 0.99

Fishing mortality in last year = 0.344 , 2.5th perc = 0.265 , 97.5 perc = 0.973

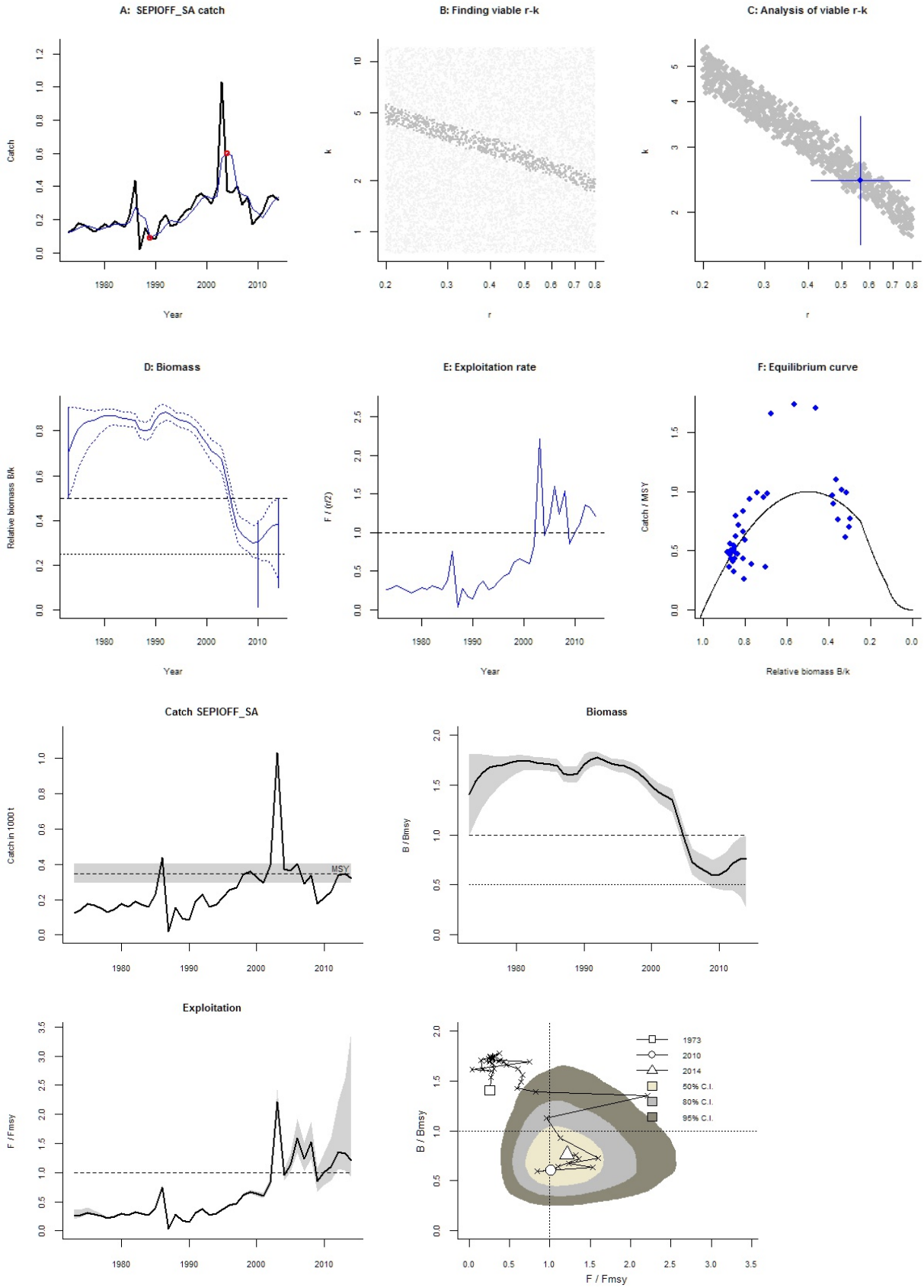
$F/F_{msy}$  = 1.21 , 2.5th perc = 0.936 , 97.5 perc = 3.43

Stock status and exploitation in 2014

Biomass = 0.93 ,  $B/B_{msy}$  = 0.764 , fishing mortality  $F$  = 0.344 ,  $F/F_{msy}$  = 1.21

Comment: Catch=landings from FishStat (Tunisia, France). RF start 0.5-0.9, int 2010 0.01-0.4, final 0.1-0.5

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Species: *Spicara maena* , stock: SPICMAE\_SA

Blotched picarel in Sardinia

Source:

Region: Mediterranean , Sardinia

Catch data used from years 1989 - 2014 , 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  $r$  = 0.48 - 1.3 expert, , prior range for  $k$  = 0.295 - 3.17

Results of CMSY analysis with altogether 3462 viable trajectories for 773 r-k pairs

$r = 1.01$  , 95% CL = 0.796 - 1.27 ,  $k = 1.15$  , 95% CL = 0.855 - 1.55

MSY = 0.29 , 95% CL = 0.257 - 0.327

Relative biomass last year = 0.294  $k$ , 2.5th = 0.0308 , 97.5th = 0.397

Exploitation  $F/(r/2)$  in last year = 1.04

Results for Management (based on CMSY analysis)

$F_{msy} = 0.504$  , 95% CL = 0.398 - 0.637 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.504$  , 95% CL = 0.398 - 0.637 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.29 , 95% CL = 0.257 - 0.327

$B_{msy} = 0.575$  , 95% CL = 0.428 - 0.774

Biomass in last year = 0.339 , 2.5th perc = 0.0354 , 97.5 perc = 0.457

$B/B_{msy}$  in last year = 0.589 , 2.5th perc = 0.0616 , 97.5 perc = 0.793

Fishing mortality in last year = 0.522 , 2.5th perc = 0.388 , 97.5 perc = 4.99

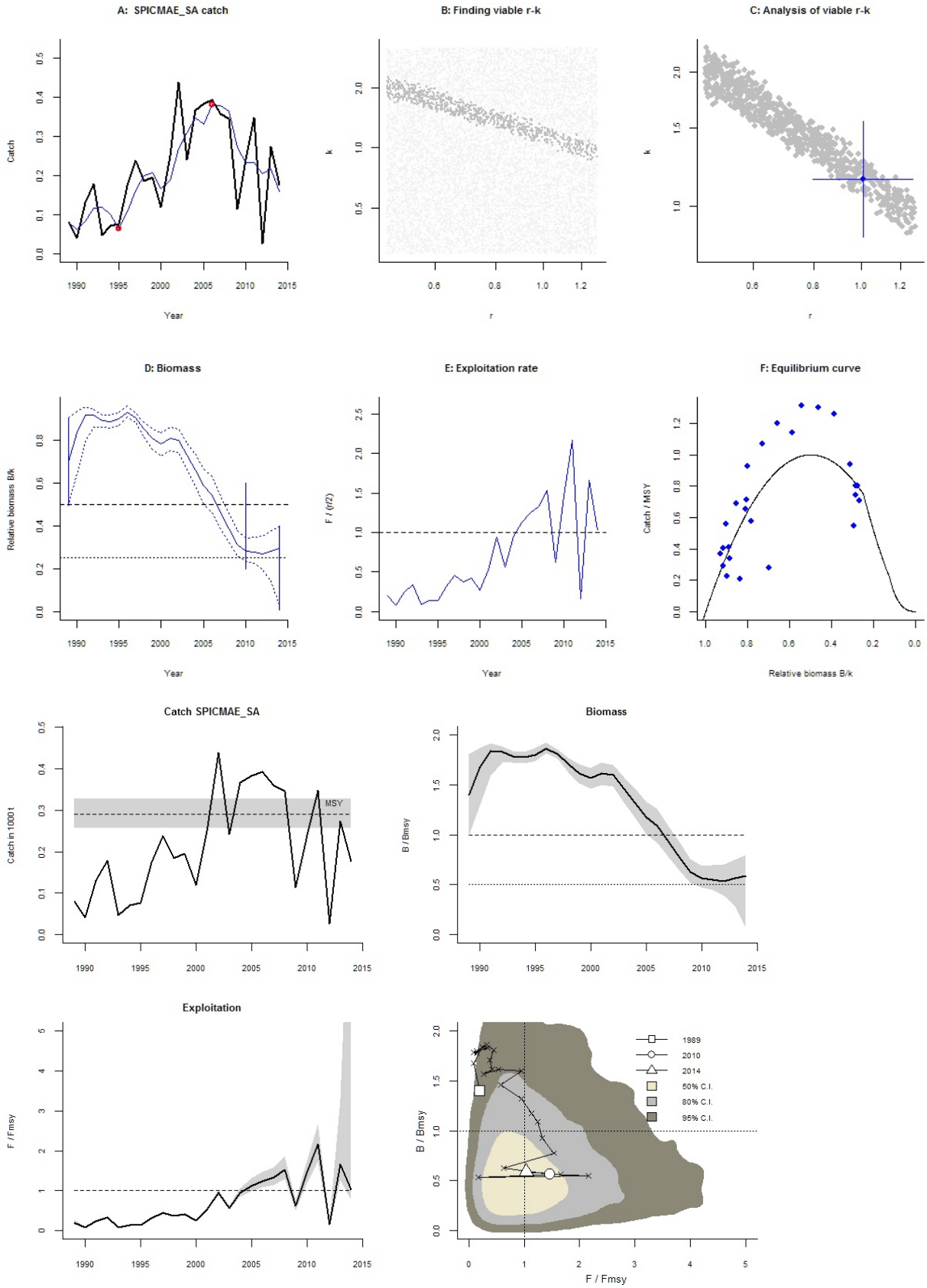
$F/F_{msy} = 1.04$  , 2.5th perc = 0.77 , 97.5 perc = 9.91

Stock status and exploitation in 2014

Biomass = 0.339 ,  $B/B_{msy} = 0.589$  , fishing mortality  $F = 0.522$  ,  $F/F_{msy} = 1.04$

Comment: Catch=landings from FishStat (Tunisia). RF start 0.5-0.9, int 2010 0.2-0.6, final 0.01-0.4

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**Adriatic Sea** (analyzed with CMSY\_O\_7m.R; see Comment for data sources)

Species: *Atherina boyeri* , stock: Athe\_boy\_AD

Sand smelt in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1970 - 2014 , abundance = None

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 = 0.01 - 0.4 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 4.61 - 73.7

Results of CMSY analysis with altogether 326 viable trajectories for 317 r-k pairs

$r = 0.328$  , 95% CL = 0.226 - 0.475 ,  $k = 33.7$  , 95% CL = 22.3 - 51

MSY = 2.76 , 95% CL = 1.67 - 4.58

Relative biomass last year = 0.186  $k$ , 2.5th = 0.0182 , 97.5th = 0.379

Exploitation  $F/(r/2)$  in last year = 0.413

Results for Management (based on CMSY analysis)

$F_{msy} = 0.164$  , 95% CL = 0.113 - 0.238 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.122$  , 95% CL = 0.0844 - 0.177 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 2.76 , 95% CL = 1.67 - 4.58

$B_{msy} = 16.9$  , 95% CL = 11.1 - 25.5

Biomass in last year = 6.28 , 2.5th perc = 0.614 , 97.5 perc = 12.8

$B/B_{msy}$  in last year = 0.373 , 2.5th perc = 0.0364 , 97.5 perc = 0.759

Fishing mortality in last year = 0.0554 , 2.5th perc = 0.0272 , 97.5 perc = 0.567

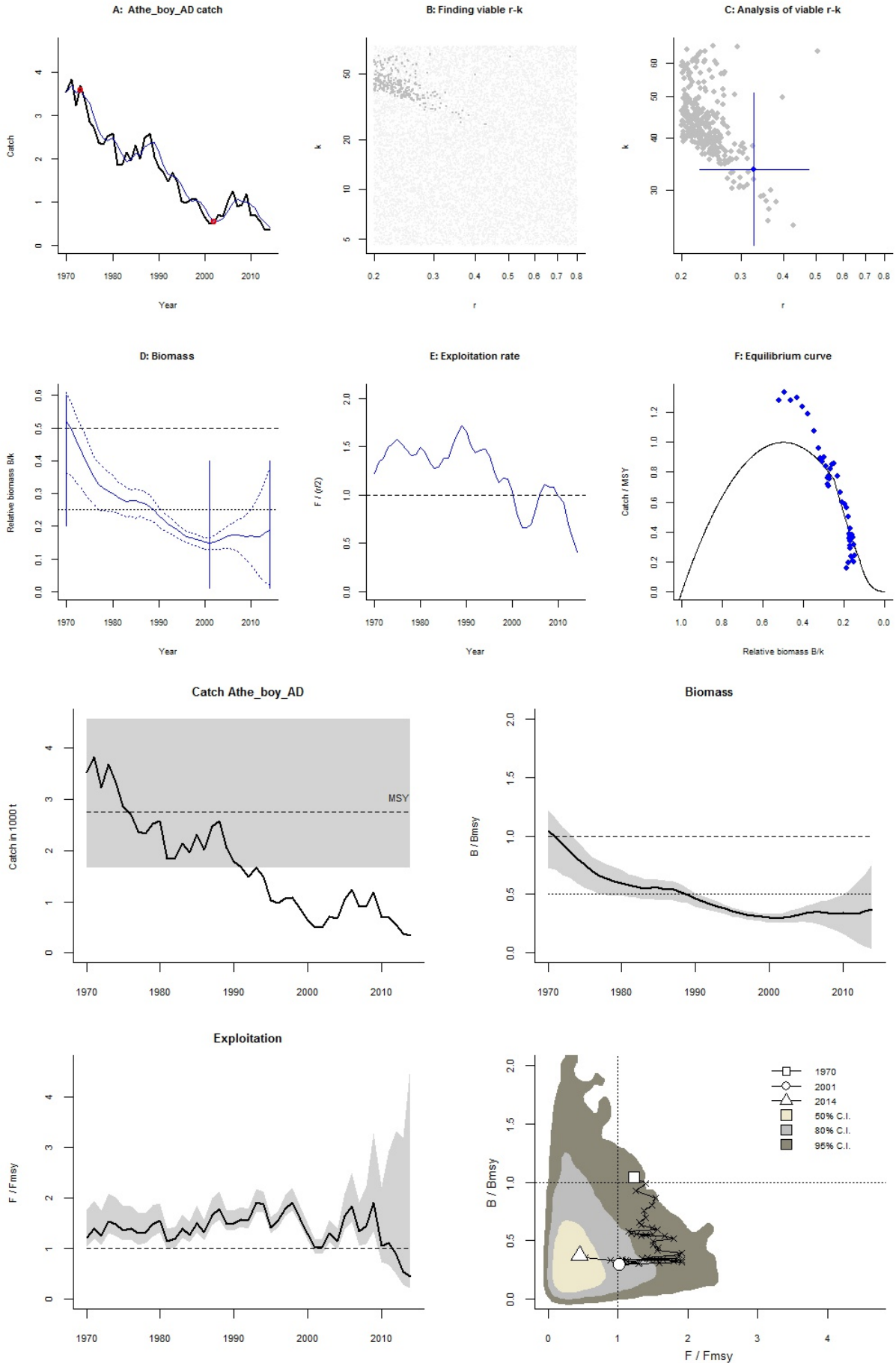
$F/F_{msy} = 0.453$  , 2.5th perc = 0.223 , 97.5 perc = 4.64

Stock status and exploitation in 2014

Biomass = 6.28 ,  $B/B_{msy} = 0.373$  , fishing mortality  $F = 0.0554$  ,  $F/F_{msy} = 0.453$

Comment: Catch=landings from FishStat (Italy, Croatia, Slovenia). RF final 0.3. GS final 0.4 because trawling was banned in 3 nm zone, causing decline in catch.

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Species: *Belone belone* , stock: Belo\_bel\_AD

Garfish in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1970 - 2014 , abundance = None

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  $r$  = 0.19 - 1 expert, , prior range for  $k$  = 0.28 - 5.89

Results of CMSY analysis with altogether 1506 viable trajectories for 1135 r-k pairs

$r$  = 0.423 , 95% CL = 0.281 - 0.637 ,  $k$  = 1.72 , 95% CL = 1.27 - 2.35

MSY = 0.182 , 95% CL = 0.165 - 0.202

Relative biomass last year = 0.0965  $k$ , 2.5th = 0.0129 , 97.5th = 0.282

Exploitation  $F/(r/2)$  in last year = 0.123

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.212 , 95% CL = 0.141 - 0.318 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0817 , 95% CL = 0.0543 - 0.123 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.182 , 95% CL = 0.165 - 0.202

$B_{msy}$  = 0.862 , 95% CL = 0.634 - 1.17

Biomass in last year = 0.166 , 2.5th perc = 0.0222 , 97.5 perc = 0.487

$B/B_{msy}$  in last year = 0.193 , 2.5th perc = 0.0258 , 97.5 perc = 0.565

Fishing mortality in last year = 0.024 , 2.5th perc = 0.00822 , 97.5 perc = 0.18

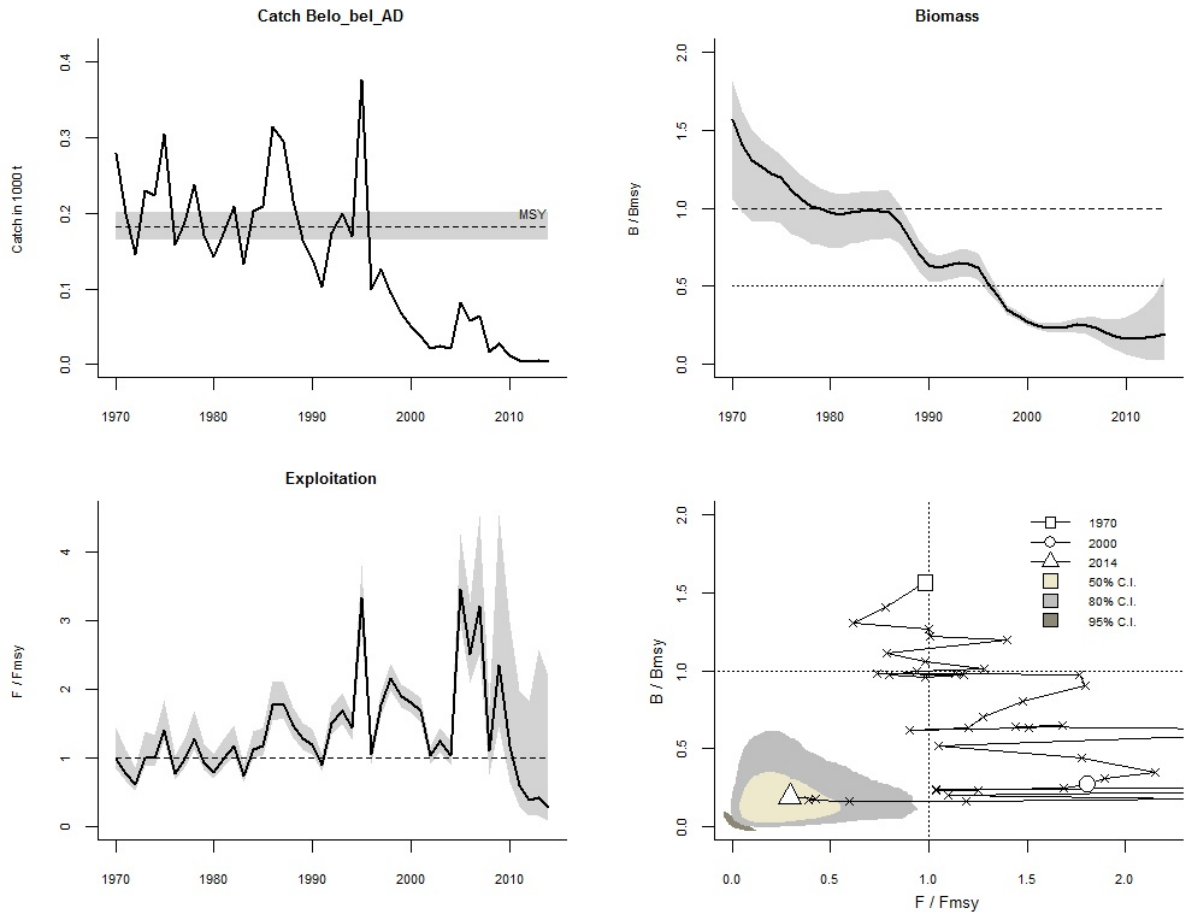
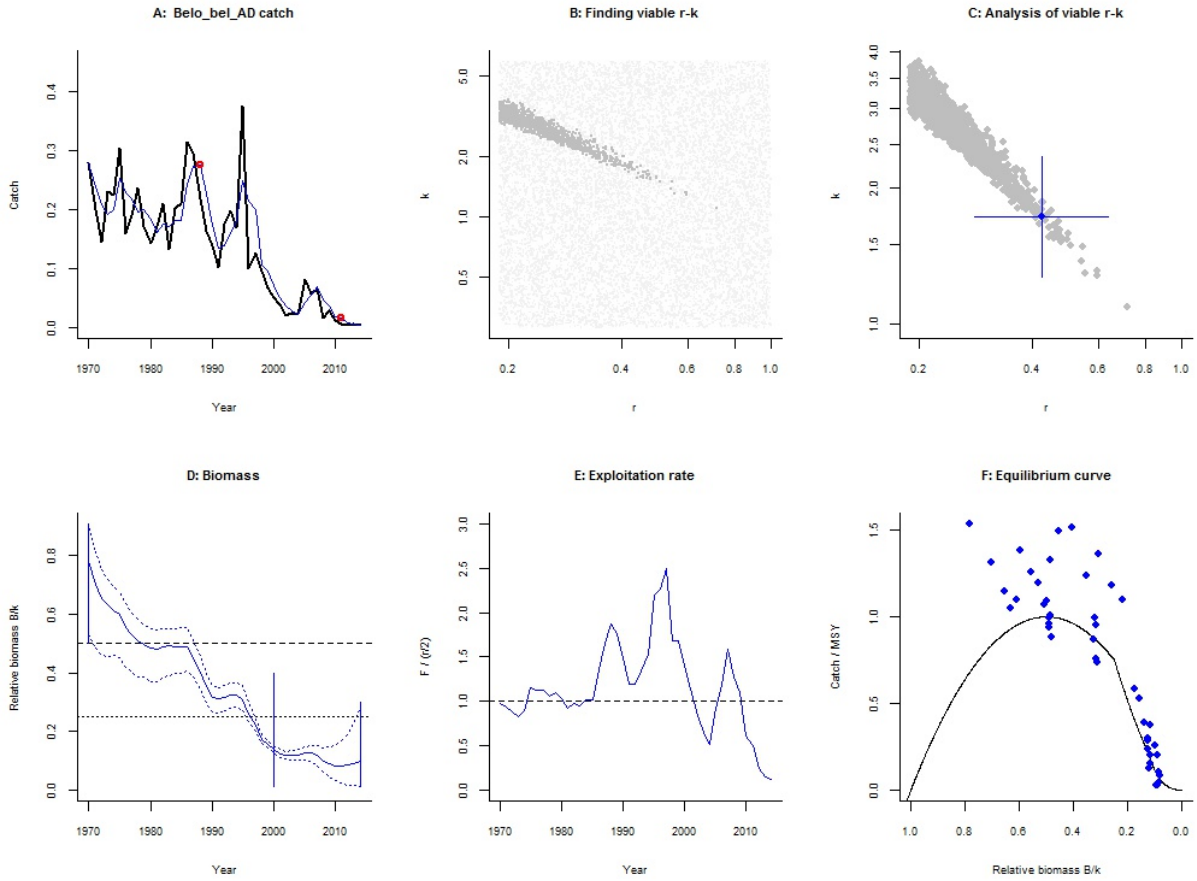
$F/F_{msy}$  = 0.294 , 2.5th perc = 0.101 , 97.5 perc = 2.2

Stock status and exploitation in 2014

Biomass = 0.166 ,  $B/B_{msy}$  = 0.193 , fishing mortality  $F$  = 0.024 ,  $F/F_{msy}$  = 0.294

Comment: Catch=landings from FishStat (Italy, Croatia, Slovenia, Serbia and Montenegro). RF final 0.2.  
GS final 0.3, low catches caused by low demand.

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Species: *Bolinus brandaris* , stock: Boli\_bra\_AD

Purple dye murex in Adriatic

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1972 - 2015 , abundance = CPUE

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.5 - 0.9 in year 1990 expert

Prior final relative biomass = 0.5 - 0.9 expert

Prior range for  $r$  = 0.6 - 1.5 default , prior range for  $k$  = 1.73 - 25.9

Prior range of  $q$  = 0.0147 - 0.0464

Results of CMSY analysis with altogether 35574 viable trajectories for 4001 r-k pairs

$r$  = 1.19 , 95% CL = 0.957 - 1.48 ,  $k$  = 5.38 , 95% CL = 3.15 - 9.2

MSY = 1.6 , 95% CL = 0.859 - 2.99

Relative biomass last year = 0.735  $k$ , 2.5th = 0.513 , 97.5th = 0.867

Exploitation  $F/(r/2)$  in last year = 0.484

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.972 , 95% CL = 0.678 - 1.39 ,  $k$  = 4.26 , 95% CL = 3.24 - 5.6

MSY = 1.04 , 95% CL = 0.824 - 1.3

Relative biomass in last year = 0.518  $k$ , 2.5th perc = 0.419 , 97.5th perc = 0.694

Exploitation  $F/(r/2)$  in last year = 0.838

$q$  = 0.0225 ,  $lcl$  = 0.0175 ,  $ucl$  = 0.0289

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.486 , 95% CL = 0.339 - 0.697 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.486 , 95% CL = 0.339 - 0.697 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.04 , 95% CL = 0.824 - 1.3

$B_{msy}$  = 2.13 , 95% CL = 1.62 - 2.8

Biomass in last year = 2.21 , 2.5th perc = 1.79 , 97.5 perc = 2.96

$B/B_{msy}$  in last year = 1.04 , 2.5th perc = 0.839 , 97.5 perc = 1.39

Fishing mortality in last year = 0.407 , 2.5th perc = 0.304 , 97.5 perc = 0.504

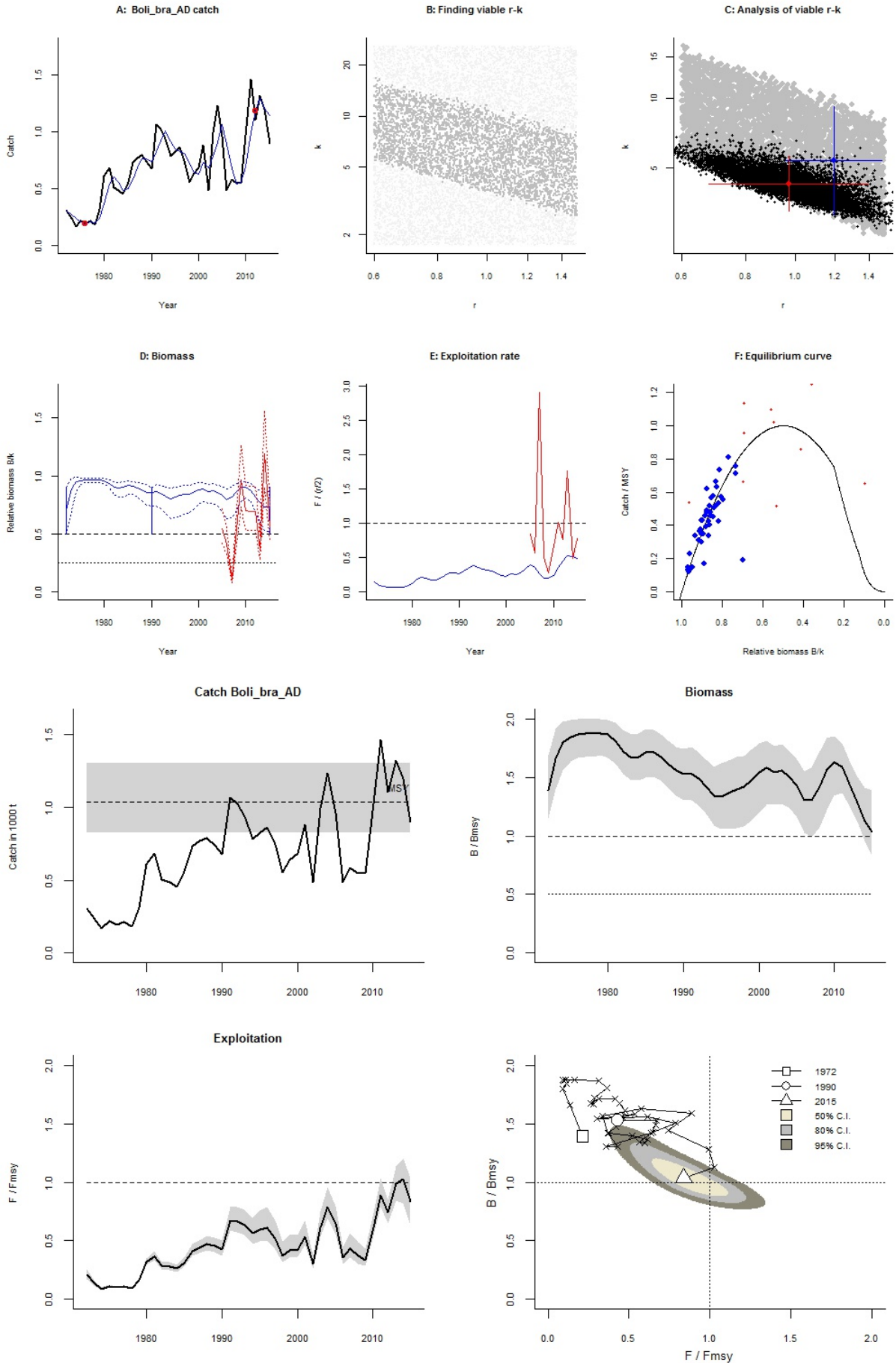
$F/F_{msy}$  = 0.838 , 2.5th perc = 0.626 , 97.5 perc = 1.04

Stock status and exploitation in 2014

Biomass = 2.41 ,  $B/B_{msy}$  = 1.13 , fishing mortality  $F$  = 0.498 ,  $F/F_{msy}$  = 1.02

Comment: OK RF

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Species: *Boops boops* , stock: Boop\_Boo\_AD

Bogue in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1970 - 2014 , abundance = None

Prior initial relative biomass = 0.5 - 0.9 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  $r$  = 0.31 - 1.1 expert, , prior range for  $k$  = 2.2 - 31.3

Results of CMSY analysis with altogether 60 viable trajectories for 60 r-k pairs

$r$  = 0.449 , 95% CL = 0.399 - 0.506 ,  $k$  = 14.2 , 95% CL = 11.5 - 17.7

MSY = 1.6 , 95% CL = 1.32 - 1.94

Relative biomass last year = 0.0669  $k$ , 2.5th = 0.0239 , 97.5th = 0.157

Exploitation  $F/(r/2)$  in last year = 0.627

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.225 , 95% CL = 0.2 - 0.253 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0601 , 95% CL = 0.0534 - 0.0677 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.6 , 95% CL = 1.32 - 1.94

$B_{msy}$  = 7.12 , 95% CL = 5.74 - 8.84

Biomass in last year = 0.953 , 2.5th perc = 0.34 , 97.5 perc = 2.23

$B/B_{msy}$  in last year = 0.134 , 2.5th perc = 0.0478 , 97.5 perc = 0.313

Fishing mortality in last year = 0.108 , 2.5th perc = 0.0462 , 97.5 perc = 0.303

$F/F_{msy}$  = 1.8 , 2.5th perc = 0.768 , 97.5 perc = 5.03

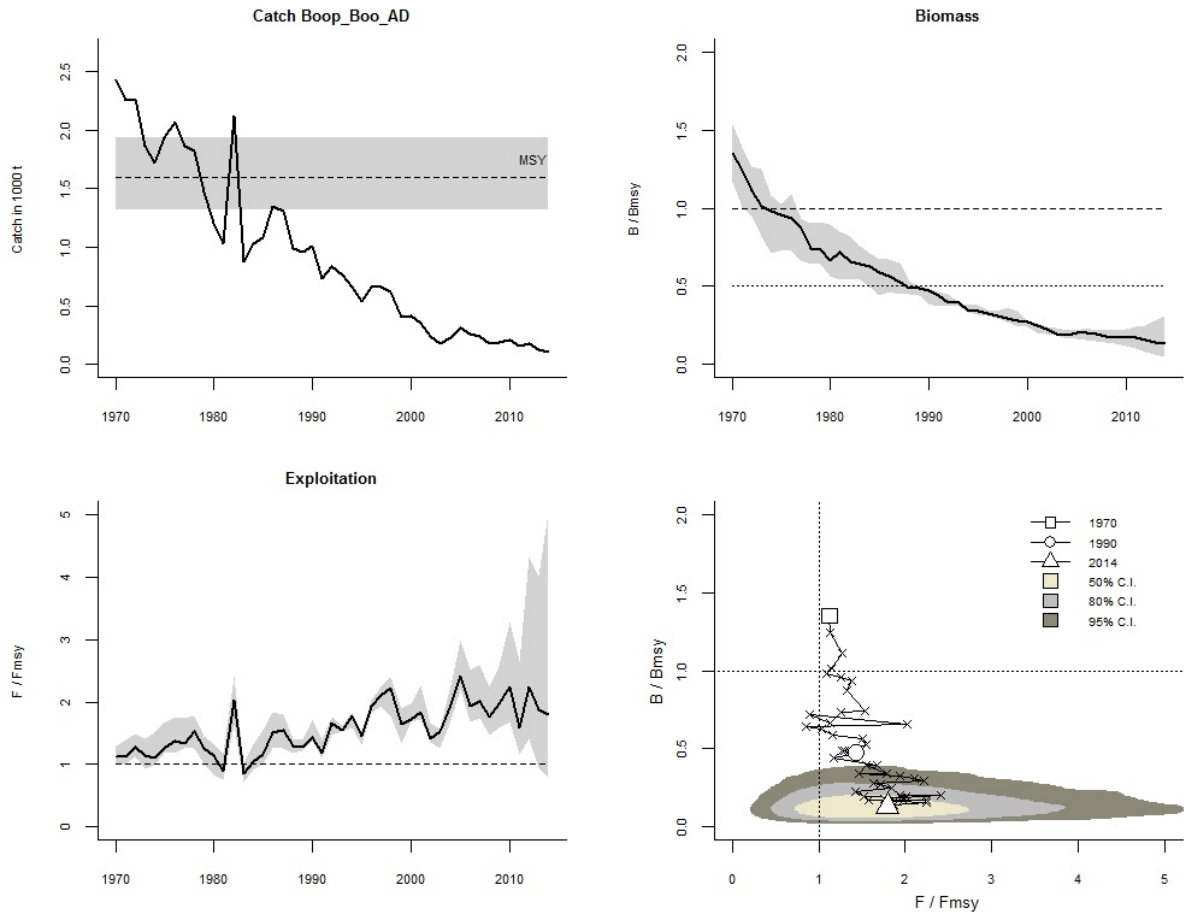
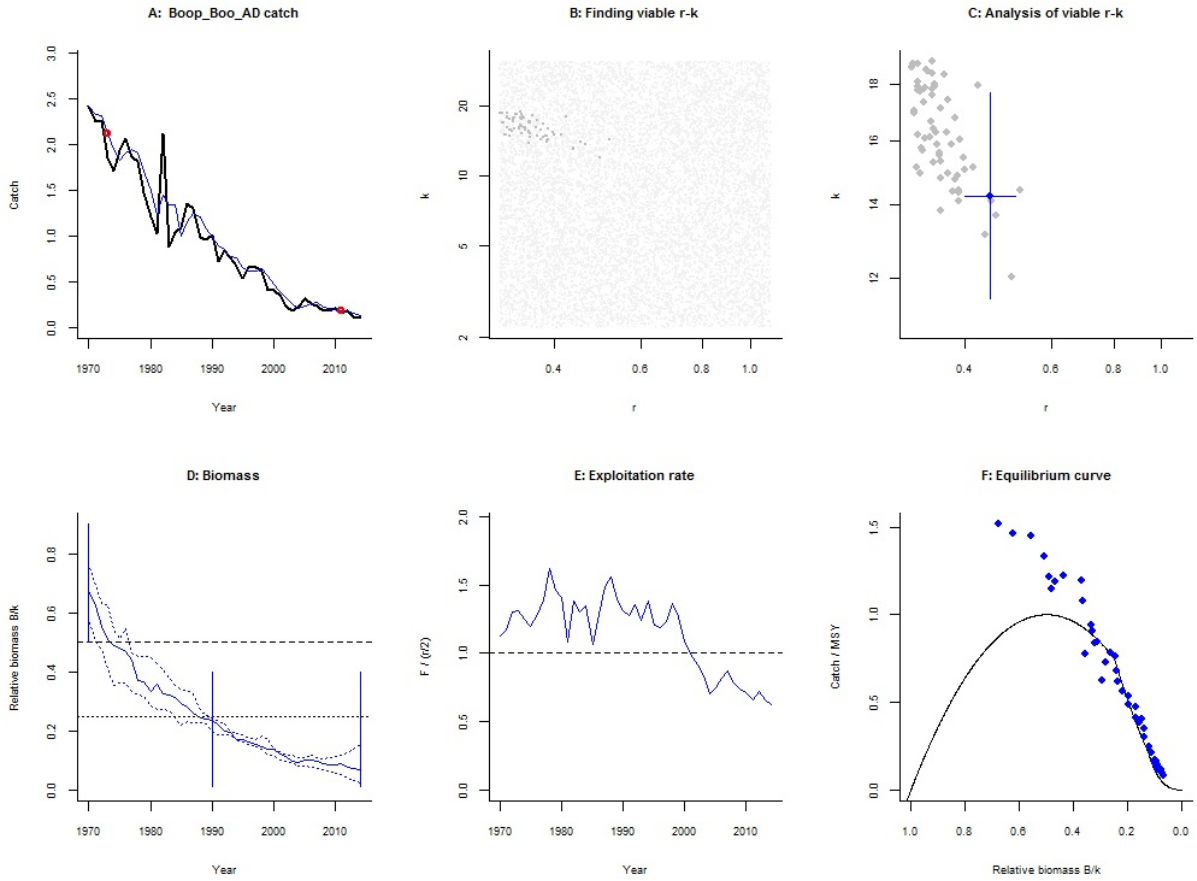
Stock status and exploitation in 2014

Biomass = 0.953 ,  $B/B_{msy}$  = 0.134 , fishing mortality  $F$  = 0.108 ,  $F/F_{msy}$  = 1.8

Comment: Catch=landings from FishStat (Yugoslavia, Italy, Croatia, Serbia and Montenegro, Slovenia).

RF int 1990 0.01-0.4, final 0.3. GS final 0.4, decline in catches caused by low market demand.

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Species: *Chamelea gallina* , stock: Cham\_gal\_AD

Striped venus in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1970 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.1 - 0.5 in year 1995 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 47 - 752

Results of CMSY analysis with altogether 1571 viable trajectories for 845 r-k pairs

$r = 0.498$  , 95% CL = 0.325 - 0.763 ,  $k = 209$  , 95% CL = 151 - 290

MSY = 26 , 95% CL = 24 - 28.1

Relative biomass last year = 0.212  $k$  , 2.5th = 0.0148 , 97.5th = 0.296

Exploitation  $F/(r/2)$  in last year = 1.44

Results for Management (based on CMSY analysis)

$F_{msy} = 0.249$  , 95% CL = 0.162 - 0.381 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.211$  , 95% CL = 0.138 - 0.323 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 26 , 95% CL = 24 - 28.1

$B_{msy} = 104$  , 95% CL = 75.3 - 145

Biomass in last year = 44.2 , 2.5th perc = 3.1 , 97.5 perc = 61.9

$B/B_{msy}$  in last year = 0.423 , 2.5th perc = 0.0297 , 97.5 perc = 0.593

Fishing mortality in last year = 0.316 , 2.5th perc = 0.226 , 97.5 perc = 4.51

$F/F_{msy} = 1.5$  , 2.5th perc = 1.07 , 97.5 perc = 21.4

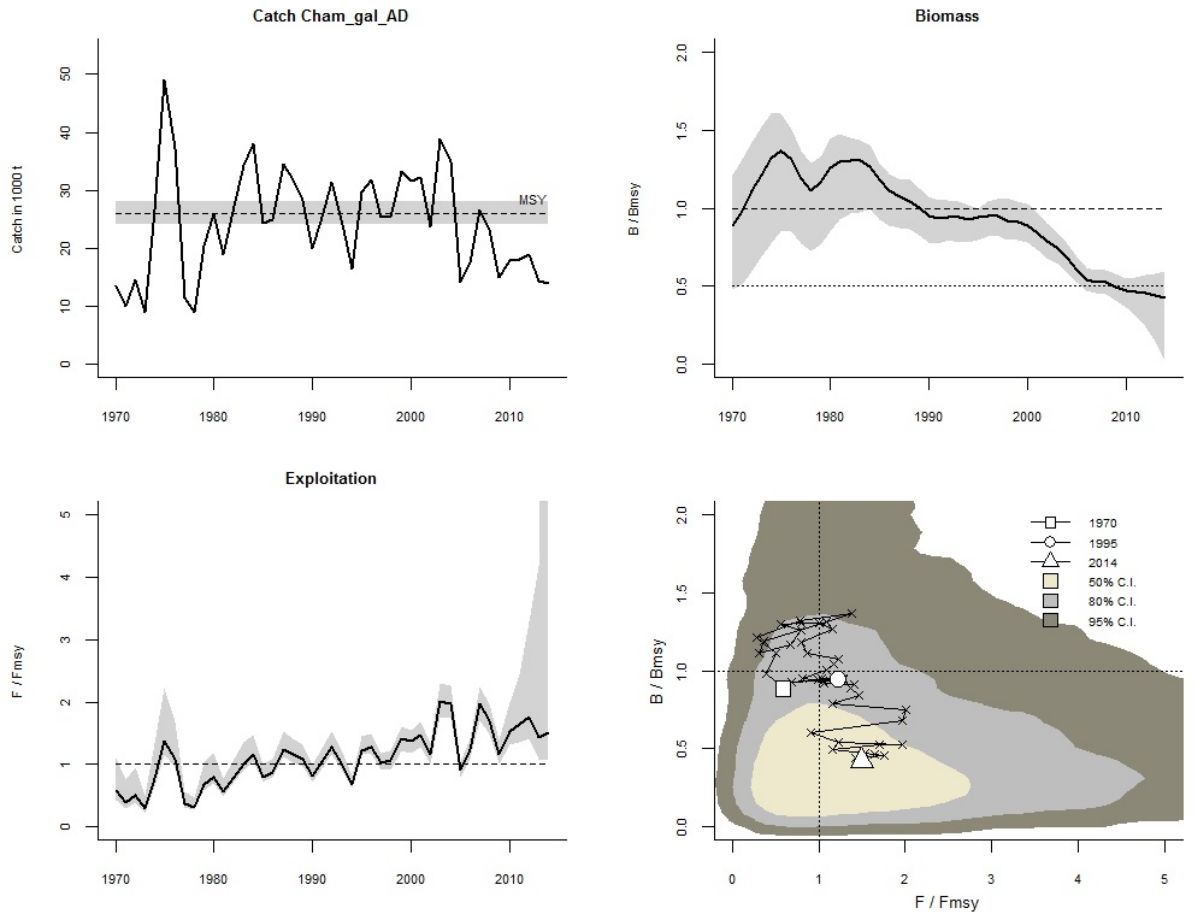
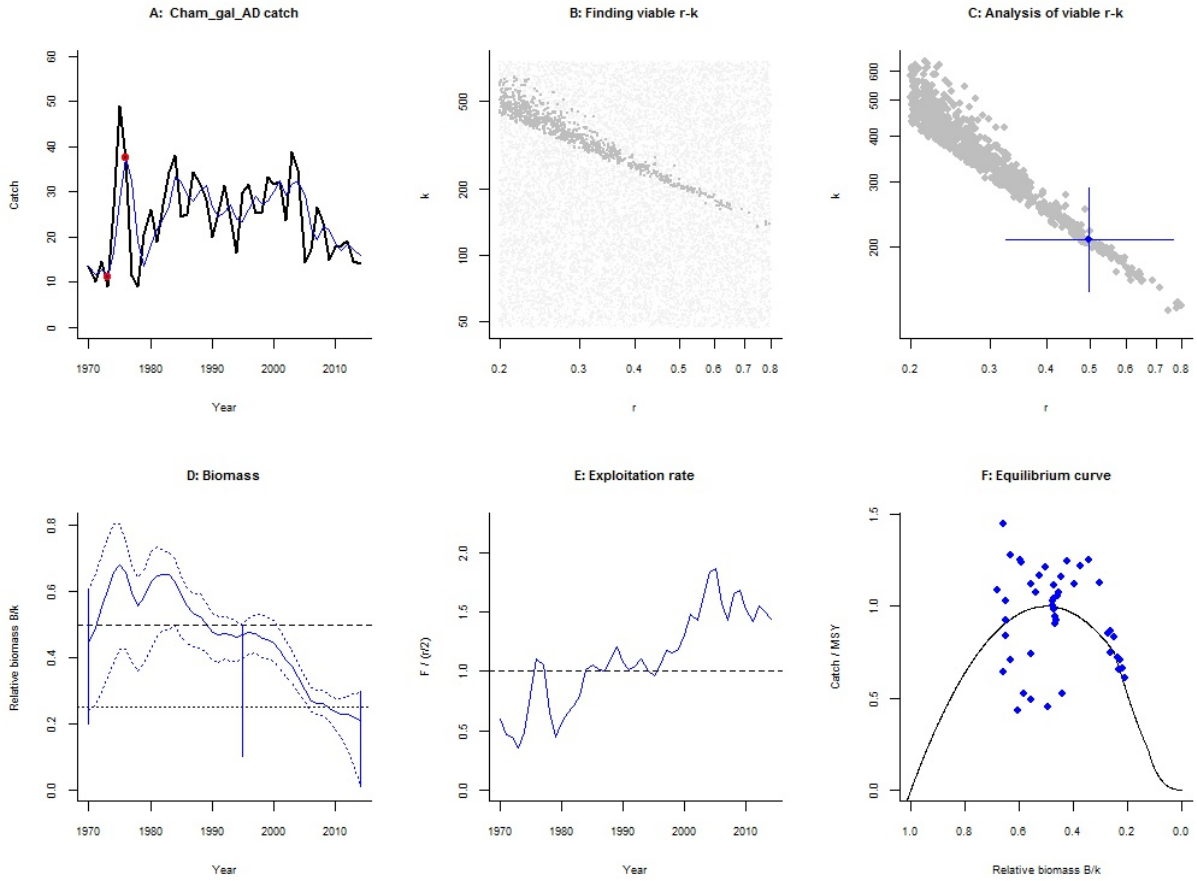
Stock status and exploitation in 2014

Biomass = 44.2 ,  $B/B_{msy} = 0.423$  , fishing mortality  $F = 0.316$  ,  $F/F_{msy} = 1.5$

Comment: Catch=landings from FishStat (Slovenia, Italy). RF int 1995 0.1-0.5, final 0.3. GS OK.

Scarcella, G., Mosteiro Cabanelas, A. 2016. The clam fisheries sector in the EU/ the Adriatic Sea case. European Parliament's Committee on Fisheries. <http://www.europarl.europa.eu/supporting-analyses>. 40 pp

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Species: *Conger conger* , stock: Cong\_con\_AD

Conger eel in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1970 - 2014 , abundance = None

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  $r$  = 0.16 - 0.46 expert , , prior range for  $k$  = 0.368 - 4.23

Results of CMSY analysis with altogether 2324 viable trajectories for 1829 r-k pairs

$r$  = 0.343 , 95% CL = 0.259 - 0.455 ,  $k$  = 1.49 , 95% CL = 1.06 - 2.08

MSY = 0.128 , 95% CL = 0.106 - 0.154

Relative biomass last year = 0.172  $k$ , 2.5th = 0.0193 , 97.5th = 0.297

Exploitation  $F/(r/2)$  in last year = 2.15

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.172 , 95% CL = 0.129 - 0.227 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.118 , 95% CL = 0.089 - 0.157 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.128 , 95% CL = 0.106 - 0.154

$B_{msy}$  = 0.745 , 95% CL = 0.532 - 1.04

Biomass in last year = 0.256 , 2.5th perc = 0.0287 , 97.5 perc = 0.442

$B/B_{msy}$  in last year = 0.344 , 2.5th perc = 0.0386 , 97.5 perc = 0.594

Fishing mortality in last year = 0.363 , 2.5th perc = 0.21 , 97.5 perc = 3.24

$F/F_{msy}$  = 3.07 , 2.5th perc = 1.78 , 97.5 perc = 27.4

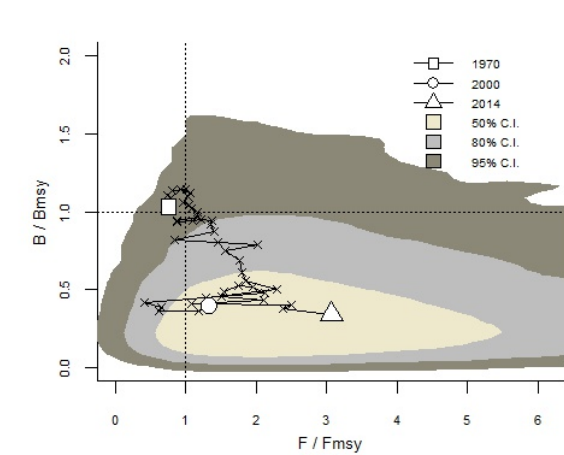
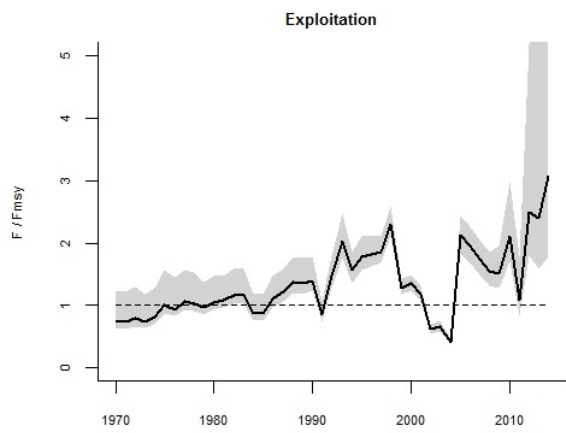
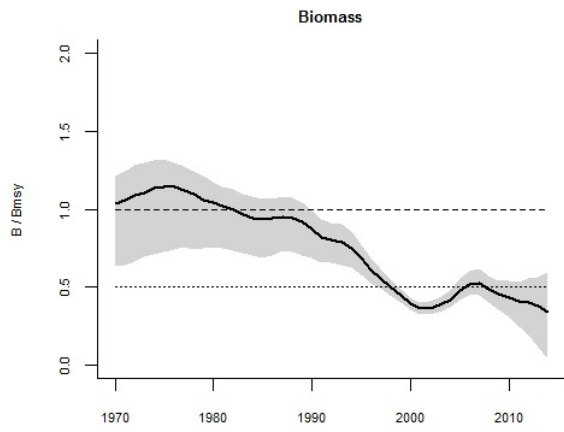
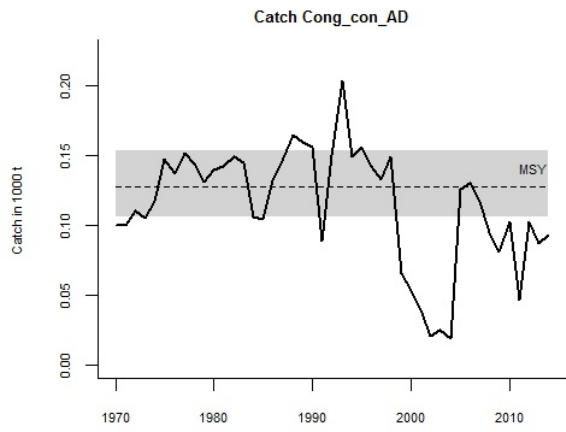
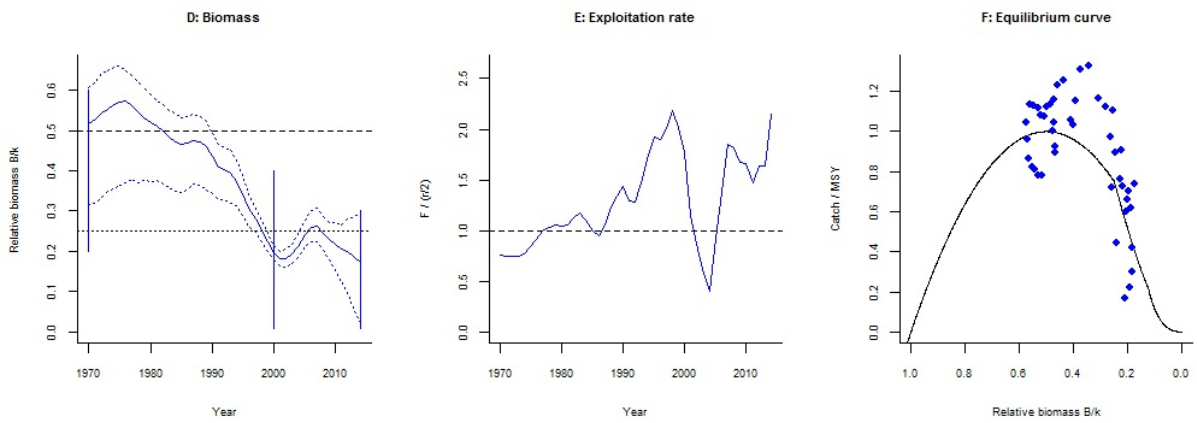
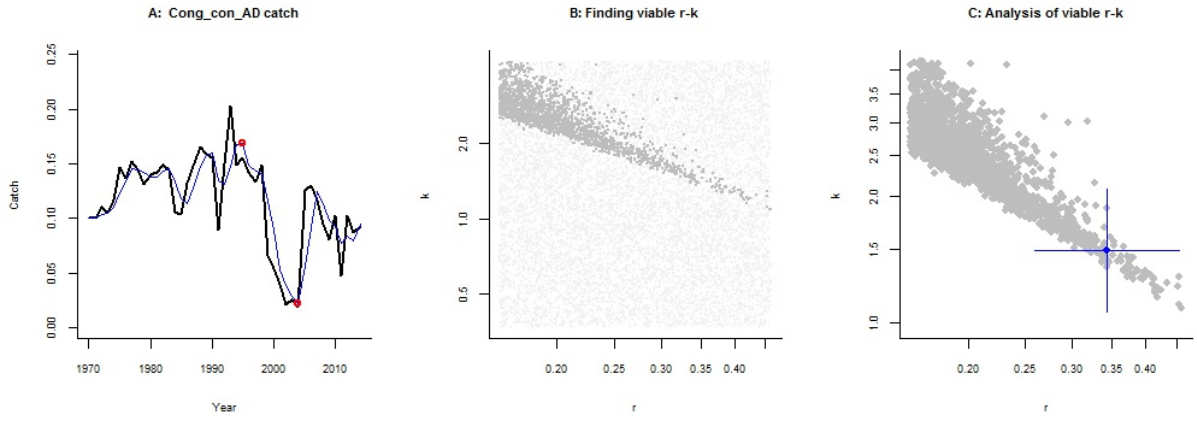
Stock status and exploitation in 2014

Biomass = 0.256 ,  $B/B_{msy}$  = 0.344 , fishing mortality  $F$  = 0.363 ,  $F/F_{msy}$  = 3.07

Comment: Catch=landings from FishStat (Serbia and Montenegro, Slovenia, Italy, Croatia, Yugoslavia).

RF int 2000 0.01-0.4, final 0.3. GS OK

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Species: *Dentex dentex* , stock: Dent\_den\_AD

Common dentex in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1970 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.15 - 0.73 expert , , prior range for  $k$  = 0.213 - 4.14

Results of CMSY analysis with altogether 1436 viable trajectories for 1120 r-k pairs

$r$  = 0.395 , 95% CL = 0.256 - 0.608 ,  $k$  = 1.04 , 95% CL = 0.716 - 1.51

MSY = 0.102 , 95% CL = 0.0896 - 0.117

Relative biomass last year = 0.152  $k$  , 2.5th = 0.0162 , 97.5th = 0.387

Exploitation  $F/(r/2)$  in last year = 0.931

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.197 , 95% CL = 0.128 - 0.304 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.12 , 95% CL = 0.0779 - 0.185 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.102 , 95% CL = 0.0896 - 0.117

$B_{msy}$  = 0.519 , 95% CL = 0.358 - 0.753

Biomass in last year = 0.158 , 2.5th perc = 0.0169 , 97.5 perc = 0.402

$B/B_{msy}$  in last year = 0.304 , 2.5th perc = 0.0325 , 97.5 perc = 0.774

Fishing mortality in last year = 0.209 , 2.5th perc = 0.0821 , 97.5 perc = 1.96

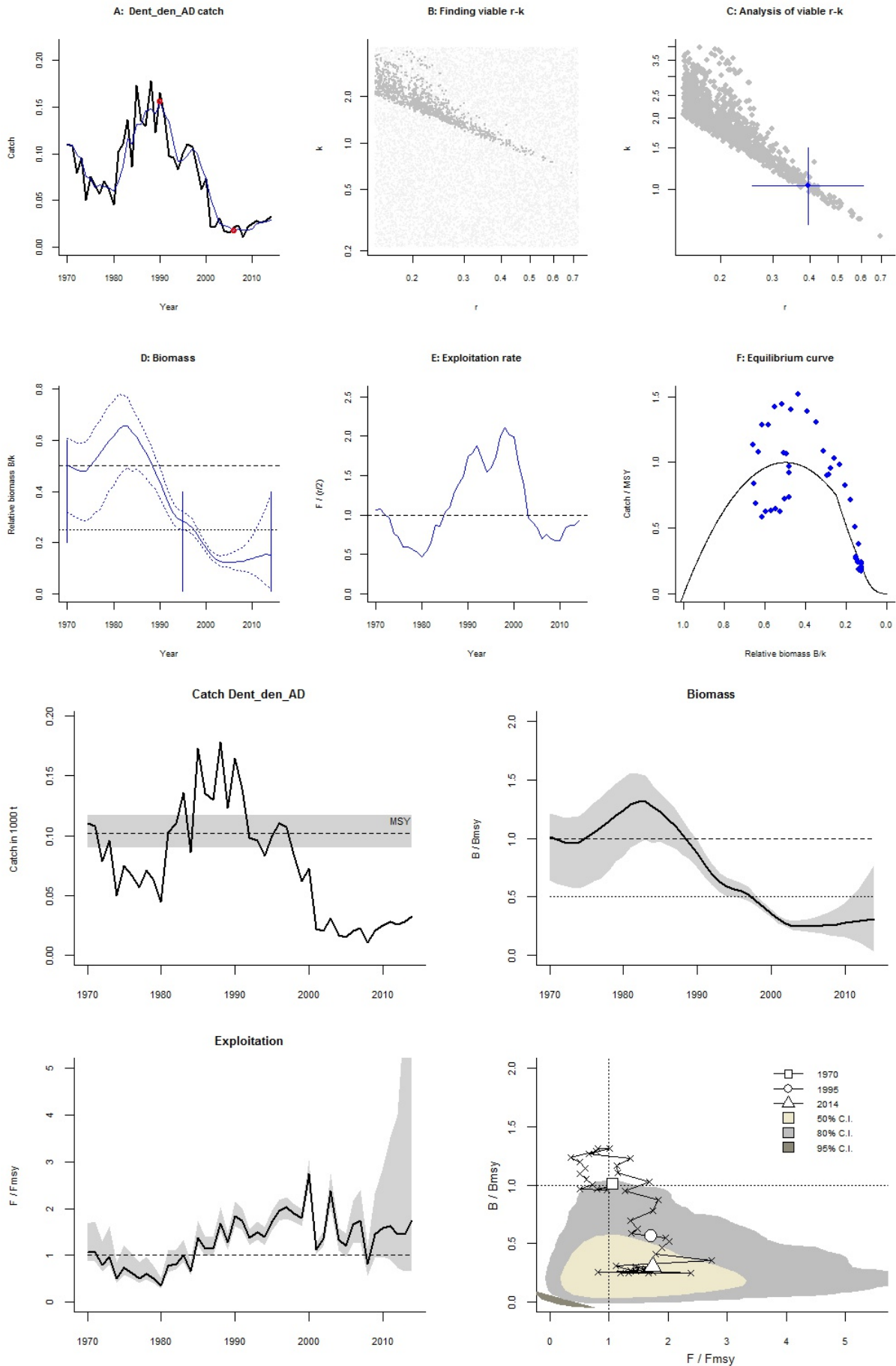
$F/F_{msy}$  = 1.74 , 2.5th perc = 0.684 , 97.5 perc = 16.3

Stock status and exploitation in 2014

Biomass = 0.158 ,  $B/B_{msy}$  = 0.304 , fishing mortality  $F$  = 0.209 ,  $F/F_{msy}$  = 1.74

Comment: Catch=landings from FishStat (Croatia, Italy, Serbia and Montenegro, Yugoslavia, Montenegro). GS OK

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Species: *Engraulis encrasicolus* , stock: Engr\_enc\_AD

Anchovy in Adriatic Sea

Source: GFCM 2014 WGSP, EASME EMFF 2014, M from Colloca et al 2013

Region: Mediterranean , Adriatic Sea

Catch data used from years 1975 - 2013 , abundance = CPUE

Prior initial relative biomass = 0.5 - 0.9 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  $r$  = 0.26 - 1.2 expert, , prior range for  $k$  = 52.6 - 939

Prior range of  $q$  = 3.27 - 13.8

Results of CMSY analysis with altogether 2068 viable trajectories for 1668 r-k pairs

$r$  = 0.752 , 95% CL = 0.504 - 1.12 ,  $k$  = 188 , 95% CL = 125 - 283

MSY = 35.4 , 95% CL = 30.8 - 40.6

Relative biomass last year = 0.151  $k$ , 2.5th = 0.0169 , 97.5th = 0.358

Exploitation  $F/(r/2)$  in last year = 3.51

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.542 , 95% CL = 0.361 - 0.812 ,  $k$  = 264 , 95% CL = 191 - 363

MSY = 35.7 , 95% CL = 29.8 - 42.9

Relative biomass in last year = 0.35  $k$ , 2.5th perc = 0.213 , 97.5th perc = 0.454

Exploitation  $F/(r/2)$  in last year = 1.31

$q$  = 4.84 , lcl = 3.68 , ucl = 6.37

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.271 , 95% CL = 0.181 - 0.406 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.271 , 95% CL = 0.181 - 0.406 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 35.7 , 95% CL = 29.8 - 42.9

$B_{msy}$  = 132 , 95% CL = 95.7 - 182

Biomass in last year = 92.4 , 2.5th perc = 56.3 , 97.5 perc = 120

$B/B_{msy}$  in last year = 0.7 , 2.5th perc = 0.427 , 97.5 perc = 0.908

Fishing mortality in last year = 0.355 , 2.5th perc = 0.274 , 97.5 perc = 0.582

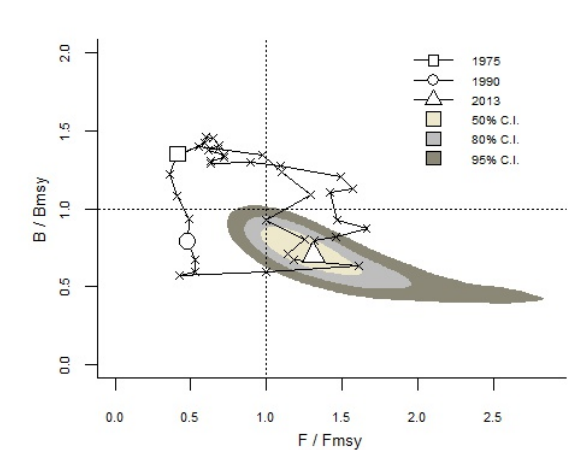
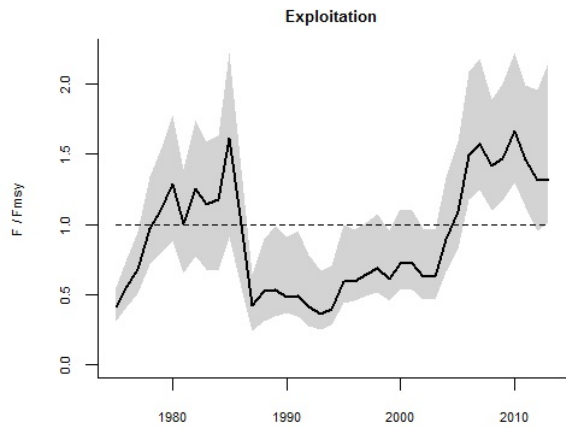
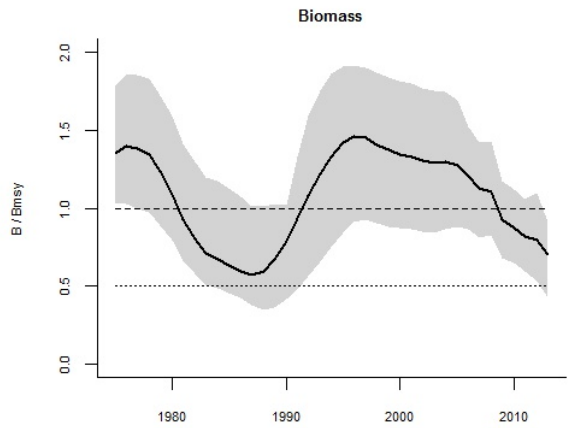
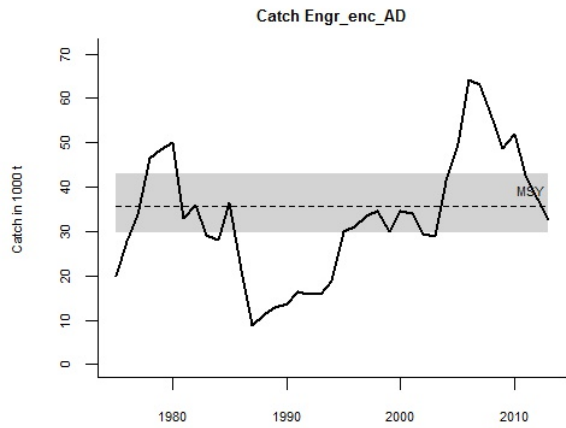
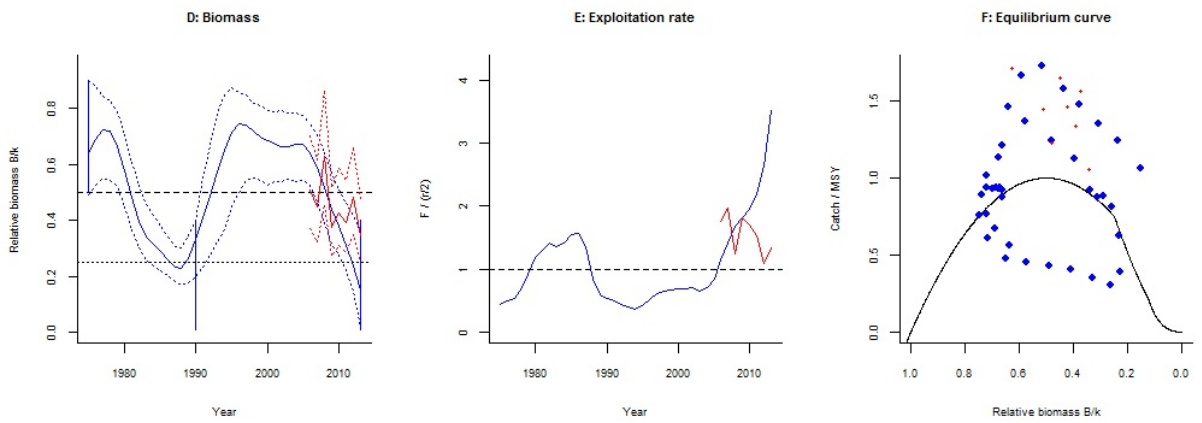
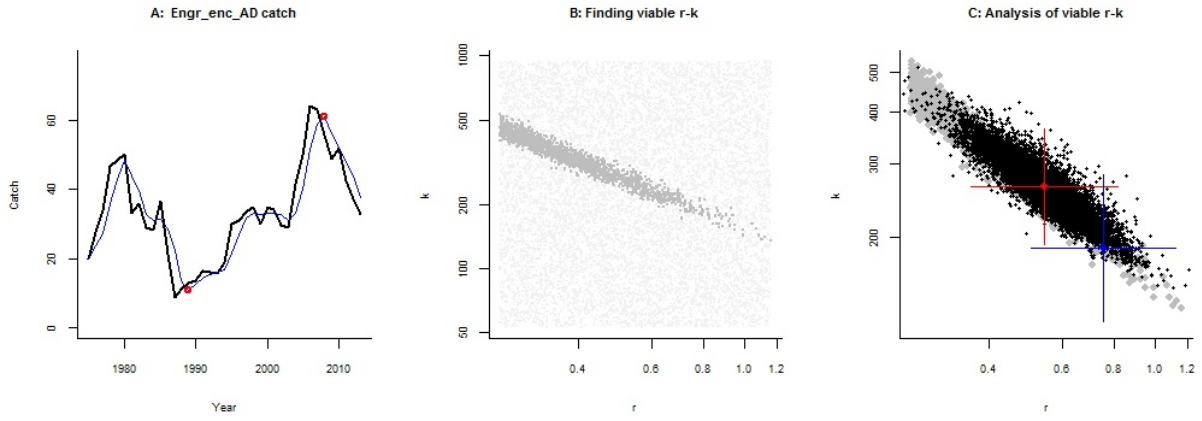
$F/F_{msy}$  = 1.31 , 2.5th perc = 1.01 , 97.5 perc = 2.15

Stock status and exploitation in 2014

Biomass = ,  $B/B_{msy}$  = , fishing mortality  $F$  = ,  $F/F_{msy}$  =

Comment: Landings from Stock assessment form GFCM 2015 (17+18) MEDIAS 17+18. GS OK, very similar to SAM

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Species: *Homarus gammarus* , stock: Hom\_gam\_AD

Lobster in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1970 - 2013 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 0.0542 - 0.867

Results of CMSY analysis with altogether 1367 viable trajectories for 1229 r-k pairs

$r$  = 0.373 , 95% CL = 0.293 - 0.474 ,  $k$  = 0.331 , 95% CL = 0.244 - 0.449

MSY = 0.0308 , 95% CL = 0.0252 - 0.0377

Relative biomass last year = 0.118  $k$ , 2.5th = 0.0121 , 97.5th = 0.287

Exploitation  $F/(r/2)$  in last year = 0.689

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.186 , 95% CL = 0.146 - 0.237 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0878 , 95% CL = 0.069 - 0.112 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.0308 , 95% CL = 0.0252 - 0.0377

$B_{msy}$  = 0.165 , 95% CL = 0.122 - 0.224

Biomass in last year = 0.039 , 2.5th perc = 0.004 , 97.5 perc = 0.095

$B/B_{msy}$  in last year = 0.236 , 2.5th perc = 0.0242 , 97.5 perc = 0.575

Fishing mortality in last year = 0.154 , 2.5th perc = 0.0631 , 97.5 perc = 1.5

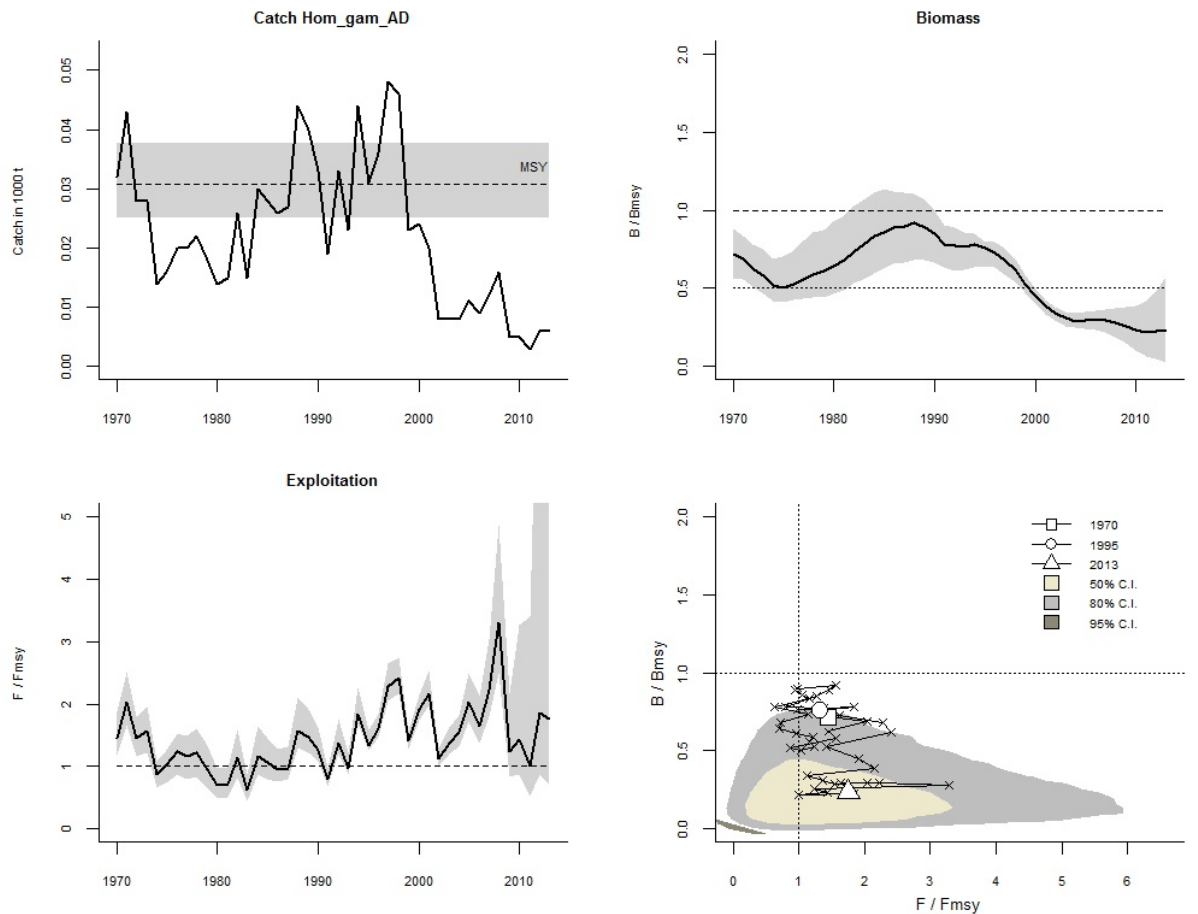
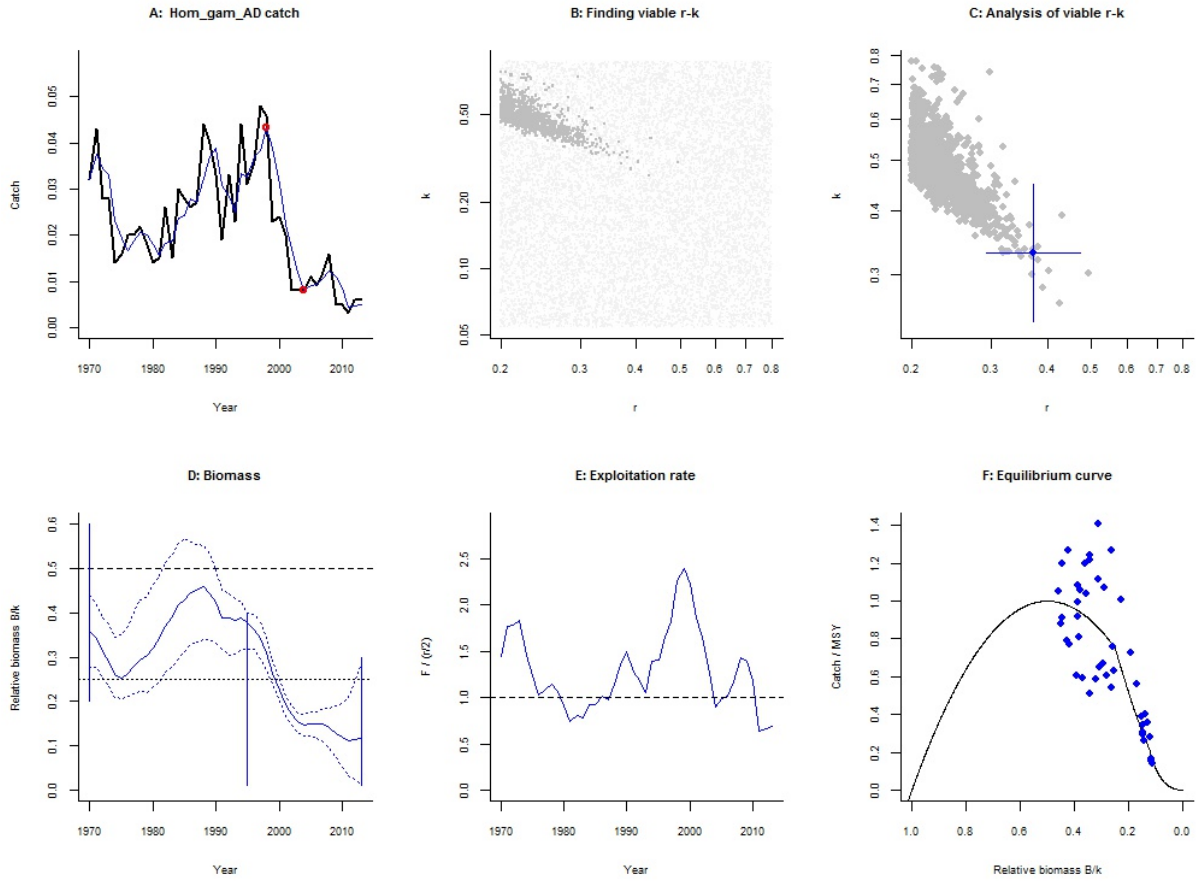
$F/F_{msy}$  = 1.75 , 2.5th perc = 0.719 , 97.5 perc = 17.1

Stock status and exploitation in 2014

Biomass = ,  $B/B_{msy}$  = , fishing mortality  $F$  = ,  $F/F_{msy}$  =

Comment: Catch=landings from FishStat (Croatia, Italy, Serbia and Montenegro, Yugoslavia). GS OK

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Species: *Illex coindettii* , stock: Ille\_coi\_AD

Shortfin squid in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1985 - 2013 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 4.82 - 77

Prior range of  $q$  = 0.00358 - 0.0143

Results of CMSY analysis with altogether 1845 viable trajectories for 1741 r-k pairs

$r$  = 0.435 , 95% CL = 0.284 - 0.665 ,  $k$  = 34.5 , 95% CL = 19.3 - 61.6

MSY = 3.75 , 95% CL = 1.95 - 7.24

Relative biomass last year = 0.114  $k$ , 2.5th = 0.0124 , 97.5th = 0.29

Exploitation  $F/(r/2)$  in last year = 0.858

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.607 , 95% CL = 0.409 - 0.901 ,  $k$  = 21.1 , 95% CL = 14.9 - 29.8

MSY = 3.2 , 95% CL = 2.62 - 3.91

Relative biomass in last year = 0.16  $k$ , 2.5th perc = 0.0483 , 97.5th perc = 0.328

Exploitation  $F/(r/2)$  in last year = 0.671

$q$  = 0.00496 , lcl = 0.00366 , ucl = 0.00672

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.304 , 95% CL = 0.205 - 0.451 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.195 , 95% CL = 0.131 - 0.289 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 3.2 , 95% CL = 2.62 - 3.91

$B_{msy}$  = 10.5 , 95% CL = 7.44 - 14.9

Biomass in last year = 3.38 , 2.5th perc = 1.02 , 97.5 perc = 6.9

$B/B_{msy}$  in last year = 0.32 , 2.5th perc = 0.0966 , 97.5 perc = 0.655

Fishing mortality in last year = 0.204 , 2.5th perc = 0.0997 , 97.5 perc = 0.676

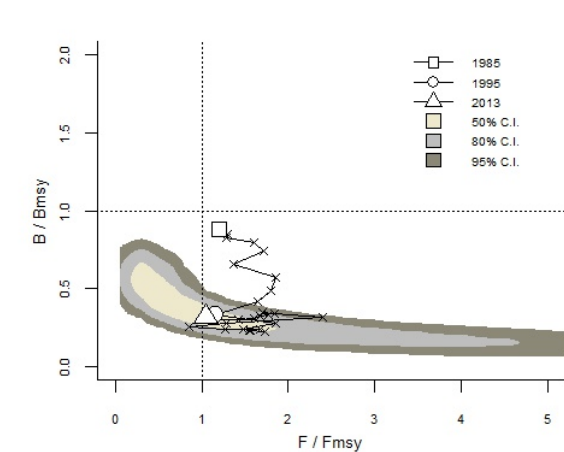
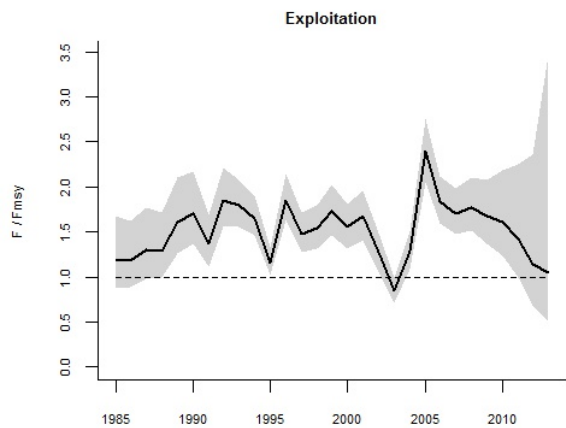
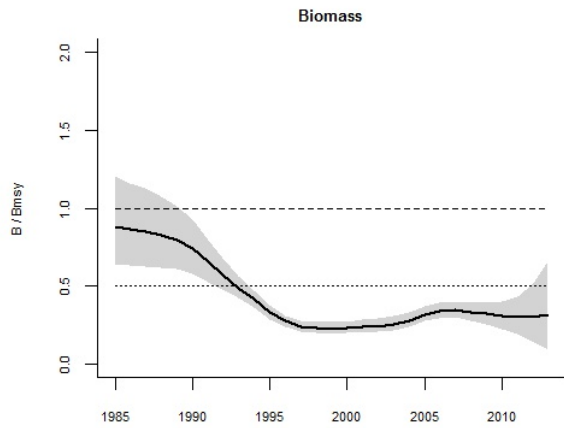
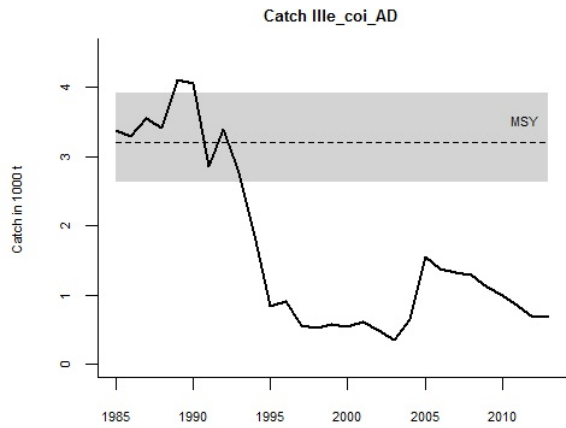
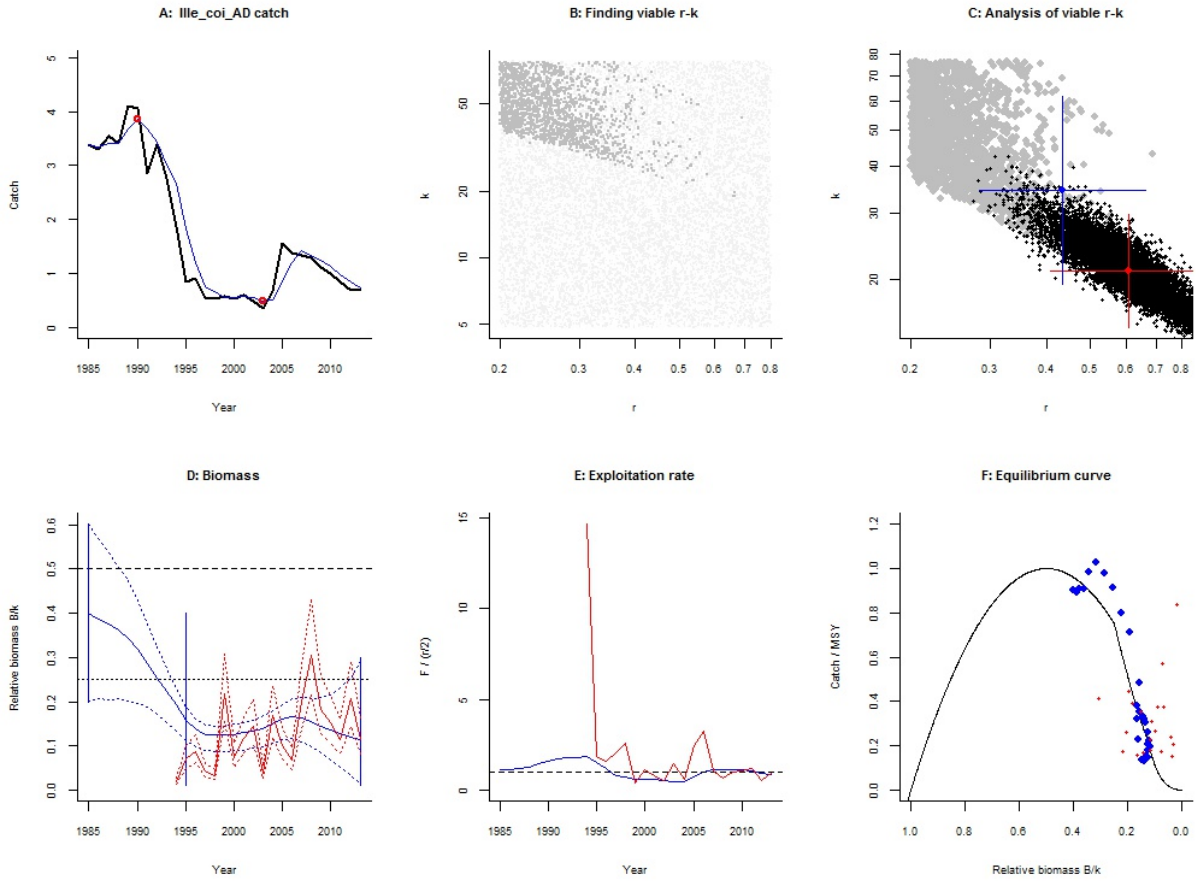
$F/F_{msy}$  = 1.05 , 2.5th perc = 0.512 , 97.5 perc = 3.47

Stock status and exploitation in 2014

Biomass = ,  $B/B_{msy}$  = , fishing mortality  $F$  = ,  $F/F_{msy}$  =

Comment: Catch=landings from FishStat (Italy). CPUE from MEDITS. RF final 0.3. GS OK [Thanasis source]

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Species: *Loligo vulgaris* , stock: Loli\_vul\_AD

European squid in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1970 - 2013 , 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  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 2.94 - 47

Prior range of  $q$  = 0.00091 - 0.00364

Results of CMSY analysis with altogether 726 viable trajectories for 674 r-k pairs

$r$  = 0.359 , 95% CL = 0.269 - 0.478 ,  $k$  = 15.5 , 95% CL = 12.1 - 19.8

MSY = 1.39 , 95% CL = 1.24 - 1.56

Relative biomass last year = 0.101  $k$ , 2.5th = 0.0138 , 97.5th = 0.267

Exploitation  $F/(r/2)$  in last year = 0.428

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.338 , 95% CL = 0.222 - 0.513 ,  $k$  = 16.3 , 95% CL = 11.8 - 22.4

MSY = 1.37 , 95% CL = 1.14 - 1.65

Relative biomass in last year = 0.0533  $k$ , 2.5th perc = 0.0121 , 97.5th perc = 0.199

Exploitation  $F/(r/2)$  in last year = 0.683

$q$  = 0.00145 , lcl = 0.00105 , ucl = 0.002

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.179 , 95% CL = 0.135 - 0.239 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0722 , 95% CL = 0.0542 - 0.0961 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.39 , 95% CL = 1.24 - 1.56

$B_{msy}$  = 7.76 , 95% CL = 6.07 - 9.91

Biomass in last year = 1.56 , 2.5th perc = 0.214 , 97.5 perc = 4.15

$B/B_{msy}$  in last year = 0.201 , 2.5th perc = 0.0276 , 97.5 perc = 0.535

Fishing mortality in last year = 0.0641 , 2.5th perc = 0.0241 , 97.5 perc = 0.468

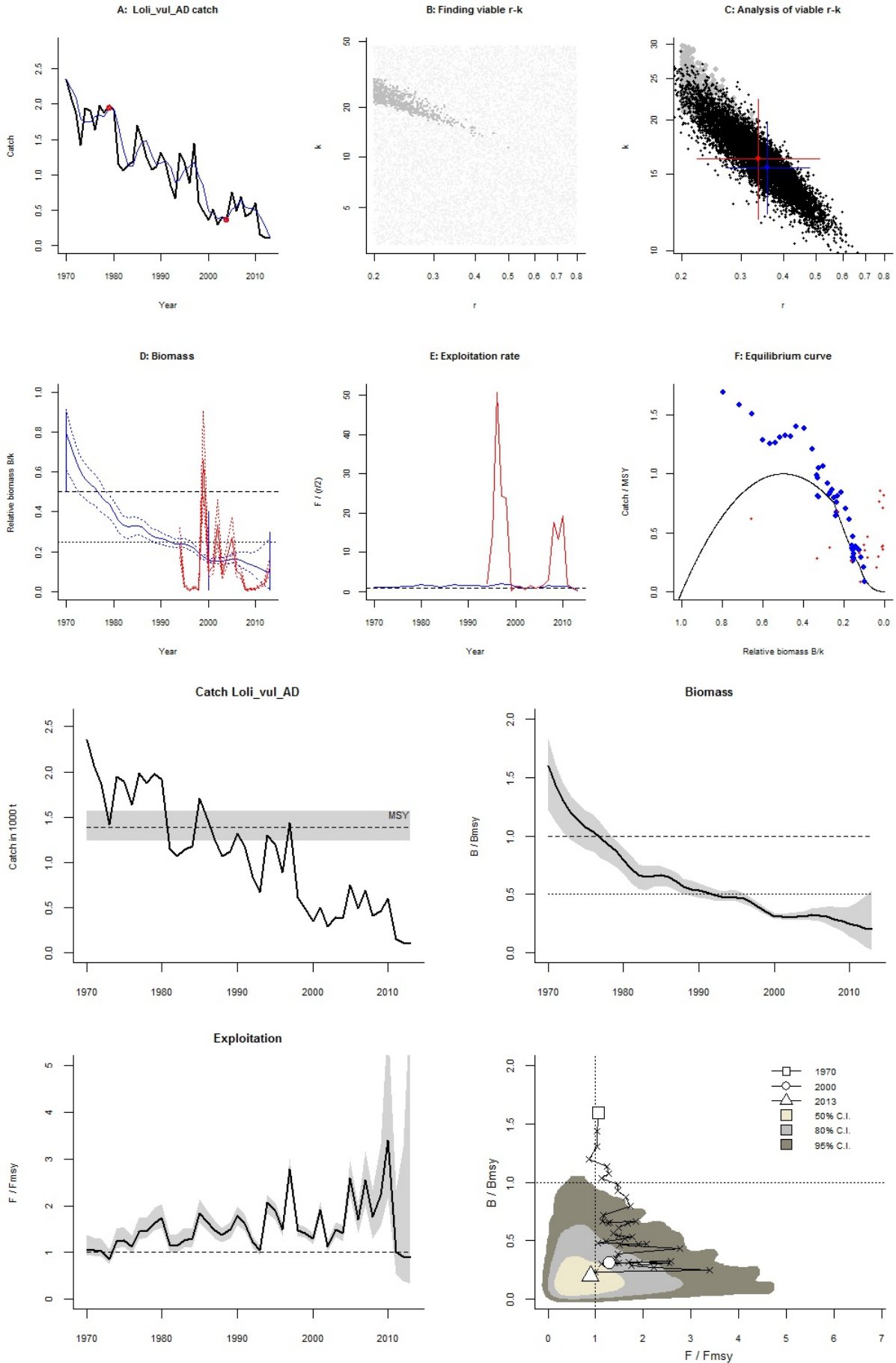
$F/F_{msy}$  = 0.888 , 2.5th perc = 0.334 , 97.5 perc = 6.48

Stock status and exploitation in 2014

Biomass = ,  $B/B_{msy}$  = , fishing mortality  $F$  = ,  $F/F_{msy}$  =

Comment: Catch=landings from FishStat. CPUE from MEDITS. RF int 2000 0.01-0.4, final 0.3. GS OK,

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Species: *Lophius* spp. , stock: Lophius\_AD

Blackbellied angler in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1970 - 2013 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1998 default

Prior final relative biomass = 0.1 - 0.5 expert

Prior range for  $r$  = 0.2 - 0.54 expert, , prior range for  $k$  = 1.25 - 13.4

Results of CMSY analysis with altogether 1493 viable trajectories for 814 r-k pairs

$r$  = 0.422 , 95% CL = 0.334 - 0.534 ,  $k$  = 3.57 , 95% CL = 2.67 - 4.77

MSY = 0.377 , 95% CL = 0.338 - 0.42

Relative biomass last year = 0.358  $k$ , 2.5th = 0.13 , 97.5th = 0.492

Exploitation  $F/(r/2)$  in last year = 1.16

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.211 , 95% CL = 0.167 - 0.267 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.211 , 95% CL = 0.167 - 0.267 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.377 , 95% CL = 0.338 - 0.42

$B_{msy}$  = 1.79 , 95% CL = 1.34 - 2.39

Biomass in last year = 1.28 , 2.5th perc = 0.465 , 97.5 perc = 1.76

$B/B_{msy}$  in last year = 0.716 , 2.5th perc = 0.261 , 97.5 perc = 0.984

Fishing mortality in last year = 0.196 , 2.5th perc = 0.142 , 97.5 perc = 0.537

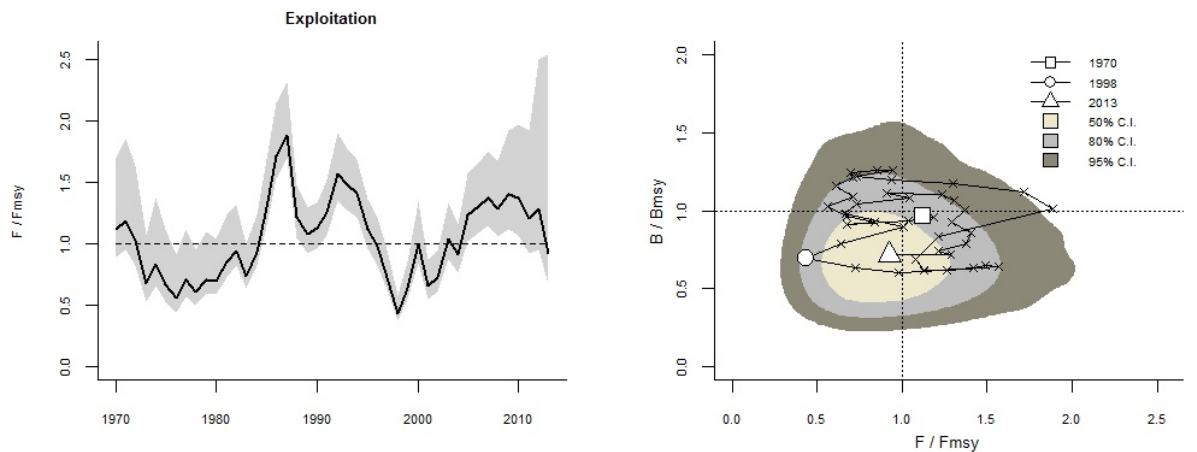
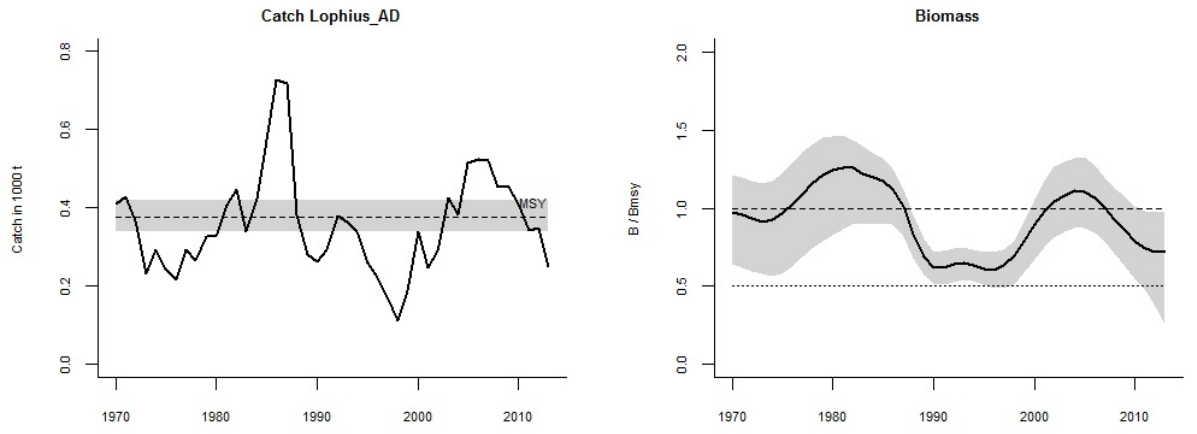
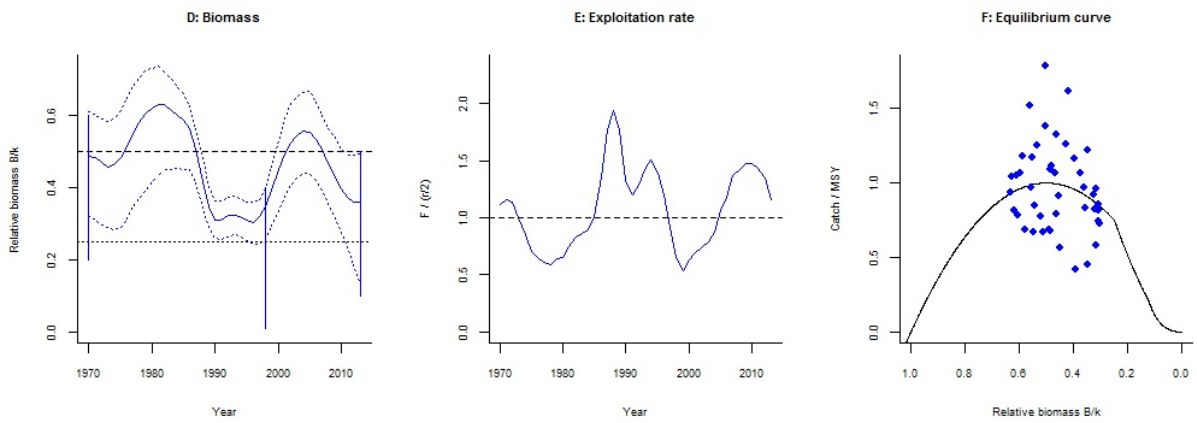
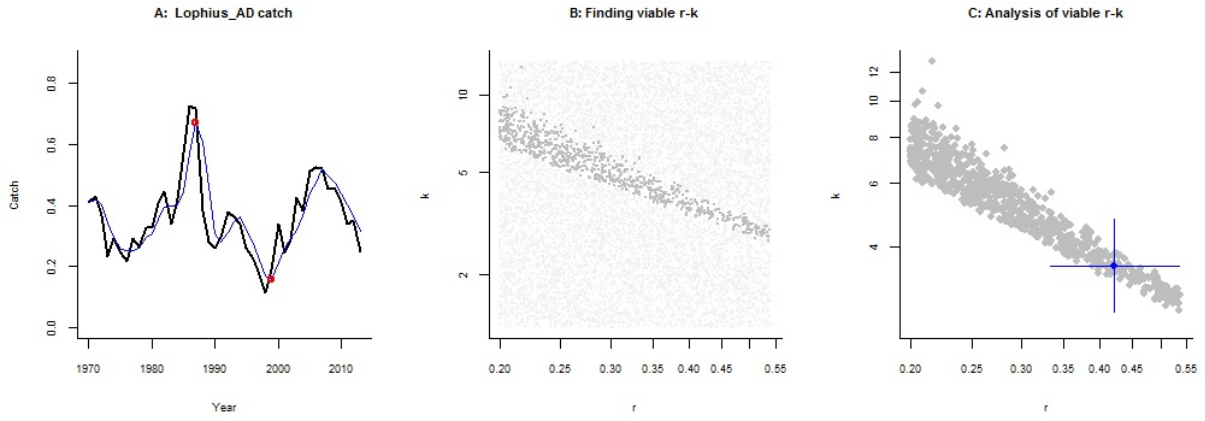
$F/F_{msy}$  = 0.926 , 2.5th perc = 0.674 , 97.5 perc = 2.55

Stock status and exploitation in 2014

Biomass = ,  $B/B_{msy}$  = , fishing mortality  $F$  = ,  $F/F_{msy}$  =

Comment: Catch=landings from FishStat (Italy). RF final 0.1-0.5. GS OK

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Species: *Merluccius merluccius* , stock: Merl\_mer\_AD

Hake in Adriatic Sea

Source: STECF 16-08

Region: Mediterranean , Adriatic Sea

Catch data used from years 1978 - 2013 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.3 in year 1997 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.22 - 0.95 expert , , prior range for  $k$  = 36.9 - 637

Prior range of  $q$  = 0.00158 - 0.00658

Results of CMSY analysis with altogether 1427 viable trajectories for 1206 r-k pairs

$r$  = 0.475 , 95% CL = 0.328 - 0.688 ,  $k$  = 177 , 95% CL = 131 - 238

MSY = 21 , 95% CL = 18.9 - 23.3

Relative biomass last year = 0.119  $k$ , 2.5th = 0.016 , 97.5th = 0.291

Exploitation  $F/(r/2)$  in last year = 1.89

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.579 , 95% CL = 0.422 - 0.795 ,  $k$  = 151 , 95% CL = 117 - 193

MSY = 21.8 , 95% CL = 18.9 - 25.2

Relative biomass in last year = 0.219  $k$ , 2.5th perc = 0.142 , 97.5th perc = 0.315

Exploitation  $F/(r/2)$  in last year = 0.998

$q$  = 0.00218 , lcl = 0.00164 , ucl = 0.00289

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.237 , 95% CL = 0.164 - 0.344 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.113 , 95% CL = 0.0776 - 0.163 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 21 , 95% CL = 18.9 - 23.3

$B_{msy}$  = 88.3 , 95% CL = 65.7 - 119

Biomass in last year = 20.9 , 2.5th perc = 2.83 , 97.5 perc = 51.3

$B/B_{msy}$  in last year = 0.237 , 2.5th perc = 0.032 , 97.5 perc = 0.581

Fishing mortality in last year = 0.456 , 2.5th perc = 0.186 , 97.5 perc = 3.37

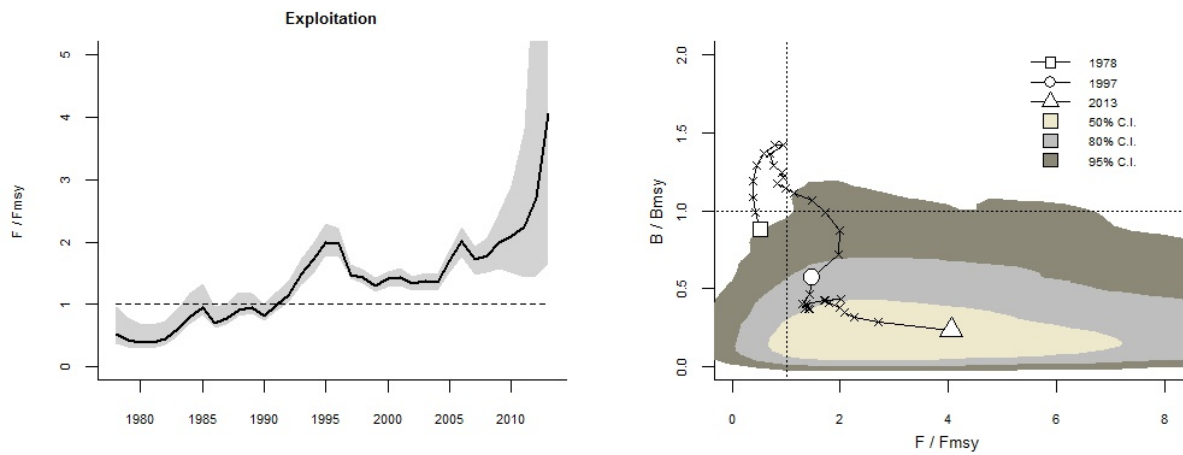
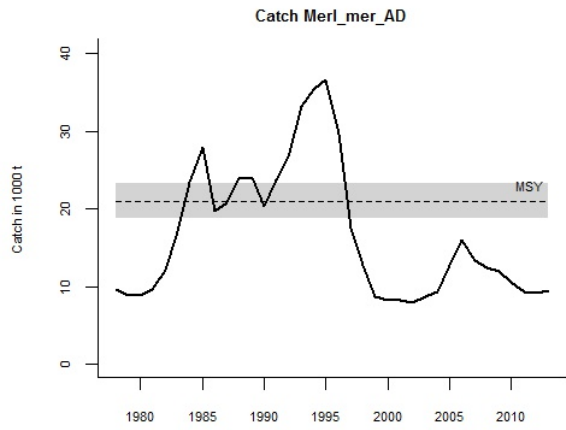
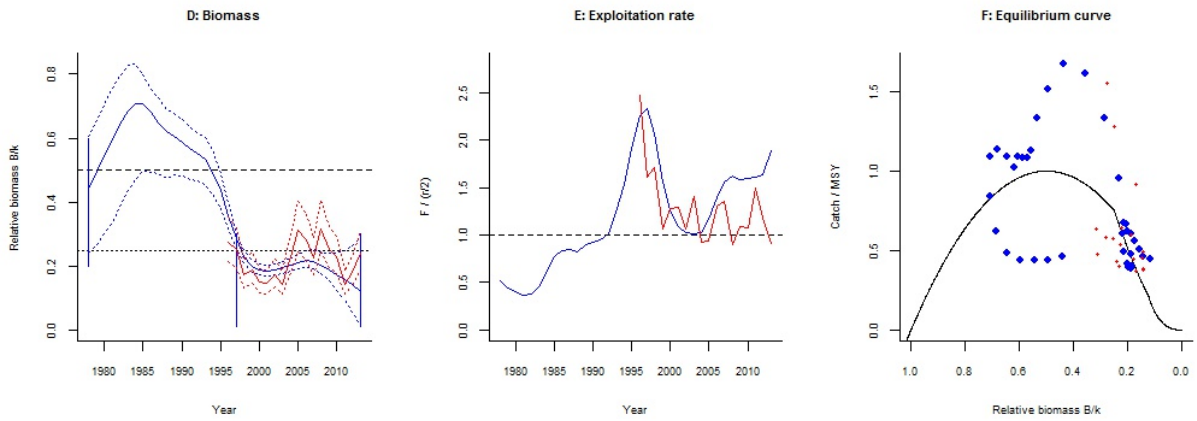
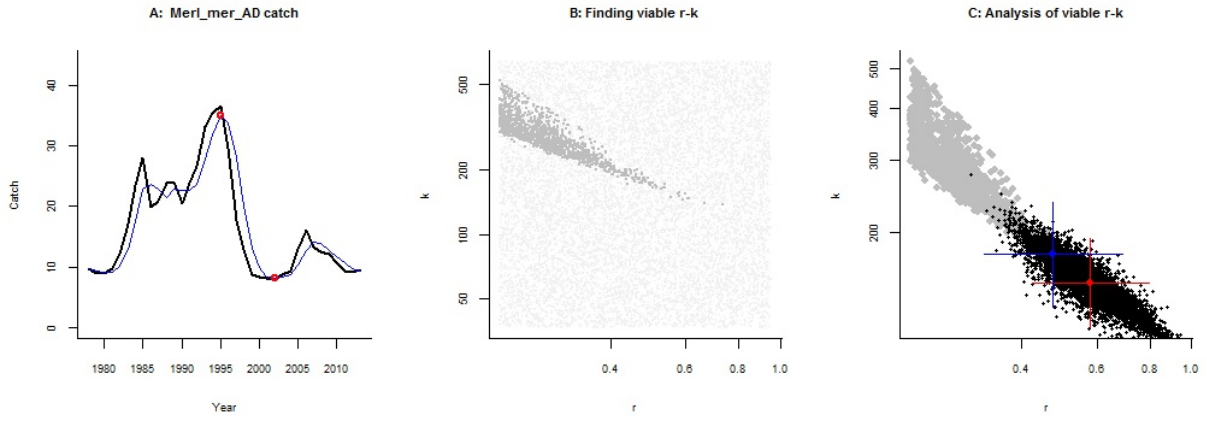
$F/F_{msy}$  = 4.05 , 2.5th perc = 1.65 , 97.5 perc = 30

Stock status and exploitation in 2014

Biomass = ,  $B/B_{msy}$  = , fishing mortality  $F$  = ,  $F/F_{msy}$  =

Comment: GSA 17-18-19-20 Fishstat - MEDITS 17-18-19. GS OK

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Species: *Micromesistius poutassou* , stock: Micr\_pou\_AD

Blue whiting in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1975 - 2013 , 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 = 0.01 - 0.4 expert

Prior range for  $r$  = 0.21 - 1.1 expert, , prior range for  $k$  = 1.56 - 32.5

Prior range of  $q$  = 0.0105 - 0.0479

Results of CMSY analysis with altogether 2221 viable trajectories for 1647 r-k pairs

$r$  = 0.421 , 95% CL = 0.286 - 0.621 ,  $k$  = 8.92 , 95% CL = 6.72 - 11.9

MSY = 0.939 , 95% CL = 0.834 - 1.06

Relative biomass last year = 0.178  $k$ , 2.5th = 0.0151 , 97.5th = 0.391

Exploitation  $F/(r/2)$  in last year = 0.379

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.525 , 95% CL = 0.327 - 0.843 ,  $k$  = 7.66 , 95% CL = 5.25 - 11.2

MSY = 1.01 , 95% CL = 0.869 - 1.17

Relative biomass in last year = 0.213  $k$ , 2.5th perc = 0.0422 , 97.5th perc = 0.445

Exploitation  $F/(r/2)$  in last year = 0.308

$q$  = 0.0141 , lcl = 0.00967 , ucl = 0.0206

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.211 , 95% CL = 0.143 - 0.31 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.15 , 95% CL = 0.102 - 0.221 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.939 , 95% CL = 0.834 - 1.06

$B_{msy}$  = 4.46 , 95% CL = 3.36 - 5.93

Biomass in last year = 1.59 , 2.5th perc = 0.135 , 97.5 perc = 3.49

$B/B_{msy}$  in last year = 0.356 , 2.5th perc = 0.0302 , 97.5 perc = 0.782

Fishing mortality in last year = 0.0831 , 2.5th perc = 0.0378 , 97.5 perc = 0.98

$F/F_{msy}$  = 0.554 , 2.5th perc = 0.252 , 97.5 perc = 6.54

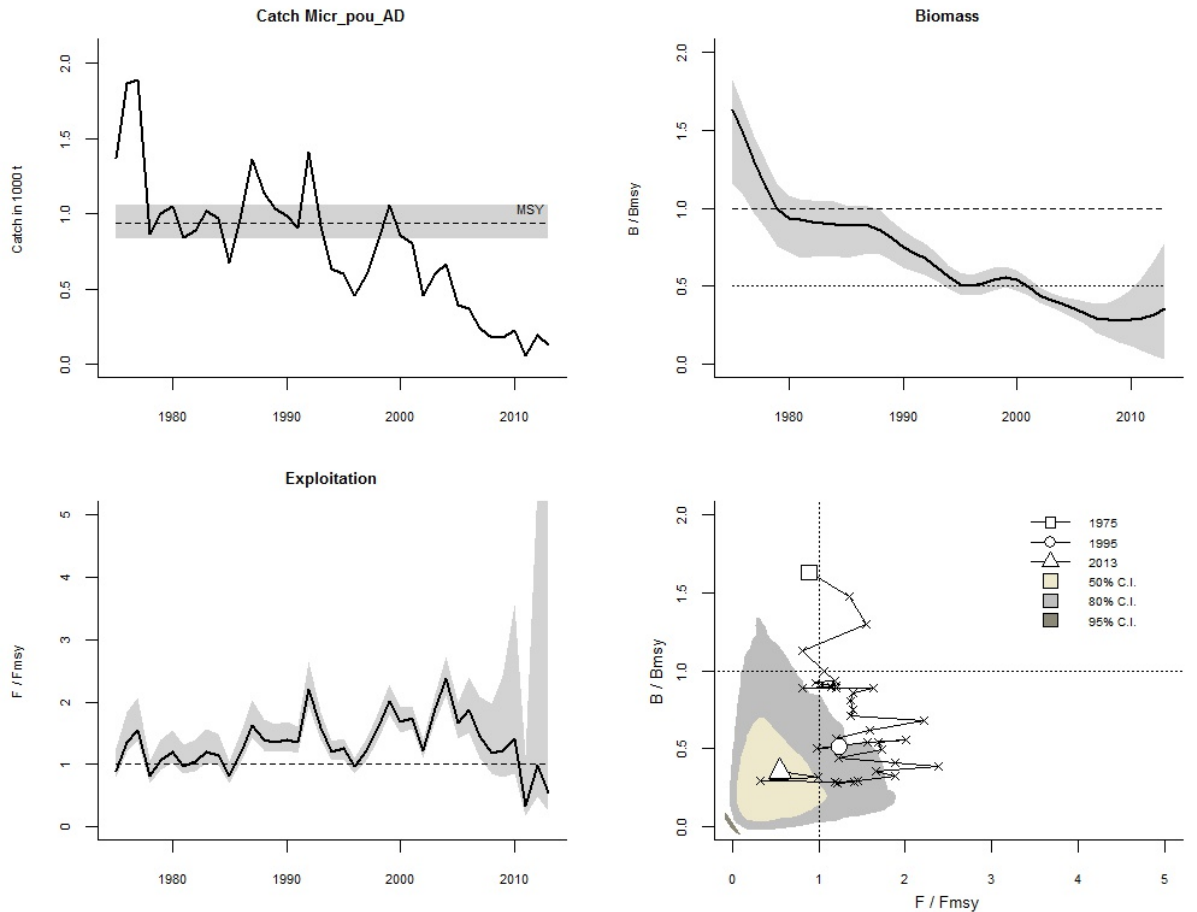
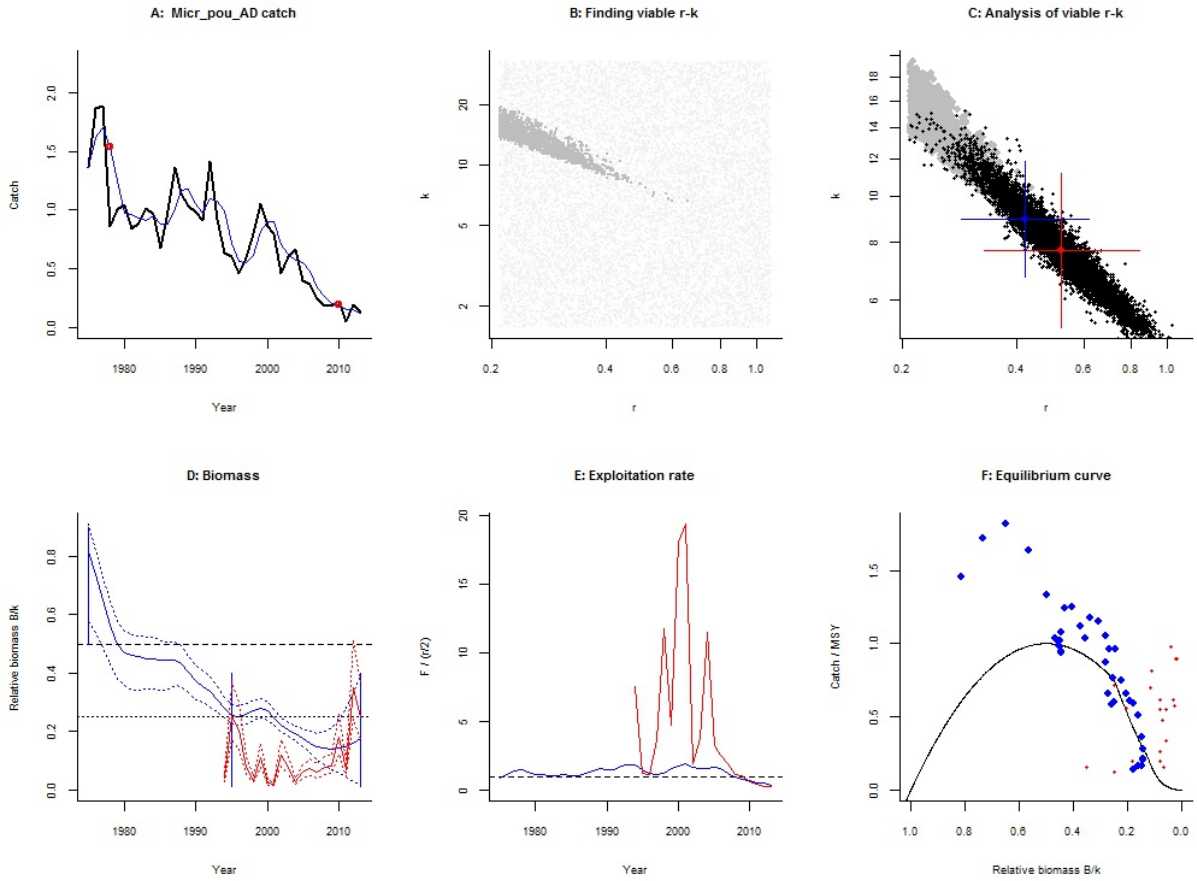
Stock status and exploitation in 2014

Biomass = ,  $B/B_{msy}$  = , fishing mortality  $F$  = ,  $F/F_{msy}$  =

Comment: Catch=landings from FishStat (Italy, Croatia). CPUE from MEDITS. RF int 2000 0.01-0.4. GS

OK

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Species: *Mullus barbatus* , stock: Mull\_bar\_AD

Red mullet in Adriatic Sea

Source: STECF 16-08

Region: Mediterranean , Adriatic Sea

Catch data used from years 1975 - 2013 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 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  $r$  = 0.22 - 1.2 expert, , prior range for  $k$  = 4.22 - 95.8

Prior range of  $q$  = 0.000928 - 0.00443

Results of CMSY analysis with altogether 751 viable trajectories for 751 r-k pairs

$r$  = 0.497 , 95% CL = 0.382 - 0.645 ,  $k$  = 31.8 , 95% CL = 23.6 - 43

MSY = 3.95 , 95% CL = 3.65 - 4.28

Relative biomass last year = 0.254  $k$ , 2.5th = 0.0557 , 97.5th = 0.396

Exploitation  $F/(r/2)$  in last year = 1.71

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.681 , 95% CL = 0.422 - 1.1 ,  $k$  = 22 , 95% CL = 14.1 - 34.3

MSY = 3.74 , 95% CL = 3.21 - 4.36

Relative biomass in last year = 0.392  $k$ , 2.5th perc = 0.235 , 97.5th perc = 0.495

Exploitation  $F/(r/2)$  in last year = 1.15

$q$  = 0.00143 , lcl = 0.00103 , ucl = 0.00198

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.248 , 95% CL = 0.191 - 0.322 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.248 , 95% CL = 0.191 - 0.322 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 3.95 , 95% CL = 3.65 - 4.28

$B_{msy}$  = 15.9 , 95% CL = 11.8 - 21.5

Biomass in last year = 8.07 , 2.5th perc = 1.77 , 97.5 perc = 12.6

$B/B_{msy}$  in last year = 0.507 , 2.5th perc = 0.111 , 97.5 perc = 0.792

Fishing mortality in last year = 0.418 , 2.5th perc = 0.267 , 97.5 perc = 1.9

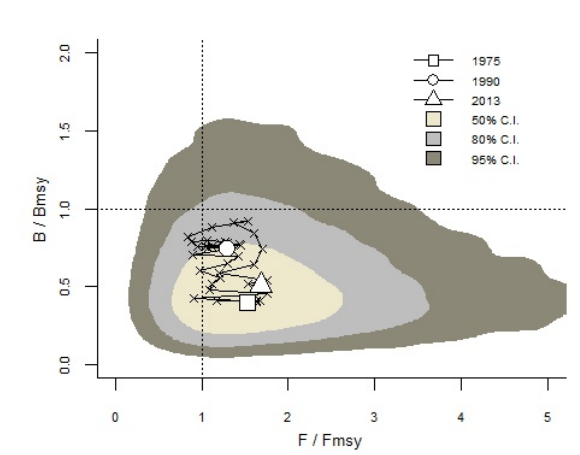
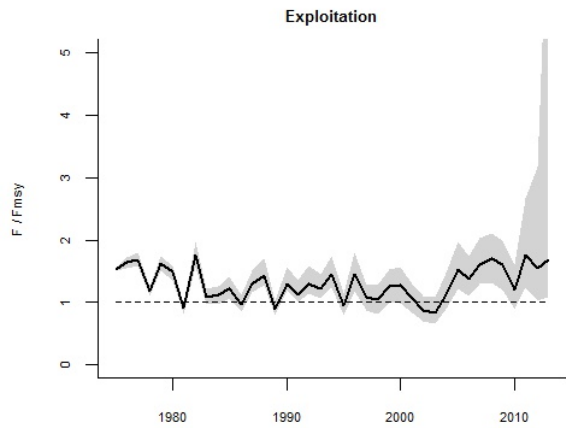
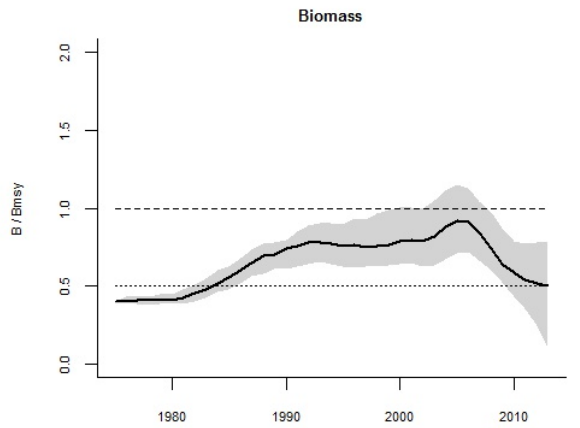
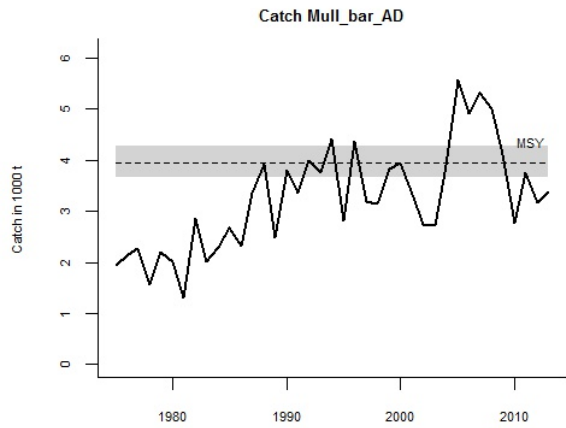
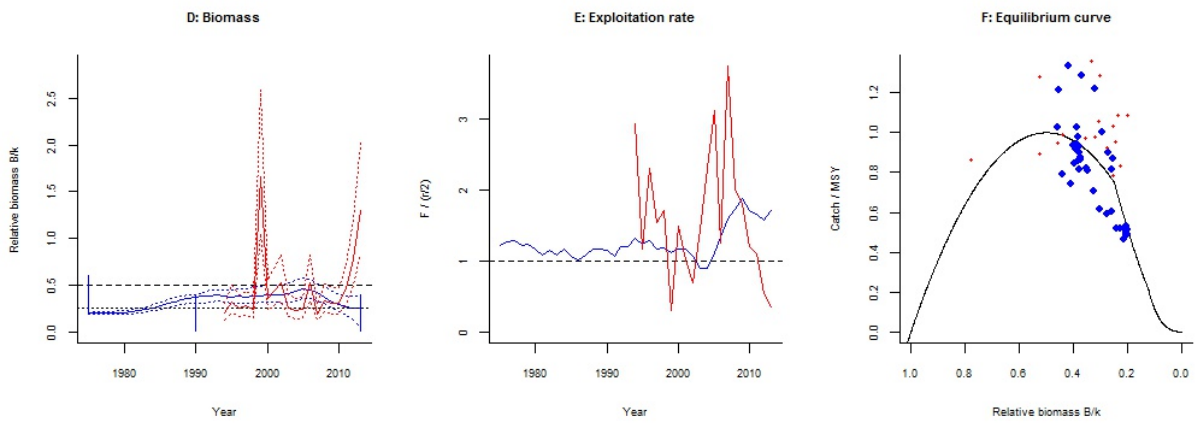
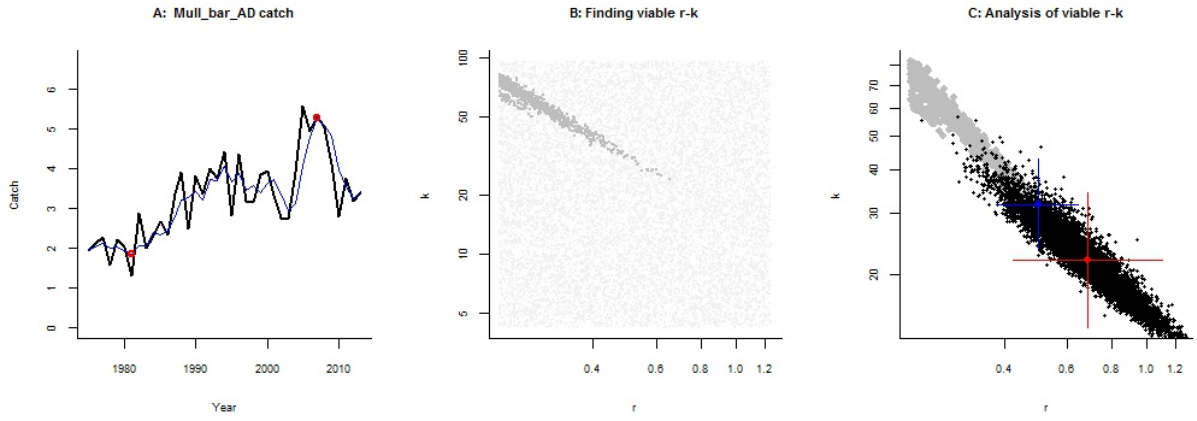
$F/F_{msy}$  = 1.68 , 2.5th perc = 1.08 , 97.5 perc = 7.66

Stock status and exploitation in 2014

Biomass = ,  $B/B_{msy}$  = , fishing mortality  $F$  = ,  $F/F_{msy}$  =

Comment: GSA 17 Fishstat - MEDITS 17 (From SGMED 2014). GS OK

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Species: *Oblada melanura* , stock: Obla\_mel\_AD

Saddled seabream in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1972 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.2 - 0.6 in year 1995 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.68 - 0.88 expert, , prior range for  $k$  = 0.277 - 1.43

Results of CMSY analysis with altogether 30 viable trajectories for 30 r-k pairs

$r$  = 0.78 , 95% CL = 0.717 - 0.849 ,  $k$  = 0.939 , 95% CL = 0.839 - 1.05

MSY = 0.183 , 95% CL = 0.161 - 0.208

Relative biomass last year = 0.0803  $k$ , 2.5th = 0.0129 , 97.5th = 0.227

Exploitation  $F/(r/2)$  in last year = 1.42

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.39 , 95% CL = 0.359 - 0.425 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.125 , 95% CL = 0.115 - 0.136 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.183 , 95% CL = 0.161 - 0.208

$B_{msy}$  = 0.469 , 95% CL = 0.419 - 0.525

Biomass in last year = 0.0754 , 2.5th perc = 0.0121 , 97.5 perc = 0.213

$B/B_{msy}$  in last year = 0.161 , 2.5th perc = 0.0259 , 97.5 perc = 0.453

Fishing mortality in last year = 0.451 , 2.5th perc = 0.16 , 97.5 perc = 2.8

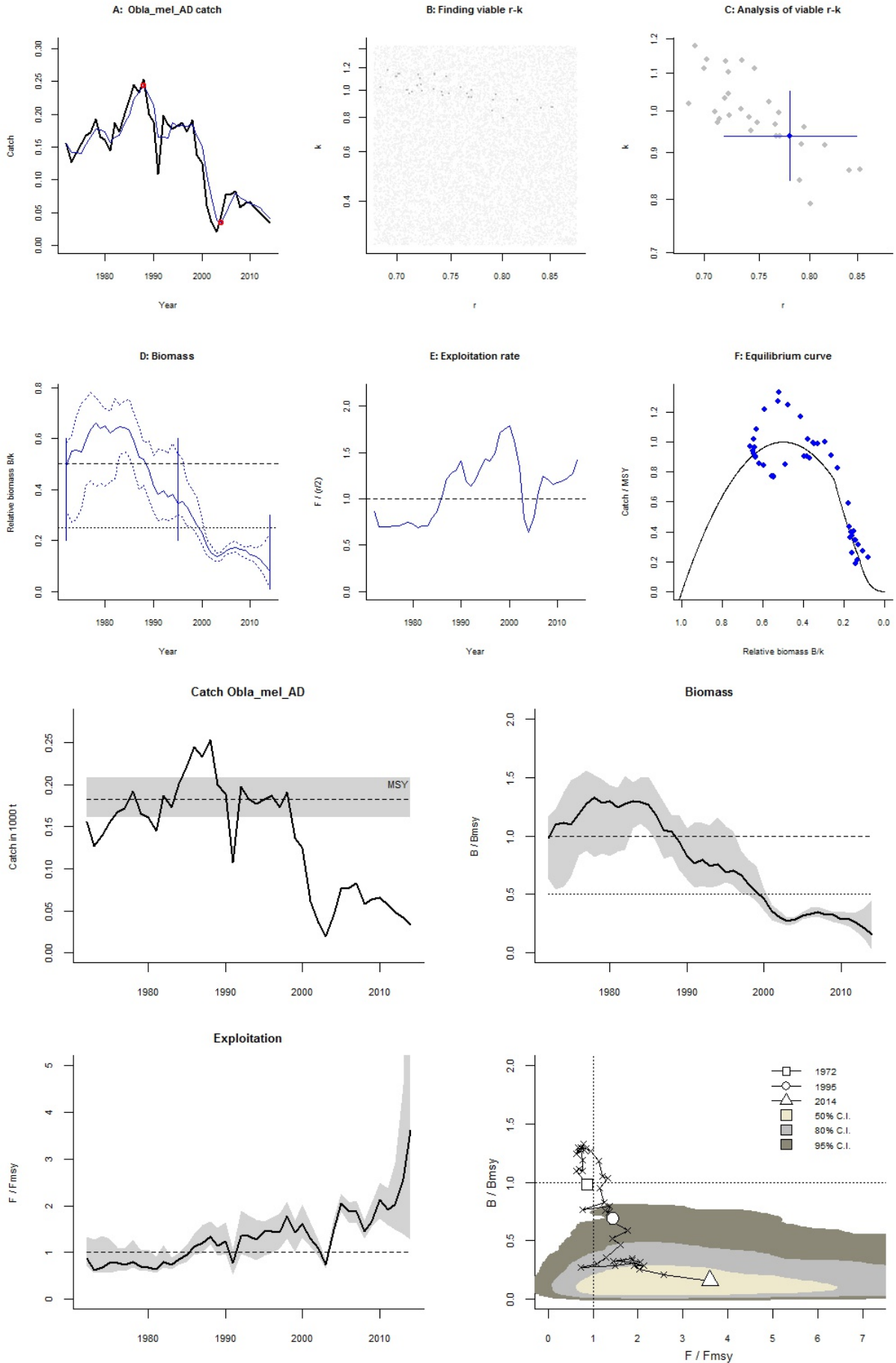
$F/F_{msy}$  = 3.6 , 2.5th perc = 1.28 , 97.5 perc = 22.3

Stock status and exploitation in 2014

Biomass = 0.0754 ,  $B/B_{msy}$  = 0.161 , fishing mortality  $F$  = 0.451 ,  $F/F_{msy}$  = 3.6

Comment: Catch=landings from FishStat (Italy, Croatia). RF int 1995 0.2-0.6, final 0.3. GS OK

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Species: *Pagellus erythrinus* , stock: Page\_ery\_AD

Common pandora in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1970 - 2013 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.3 in year 1996 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.22 - 0.97 expert, , prior range for  $k$  = 0.717 - 12.6

Prior range of  $q$  = 0.00505 - 0.0212

Results of CMSY analysis with altogether 555 viable trajectories for 510 r-k pairs

$r$  = 0.368 , 95% CL = 0.296 - 0.457 ,  $k$  = 3.9 , 95% CL = 2.99 - 5.1

MSY = 0.359 , 95% CL = 0.295 - 0.437

Relative biomass last year = 0.125  $k$  , 2.5th = 0.0128 , 97.5th = 0.298

Exploitation  $F/(r/2)$  in last year = 1.05

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.465 , 95% CL = 0.289 - 0.748 ,  $k$  = 3.01 , 95% CL = 2.02 - 4.47

MSY = 0.35 , 95% CL = 0.306 - 0.4

Relative biomass in last year = 0.141  $k$  , 2.5th perc = 0.0236 , 97.5th perc = 0.329

Exploitation  $F/(r/2)$  in last year = 0.799

$q$  = 0.00712 , lcl = 0.00501 , ucl = 0.0101

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.184 , 95% CL = 0.148 - 0.228 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.092 , 95% CL = 0.0741 - 0.114 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.359 , 95% CL = 0.295 - 0.437

$B_{msy}$  = 1.95 , 95% CL = 1.49 - 2.55

Biomass in last year = 0.488 , 2.5th perc = 0.0498 , 97.5 perc = 1.16

$B/B_{msy}$  in last year = 0.25 , 2.5th perc = 0.0255 , 97.5 perc = 0.596

Fishing mortality in last year = 0.162 , 2.5th perc = 0.068 , 97.5 perc = 1.59

$F/F_{msy}$  = 1.76 , 2.5th perc = 0.739 , 97.5 perc = 17.2

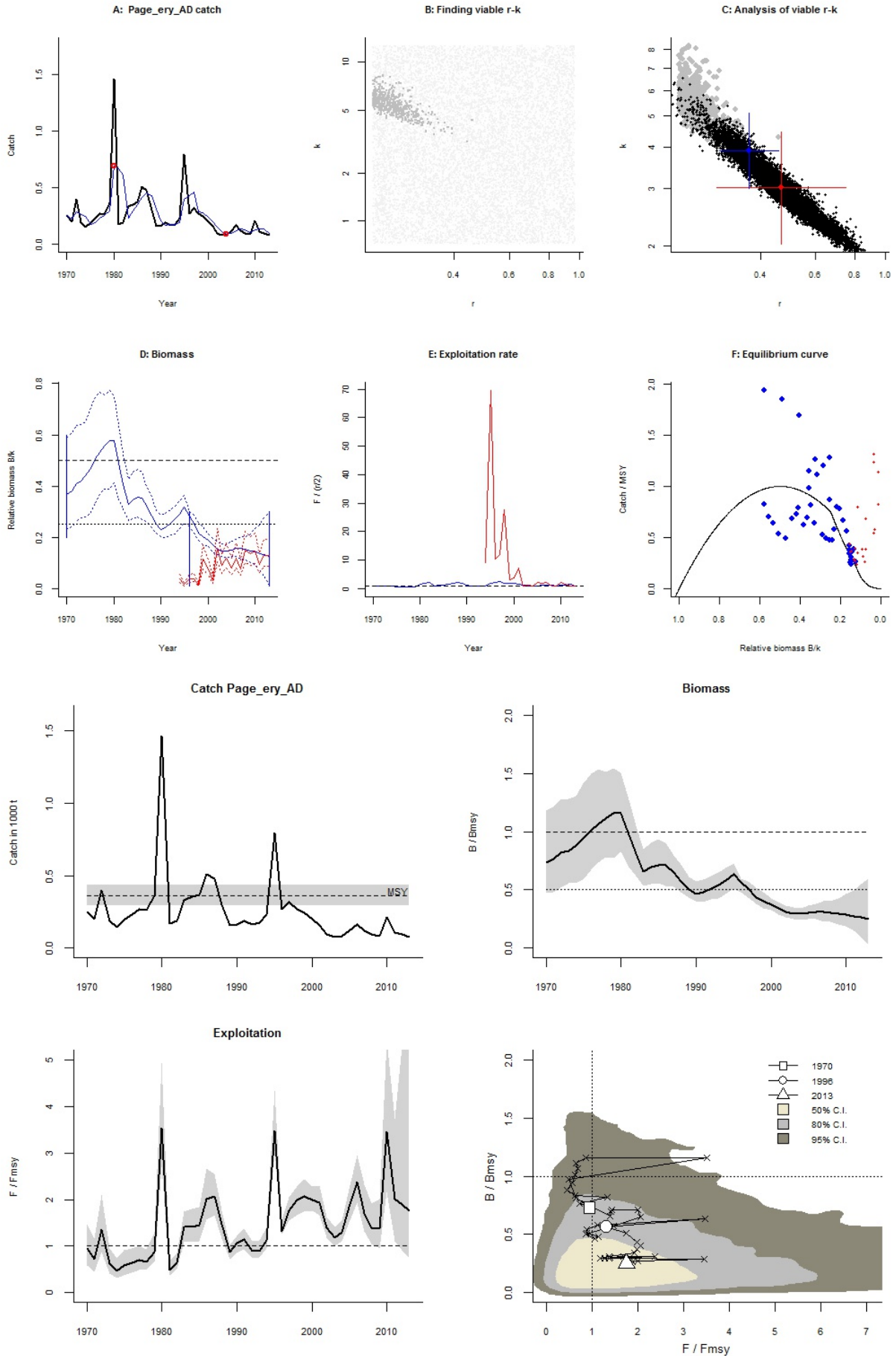
Stock status and exploitation in 2014

Biomass = ,  $B/B_{msy}$  = , fishing mortality  $F$  = ,  $F/F_{msy}$  =

Comment: Catch=landings from FishStat (Croatia, Italy, Slovenia). CPUE from MEDITS. RF final 0.3. GS

OK

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Species: *Palinurus elephas* , stock: Pali\_ele\_AD

Common spiny lobster in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1972 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2007 default

Prior final relative biomass = 0.01 - 0.4 , default

Prior range for  $r$  = 0.05 - 0.5 default , prior range for  $k$  = 0.164 - 6.56

Results of CMSY analysis with altogether 4368 viable trajectories for 2841 r-k pairs

$r$  = 0.225 , 95% CL = 0.127 - 0.399 ,  $k$  = 0.847 , 95% CL = 0.433 - 1.66

MSY = 0.0477 , 95% CL = 0.0325 - 0.0701

Relative biomass last year = 0.182  $k$  , 2.5th = 0.0142 , 97.5th = 0.392

Exploitation  $F/(r/2)$  in last year = 0.632

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.113 , 95% CL = 0.0637 - 0.199 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0821 , 95% CL = 0.0465 - 0.145 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.0477 , 95% CL = 0.0325 - 0.0701

$B_{msy}$  = 0.424 , 95% CL = 0.217 - 0.829

Biomass in last year = 0.154 , 2.5th perc = 0.012 , 97.5 perc = 0.332

$B/B_{msy}$  in last year = 0.364 , 2.5th perc = 0.0284 , 97.5 perc = 0.785

Fishing mortality in last year = 0.0648 , 2.5th perc = 0.0301 , 97.5 perc = 0.831

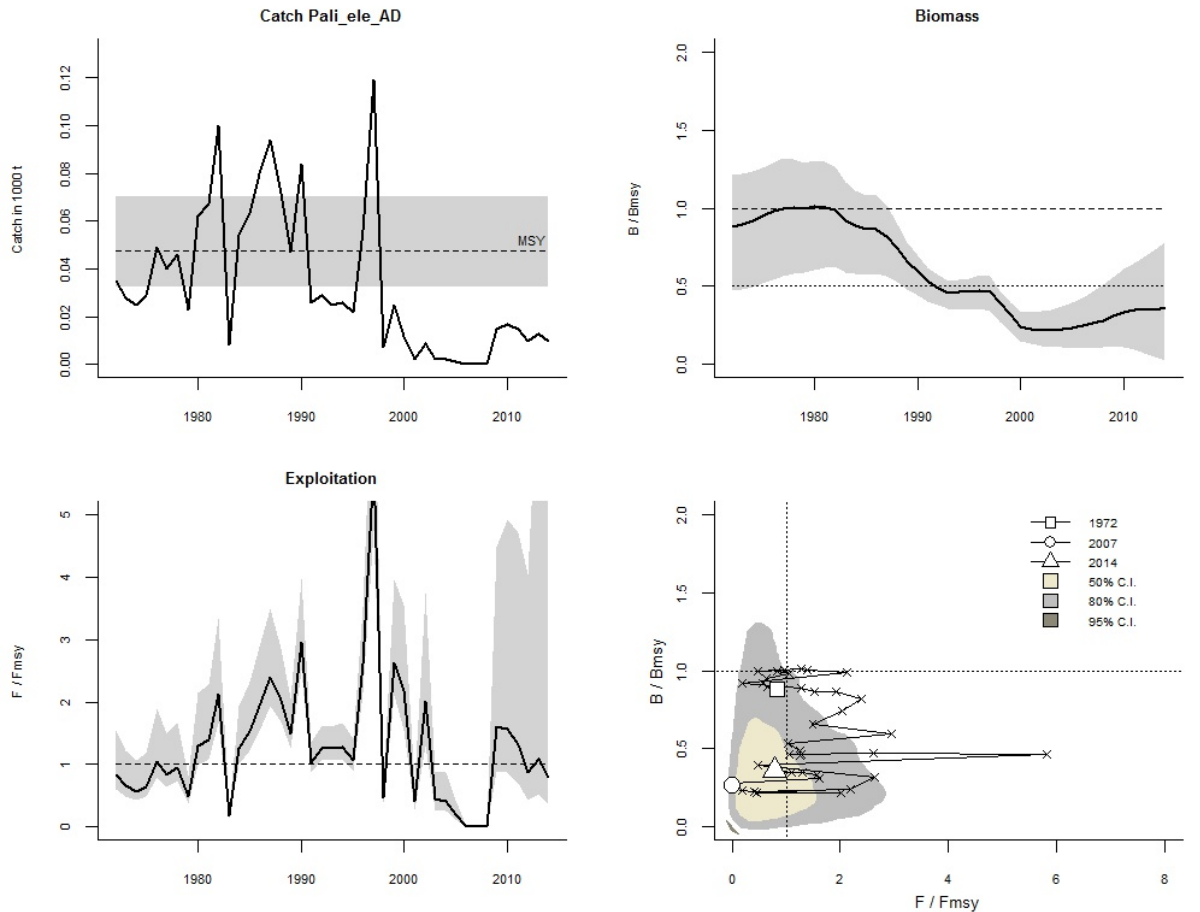
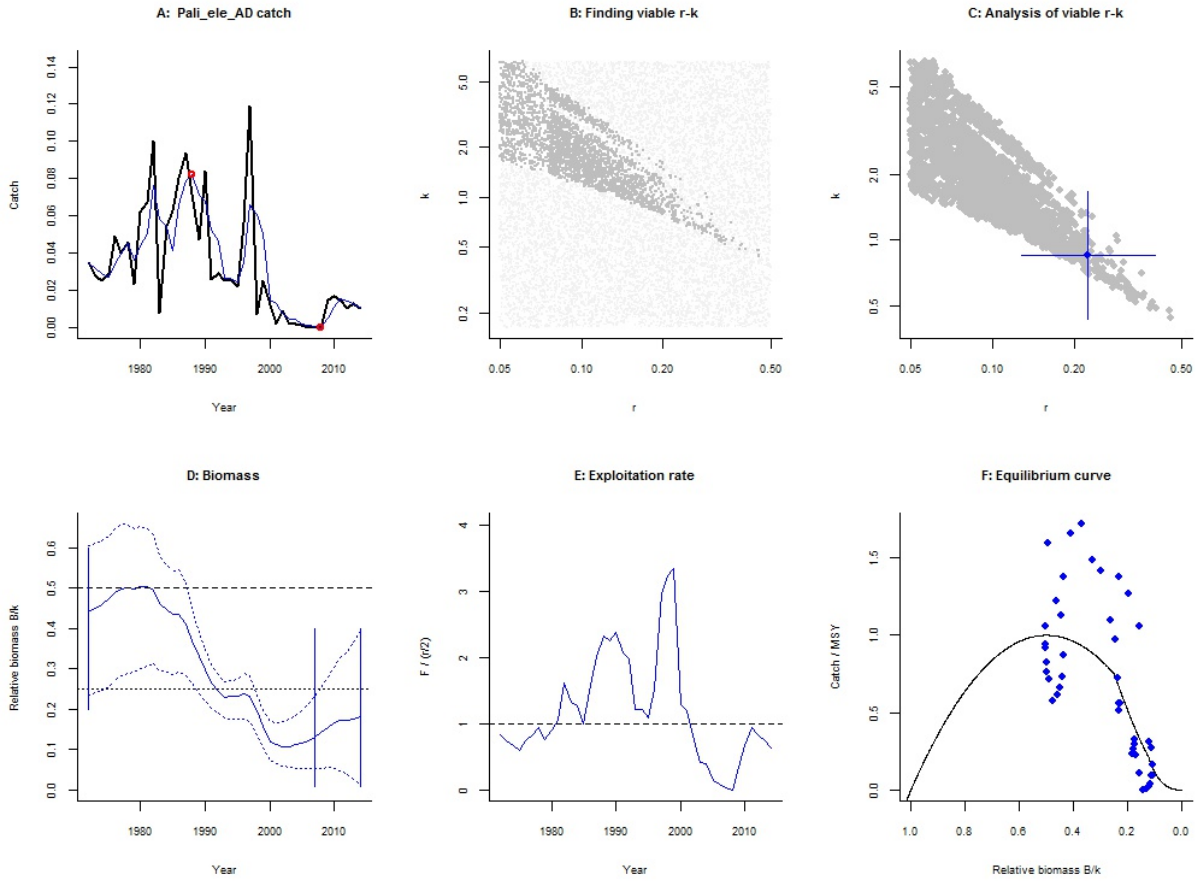
$F/F_{msy}$  = 0.788 , 2.5th perc = 0.366 , 97.5 perc = 10.1

Stock status and exploitation in 2014

Biomass = 0.154 ,  $B/B_{msy}$  = 0.364 , fishing mortality  $F$  = 0.0648 ,  $F/F_{msy}$  = 0.788

Comment: Catch=landings from FishStat (Italy, Croatia). GS OK

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Species: *Pecten jacobaeus* , stock: Pect\_jac\_AD

Scallop in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1972 - 2015 , abundance = CPUE

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1990 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 1.94 - 31

Prior range of  $q$  = 0.00604 - 0.0241

Results of CMSY analysis with altogether 2652 viable trajectories for 1670 r-k pairs

$r$  = 0.453 , 95% CL = 0.286 - 0.718 ,  $k$  = 8.05 , 95% CL = 5.85 - 11.1

MSY = 0.911 , 95% CL = 0.819 - 1.01

Relative biomass last year = 0.0943  $k$  , 2.5th = 0.0126 , 97.5th = 0.287

Exploitation  $F/(r/2)$  in last year = 0.425

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.433 , 95% CL = 0.254 - 0.739 ,  $k$  = 8.47 , 95% CL = 5.71 - 12.6

MSY = 0.917 , 95% CL = 0.762 - 1.1

Relative biomass in last year = 0.0296  $k$  , 2.5th perc = 0.0114 , 97.5th perc = 0.0939

Exploitation  $F/(r/2)$  in last year = 0.917

$q$  = 0.00869 , lcl = 0.00617 , ucl = 0.0123

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.226 , 95% CL = 0.143 - 0.359 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0854 , 95% CL = 0.0538 - 0.135 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.911 , 95% CL = 0.819 - 1.01

$B_{msy}$  = 4.02 , 95% CL = 2.93 - 5.53

Biomass in last year = 0.759 , 2.5th perc = 0.102 , 97.5 perc = 2.31

$B/B_{msy}$  in last year = 0.189 , 2.5th perc = 0.0252 , 97.5 perc = 0.574

Fishing mortality in last year = 0.0656 , 2.5th perc = 0.0216 , 97.5 perc = 0.491

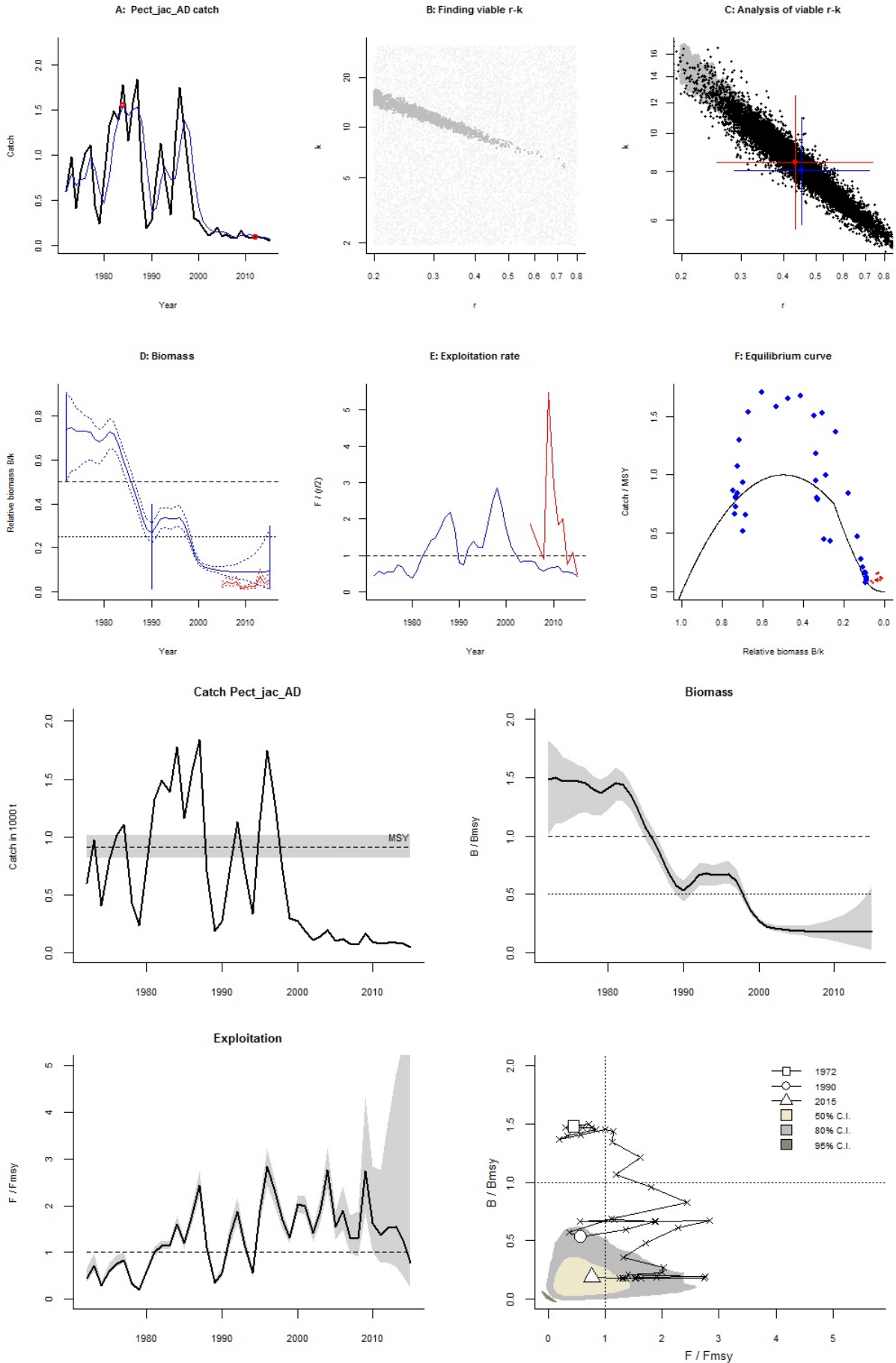
$F/F_{msy}$  = 0.769 , 2.5th perc = 0.252 , 97.5 perc = 5.75

Stock status and exploitation in 2014

Biomass = 0.738 ,  $B/B_{msy}$  = 0.183 , fishing mortality  $F$  = 0.105 ,  $F/F_{msy}$  = 1.26

Comment: Catch=landings from FishStat. Final 0.3.

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Species: *Penaeus kerathurus* , stock: Pena\_ker\_AD

Caramote prawn in Adriatic

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1972 - 2015 , abundance = CPUE

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.5 - 0.9 in year 1990 expert

Prior final relative biomass = 0.5 - 0.9 expert

Prior range for  $r$  = 0.6 - 1.5 default , prior range for  $k$  = 0.759 - 11.4

Prior range of  $q$  = 0.00414 - 0.0131

Results of CMSY analysis with altogether 3354 viable trajectories for 1039 r-k pairs

$r$  = 1.19 , 95% CL = 0.962 - 1.48 ,  $k$  = 1.6 , 95% CL = 1.18 - 2.17

MSY = 0.477 , 95% CL = 0.401 - 0.568

Relative biomass last year = 0.61  $k$ , 2.5th = 0.507 , 97.5th = 0.786

Exploitation  $F/(r/2)$  in last year = 0.739

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 1.07 , 95% CL = 0.752 - 1.52 ,  $k$  = 1.84 , 95% CL = 1.4 - 2.42

MSY = 0.493 , 95% CL = 0.4 - 0.607

Relative biomass in last year = 0.647  $k$ , 2.5th perc = 0.456 , 97.5th perc = 0.831

Exploitation  $F/(r/2)$  in last year = 0.829

$q$  = 0.00626 , lcl = 0.00482 , ucl = 0.00813

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.597 , 95% CL = 0.481 - 0.741 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.597 , 95% CL = 0.481 - 0.741 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.477 , 95% CL = 0.401 - 0.568

$B_{msy}$  = 0.8 , 95% CL = 0.589 - 1.08

Biomass in last year = 0.976 , 2.5th perc = 0.81 , 97.5 perc = 1.26

$B/B_{msy}$  in last year = 1.22 , 2.5th perc = 1.01 , 97.5 perc = 1.57

Fishing mortality in last year = 0.541 , 2.5th perc = 0.42 , 97.5 perc = 0.652

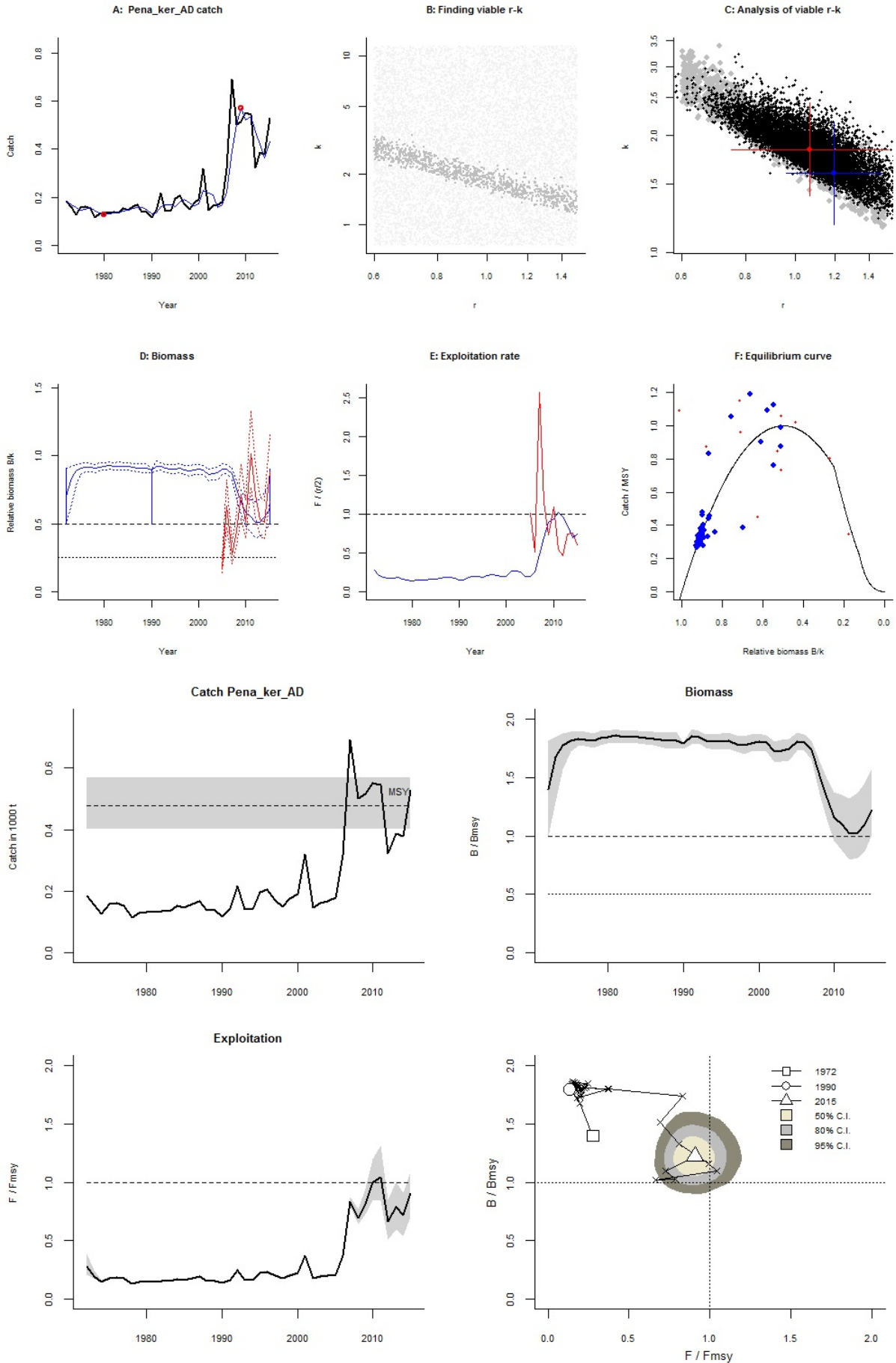
$F/F_{msy}$  = 0.907 , 2.5th perc = 0.704 , 97.5 perc = 1.09

Stock status and exploitation in 2014

Biomass = 0.874 ,  $B/B_{msy}$  = 1.09 , fishing mortality  $F$  = 0.432 ,  $F/F_{msy}$  = 0.723

Comment: RF OK

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Species: *Scophthalmus maximus* , stock: Pset\_max\_AD

Turbot in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1970 - 2013 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.2 - 0.6 in year 2006 default

Prior final relative biomass = 0.5 - 0.9 , default

Prior range for  $r$  = 0.25 - 0.82 expert, , prior range for  $k$  = 21.2 - 417

Prior range of  $q$  = 2.36e-05 - 8.54e-05

Results of CMSY analysis with altogether 2531 viable trajectories for 1704 r-k pairs

$r$  = 0.611 , 95% CL = 0.461 - 0.811 ,  $k$  = 45.7 , 95% CL = 32.9 - 63.4

MSY = 6.98 , 95% CL = 6.39 - 7.62

Relative biomass last year = 0.525  $k$ , 2.5th = 0.501 , 97.5th = 0.605

Exploitation  $F/(r/2)$  in last year = 0.96

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.455 , 95% CL = 0.302 - 0.687 ,  $k$  = 65.8 , 95% CL = 48.5 - 89.1

MSY = 7.49 , 95% CL = 5.93 - 9.46

Relative biomass in last year = 0.584  $k$ , 2.5th perc = 0.446 , 97.5th perc = 0.774

Exploitation  $F/(r/2)$  in last year = 0.931

$q$  = 4.04e-05 , lcl = 3.05e-05 , ucl = 5.35e-05

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.228 , 95% CL = 0.151 - 0.344 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.228 , 95% CL = 0.151 - 0.344 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 7.49 , 95% CL = 5.93 - 9.46

$B_{msy}$  = 32.9 , 95% CL = 24.3 - 44.5

Biomass in last year = 38.4 , 2.5th perc = 29.3 , 97.5 perc = 50.9

$B/B_{msy}$  in last year = 1.17 , 2.5th perc = 0.891 , 97.5 perc = 1.55

Fishing mortality in last year = 0.212 , 2.5th perc = 0.16 , 97.5 perc = 0.278

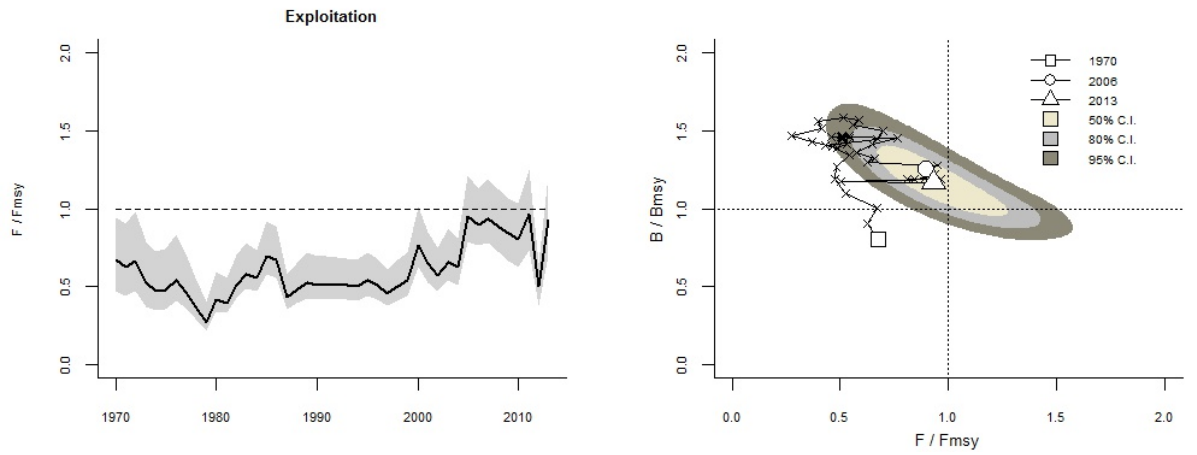
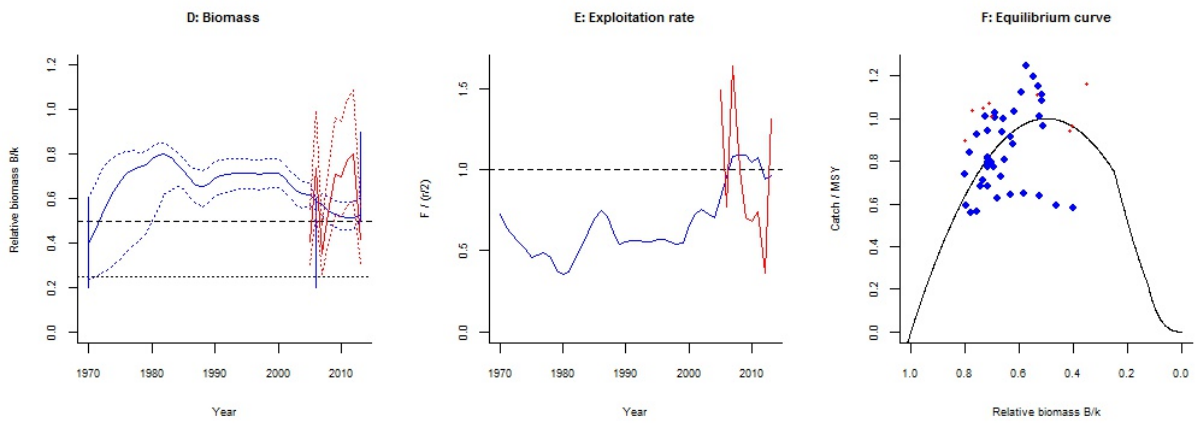
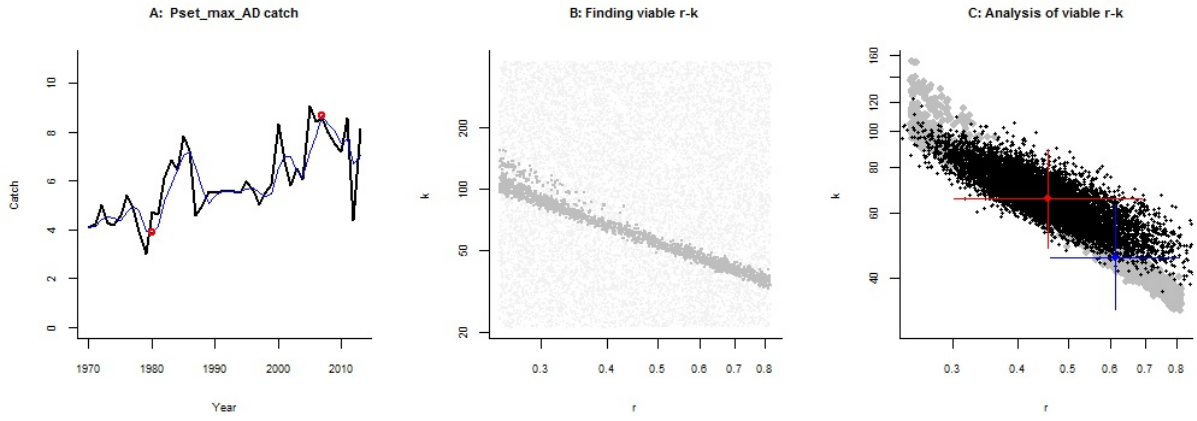
$F/F_{msy}$  = 0.931 , 2.5th perc = 0.702 , 97.5 perc = 1.22

Stock status and exploitation in 2014

Biomass = ,  $B/B_{msy}$  = , fishing mortality  $F$  = ,  $F/F_{msy}$  =

Comment: Catch=landings from FishStat. CPUE from SOLEMON

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Species: *Scophthalmus rhombus* , stock: Scop\_rho\_AD

Brill in Adriatic

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1972 - 2015 , abundance = CPUE

Prior initial relative biomass = 0.5 - 0.9 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  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 0.716 - 11.5

Prior range of  $q$  = 0.0116 - 0.0465

Results of CMSY analysis with altogether 1460 viable trajectories for 1089 r-k pairs

$r$  = 0.407 , 95% CL = 0.257 - 0.643 ,  $k$  = 3.12 , 95% CL = 2.38 - 4.09

MSY = 0.317 , 95% CL = 0.289 - 0.348

Relative biomass last year = 0.129  $k$ , 2.5th = 0.012 , 97.5th = 0.384

Exploitation  $F/(r/2)$  in last year = 0.749

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.424 , 95% CL = 0.256 - 0.703 ,  $k$  = 3.03 , 95% CL = 2.02 - 4.53

MSY = 0.321 , 95% CL = 0.274 - 0.377

Relative biomass in last year = 0.0373  $k$ , 2.5th perc = 0.0123 , 97.5th perc = 0.102

Exploitation  $F/(r/2)$  in last year = 2.71

$q$  = 0.0172 ,  $lcl$  = 0.0125 ,  $ucl$  = 0.0236

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.203 , 95% CL = 0.129 - 0.321 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.105 , 95% CL = 0.0661 - 0.165 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.317 , 95% CL = 0.289 - 0.348

$B_{msy}$  = 1.56 , 95% CL = 1.19 - 2.04

Biomass in last year = 0.401 , 2.5th perc = 0.0373 , 97.5 perc = 1.2

$B/B_{msy}$  in last year = 0.257 , 2.5th perc = 0.0239 , 97.5 perc = 0.768

Fishing mortality in last year = 0.162 , 2.5th perc = 0.0542 , 97.5 perc = 1.74

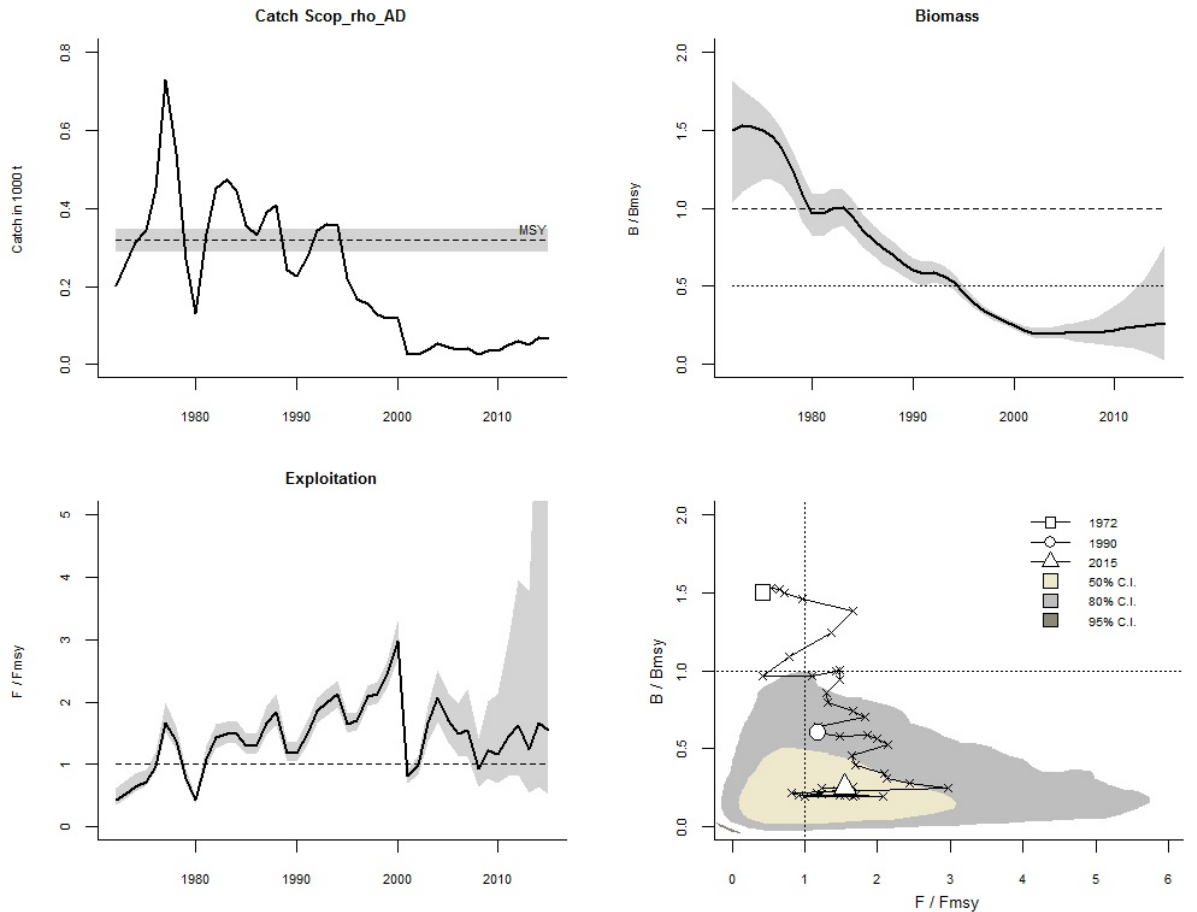
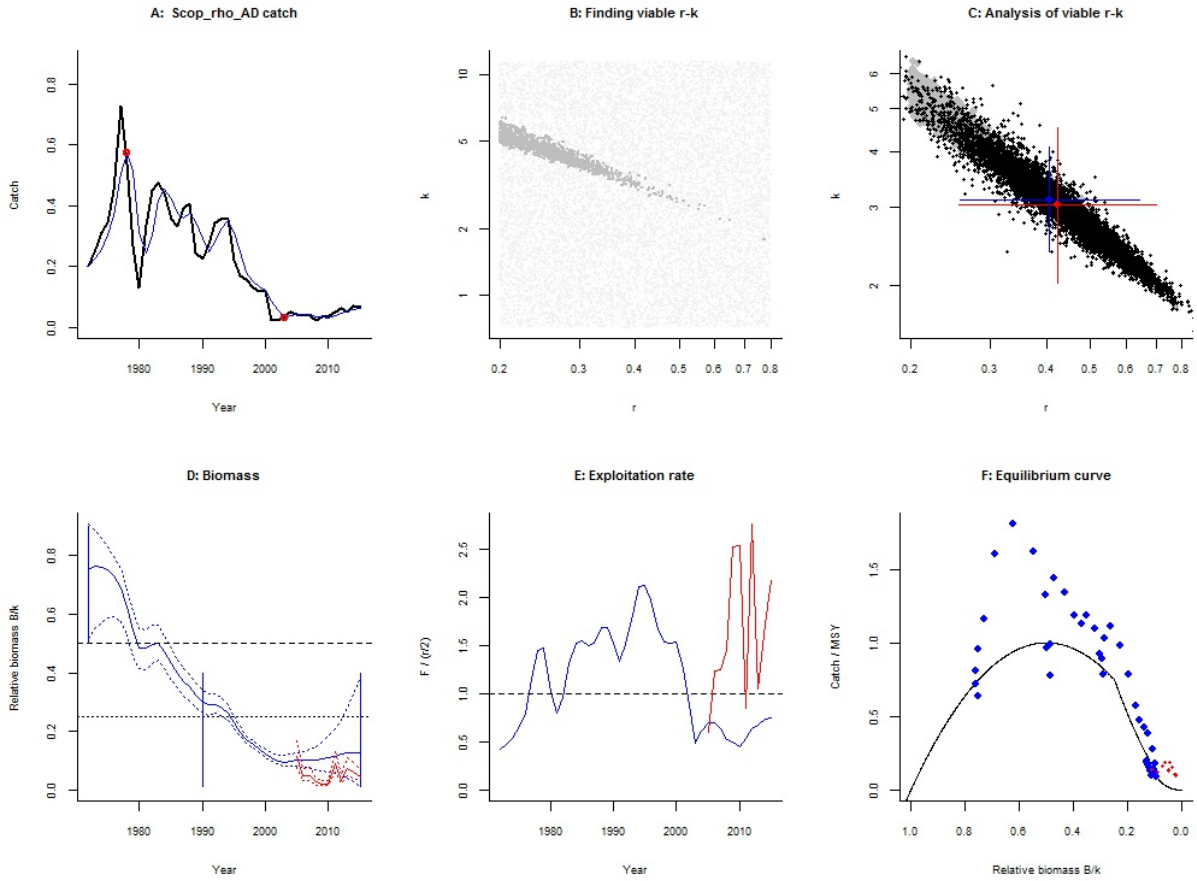
$F/F_{msy}$  = 1.55 , 2.5th perc = 0.519 , 97.5 perc = 16.7

Stock status and exploitation in 2014

Biomass = 0.399 ,  $B/B_{msy}$  = 0.256 , fishing mortality  $F$  = 0.172 ,  $F/F_{msy}$  = 1.66

Comment: RF OK

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Species: *Sardina pilchardus* , stock: Sard\_pil\_AD

Sardine in Adriatic Sea

Source: EASME EMFF 2014, M from Colloca et al 2013

Region: Mediterranean , Adriatic Sea

Catch data used from years 1975 - 2013 , 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  $r$  = 0.27 - 1.1 expert, , prior range for  $k$  = 84.7 - 1381

Prior range of  $q$  = 1.94 - 7.83

Results of CMSY analysis with altogether 414 viable trajectories for 407 r-k pairs

$r$  = 0.484 , 95% CL = 0.401 - 0.586 ,  $k$  = 550 , 95% CL = 415 - 728

MSY = 66.6 , 95% CL = 55.8 - 79.6

Relative biomass last year = 0.284  $k$ , 2.5th = 0.0153 , 97.5th = 0.396

Exploitation  $F/(r/2)$  in last year = 1.53

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.687 , 95% CL = 0.484 - 0.976 ,  $k$  = 401 , 95% CL = 298 - 540

MSY = 68.9 , 95% CL = 62 - 76.7

Relative biomass in last year = 0.338  $k$ , 2.5th perc = 0.17 , 97.5th perc = 0.472

Exploitation  $F/(r/2)$  in last year = 1.28

$q$  = 2.86 , lcl = 2.11 , ucl = 3.87

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.242 , 95% CL = 0.2 - 0.293 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.242 , 95% CL = 0.2 - 0.293 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 66.6 , 95% CL = 55.8 - 79.6

$B_{msy}$  = 275 , 95% CL = 208 - 364

Biomass in last year = 156 , 2.5th perc = 8.41 , 97.5 perc = 218

$B/B_{msy}$  in last year = 0.568 , 2.5th perc = 0.0306 , 97.5 perc = 0.791

Fishing mortality in last year = 0.383 , 2.5th perc = 0.275 , 97.5 perc = 7.11

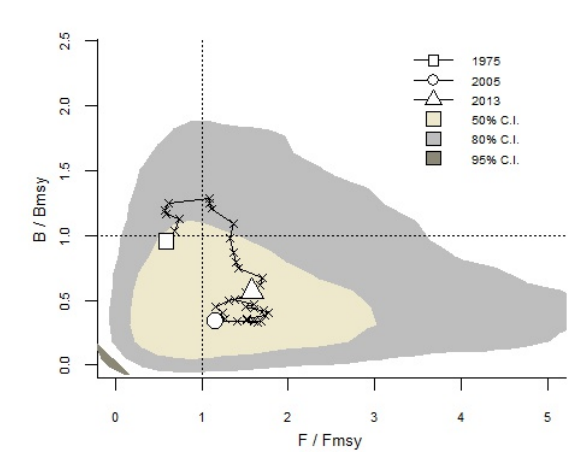
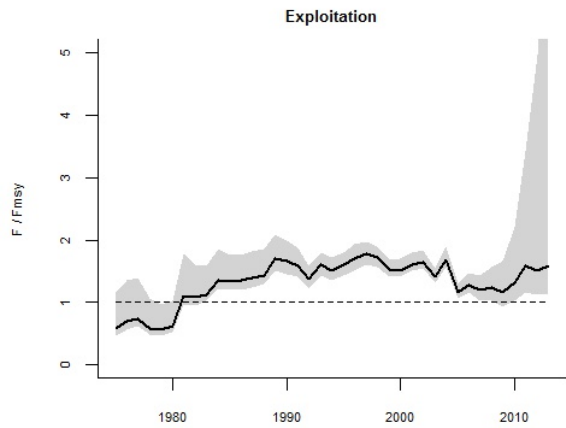
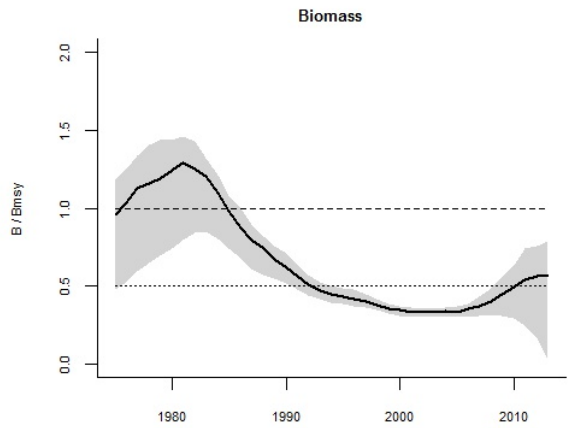
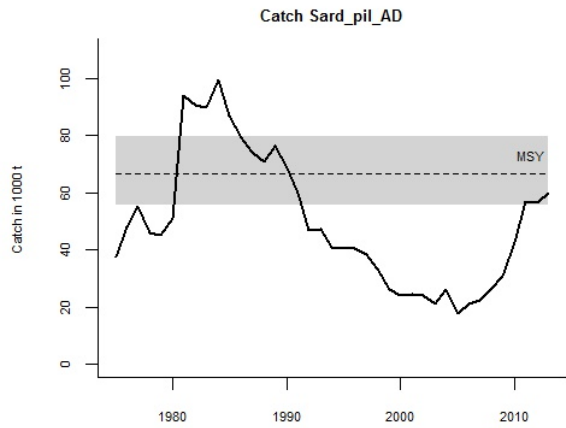
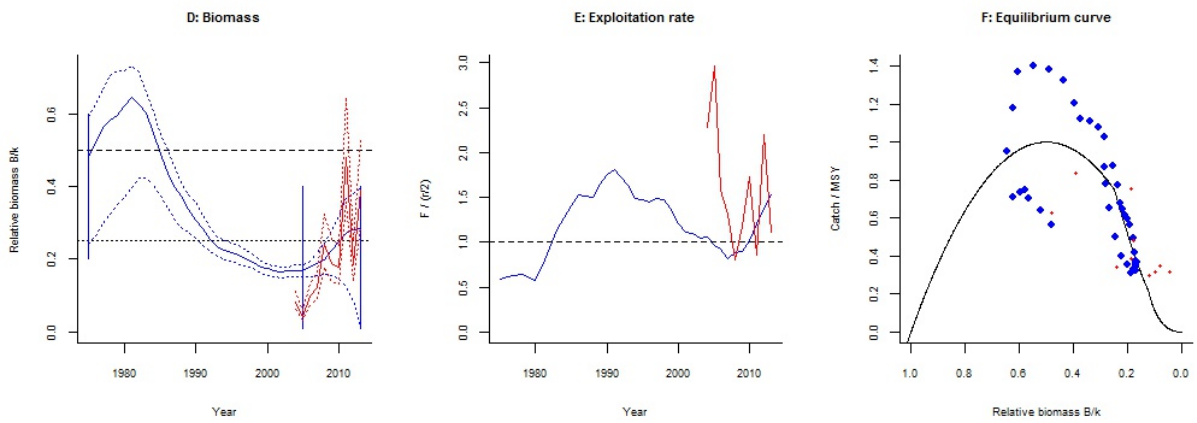
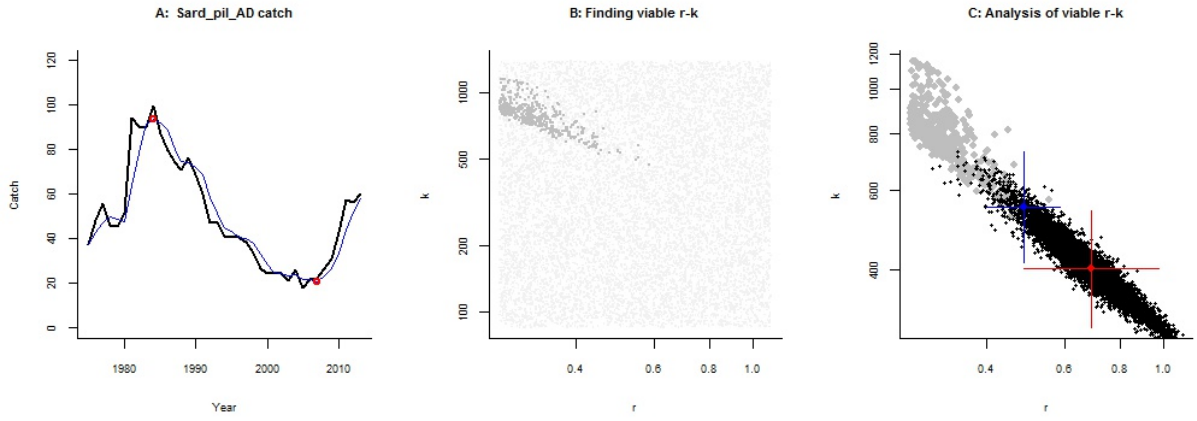
$F/F_{msy}$  = 1.58 , 2.5th perc = 1.14 , 97.5 perc = 29.4

Stock status and exploitation in 2014

Biomass = ,  $B/B_{msy}$  = , fishing mortality  $F$  = ,  $F/F_{msy}$  =

Comment: Landings from Stock assessment form GFCM 2015 (17+18) MEDIAS 17+18. GS OK, similar to SAM

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Species: *Sepia officinalis* , stock: Sepi\_off\_AD

Cuttlefish in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1972 - 2015 , abundance = CPUE

Prior initial relative biomass = 0.5 - 0.9 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  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 8.99 - 144

Prior range of  $q$  = 0.00205 - 0.00821

Results of CMSY analysis with altogether 254 viable trajectories for 245 r-k pairs

$r$  = 0.517 , 95% CL = 0.343 - 0.779 ,  $k$  = 29.5 , 95% CL = 20.5 - 42.6

MSY = 3.81 , 95% CL = 3.36 - 4.34

Relative biomass last year = 0.229  $k$ , 2.5th = 0.0214 , 97.5th = 0.395

Exploitation  $F/(r/2)$  in last year = 1.89

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.44 , 95% CL = 0.297 - 0.652 ,  $k$  = 35.3 , 95% CL = 25.5 - 48.9

MSY = 3.88 , 95% CL = 3.37 - 4.48

Relative biomass in last year = 0.318  $k$ , 2.5th perc = 0.152 , 97.5th perc = 0.454

Exploitation  $F/(r/2)$  in last year = 1.38

$q$  = 0.00323 , lcl = 0.00245 , ucl = 0.00427

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.258 , 95% CL = 0.171 - 0.39 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.236 , 95% CL = 0.157 - 0.356 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 3.81 , 95% CL = 3.36 - 4.34

$B_{msy}$  = 14.8 , 95% CL = 10.2 - 21.3

Biomass in last year = 6.75 , 2.5th perc = 0.631 , 97.5 perc = 11.7

$B/B_{msy}$  in last year = 0.457 , 2.5th perc = 0.0428 , 97.5 perc = 0.79

Fishing mortality in last year = 0.505 , 2.5th perc = 0.292 , 97.5 perc = 5.4

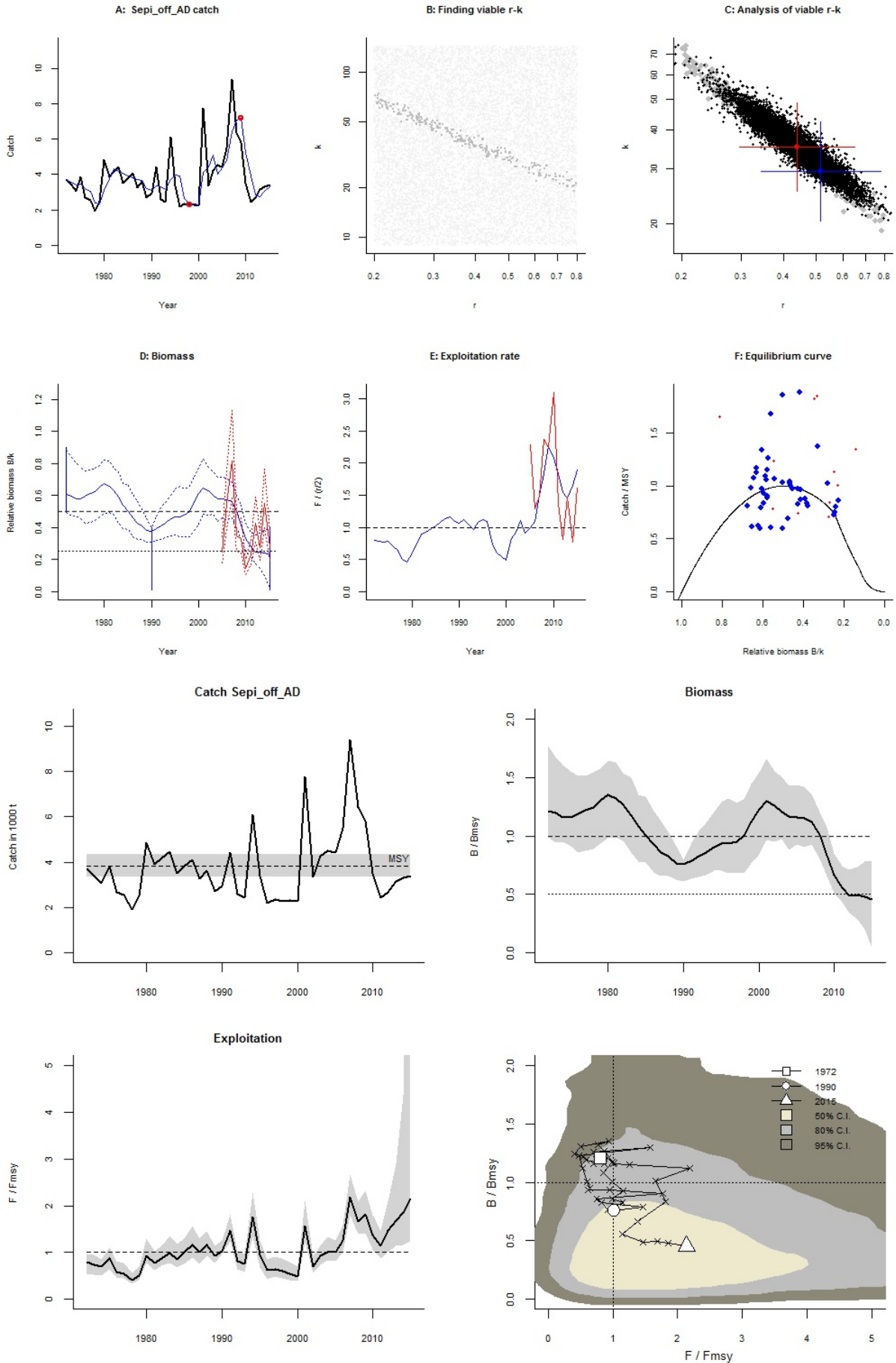
$F/F_{msy}$  = 2.14 , 2.5th perc = 1.24 , 97.5 perc = 22.9

Stock status and exploitation in 2014

Biomass = 7.14 ,  $B/B_{msy}$  = 0.484 , fishing mortality  $F$  = 0.464 ,  $F/F_{msy}$  = 1.85

Comment: Catch=landings from FishStat (Croatia, Italy, Serbia and Montenegro, Yugoslavia, Montenegro). CPUE from SOLEMON. RF final 0.3.

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Species: *Seriola dumerili* , stock: Seri\_dum\_AD

Greater amberjack in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1970 - 2014 , abundance = None

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.3 - 0.7 in year 2000 expert

Prior final relative biomass = 0.3 - 0.7 expert

Prior range for  $r$  = 0.44 - 0.84 expert, , prior range for  $k$  = 0.102 - 0.782

Results of CMSY analysis with altogether 10113 viable trajectories for 1559 r-k pairs

$r$  = 0.715 , 95% CL = 0.613 - 0.835 ,  $k$  = 0.306 , 95% CL = 0.239 - 0.392

MSY = 0.0547 , 95% CL = 0.0457 - 0.0656

Relative biomass last year = 0.67  $k$ , 2.5th = 0.479 , 97.5th = 0.699

Exploitation  $F/(r/2)$  in last year = 0.923

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.358 , 95% CL = 0.307 - 0.417 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.358 , 95% CL = 0.307 - 0.417 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.0547 , 95% CL = 0.0457 - 0.0656

$B_{msy}$  = 0.153 , 95% CL = 0.12 - 0.196

Biomass in last year = 0.205 , 2.5th perc = 0.147 , 97.5 perc = 0.214

$B/B_{msy}$  in last year = 1.34 , 2.5th perc = 0.958 , 97.5 perc = 1.4

Fishing mortality in last year = 0.454 , 2.5th perc = 0.435 , 97.5 perc = 0.634

$F/F_{msy}$  = 1.27 , 2.5th perc = 1.22 , 97.5 perc = 1.77

Stock status and exploitation in 2014

Biomass = 0.205 ,  $B/B_{msy}$  = 1.34 , fishing mortality  $F$  = 0.454 ,  $F/F_{msy}$  = 1.27

Comment: Catch=landings from FishStat (Italy, Croatia). RF int 2000 0.3-0.7, final 0.3-0.7. GS OK

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Species: *Solea solea* , stock: Sole\_sol\_AD

Common sole in Adriatic Sea

Source: EASME EMFF 2014, M from Colloca et al 2013

Region: Mediterranean , Adriatic Sea

Catch data used from years 1972 - 2015 , abundance = CPUE

Prior initial relative biomass = 0.5 - 0.9 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  $r$  = 0.21 - 1 expert , , prior range for  $k$  = 2.48 - 48.2

Prior range of  $q$  = 0.0068 - 0.03

Results of CMSY analysis with altogether 3114 viable trajectories for 1890 r-k pairs

$r$  = 0.616 , 95% CL = 0.397 - 0.956 ,  $k$  = 11.3 , 95% CL = 7.78 - 16.4

MSY = 1.74 , 95% CL = 1.62 - 1.87

Relative biomass last year = 0.3  $k$ , 2.5th = 0.0277 , 97.5th = 0.397

Exploitation  $F/(r/2)$  in last year = 1.74

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.643 , 95% CL = 0.45 - 0.917 ,  $k$  = 11.2 , 95% CL = 8.13 - 15.5

MSY = 1.8 , 95% CL = 1.64 - 1.98

Relative biomass in last year = 0.403  $k$ , 2.5th perc = 0.238 , 97.5th perc = 0.505

Exploitation  $F/(r/2)$  in last year = 1.48

$q$  = 0.0101 , lcl = 0.00758 , ucl = 0.0135

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.308 , 95% CL = 0.198 - 0.478 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.308 , 95% CL = 0.198 - 0.478 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.74 , 95% CL = 1.62 - 1.87

$B_{msy}$  = 5.65 , 95% CL = 3.89 - 8.21

Biomass in last year = 3.39 , 2.5th perc = 0.313 , 97.5 perc = 4.49

$B/B_{msy}$  in last year = 0.6 , 2.5th perc = 0.0554 , 97.5 perc = 0.794

Fishing mortality in last year = 0.634 , 2.5th perc = 0.479 , 97.5 perc = 6.87

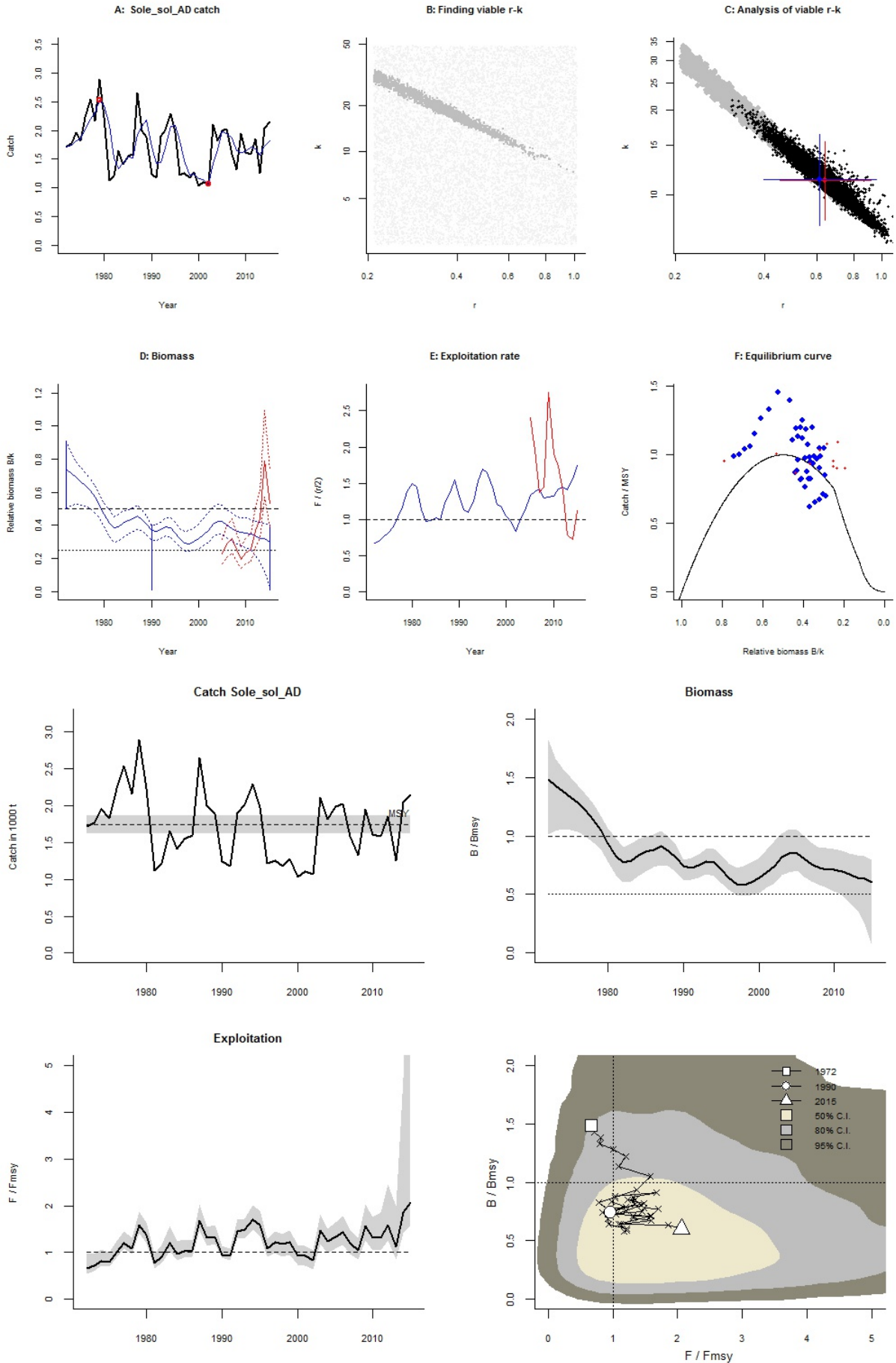
$F/F_{msy}$  = 2.06 , 2.5th perc = 1.56 , 97.5 perc = 22.3

Stock status and exploitation in 2014

Biomass = 3.6 ,  $B/B_{msy}$  = 0.637 , fishing mortality  $F$  = 0.569 ,  $F/F_{msy}$  = 1.85

Comment: Landings from Stock assessment SGMED 2015 - CPUE from SOLEMON Only 17. RF OK

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Species: *SpondylIOSoma cantharus* , stock: Spod\_can\_AD

Black seabream in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1972 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2004 default

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.24 - 1.0 expert, , prior range for  $k$  = 0.06 - 1.05

Results of CMSY analysis with altogether 726 viable trajectories for 691 r-k pairs

$r$  = 0.472 , 95% CL = 0.381 - 0.585 ,  $k$  = 0.392 , 95% CL = 0.293 - 0.523

MSY = 0.0462 , 95% CL = 0.0398 - 0.0537

Relative biomass last year = 0.11  $k$ , 2.5th = 0.0132 , 97.5th = 0.283

Exploitation  $F/(r/2)$  in last year = 0.691

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.236 , 95% CL = 0.191 - 0.292 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.104 , 95% CL = 0.0836 - 0.128 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.0462 , 95% CL = 0.0398 - 0.0537

$B_{msy}$  = 0.196 , 95% CL = 0.146 - 0.262

Biomass in last year = 0.0429 , 2.5th perc = 0.00516 , 97.5 perc = 0.111

$B/B_{msy}$  in last year = 0.219 , 2.5th perc = 0.0263 , 97.5 perc = 0.565

Fishing mortality in last year = 0.21 , 2.5th perc = 0.0813 , 97.5 perc = 1.75

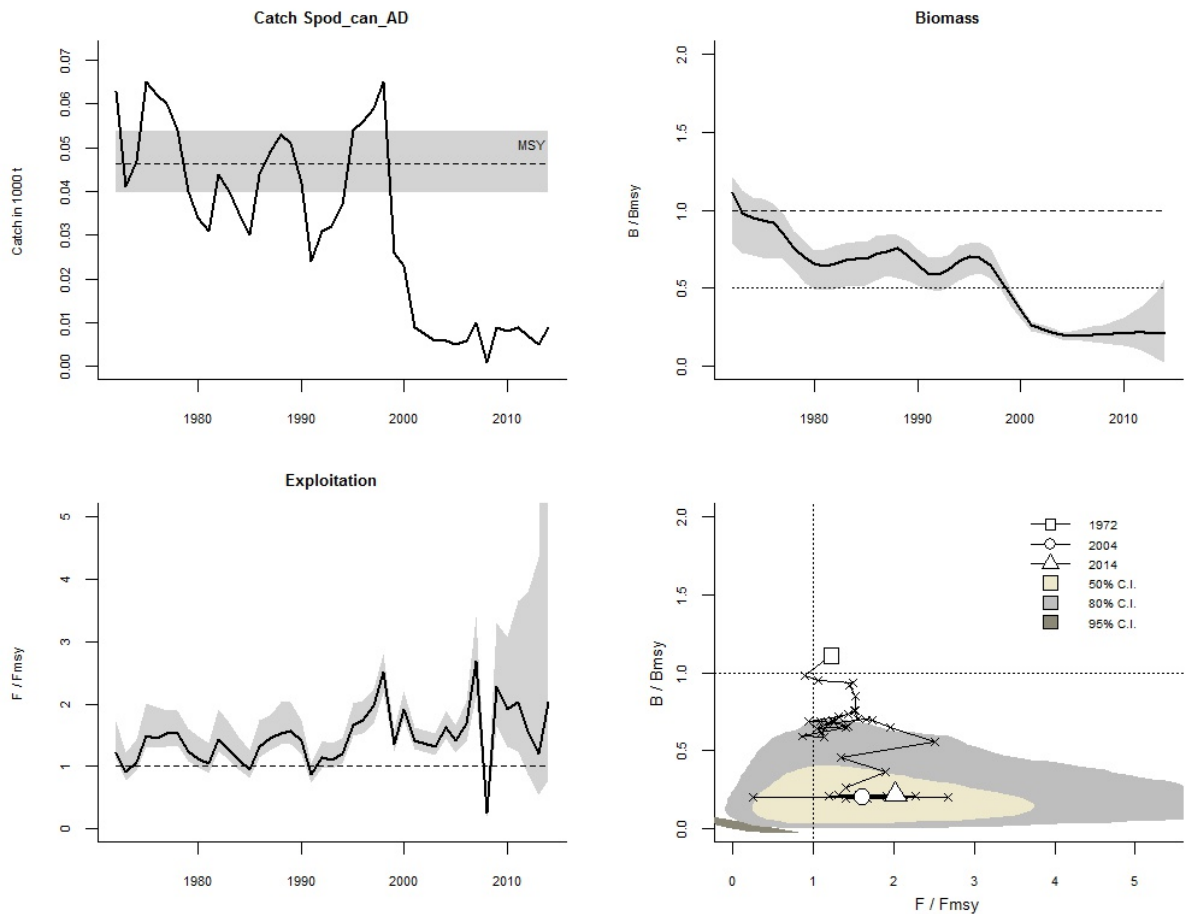
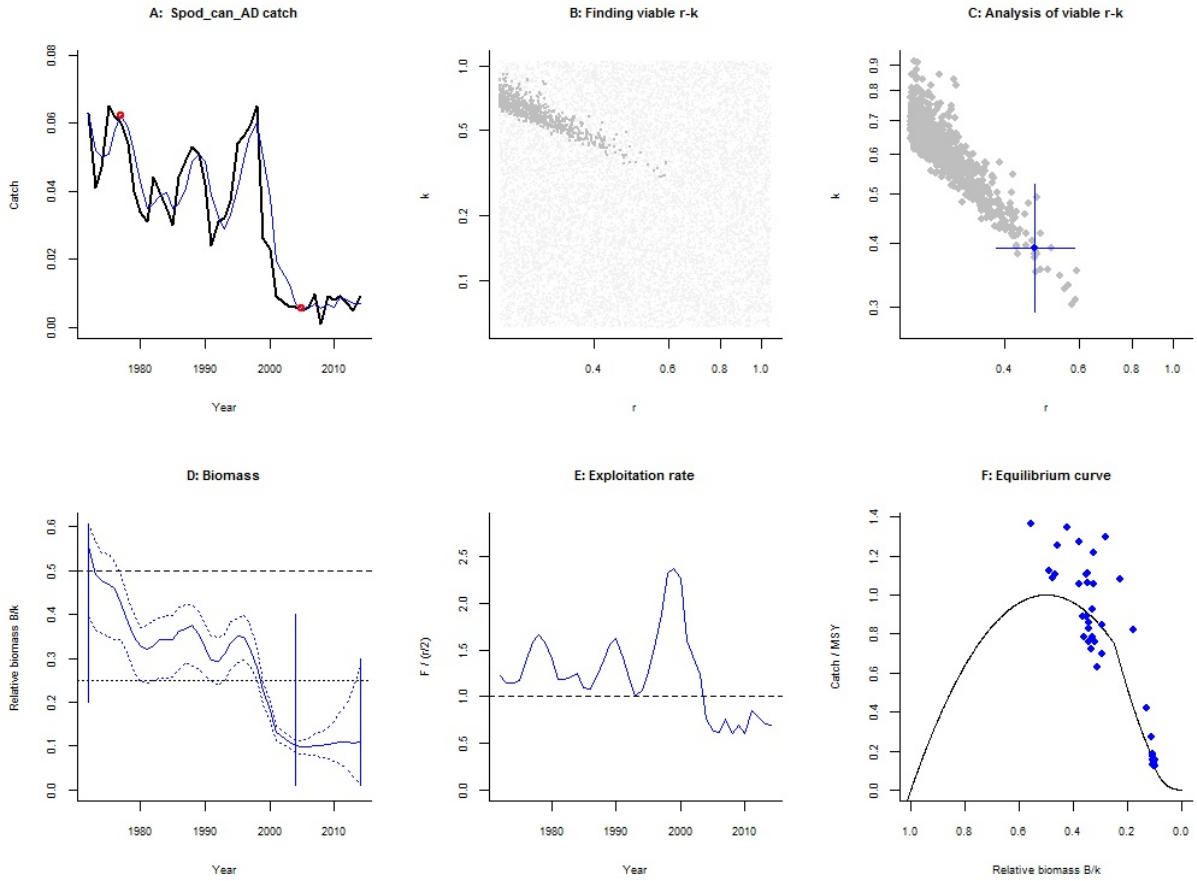
$F/F_{msy}$  = 2.03 , 2.5th perc = 0.785 , 97.5 perc = 16.9

Stock status and exploitation in 2014

Biomass = 0.0429 ,  $B/B_{msy}$  = 0.219 , fishing mortality  $F$  = 0.21 ,  $F/F_{msy}$  = 2.03

Comment: Catch=landings from FishStat (Croatia, Serbia and Montenegro, Yugoslavia). RF final 0.3. GS  
OK

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Species: *Squilla mantis* , stock: Squi\_man\_AD

Mantis shrimp in Adriatic Sea

Source: STECF 16-08

Region: Mediterranean , Adriatic Sea

Catch data used from years 1970 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert

Prior final relative biomass = 0.2 - 0.6 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 5.78 - 92.5

Prior range of  $q$  = 0.000644 - 0.00258

Results of CMSY analysis with altogether 807 viable trajectories for 798 r-k pairs

$r$  = 0.37 , 95% CL = 0.275 - 0.496 ,  $k$  = 44.5 , 95% CL = 32.7 - 60.7

MSY = 4.12 , 95% CL = 3.29 - 5.15

Relative biomass last year = 0.35  $k$ , 2.5th = 0.213 , 97.5th = 0.566

Exploitation  $F/(r/2)$  in last year = 0.99

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.448 , 95% CL = 0.292 - 0.689 ,  $k$  = 32 , 95% CL = 21.8 - 47.2

MSY = 3.59 , 95% CL = 3.11 - 4.15

Relative biomass in last year = 0.351  $k$ , 2.5th perc = 0.191 , 97.5th perc = 0.621

Exploitation  $F/(r/2)$  in last year = 1.25

$q$  = 0.00109 , lcl = 0.000803 , ucl = 0.00148

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.185 , 95% CL = 0.138 - 0.248 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.185 , 95% CL = 0.138 - 0.248 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 4.12 , 95% CL = 3.29 - 5.15

$B_{msy}$  = 22.3 , 95% CL = 16.4 - 30.3

Biomass in last year = 15.6 , 2.5th perc = 9.49 , 97.5 perc = 25.2

$B/B_{msy}$  in last year = 0.7 , 2.5th perc = 0.426 , 97.5 perc = 1.13

Fishing mortality in last year = 0.202 , 2.5th perc = 0.125 , 97.5 perc = 0.332

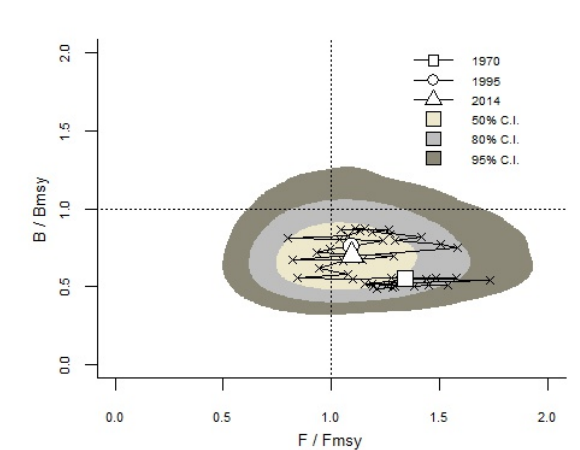
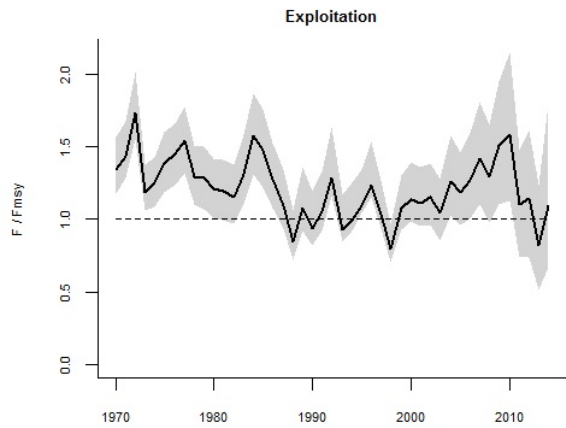
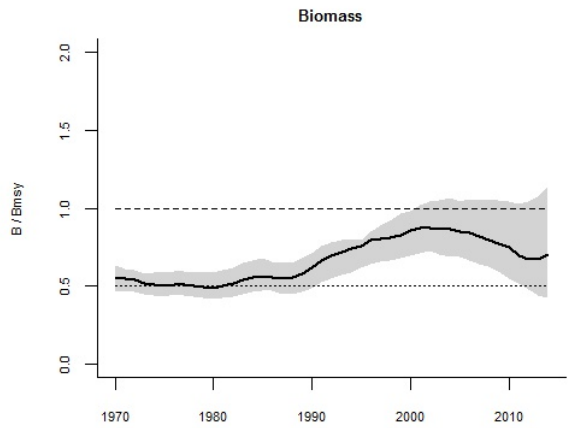
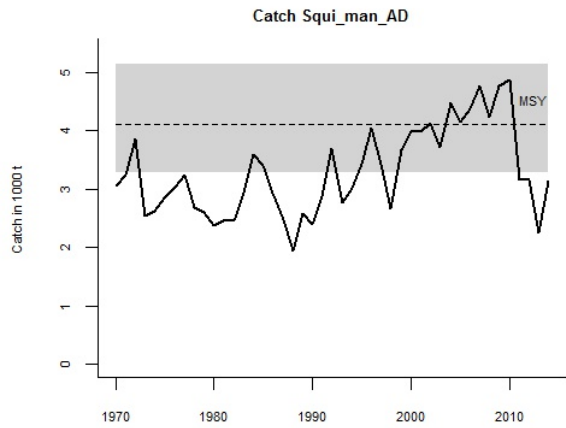
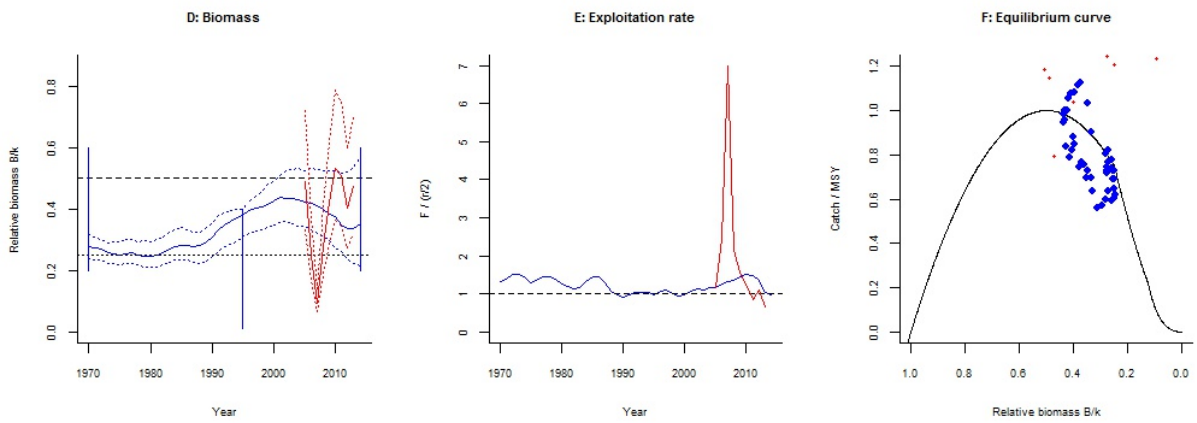
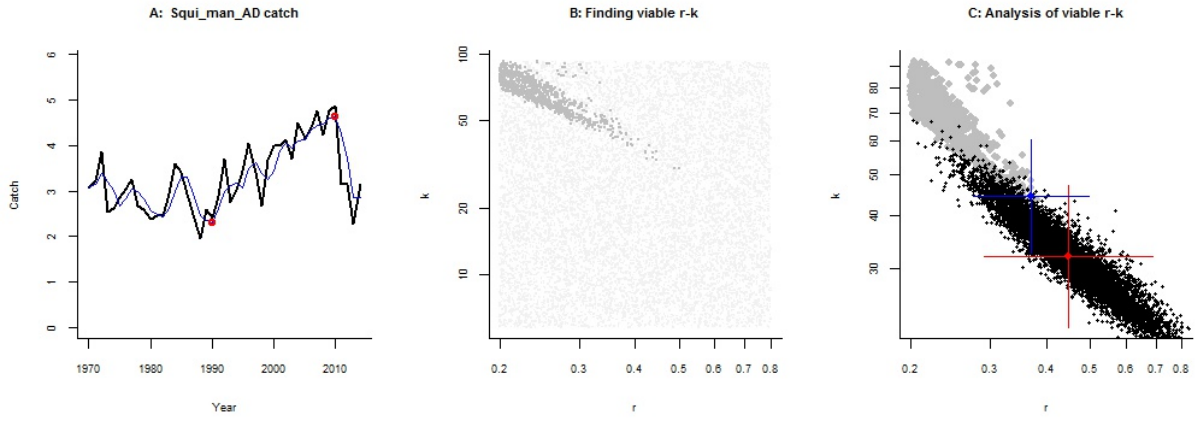
$F/F_{msy}$  = 1.09 , 2.5th perc = 0.676 , 97.5 perc = 1.8

Stock status and exploitation in 2014

Biomass = 15.6 ,  $B/B_{msy}$  = 0.7 , fishing mortality  $F$  = 0.202 ,  $F/F_{msy}$  = 1.09

Comment: Catch=landings from FishStat (Italy, Croatia, Slovenia). GS OK

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Species: *Trachurus spp* , stock: Trachurus\_AD

Horse mackerels in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1970 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 4.01 - 64.1

Results of CMSY analysis with altogether 653 viable trajectories for 622 r-k pairs

$r$  = 0.333 , 95% CL = 0.282 - 0.393 ,  $k$  = 28.4 , 95% CL = 21.5 - 37.4

MSY = 2.36 , 95% CL = 1.9 - 2.93

Relative biomass last year = 0.197  $k$ , 2.5th = 0.0201 , 97.5th = 0.389

Exploitation  $F/(r/2)$  in last year = 0.934

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.166 , 95% CL = 0.141 - 0.197 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.131 , 95% CL = 0.111 - 0.155 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 2.36 , 95% CL = 1.9 - 2.93

$B_{msy}$  = 14.2 , 95% CL = 10.8 - 18.7

Biomass in last year = 5.6 , 2.5th perc = 0.57 , 97.5 perc = 11

$B/B_{msy}$  in last year = 0.395 , 2.5th perc = 0.0402 , 97.5 perc = 0.777

Fishing mortality in last year = 0.121 , 2.5th perc = 0.0616 , 97.5 perc = 1.19

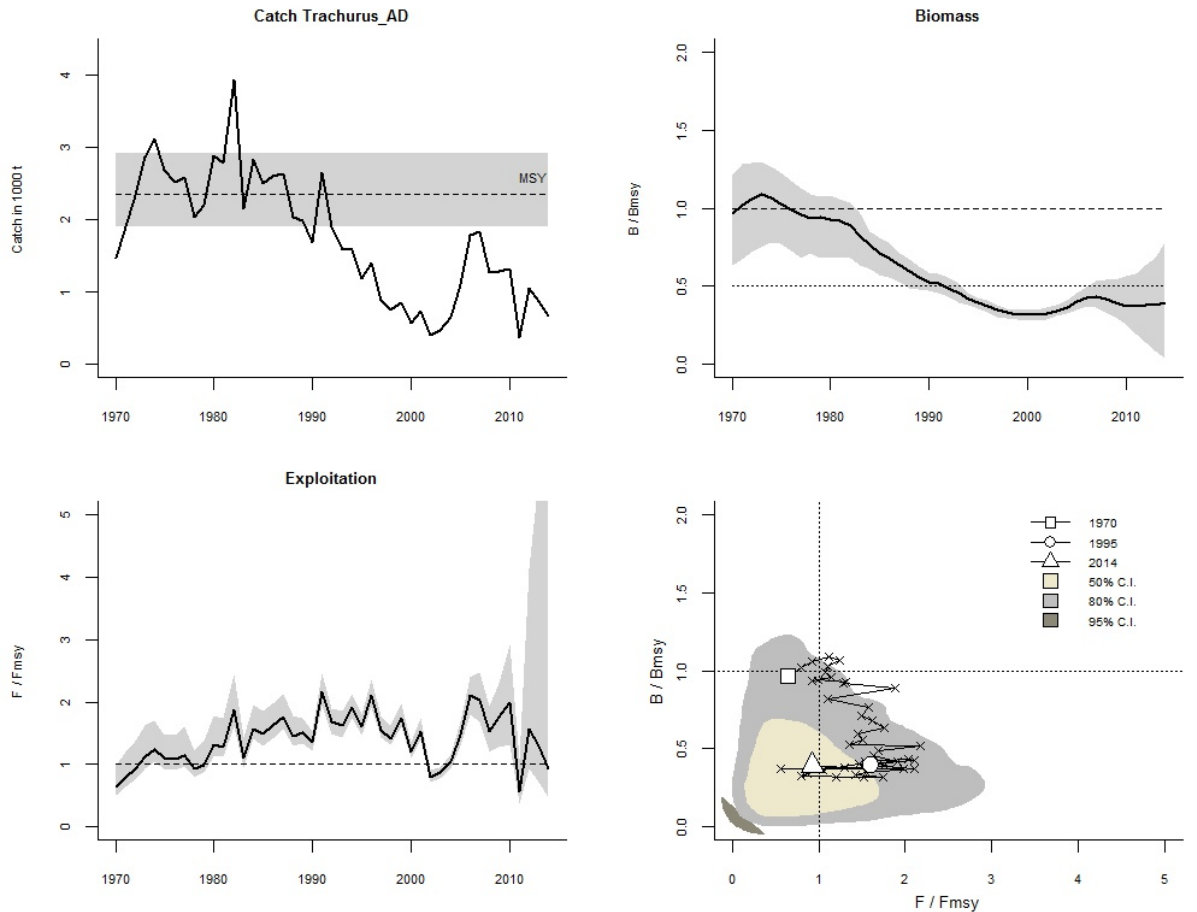
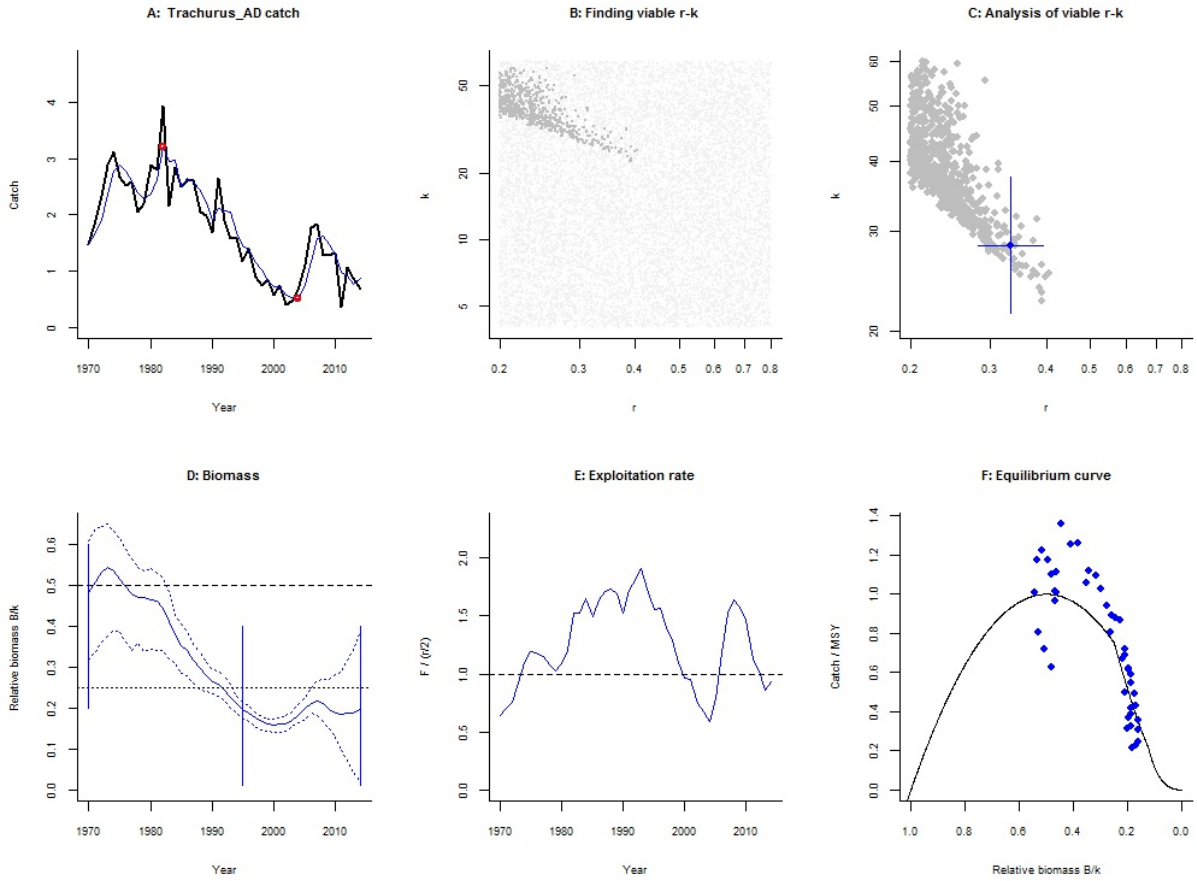
$F/F_{msy}$  = 0.925 , 2.5th perc = 0.469 , 97.5 perc = 9.09

Stock status and exploitation in 2014

Biomass = 5.6 ,  $B/B_{msy}$  = 0.395 , fishing mortality  $F$  = 0.121 ,  $F/F_{msy}$  = 0.925

Comment: Catch=landings from FishStat (Italy, Croatia, Slovenia, Montenegro). GS OK

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Species: *Trisopterus minutus* , stock: Tris\_min\_AD

Poor cod in Adriatic Sea

Source:

Region: Mediterranean , Adriatic Sea

Catch data used from years 1990 - 2013 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.5 - 0.9 in year 2005 default

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 0.484 - 7.75

Results of CMSY analysis with altogether 1820 viable trajectories for 1158 r-k pairs

$r$  = 0.566 , 95% CL = 0.407 - 0.785 ,  $k$  = 1.31 , 95% CL = 0.877 - 1.95

MSY = 0.185 , 95% CL = 0.161 - 0.213

Relative biomass last year = 0.145  $k$ , 2.5th = 0.0174 , 97.5th = 0.296

Exploitation  $F/(r/2)$  in last year = 1.62

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.283 , 95% CL = 0.204 - 0.392 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.165 , 95% CL = 0.119 - 0.228 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.185 , 95% CL = 0.161 - 0.213

$B_{msy}$  = 0.654 , 95% CL = 0.439 - 0.976

Biomass in last year = 0.19 , 2.5th perc = 0.0227 , 97.5 perc = 0.387

$B/B_{msy}$  in last year = 0.291 , 2.5th perc = 0.0347 , 97.5 perc = 0.591

Fishing mortality in last year = 0.604 , 2.5th perc = 0.297 , 97.5 perc = 5.06

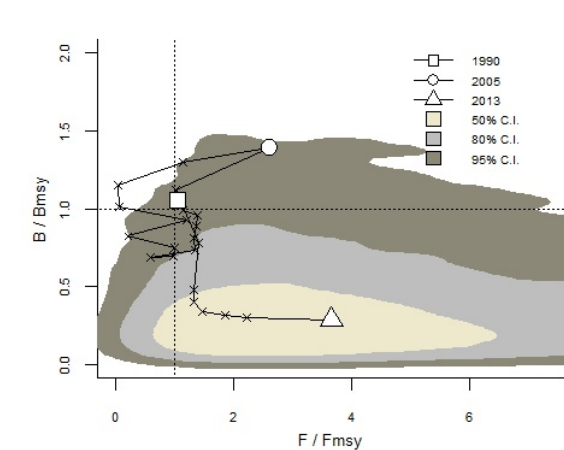
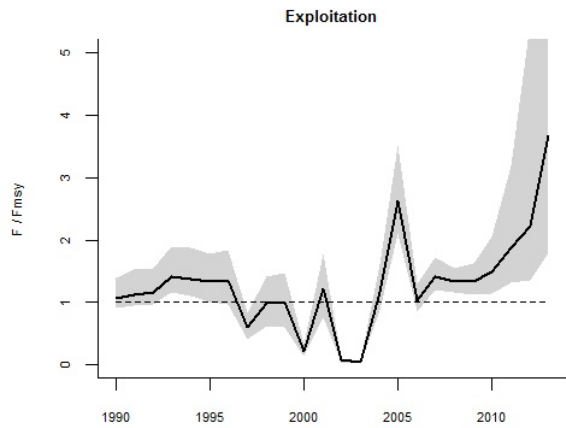
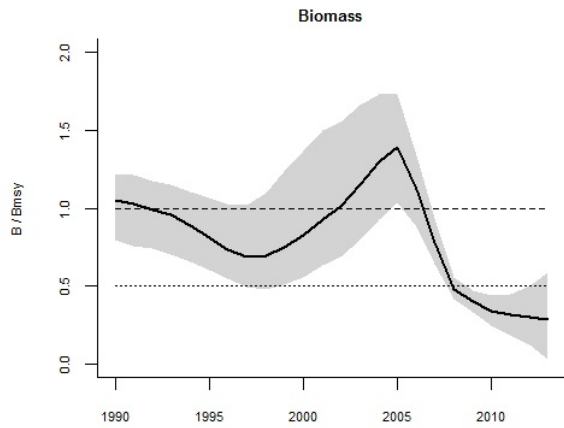
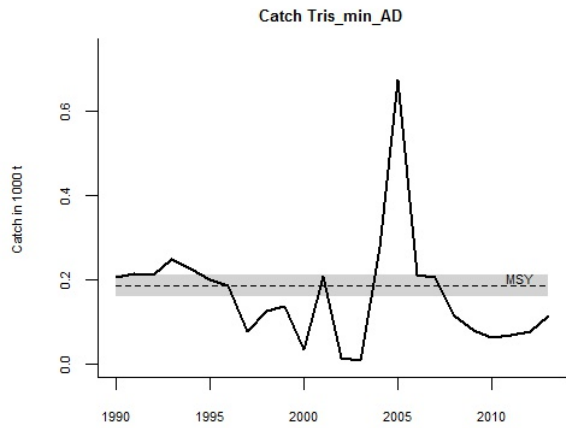
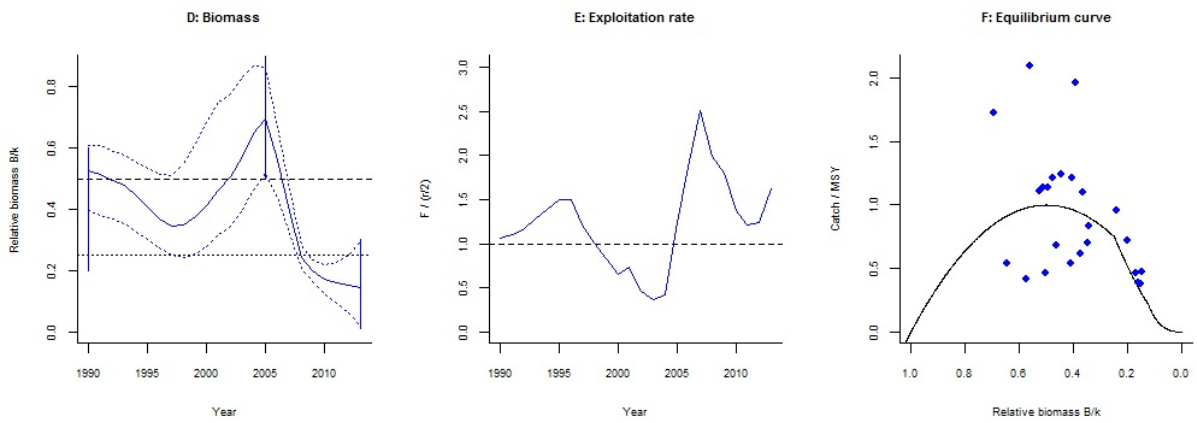
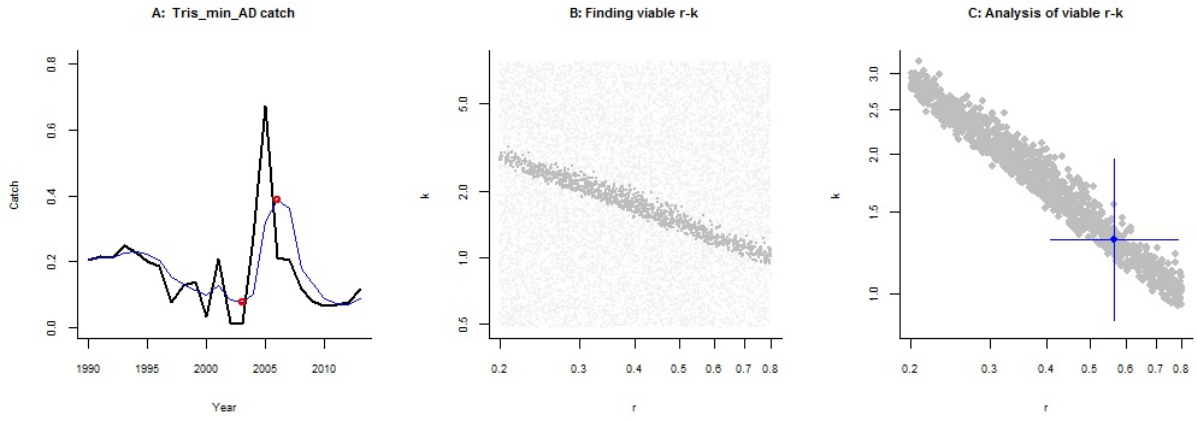
$F/F_{msy}$  = 3.67 , 2.5th perc = 1.81 , 97.5 perc = 30.8

Stock status and exploitation in 2014

Biomass = ,  $B/B_{msy}$  = , fishing mortality  $F$  = ,  $F/F_{msy}$  =

Comment: Catch=landings from FishStat. RF final 0.3. GS OK

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**Ionian Sea** (analyzed with CMSY\_O\_7m.R; see Comment for data sources)

Species: *Aristeomorpha foliacea* , stock: ARISFOL\_IS

Giant red shrimp in Ionian Sea

Source: STECF 16-08

Region: Mediterranean , Ionian Sea

Catch data used from years 1995 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 2.96 - 47.3

Prior range of  $q$  = 0.000198 - 0.000791

Results of CMSY analysis with altogether 1651 viable trajectories for 1135 r-k pairs

$r$  = 0.566 , 95% CL = 0.407 - 0.785 ,  $k$  = 14.4 , 95% CL = 9.28 - 22.5

MSY = 2.04 , 95% CL = 1.63 - 2.56

Relative biomass last year = 0.252  $k$ , 2.5th = 0.024 , 97.5th = 0.395

Exploitation  $F/(r/2)$  in last year = 2.25

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.624 , 95% CL = 0.415 - 0.937 ,  $k$  = 12.4 , 95% CL = 8.42 - 18.1

MSY = 1.93 , 95% CL = 1.71 - 2.17

Relative biomass in last year = 0.319  $k$ , 2.5th perc = 0.186 , 97.5th perc = 0.462

Exploitation  $F/(r/2)$  in last year = 1.67

$q$  = 0.000319 , lcl = 0.000236 , ucl = 0.000432

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.312 , 95% CL = 0.208 - 0.468 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.312 , 95% CL = 0.208 - 0.468 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.93 , 95% CL = 1.71 - 2.17

$B_{msy}$  = 6.18 , 95% CL = 4.21 - 9.07

Biomass in last year = 3.94 , 2.5th perc = 2.3 , 97.5 perc = 5.71

$B/B_{msy}$  in last year = 0.638 , 2.5th perc = 0.372 , 97.5 perc = 0.923

Fishing mortality in last year = 0.522 , 2.5th perc = 0.361 , 97.5 perc = 0.896

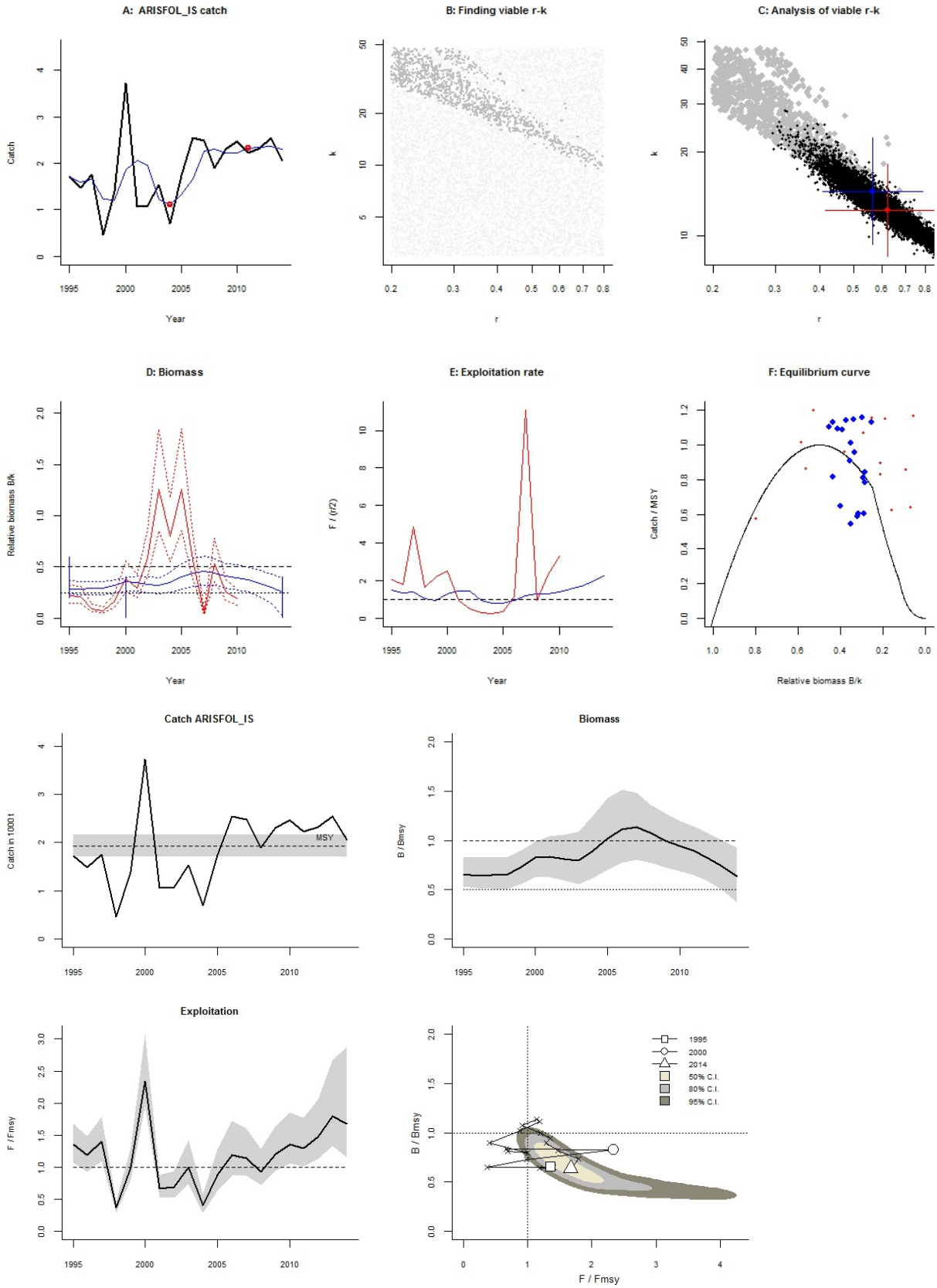
$F/F_{msy}$  = 1.67 , 2.5th perc = 1.16 , 97.5 perc = 2.87

Stock status and exploitation in 2014

Biomass = 3.94 ,  $B/B_{msy}$  = 0.638 , fishing mortality  $F$  = 0.522 ,  $F/F_{msy}$  = 1.67

Comment: Catch=landings from FishStat (Italy), Biomass from Medits for GSAs 19+20. GS OK

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Species: *Atherina boyeri* , stock: ATHEBOY\_IS

Sand smelt in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1970 - 2014 , abundance = None

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 = 0.01 - 0.4 expert

Prior range for  $r$  = 0.33 - 1.7 expert, , prior range for  $k$  = 0.314 - 6.63

Results of CMSY analysis with altogether 391 viable trajectories for 356 r-k pairs

$r = 0.57$  , 95% CL = 0.477 - 0.681 ,  $k = 2.74$  , 95% CL = 2.16 - 3.48

MSY = 0.391 , 95% CL = 0.348 - 0.439

Relative biomass last year = 0.162  $k$ , 2.5th = 0.0291 , 97.5th = 0.387

Exploitation  $F/(r/2)$  in last year = 0.352

Results for Management (based on CMSY analysis)

$F_{msy} = 0.285$  , 95% CL = 0.238 - 0.34 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.185$  , 95% CL = 0.155 - 0.221 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.391 , 95% CL = 0.348 - 0.439

$B_{msy} = 1.37$  , 95% CL = 1.08 - 1.74

Biomass in last year = 0.445 , 2.5th perc = 0.0799 , 97.5 perc = 1.06

$B/B_{msy}$  in last year = 0.324 , 2.5th perc = 0.0582 , 97.5 perc = 0.774

Fishing mortality in last year = 0.191 , 2.5th perc = 0.0801 , 97.5 perc = 1.06

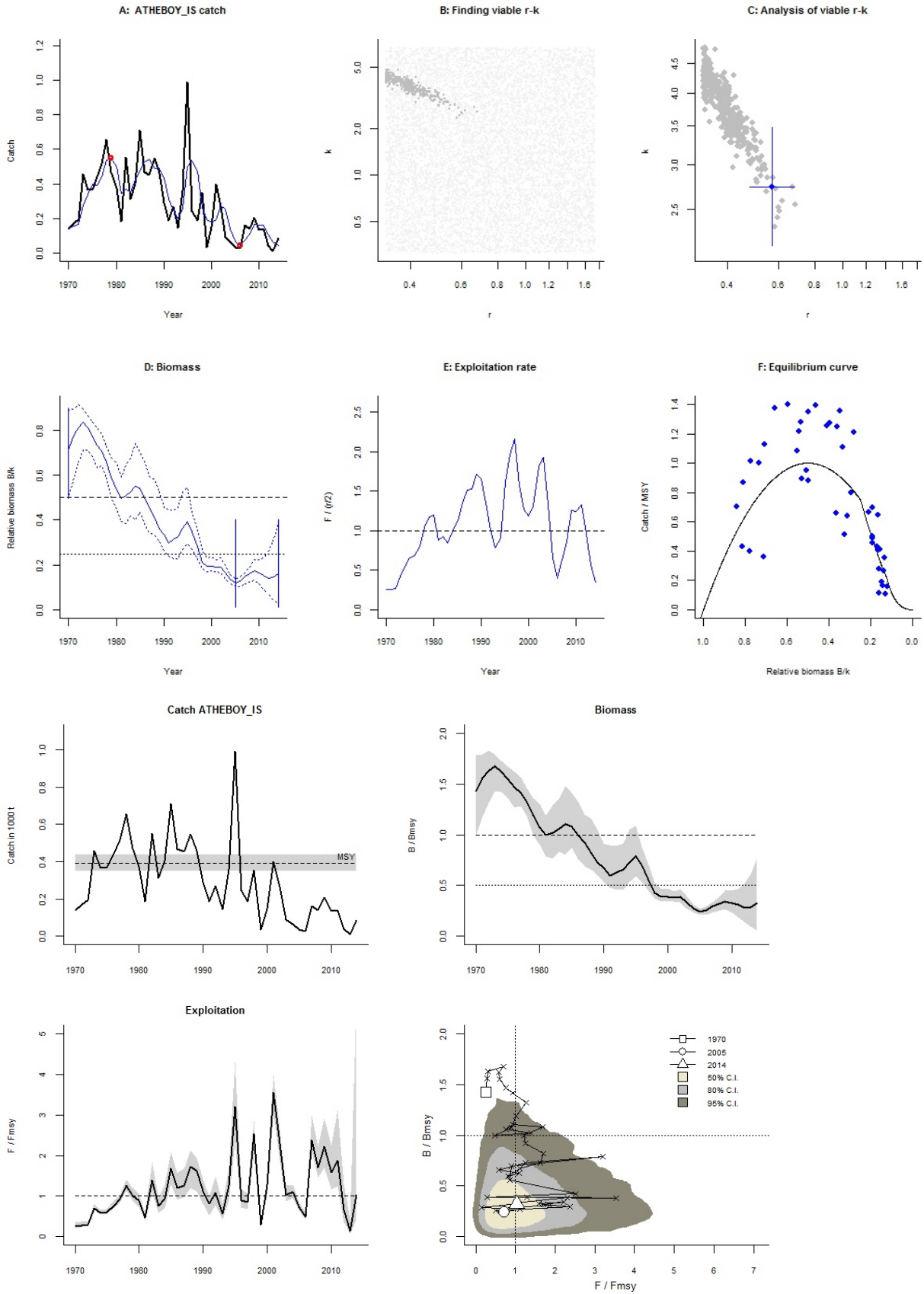
$F/F_{msy} = 1.03$  , 2.5th perc = 0.433 , 97.5 perc = 5.76

Stock status and exploitation in 2014

Biomass = 0.445 ,  $B/B_{msy} = 0.324$  , fishing mortality  $F = 0.191$  ,  $F/F_{msy} = 1.03$

Comment: Catch=landings from FishStat (Tunisia, Greece, Italy, Albania). RF final 0.3. GS final 0.4

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Species: *Belone belone* , stock: BELOBEL\_IS

Garfish in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1970 - 2014 , abundance = None

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 = 0.01 - 0.4 expert

Prior range for  $r$  = 0.19 - 1 expert, , prior range for  $k$  = 0.398 - 8.39

Results of CMSY analysis with altogether 3733 viable trajectories for 1315 r-k pairs

$r$  = 0.556 , 95% CL = 0.394 - 0.784 ,  $k$  = 2.1 , 95% CL = 1.44 - 3.06

MSY = 0.291 , 95% CL = 0.272 - 0.312

Relative biomass last year = 0.283  $k$ , 2.5th = 0.0237 , 97.5th = 0.397

Exploitation  $F/(r/2)$  in last year = 0.868

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.278 , 95% CL = 0.197 - 0.392 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.278 , 95% CL = 0.197 - 0.392 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.291 , 95% CL = 0.272 - 0.312

$B_{msy}$  = 1.05 , 95% CL = 0.718 - 1.53

Biomass in last year = 0.593 , 2.5th perc = 0.0498 , 97.5 perc = 0.833

$B/B_{msy}$  in last year = 0.566 , 2.5th perc = 0.0475 , 97.5 perc = 0.795

Fishing mortality in last year = 0.278 , 2.5th perc = 0.198 , 97.5 perc = 3.32

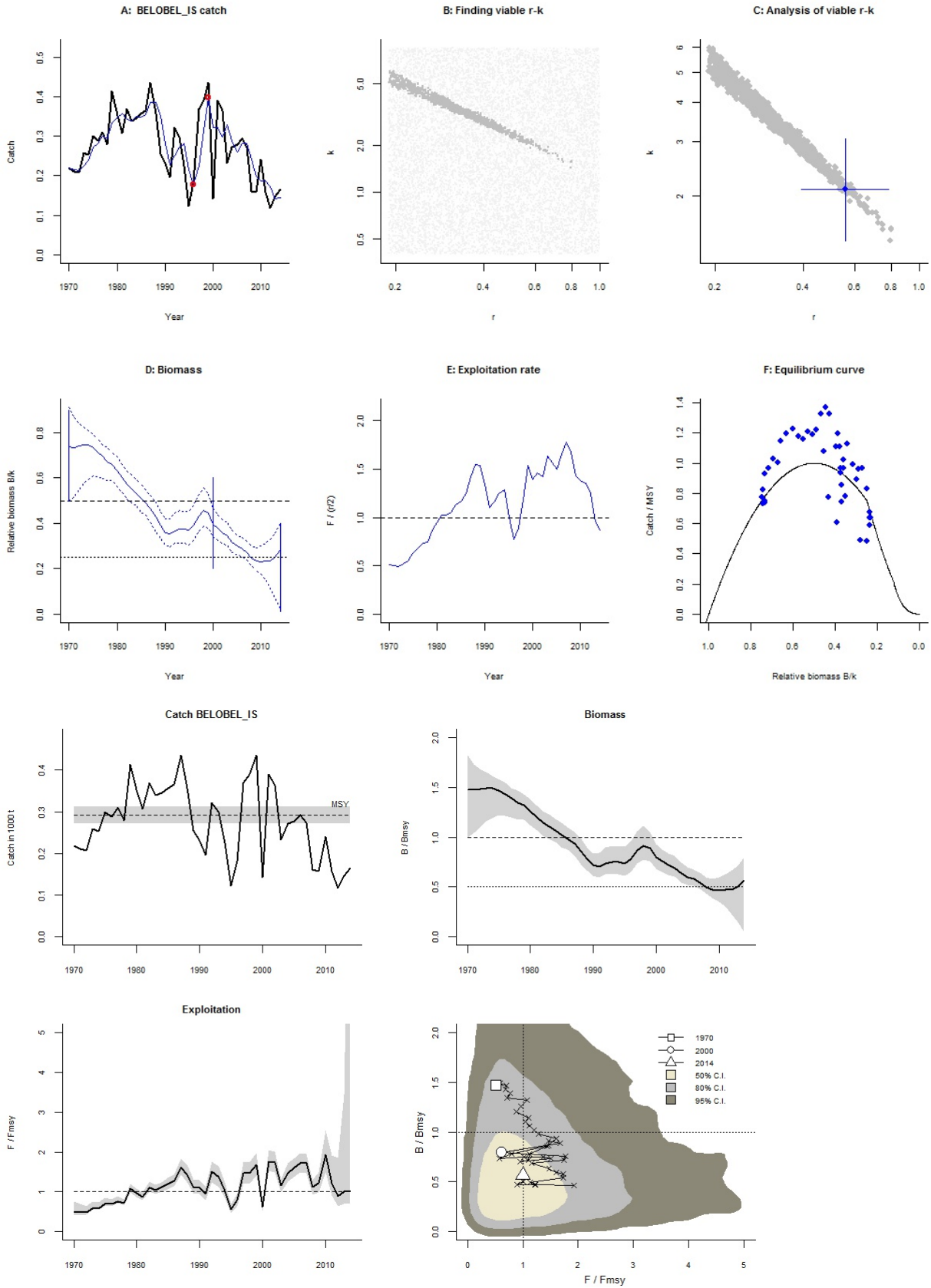
$F/F_{msy}$  = 1 , 2.5th perc = 0.713 , 97.5 perc = 11.9

Stock status and exploitation in 2014

Biomass = 0.593 ,  $B/B_{msy}$  = 0.566 , fishing mortality  $F$  = 0.278 ,  $F/F_{msy}$  = 1

Comment: Catch=landings from FishStat (Italy, Greece, Tunisia, Albania). RF int 2000 0.2-0.6, final 0.01-0.4. GS OK

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Species: *Boops boops* , stock: BOOPBOO\_IS

Bogue in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1973 - 2014 , 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 - 0.3 expert

Prior range for  $r$  = 0.31 - 1.1 expert, , prior range for  $k$  = 5.71 - 81

Prior range of  $q$  = 0.000607 - 0.00229

Results of CMSY analysis with altogether 295 viable trajectories for 283 r-k pairs

$r$  = 0.475 , 95% CL = 0.412 - 0.547 ,  $k$  = 36.5 , 95% CL = 29.4 - 45.3

MSY = 4.33 , 95% CL = 3.79 - 4.94

Relative biomass last year = 0.151  $k$ , 2.5th = 0.012 , 97.5th = 0.29

Exploitation  $F/(r/2)$  in last year = 1.34

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.59 , 95% CL = 0.44 - 0.79 ,  $k$  = 30.7 , 95% CL = 23.9 - 39.3

MSY = 4.52 , 95% CL = 4.07 - 5.02

Relative biomass in last year = 0.208  $k$ , 2.5th perc = 0.0682 , 97.5th perc = 0.354

Exploitation  $F/(r/2)$  in last year = 0.697

$q$  = 0.000895 ,  $lcl$  = 0.000693 ,  $ucl$  = 0.00116

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.295 , 95% CL = 0.22 - 0.395 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.246 , 95% CL = 0.183 - 0.329 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 4.52 , 95% CL = 4.07 - 5.02

$B_{msy}$  = 15.3 , 95% CL = 12 - 19.6

Biomass in last year = 6.38 , 2.5th perc = 2.09 , 97.5 perc = 10.8

$B/B_{msy}$  in last year = 0.416 , 2.5th perc = 0.136 , 97.5 perc = 0.707

Fishing mortality in last year = 0.206 , 2.5th perc = 0.121 , 97.5 perc = 0.627

$F/F_{msy}$  = 0.837 , 2.5th perc = 0.493 , 97.5 perc = 2.55

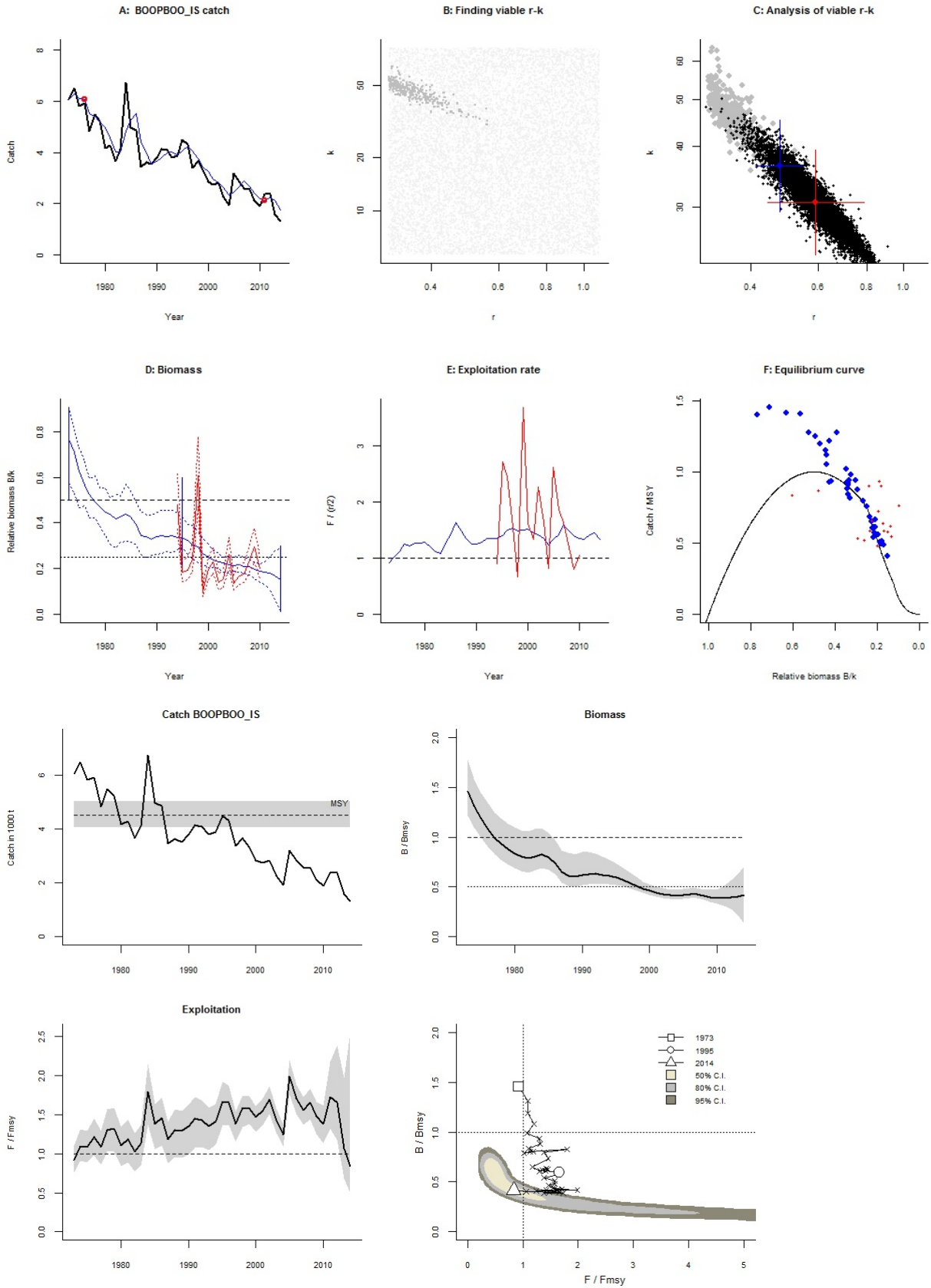
Stock status and exploitation in 2014

Biomass = 6.38 ,  $B/B_{msy}$  = 0.416 , fishing mortality  $F$  = 0.206 ,  $F/F_{msy}$  = 0.837

Comment: Catch=landings from FishStat (Italy+Greece+Albania), Biomass from Medits for GSAs 19+20.

RF final 0.3. GS OK

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Species: *Conger conger* , stock: CONGCON\_IS

Conger eel in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1994 - 2014 , abundance = None

Prior initial relative biomass = 0.4 - 0.8 expert

Prior intermediate rel. biomass= 0.4 - 0.8 in year 2004 expert

Prior final relative biomass = 0.1 - 0.5 expert

Prior range for  $r$  = 0.16 - 0.46 expert, , prior range for  $k$  = 1.6 - 18.4

Results of CMSY analysis with altogether 12576 viable trajectories for 1917 r-k pairs

$r$  = 0.353 , 95% CL = 0.275 - 0.455 ,  $k$  = 4.27 , 95% CL = 2.96 - 6.17

MSY = 0.378 , 95% CL = 0.301 - 0.474

Relative biomass last year = 0.305  $k$ , 2.5th = 0.11 , 97.5th = 0.492

Exploitation  $F/(r/2)$  in last year = 1.56

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.177 , 95% CL = 0.137 - 0.227 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.177 , 95% CL = 0.137 - 0.227 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.378 , 95% CL = 0.301 - 0.474

$B_{msy}$  = 2.14 , 95% CL = 1.48 - 3.09

Biomass in last year = 1.3 , 2.5th perc = 0.468 , 97.5 perc = 2.1

$B/B_{msy}$  in last year = 0.61 , 2.5th perc = 0.219 , 97.5 perc = 0.984

Fishing mortality in last year = 0.253 , 2.5th perc = 0.157 , 97.5 perc = 0.705

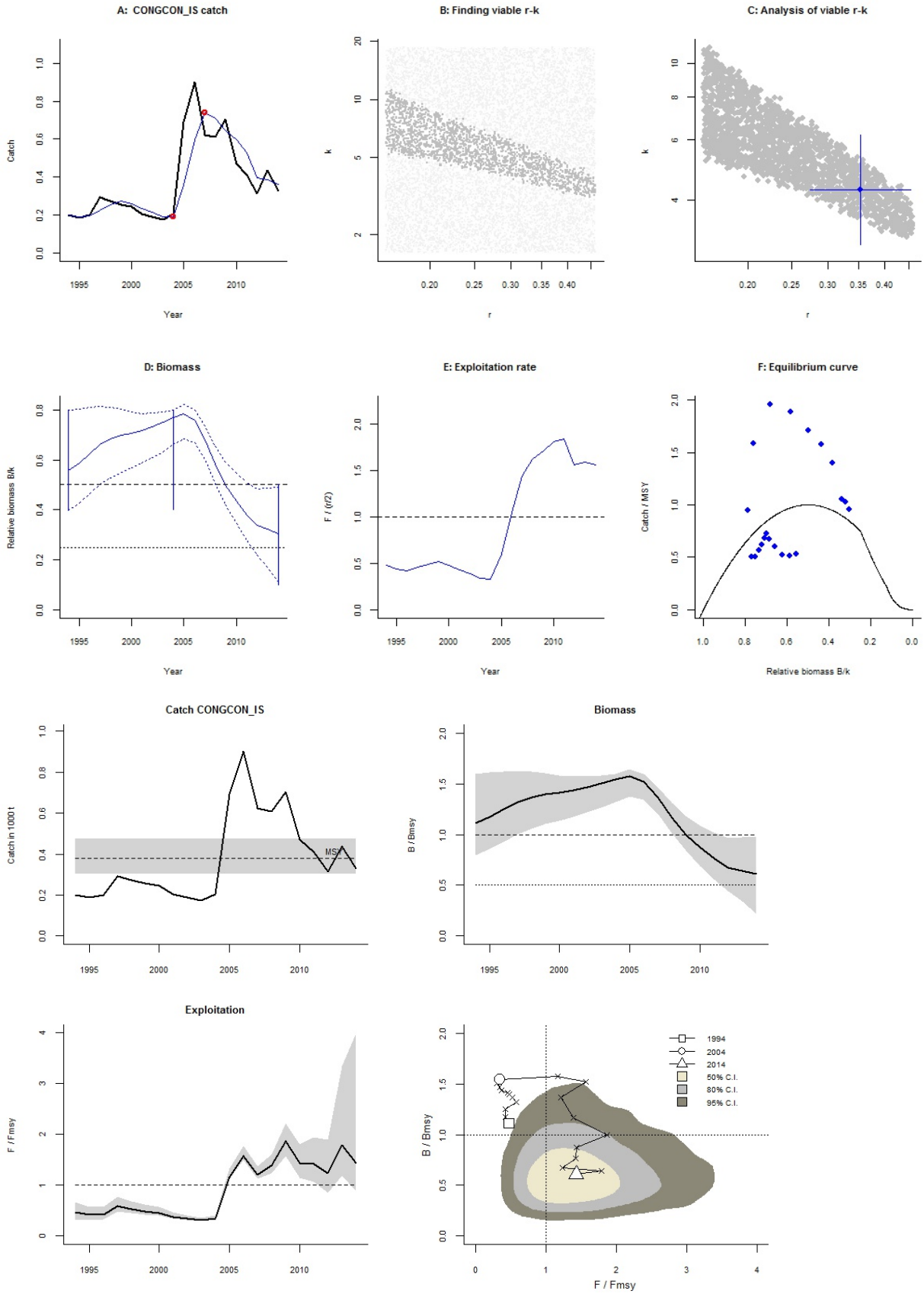
$F/F_{msy}$  = 1.43 , 2.5th perc = 0.888 , 97.5 perc = 3.99

Stock status and exploitation in 2014

Biomass = 1.3 ,  $B/B_{msy}$  = 0.61 , fishing mortality  $F$  = 0.253 ,  $F/F_{msy}$  = 1.43

Comment: Catch=landings from FishStat (Malta, Greece, Italy, Tunisia, Albania). RF start 0.4-0.8, int 2004 0.4-0.8, final 0.1-0.5. GS OK

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Species: *Coryphaena hippurus* , stock: CORYHIP\_IS

Common dolphinfish in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1970 - 2014 , abundance = None

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.2 - 0.6 in year 2007 default

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.39 - 1.5 expert, , prior range for  $k$  = 1.81 - 28.5

Results of CMSY analysis with altogether 2496 viable trajectories for 1711 r-k pairs

$r$  = 1.09 , 95% CL = 0.788 - 1.52 ,  $k$  = 7.74 , 95% CL = 5.18 - 11.6

MSY = 2.12 , 95% CL = 1.83 - 2.45

Relative biomass last year = 0.163  $k$ , 2.5th = 0.0166 , 97.5th = 0.295

Exploitation  $F/(r/2)$  in last year = 1.83

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.547 , 95% CL = 0.394 - 0.759 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.357 , 95% CL = 0.257 - 0.495 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 2.12 , 95% CL = 1.83 - 2.45

$B_{msy}$  = 3.87 , 95% CL = 2.59 - 5.79

Biomass in last year = 1.26 , 2.5th perc = 0.129 , 97.5 perc = 2.29

$B/B_{msy}$  in last year = 0.326 , 2.5th perc = 0.0332 , 97.5 perc = 0.59

Fishing mortality in last year = 0.694 , 2.5th perc = 0.384 , 97.5 perc = 6.81

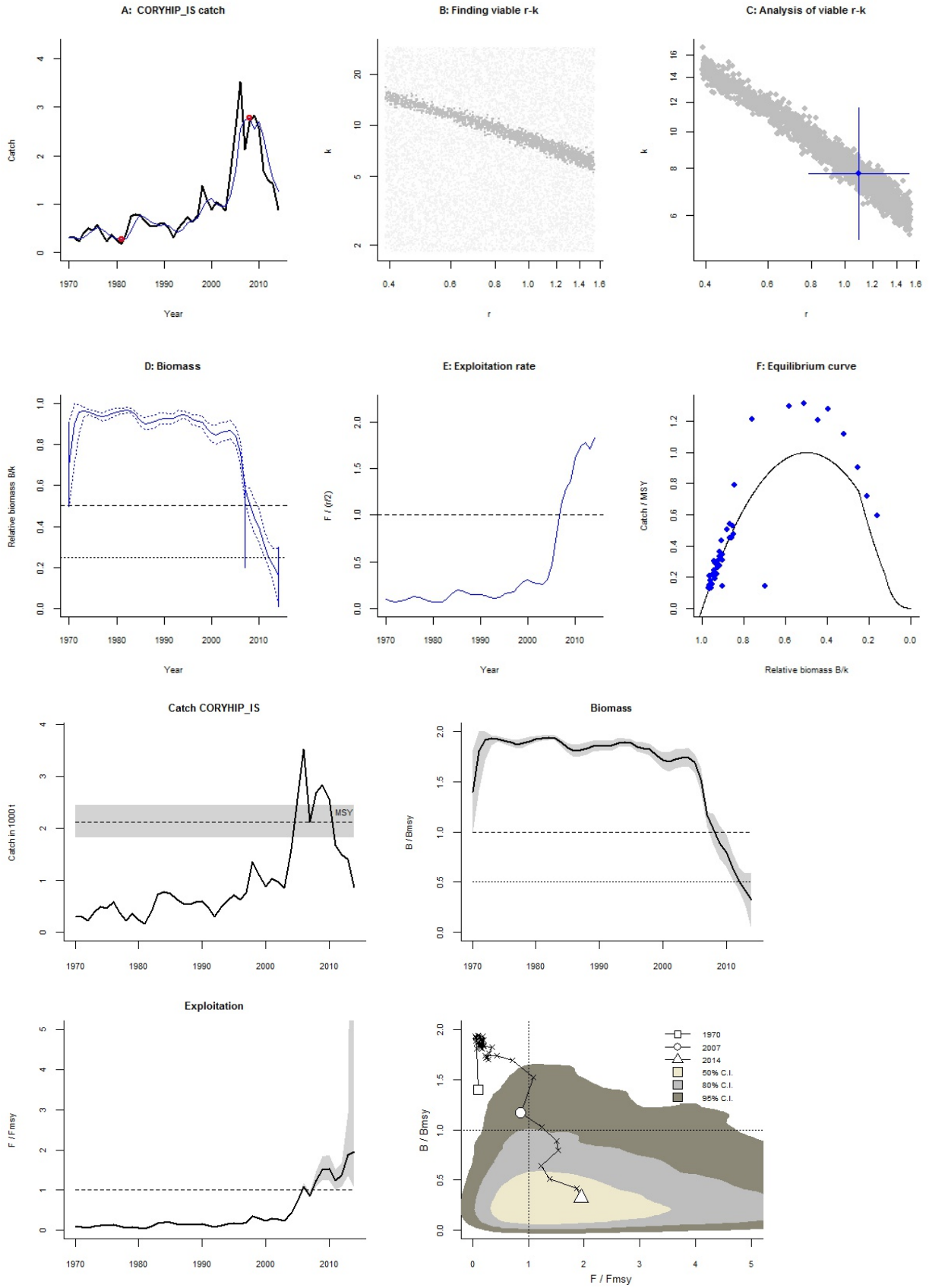
$F/F_{msy}$  = 1.95 , 2.5th perc = 1.08 , 97.5 perc = 19.1

Stock status and exploitation in 2014

Biomass = 1.26 ,  $B/B_{msy}$  = 0.326 , fishing mortality  $F$  = 0.694 ,  $F/F_{msy}$  = 1.95

Comment: Catch=landings from FishStat (Libya, Italy, Malta, Tunisia). RF final 0.3. GS OK

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Species: *Dentex dentex* , stock: DENTDEN\_IS

Common dentex in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1972 - 2014 , abundance = None

Prior initial relative biomass = 0.4 - 0.8 expert

Prior intermediate rel. biomass= 0.01 - 0.3 in year 2000 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.15 - 0.73 expert , , prior range for  $k$  = 4.64 - 90.2

Results of CMSY analysis with altogether 3084 viable trajectories for 1437 r-k pairs

$r$  = 0.438 , 95% CL = 0.314 - 0.611 ,  $k$  = 15.9 , 95% CL = 10.7 - 23.7

MSY = 1.74 , 95% CL = 1.53 - 1.99

Relative biomass last year = 0.219  $k$ , 2.5th = 0.0156 , 97.5th = 0.395

Exploitation  $F/(r/2)$  in last year = 1.04

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.219 , 95% CL = 0.157 - 0.306 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.192 , 95% CL = 0.137 - 0.267 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.74 , 95% CL = 1.53 - 1.99

$B_{msy}$  = 7.95 , 95% CL = 5.33 - 11.9

Biomass in last year = 3.48 , 2.5th perc = 0.248 , 97.5 perc = 6.28

$B/B_{msy}$  in last year = 0.437 , 2.5th perc = 0.0312 , 97.5 perc = 0.79

Fishing mortality in last year = 0.234 , 2.5th perc = 0.129 , 97.5 perc = 3.28

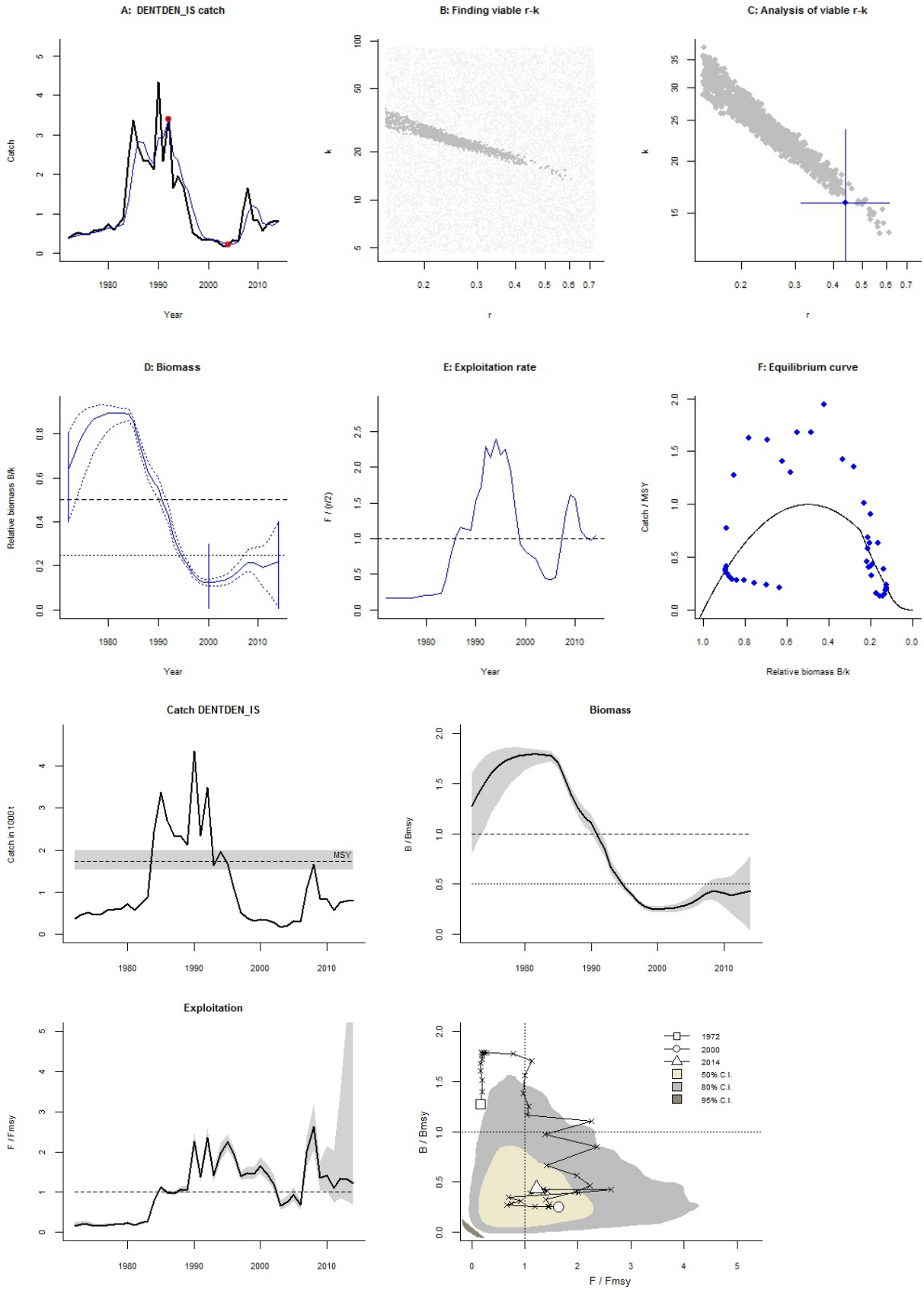
$F/F_{msy}$  = 1.22 , 2.5th perc = 0.675 , 97.5 perc = 17.1

Stock status and exploitation in 2014

Biomass = 3.48 ,  $B/B_{msy}$  = 0.437 , fishing mortality  $F$  = 0.234 ,  $F/F_{msy}$  = 1.22

Comment: Catch=landings from FishStat (Tunisia, Malta, Greece, Libya, Italy, Albania). RF start 0.4-0.8, int 2000 0.01-0.3, final 0.01-0.4. GS OK

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Species: *Dicentrarchus labrax* , stock: DICELAB\_IS

European seabass in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1970 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2006 default

Prior final relative biomass = 0.01 - 0.2 expert

Prior range for  $r$  = 0.17 - 0.88 expert, , prior range for  $k$  = 1.65 - 34.1

Results of CMSY analysis with altogether 2938 viable trajectories for 1527 r-k pairs

$r$  = 0.517 , 95% CL = 0.322 - 0.829 ,  $k$  = 4.87 , 95% CL = 3.19 - 7.43

MSY = 0.63 , 95% CL = 0.548 - 0.724

Relative biomass last year = 0.0839  $k$ , 2.5th = 0.0128 , 97.5th = 0.189

Exploitation  $F/(r/2)$  in last year = 1.01

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.258 , 95% CL = 0.161 - 0.415 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0867 , 95% CL = 0.054 - 0.139 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.63 , 95% CL = 0.548 - 0.724

$B_{msy}$  = 2.44 , 95% CL = 1.6 - 3.72

Biomass in last year = 0.409 , 2.5th perc = 0.0625 , 97.5 perc = 0.922

$B/B_{msy}$  in last year = 0.168 , 2.5th perc = 0.0257 , 97.5 perc = 0.379

Fishing mortality in last year = 0.223 , 2.5th perc = 0.0987 , 97.5 perc = 1.46

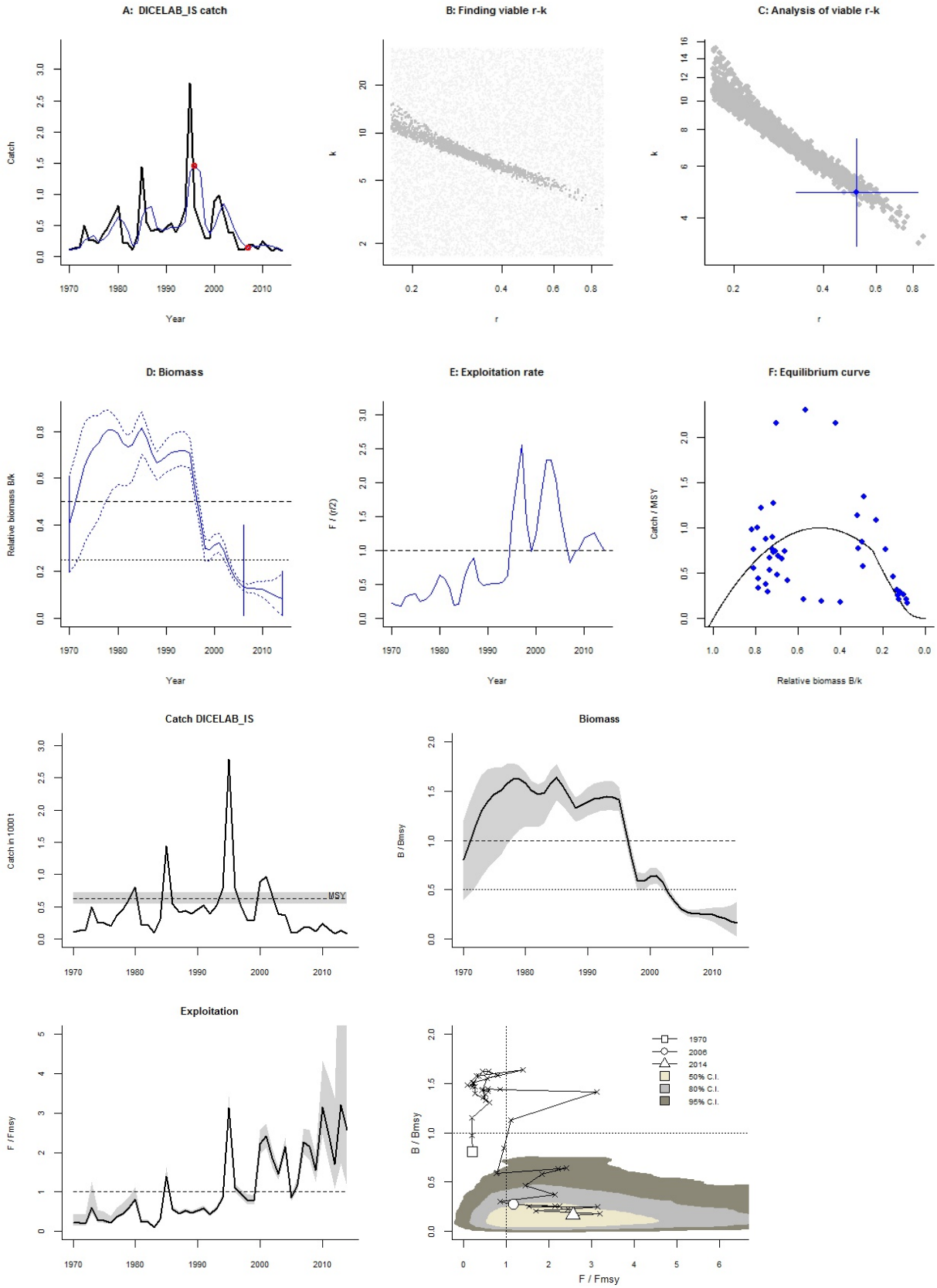
$F/F_{msy}$  = 2.57 , 2.5th perc = 1.14 , 97.5 perc = 16.8

Stock status and exploitation in 2014

Biomass = 0.409 ,  $B/B_{msy}$  = 0.168 , fishing mortality  $F$  = 0.223 ,  $F/F_{msy}$  = 2.57

Comment: Catch=landings from FishStat. RF final 0.2. GS OK

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Species: *Eledone cirrosa* , stock: ELED CIR\_IS

Horned octopus in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1970 - 2014 , abundance = None

Prior initial relative biomass = 0.4 - 0.8 expert

Prior intermediate rel. biomass= 0.4 - 0.8 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  $k$  = 3.58 - 57.2

Results of CMSY analysis with altogether 2241 viable trajectories for 1002 r-k pairs

$r$  = 0.236 , 95% CL = 0.224 - 0.248 ,  $k$  = 19.5 , 95% CL = 17.9 - 21.2

MSY = 1.15 , 95% CL = 1.08 - 1.22

Relative biomass last year = 0.217  $k$  , 2.5th = 0.201 , 97.5th = 0.277

Exploitation  $F/(r/2)$  in last year = 4.05

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.118 , 95% CL = 0.112 - 0.124 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.102 , 95% CL = 0.0971 - 0.108 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.15 , 95% CL = 1.08 - 1.22

$B_{msy}$  = 9.74 , 95% CL = 8.96 - 10.6

Biomass in last year = 4.23 , 2.5th perc = 3.92 , 97.5 perc = 5.4

$B/B_{msy}$  in last year = 0.434 , 2.5th perc = 0.402 , 97.5 perc = 0.554

Fishing mortality in last year = 0.457 , 2.5th perc = 0.358 , 97.5 perc = 0.493

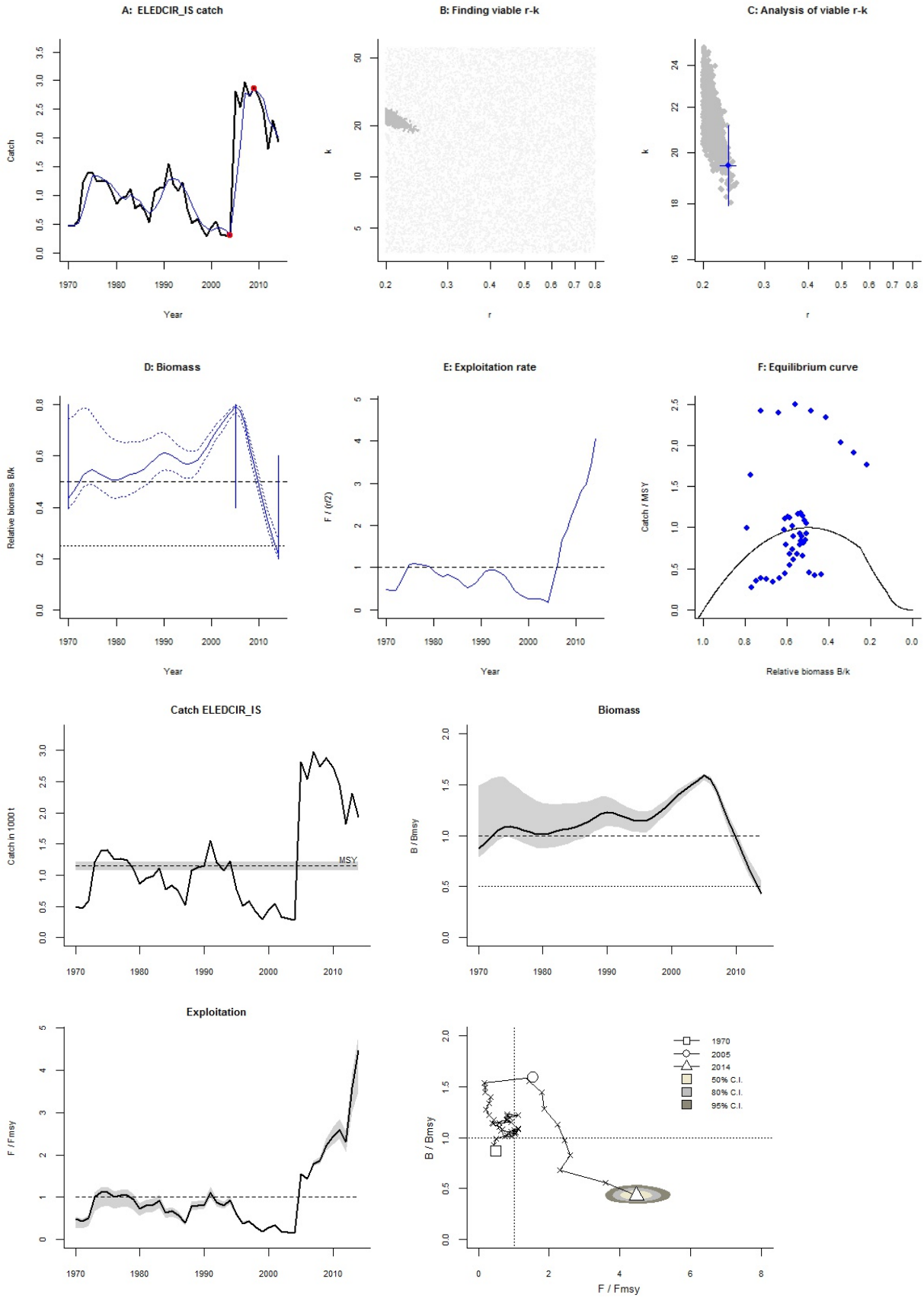
$F/F_{msy}$  = 4.47 , 2.5th perc = 3.5 , 97.5 perc = 4.82

Stock status and exploitation in 2014

Biomass = 4.23 ,  $B/B_{msy}$  = 0.434 , fishing mortality  $F$  = 0.457 ,  $F/F_{msy}$  = 4.47

Comment: Catch=landings from FishStat (Italy). RF start 0.4-0.8, int 2005 0.4-0.8, final 0.2-0.6

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Species: *Engraulis encrasicolus* , stock: ENGRENC\_IS

Anchovy in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1970 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.4 - 0.8 expert

Prior intermediate rel. biomass= 0.4 - 0.8 in year 2000 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.26 - 1.2 expert, , prior range for  $k$  = 16.5 - 294

Prior range of  $q$  = 0.000112 - 0.000471

Results of CMSY analysis with altogether 3785 viable trajectories for 676 r-k pairs

$r$  = 0.799 , 95% CL = 0.559 - 1.14 ,  $k$  = 67 , 95% CL = 43.4 - 103

MSY = 13.4 , 95% CL = 11.5 - 15.6

Relative biomass last year = 0.184  $k$ , 2.5th = 0.0202 , 97.5th = 0.296

Exploitation  $F/(r/2)$  in last year = 1.65

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.658 , 95% CL = 0.392 - 1.11 ,  $k$  = 78.4 , 95% CL = 52.5 - 117

MSY = 12.9 , 95% CL = 11.1 - 15

Relative biomass in last year = 0.258  $k$ , 2.5th perc = 0.116 , 97.5th perc = 0.361

Exploitation  $F/(r/2)$  in last year = 0.916

$q$  = 0.000201 , lcl = 0.000142 , ucl = 0.000285

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.329 , 95% CL = 0.196 - 0.553 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.329 , 95% CL = 0.196 - 0.553 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 12.9 , 95% CL = 11.1 - 15

$B_{msy}$  = 39.2 , 95% CL = 26.2 - 58.5

Biomass in last year = 20.2 , 2.5th perc = 9.08 , 97.5 perc = 28.3

$B/B_{msy}$  in last year = 0.515 , 2.5th perc = 0.232 , 97.5 perc = 0.721

Fishing mortality in last year = 0.302 , 2.5th perc = 0.215 , 97.5 perc = 0.671

$F/F_{msy}$  = 0.916 , 2.5th perc = 0.654 , 97.5 perc = 2.04

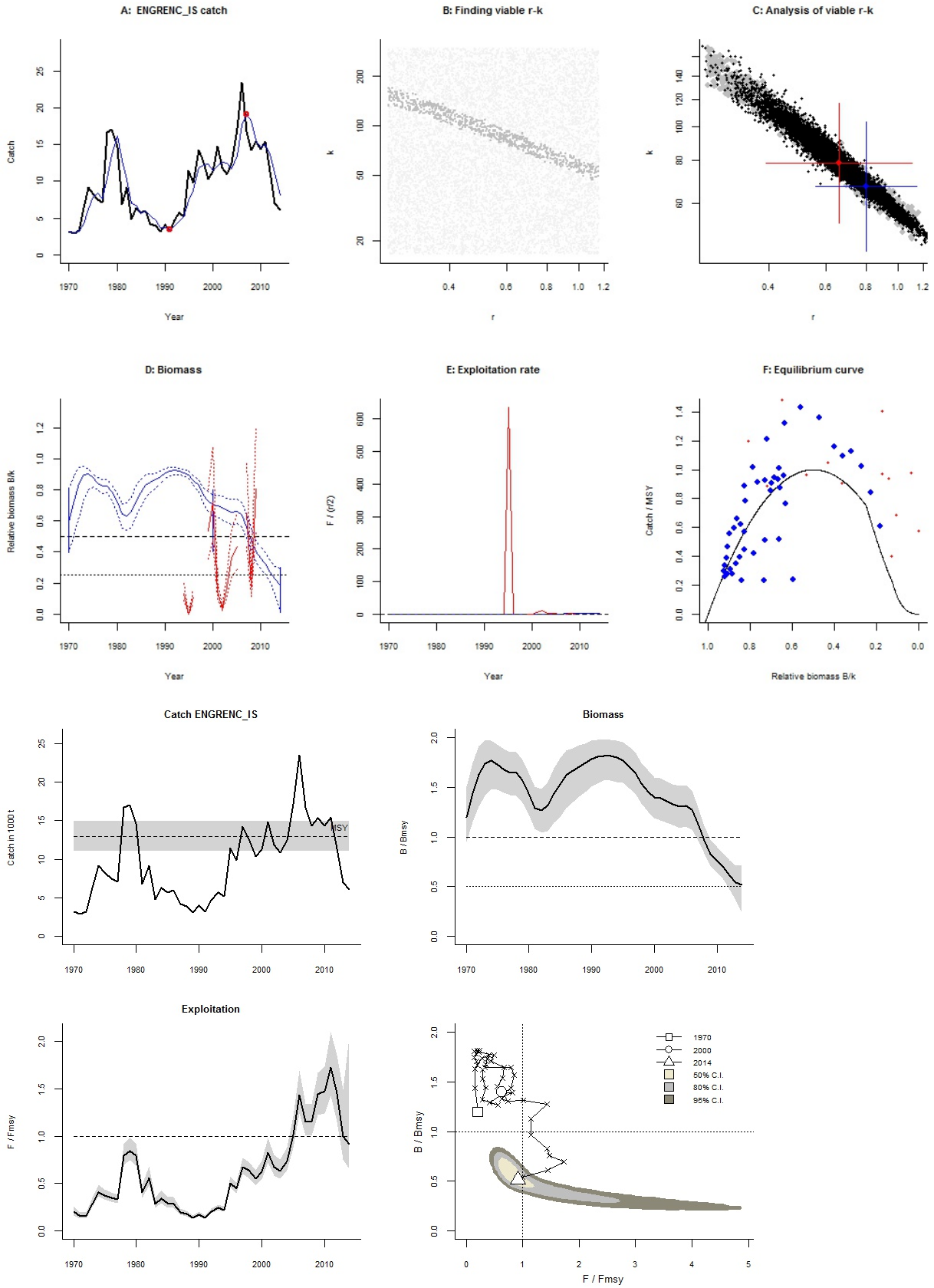
Stock status and exploitation in 2014

Biomass = 20.2 ,  $B/B_{msy}$  = 0.515 , fishing mortality  $F$  = 0.302 ,  $F/F_{msy}$  = 0.916

Comment: Catch=landings from FishStat (Greece, Italy, Albania), Biomass from Medits for GSA 20. RF

start 0.4-0.8, int 2000 0.4-0.8, final 0.01-0.3. RF OK

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Species: *Epinephelus marginatus* , stock: EPINGUA\_IS

Dusky grouper in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1985 - 2014 , abundance = None

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 - 0.1 expert

Prior range for  $r$  = 0.11 - 0.57 expert , , prior range for  $k$  = 3.55 - 73.6

Results of CMSY analysis with altogether 2007 viable trajectories for 1853 r-k pairs

$r$  = 0.364 , 95% CL = 0.239 - 0.554 ,  $k$  = 19.4 , 95% CL = 9.71 - 38.9

MSY = 1.77 , 95% CL = 0.956 - 3.28

Relative biomass last year = 0.0407  $k$  , 2.5th = 0.0111 , 97.5th = 0.0965

Exploitation  $F/(r/2)$  in last year = 0.273

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.182 , 95% CL = 0.12 - 0.277 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0296 , 95% CL = 0.0195 - 0.0451 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.77 , 95% CL = 0.956 - 3.28

$B_{msy}$  = 9.72 , 95% CL = 4.85 - 19.5

Biomass in last year = 0.791 , 2.5th perc = 0.216 , 97.5 perc = 1.88

$B/B_{msy}$  in last year = 0.0814 , 2.5th perc = 0.0222 , 97.5 perc = 0.193

Fishing mortality in last year = 0.0557 , 2.5th perc = 0.0235 , 97.5 perc = 0.204

$F/F_{msy}$  = 1.88 , 2.5th perc = 0.792 , 97.5 perc = 6.88

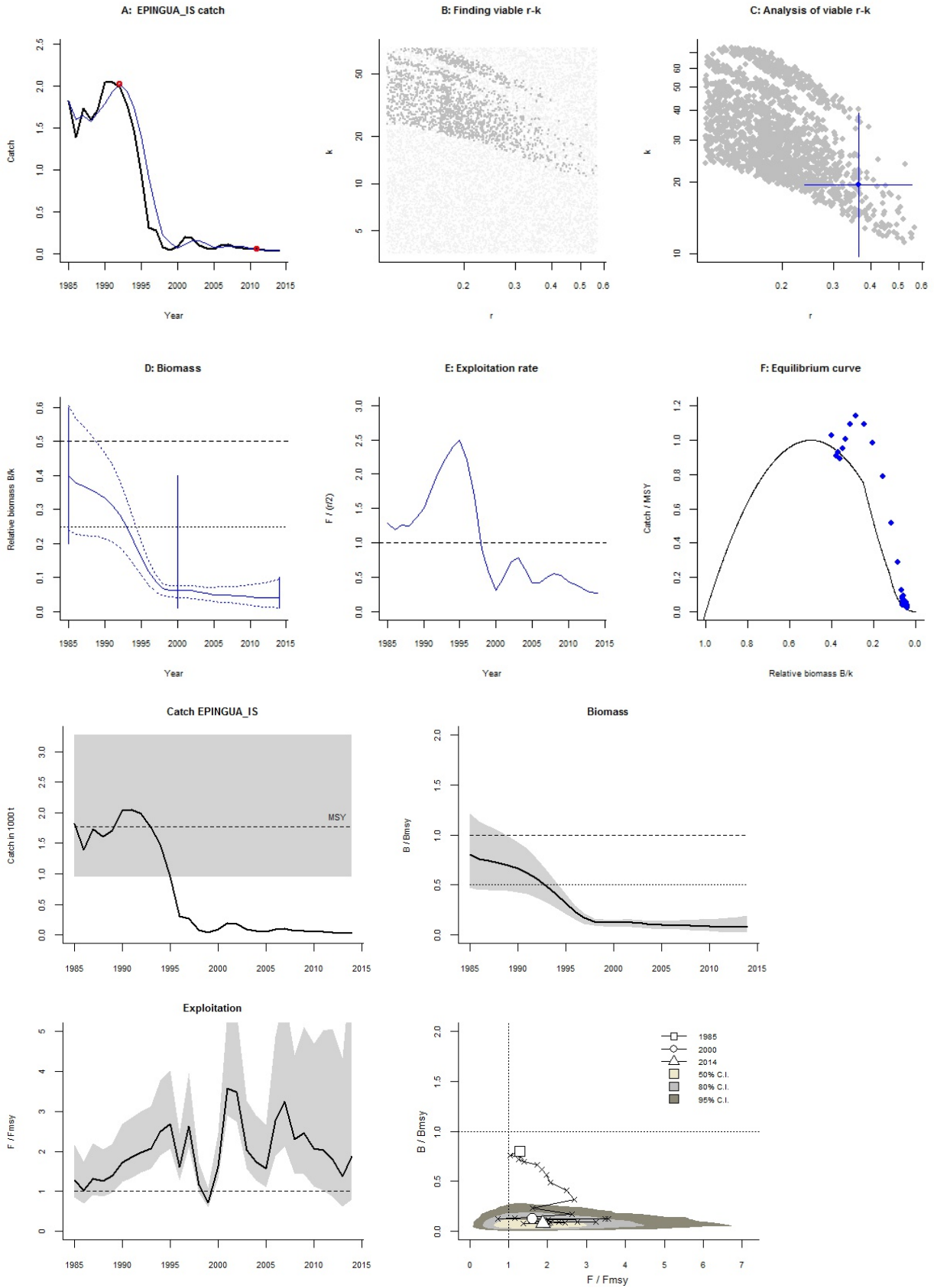
Stock status and exploitation in 2014

Biomass = 0.791 ,  $B/B_{msy}$  = 0.0814 , fishing mortality  $F$  = 0.0557 ,  $F/F_{msy}$  = 1.88

Comment: Catch=landings from FishStat (Greece, Italy). RF start 1985, int 2000 0.01-0.4, final 0.01-0.1.

GS OK

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Species: *Illex coindetii* , stock: ILLECOI\_IS

Shortfin squid in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1973 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.1 - 0.5 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  $k$  = 4.26 - 68.1

Prior range of  $q$  = 0.000826 - 0.0033

Results of CMSY analysis with altogether 2647 viable trajectories for 1801 r-k pairs

$r$  = 0.449 , 95% CL = 0.341 - 0.592 ,  $k$  = 20.2 , 95% CL = 14.9 - 27.4

MSY = 2.27 , 95% CL = 2.06 - 2.49

Relative biomass last year = 0.203  $k$ , 2.5th = 0.018 , 97.5th = 0.297

Exploitation  $F/(r/2)$  in last year = 1.11

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.433 , 95% CL = 0.301 - 0.621 ,  $k$  = 21 , 95% CL = 15.8 - 27.9

MSY = 2.27 , 95% CL = 1.97 - 2.63

Relative biomass in last year = 0.288  $k$ , 2.5th perc = 0.0751 , 97.5th perc = 0.37

Exploitation  $F/(r/2)$  in last year = 0.604

$q$  = 0.00133 , lcl = 0.000983 , ucl = 0.00181

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.216 , 95% CL = 0.151 - 0.31 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.216 , 95% CL = 0.151 - 0.31 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 2.27 , 95% CL = 1.97 - 2.63

$B_{msy}$  = 10.5 , 95% CL = 7.92 - 14

Biomass in last year = 6.06 , 2.5th perc = 1.58 , 97.5 perc = 7.79

$B/B_{msy}$  in last year = 0.576 , 2.5th perc = 0.15 , 97.5 perc = 0.741

Fishing mortality in last year = 0.131 , 2.5th perc = 0.102 , 97.5 perc = 0.501

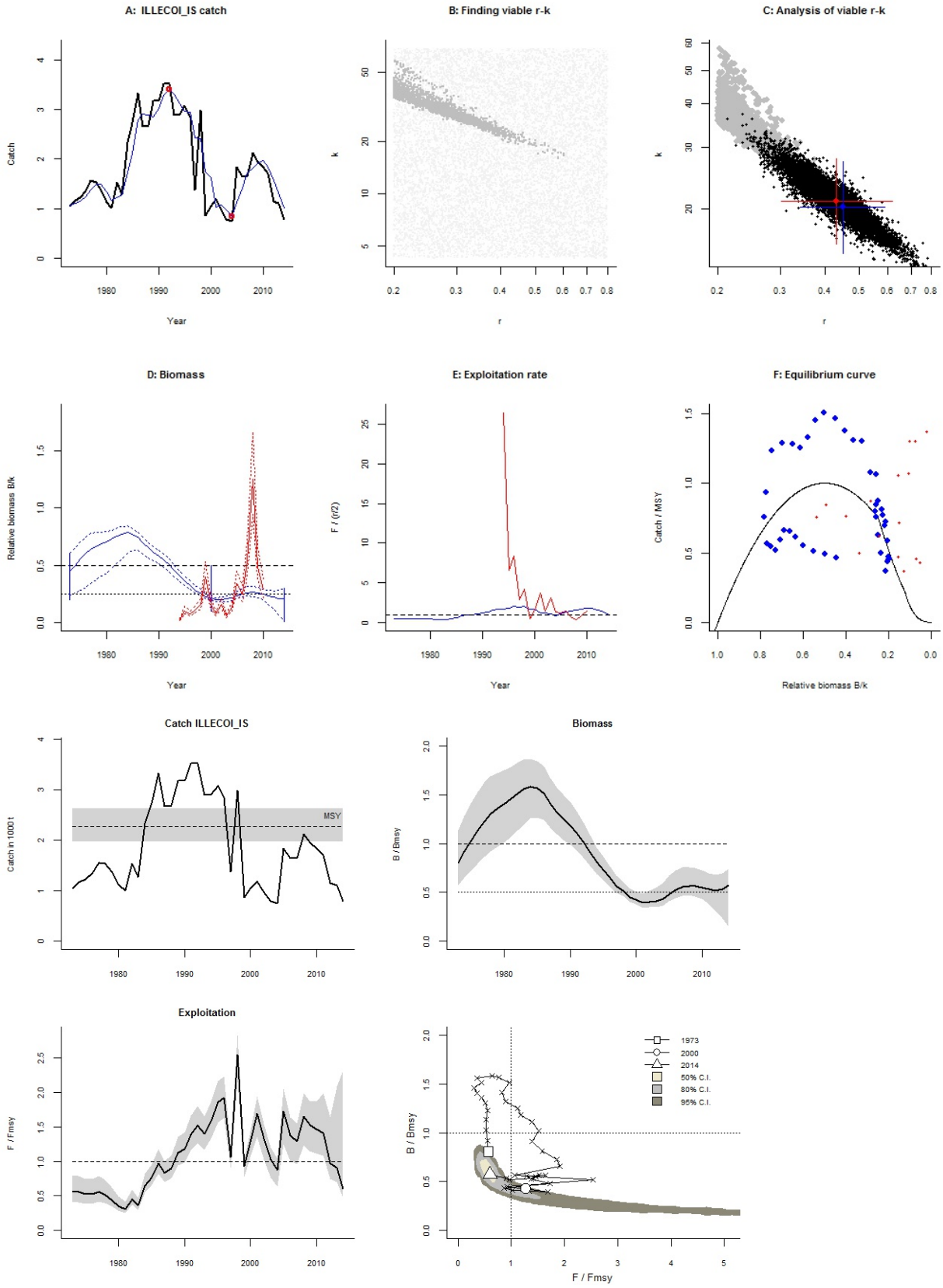
$F/F_{msy}$  = 0.604 , 2.5th perc = 0.47 , 97.5 perc = 2.32

Stock status and exploitation in 2014

Biomass = 6.06 ,  $B/B_{msy}$  = 0.576 , fishing mortality  $F$  = 0.131 ,  $F/F_{msy}$  = 0.604

Comment: Catch=landings from FishStat (Italy), Biomass from Medits for GSAs 19+20. RF int 2000 0.1-0.5, final 0.01-0.3. GS OK

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Species: *Merluccius merluccius* , stock: MERLMER\_IS  
Hake in Ionian Sea  
Source: STECF 16-08, M from Colloca et al 2013  
Region: Mediterranean , Ionian Sea  
Catch data used from years 1980 - 2014 , abundance = CPUE  
Prior initial relative biomass = 0.5 - 0.9 expert  
Prior intermediate rel. biomass= 0.5 - 0.9 in year 1993 expert  
Prior final relative biomass = 0.01 - 0.1 expert  
Prior range for r = 0.22 - 0.95 expert , , prior range for k = 30.2 - 522  
Prior range of q = 0.000392 - 0.00163

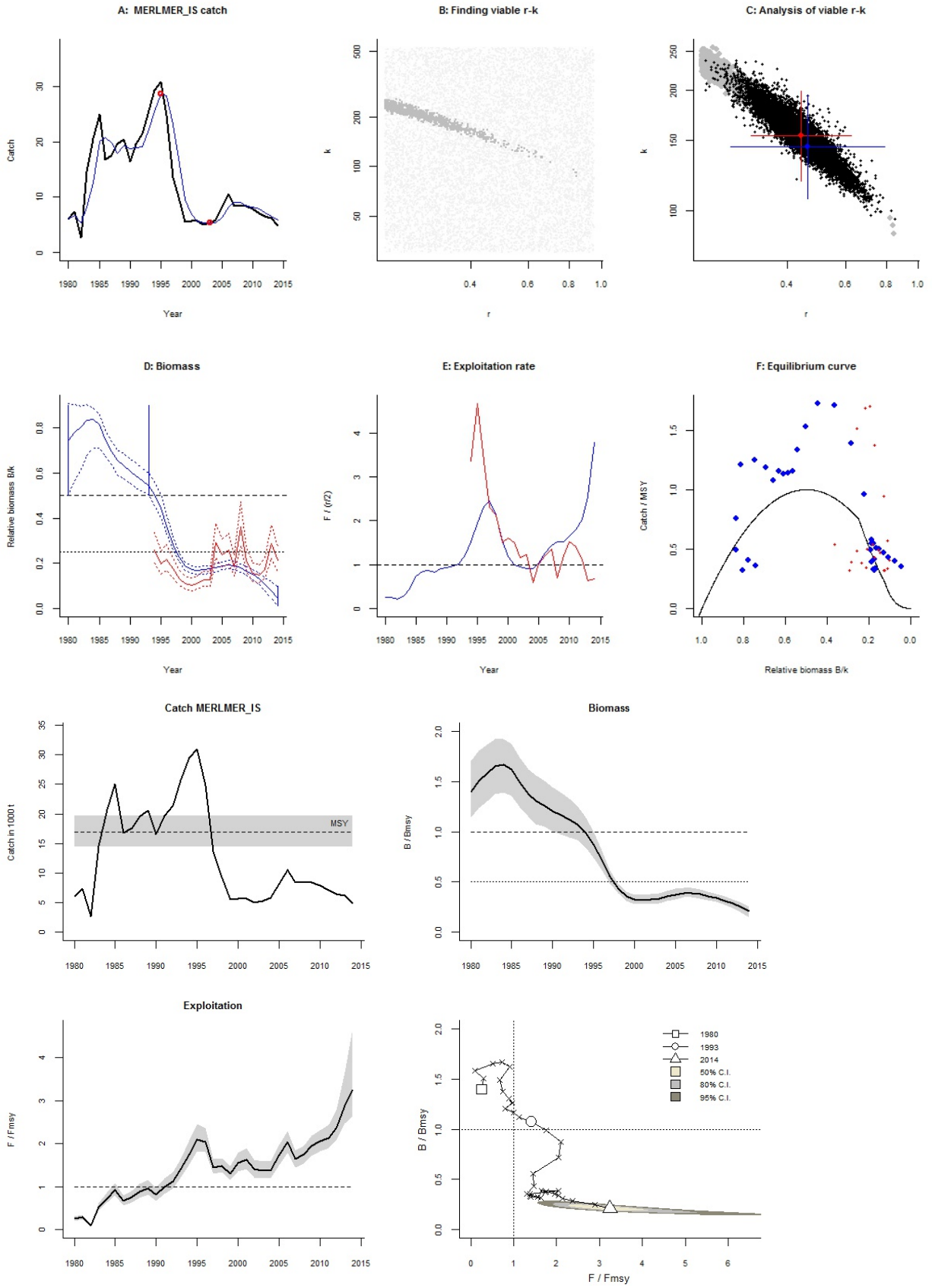
Results of CMSY analysis with altogether 950 viable trajectories for 834 r-k pairs  
r = 0.462 , 95% CL = 0.269 - 0.792 , k = 144 , 95% CL = 107 - 194  
MSY = 16.7 , 95% CL = 14.8 - 18.8  
Relative biomass last year = 0.0463 k, 2.5th = 0.012 , 97.5th = 0.0958  
Exploitation F/(r/2) in last year = 3.78

Results from Bayesian Schaefer model using catch & CPUE  
r = 0.44 , 95% CL = 0.31 - 0.627 , k = 153 , 95% CL = 118 - 199  
MSY = 16.9 , 95% CL = 14.5 - 19.7  
Relative biomass in last year = 0.106 k, 2.5th perc = 0.0732 , 97.5th perc = 0.13  
Exploitation F/(r/2) in last year = 1.37  
q = 0.000648 , lcl = 0.000497 , ucl = 0.000845

Results for Management (based on BSM analysis)  
Fmsy = 0.22 , 95% CL = 0.155 - 0.313 (if B > 1/2 Bmsy then Fmsy = 0.5 r)  
Fmsy = 0.093 , 95% CL = 0.0653 - 0.132 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)  
MSY = 16.9 , 95% CL = 14.5 - 19.7  
Bmsy = 76.7 , 95% CL = 59.2 - 99.3  
Biomass in last year = 16.2 , 2.5th perc = 11.2 , 97.5 perc = 20  
B/Bmsy in last year = 0.211 , 2.5th perc = 0.146 , 97.5 perc = 0.26  
Fishing mortality in last year = 0.302 , 2.5th perc = 0.245 , 97.5 perc = 0.435  
F/Fmsy = 3.24 , 2.5th perc = 2.63 , 97.5 perc = 4.68

Stock status and exploitation in 2014  
Biomass = 16.2 , B/Bmsy = 0.211 , fishing mortality F = 0.302 , F/Fmsy = 3.24  
Comment: Catch=landings from FishStat (Greece, Italy, Albania), Biomass from Medits for GSAs 19  
(SGMED 2015 Part 2, Table 5.2.2.6.1.3.1). GS OK

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Species: *Micromesistius poutassou* , stock: MICRPOU\_IS

Blue whiting in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1975 - 2014 , abundance = None

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 - 0.2 expert

Prior range for  $r$  = 0.21 - 1.1 expert, , prior range for  $k$  = 1.34 - 27.9

Results of CMSY analysis with altogether 1245 viable trajectories for 1036 r-k pairs

$r$  = 0.392 , 95% CL = 0.32 - 0.479 ,  $k$  = 7.65 , 95% CL = 5.9 - 9.91

MSY = 0.749 , 95% CL = 0.669 - 0.838

Relative biomass last year = 0.115  $k$ , 2.5th = 0.015 , 97.5th = 0.193

Exploitation  $F/(r/2)$  in last year = 1.03

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.196 , 95% CL = 0.16 - 0.24 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0903 , 95% CL = 0.0738 - 0.11 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.749 , 95% CL = 0.669 - 0.838

$B_{msy}$  = 3.82 , 95% CL = 2.95 - 4.96

Biomass in last year = 0.882 , 2.5th perc = 0.115 , 97.5 perc = 1.47

$B/B_{msy}$  in last year = 0.231 , 2.5th perc = 0.03 , 97.5 perc = 0.385

Fishing mortality in last year = 0.0579 , 2.5th perc = 0.0346 , 97.5 perc = 0.445

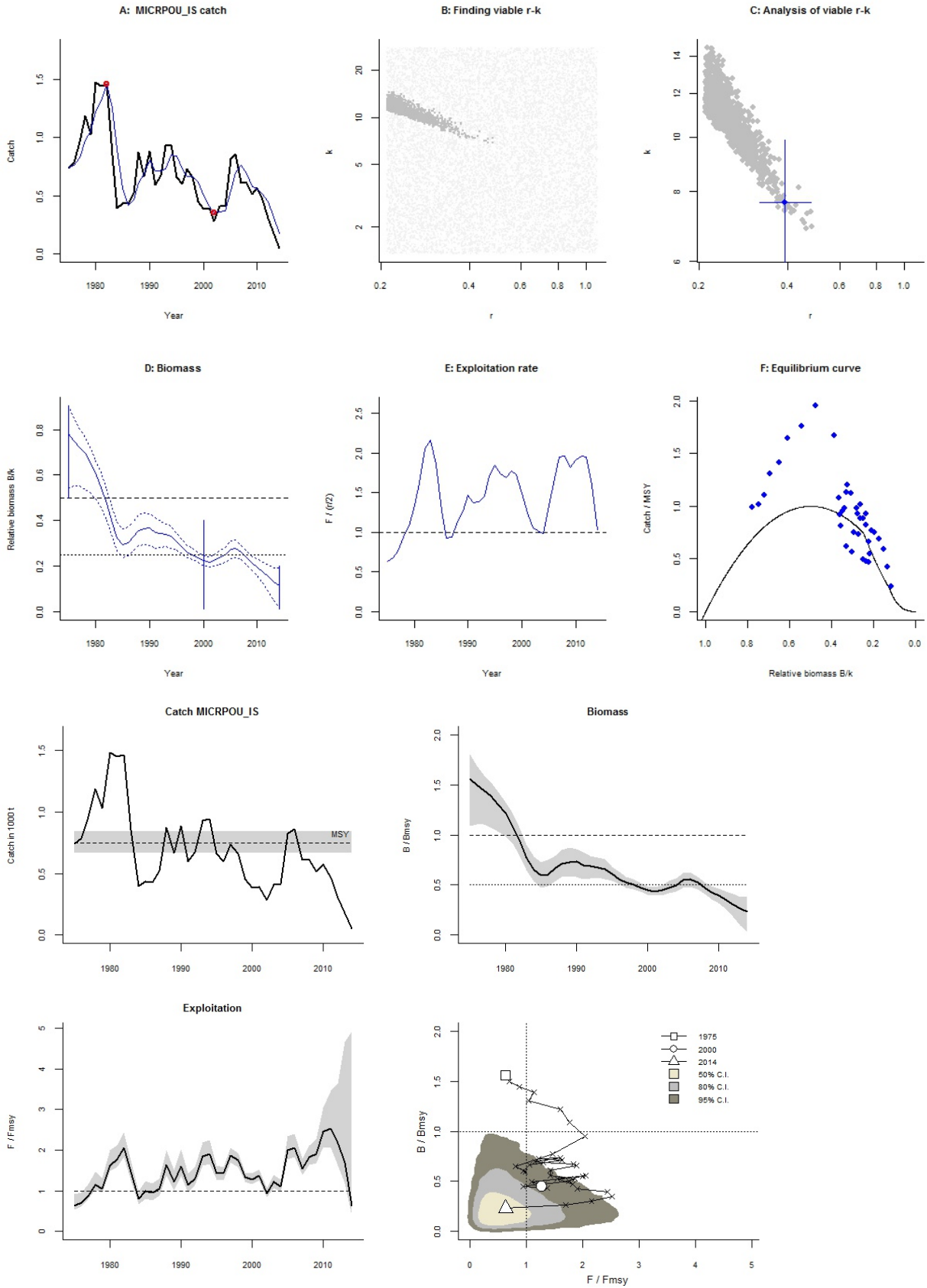
$F/F_{msy}$  = 0.641 , 2.5th perc = 0.383 , 97.5 perc = 4.93

Stock status and exploitation in 2014

Biomass = 0.882 ,  $B/B_{msy}$  = 0.231 , fishing mortality  $F$  = 0.0579 ,  $F/F_{msy}$  = 0.641

Comment: Catch=landings from FishStat (Greece, Italy). RF int 2000 0.01-0.4, final 0.2. GS OK

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Species: *Mullus barbatus* , stock: MULLBAR\_IS

Red mullet in Ionian Sea

Source: STECF 16-08

Region: Mediterranean , Ionian Sea

Catch data used from years 1974 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.2 - 0.6 in year 1992 expert

Prior final relative biomass = 0.01 - 0.1 expert

Prior range for  $r$  = 0.22 - 1.2 expert, , prior range for  $k$  = 5.06 - 115

Prior range of  $q$  = 0.00134 - 0.00641

Results of CMSY analysis with altogether 710 viable trajectories for 609 r-k pairs

$r$  = 0.497 , 95% CL = 0.289 - 0.854 ,  $k$  = 36.6 , 95% CL = 27 - 49.5

MSY = 4.54 , 95% CL = 4.18 - 4.93

Relative biomass last year = 0.0479  $k$ , 2.5th = 0.0136 , 97.5th = 0.0967

Exploitation  $F/(r/2)$  in last year = 2.82

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.529 , 95% CL = 0.34 - 0.824 ,  $k$  = 35.1 , 95% CL = 23.9 - 51.6

MSY = 4.64 , 95% CL = 4.19 - 5.14

Relative biomass in last year = 0.0964  $k$ , 2.5th perc = 0.0515 , 97.5th perc = 0.124

Exploitation  $F/(r/2)$  in last year = 1.34

$q$  = 0.00234 , lcl = 0.00168 , ucl = 0.00327

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.265 , 95% CL = 0.17 - 0.412 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.102 , 95% CL = 0.0655 - 0.159 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 4.64 , 95% CL = 4.19 - 5.14

$B_{msy}$  = 17.5 , 95% CL = 11.9 - 25.8

Biomass in last year = 3.38 , 2.5th perc = 1.81 , 97.5 perc = 4.34

$B/B_{msy}$  in last year = 0.193 , 2.5th perc = 0.103 , 97.5 perc = 0.247

Fishing mortality in last year = 0.355 , 2.5th perc = 0.277 , 97.5 perc = 0.664

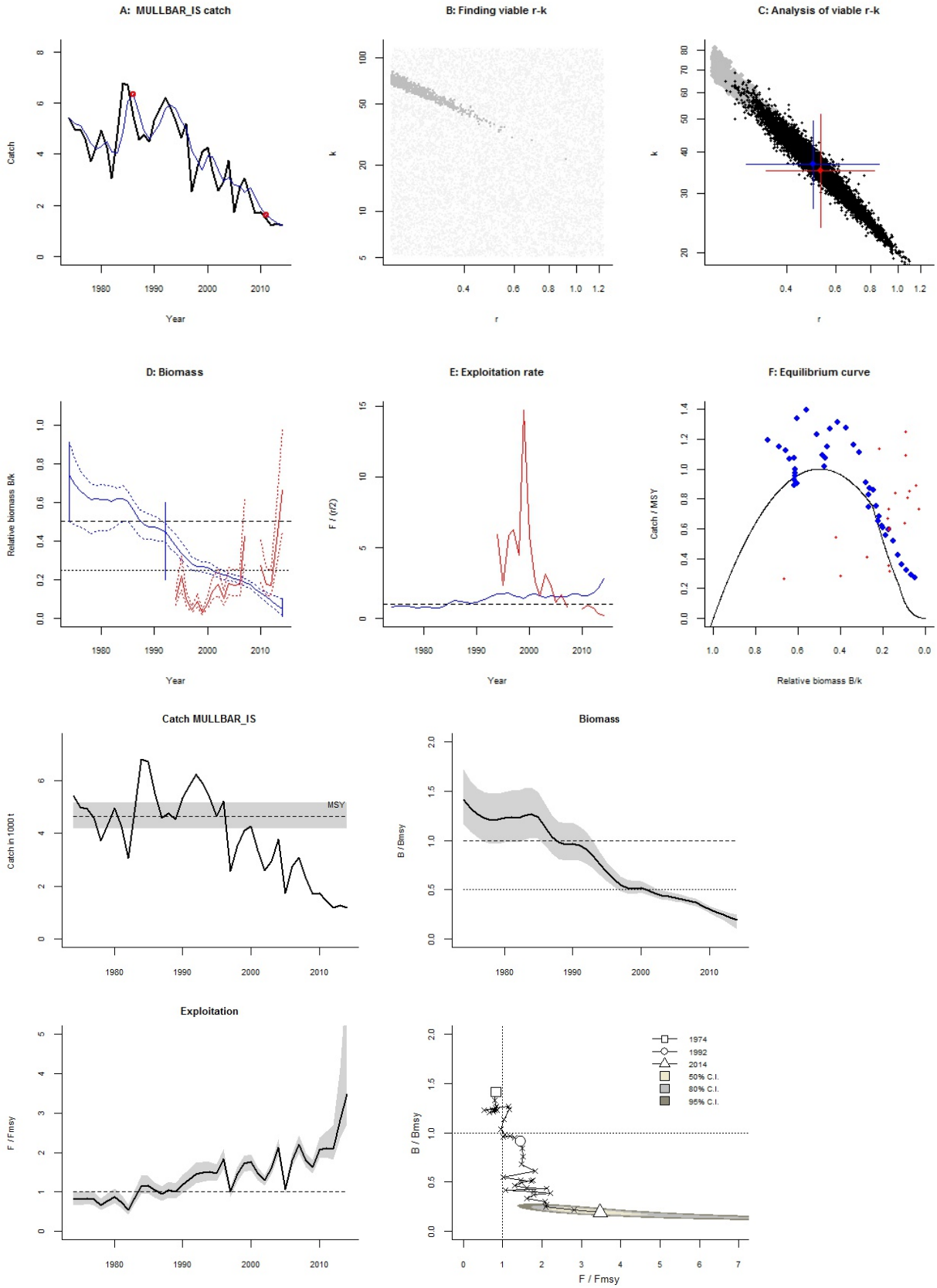
$F/F_{msy}$  = 3.48 , 2.5th perc = 2.71 , 97.5 perc = 6.51

Stock status and exploitation in 2014

Biomass = 3.38 ,  $B/B_{msy}$  = 0.193 , fishing mortality  $F$  = 0.355 ,  $F/F_{msy}$  = 3.48

Comment: Catch=landings from FishStat, Biomass from Medits for GSAs 19+20. GS OK

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Species: *Mullus surmuletus* , stock: MULLSUR\_IS

Surmulet in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1982 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.46 - 1.6 expert, , prior range for  $k$  = 0.255 - 3.51

Prior range of  $q$  = 0.00349 - 0.013

Results of CMSY analysis with altogether 166 viable trajectories for 163 r-k pairs

$r$  = 0.715 , 95% CL = 0.599 - 0.854 ,  $k$  = 1.51 , 95% CL = 1.23 - 1.86

MSY = 0.271 , 95% CL = 0.237 - 0.309

Relative biomass last year = 0.15  $k$ , 2.5th = 0.0258 , 97.5th = 0.28

Exploitation  $F/(r/2)$  in last year = 0.933

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.874 , 95% CL = 0.655 - 1.17 ,  $k$  = 1.26 , 95% CL = 0.987 - 1.62

MSY = 0.276 , 95% CL = 0.254 - 0.3

Relative biomass in last year = 0.137  $k$ , 2.5th perc = 0.0277 , 97.5th perc = 0.342

Exploitation  $F/(r/2)$  in last year = 0.941

$q$  = 0.00525 , lcl = 0.00398 , ucl = 0.00691

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.437 , 95% CL = 0.328 - 0.583 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.239 , 95% CL = 0.179 - 0.319 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.276 , 95% CL = 0.254 - 0.3

$B_{msy}$  = 0.632 , 95% CL = 0.494 - 0.808

Biomass in last year = 0.173 , 2.5th perc = 0.035 , 97.5 perc = 0.432

$B/B_{msy}$  in last year = 0.273 , 2.5th perc = 0.0555 , 97.5 perc = 0.683

Fishing mortality in last year = 0.411 , 2.5th perc = 0.164 , 97.5 perc = 2.03

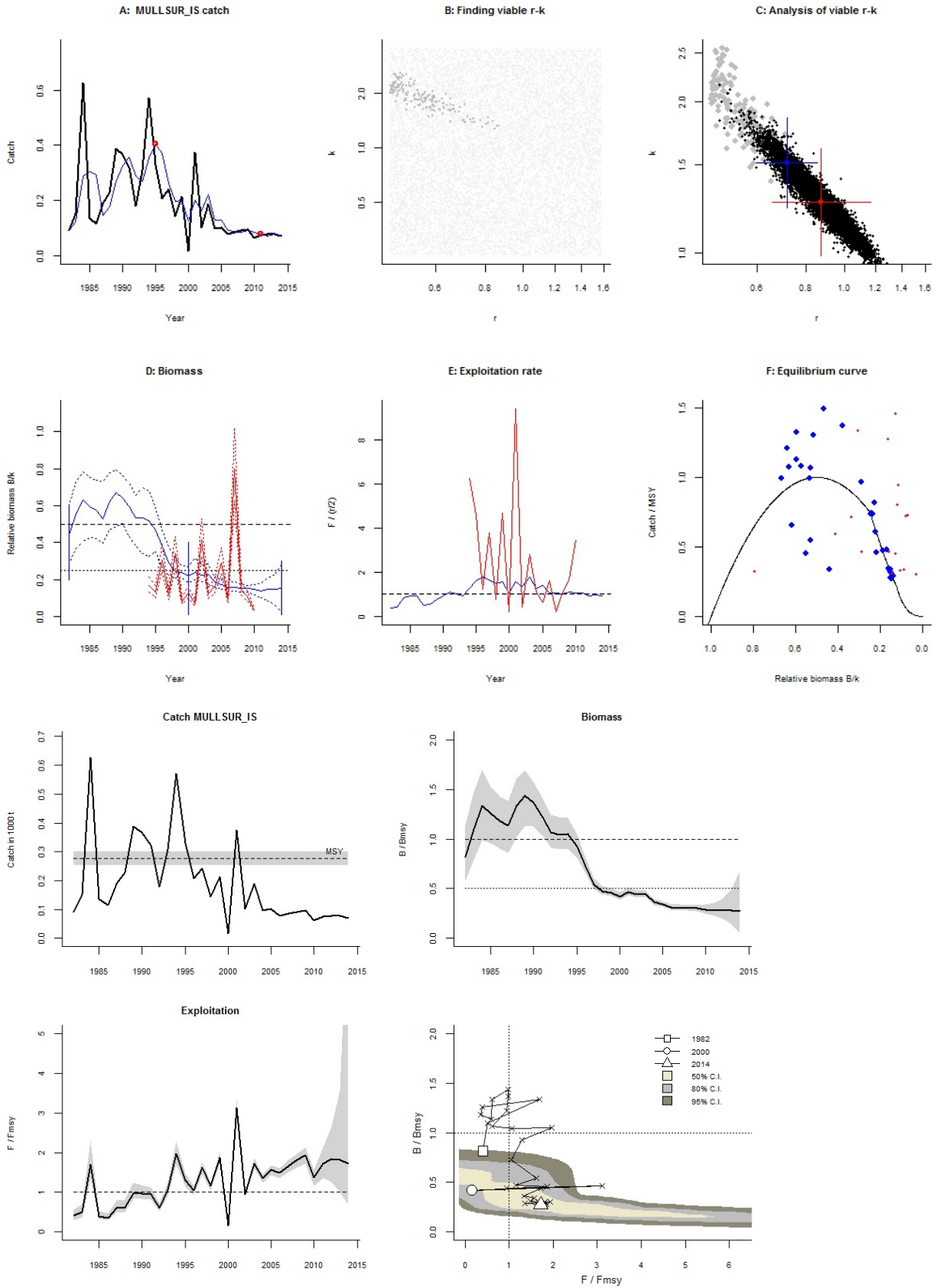
$F/F_{msy}$  = 1.72 , 2.5th perc = 0.689 , 97.5 perc = 8.48

Stock status and exploitation in 2014

Biomass = 0.173 ,  $B/B_{msy}$  = 0.273 , fishing mortality  $F$  = 0.411 ,  $F/F_{msy}$  = 1.72

Comment: Greek landings from FishStat, Italian biomass. RF final 0.3. GS OK

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Species: *Nephrops norvegicus* , stock: NEPRNOR\_IS

Norway lobster in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1980 - 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 = 0.01 - 0.3 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 4.19 - 67

Prior range of  $q$  = 0.000142 - 0.000568

Results of CMSY analysis with altogether 2939 viable trajectories for 1774 r-k pairs

$r$  = 0.49 , 95% CL = 0.343 - 0.702 ,  $k$  = 17.2 , 95% CL = 12.3 - 24

MSY = 2.1 , 95% CL = 1.89 - 2.34

Relative biomass last year = 0.19  $k$ , 2.5th = 0.0184 , 97.5th = 0.298

Exploitation  $F/(r/2)$  in last year = 1.24

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.431 , 95% CL = 0.313 - 0.593 ,  $k$  = 19.3 , 95% CL = 14.6 - 25.5

MSY = 2.08 , 95% CL = 1.83 - 2.37

Relative biomass in last year = 0.149  $k$ , 2.5th perc = 0.0534 , 97.5th perc = 0.33

Exploitation  $F/(r/2)$  in last year = 1.26

$q$  = 0.000229 , lcl = 0.000175 , ucl = 0.000301

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.215 , 95% CL = 0.157 - 0.297 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.128 , 95% CL = 0.0933 - 0.177 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 2.08 , 95% CL = 1.83 - 2.37

$B_{msy}$  = 9.65 , 95% CL = 7.3 - 12.7

Biomass in last year = 2.88 , 2.5th perc = 1.03 , 97.5 perc = 6.36

$B/B_{msy}$  in last year = 0.298 , 2.5th perc = 0.107 , 97.5 perc = 0.659

Fishing mortality in last year = 0.271 , 2.5th perc = 0.123 , 97.5 perc = 0.756

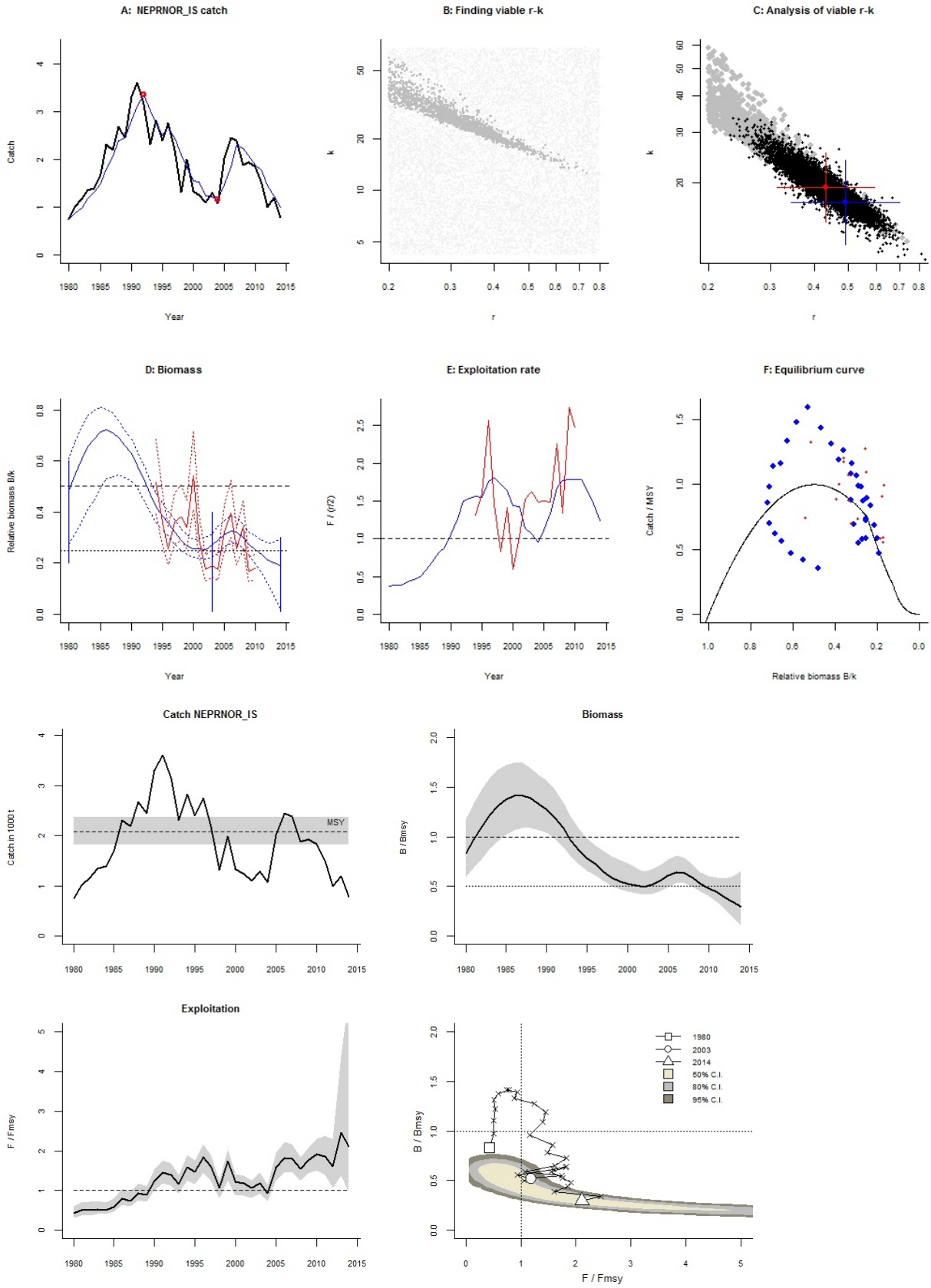
$F/F_{msy}$  = 2.11 , 2.5th perc = 0.954 , 97.5 perc = 5.89

Stock status and exploitation in 2014

Biomass = 2.88 ,  $B/B_{msy}$  = 0.298 , fishing mortality  $F$  = 0.271 ,  $F/F_{msy}$  = 2.11

Comment: Catch=landings from FishStat (Italy), Biomass from Medits for GSAs 19+20. RF start 1980, int 2003, final 0.3. GS OK

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Species: *Octopus vulgaris* , stock: OCTOVUL\_IS

Common octopus in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1975 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.1 - 0.5 in year 2000 expert

Prior final relative biomass = 0.01 - 0.2 expert

Prior range for  $r$  = 0.4 - 1 expert, , prior range for  $k$  = 6.38 - 63.8

Prior range of  $q$  = 0.000377 - 0.00119

Results of CMSY analysis with altogether 332 viable trajectories for 318 r-k pairs

$r$  = 0.654 , 95% CL = 0.519 - 0.824 ,  $k$  = 32.7 , 95% CL = 26.2 - 40.9

MSY = 5.35 , 95% CL = 4.79 - 5.97

Relative biomass last year = 0.0909  $k$ , 2.5th = 0.0111 , 97.5th = 0.183

Exploitation  $F/(r/2)$  in last year = 1.19

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.713 , 95% CL = 0.545 - 0.932 ,  $k$  = 29.3 , 95% CL = 23.2 - 37.1

MSY = 5.23 , 95% CL = 4.83 - 5.66

Relative biomass in last year = 0.139  $k$ , 2.5th perc = 0.0468 , 97.5th perc = 0.231

Exploitation  $F/(r/2)$  in last year = 0.673

$q$  = 0.000619 ,  $lcl$  = 0.000487 ,  $ucl$  = 0.000786

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.356 , 95% CL = 0.273 - 0.466 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.199 , 95% CL = 0.152 - 0.259 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 5.23 , 95% CL = 4.83 - 5.66

$B_{msy}$  = 14.7 , 95% CL = 11.6 - 18.5

Biomass in last year = 4.09 , 2.5th perc = 1.37 , 97.5 perc = 6.79

$B/B_{msy}$  in last year = 0.279 , 2.5th perc = 0.0935 , 97.5 perc = 0.463

Fishing mortality in last year = 0.24 , 2.5th perc = 0.144 , 97.5 perc = 0.714

$F/F_{msy}$  = 1.21 , 2.5th perc = 0.727 , 97.5 perc = 3.6

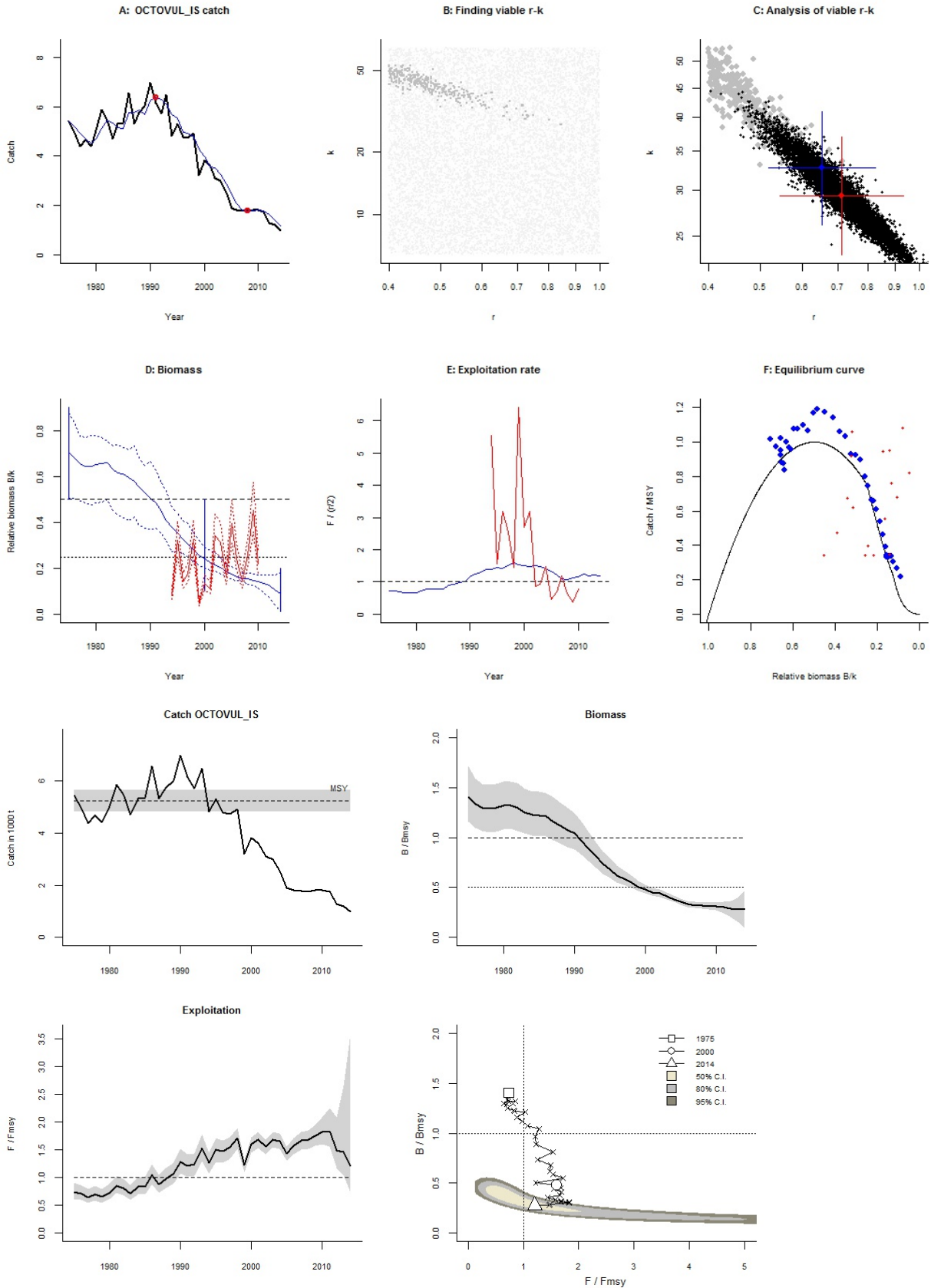
Stock status and exploitation in 2014

Biomass = 4.09 ,  $B/B_{msy}$  = 0.279 , fishing mortality  $F$  = 0.24 ,  $F/F_{msy}$  = 1.21

Comment: Catch=landings from FishStat (Italy, Greece, Albania), Biomass from Medits for GSAs 19+20.

RF int 0.1-0.5, final 0.2. GS OK

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Species: *Pagrus pagrus* , stock: PAGRPAG\_IS

Red porgy in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1970 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.2 - 0.6 in year 2005 default

Prior final relative biomass = 0.2 - 0.6 , default

Prior range for  $r$  = 0.27 - 0.86 expert , , prior range for  $k$  = 0.403 - 5.14

Results of CMSY analysis with altogether 3423 viable trajectories for 720 r-k pairs

$r$  = 0.642 , 95% CL = 0.489 - 0.844 ,  $k$  = 1.61 , 95% CL = 1.15 - 2.25

MSY = 0.258 , 95% CL = 0.228 - 0.292

Relative biomass last year = 0.294  $k$ , 2.5th = 0.206 , 97.5th = 0.503

Exploitation  $F/(r/2)$  in last year = 1.5

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.321 , 95% CL = 0.244 - 0.422 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.321 , 95% CL = 0.244 - 0.422 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.258 , 95% CL = 0.228 - 0.292

$B_{msy}$  = 0.803 , 95% CL = 0.574 - 1.12

Biomass in last year = 0.472 , 2.5th perc = 0.33 , 97.5 perc = 0.808

$B/B_{msy}$  in last year = 0.588 , 2.5th perc = 0.411 , 97.5 perc = 1.01

Fishing mortality in last year = 0.586 , 2.5th perc = 0.343 , 97.5 perc = 0.839

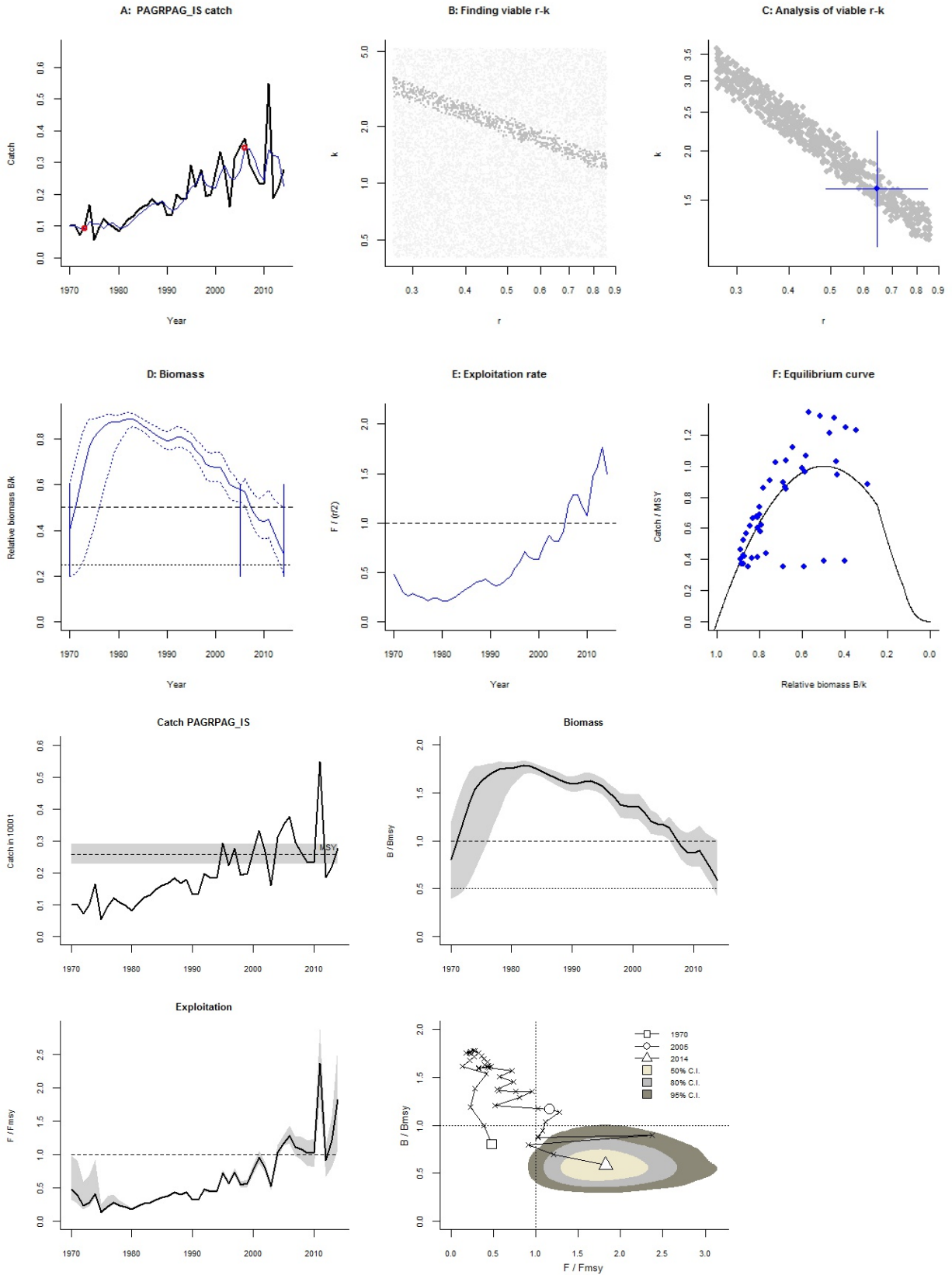
$F/F_{msy}$  = 1.83 , 2.5th perc = 1.07 , 97.5 perc = 2.61

Stock status and exploitation in 2014

Biomass = 0.472 ,  $B/B_{msy}$  = 0.588 , fishing mortality  $F$  = 0.586 ,  $F/F_{msy}$  = 1.83

Comment: Catch=landings from FishStat (Tunisia, Malta, Greece). GS OK

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Species: *Palinurus elephas* , stock: PALIELE\_IS

Common spiny lobster in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1975 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1998 default

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.05 - 0.5 default , prior range for  $k$  = 0.803 - 32.1

Results of CMSY analysis with altogether 3040 viable trajectories for 2567 r-k pairs

$r$  = 0.212 , 95% CL = 0.135 - 0.333 ,  $k$  = 6.27 , 95% CL = 2.7 - 14.6

MSY = 0.333 , 95% CL = 0.154 - 0.717

Relative biomass last year = 0.121  $k$  , 2.5th = 0.0148 , 97.5th = 0.293

Exploitation  $F/(r/2)$  in last year = 1.11

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.106 , 95% CL = 0.0676 - 0.167 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0515 , 95% CL = 0.0328 - 0.0808 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.333 , 95% CL = 0.154 - 0.717

$B_{msy}$  = 3.14 , 95% CL = 1.35 - 7.29

Biomass in last year = 0.761 , 2.5th perc = 0.093 , 97.5 perc = 1.84

$B/B_{msy}$  in last year = 0.243 , 2.5th perc = 0.0297 , 97.5 perc = 0.586

Fishing mortality in last year = 0.104 , 2.5th perc = 0.043 , 97.5 perc = 0.849

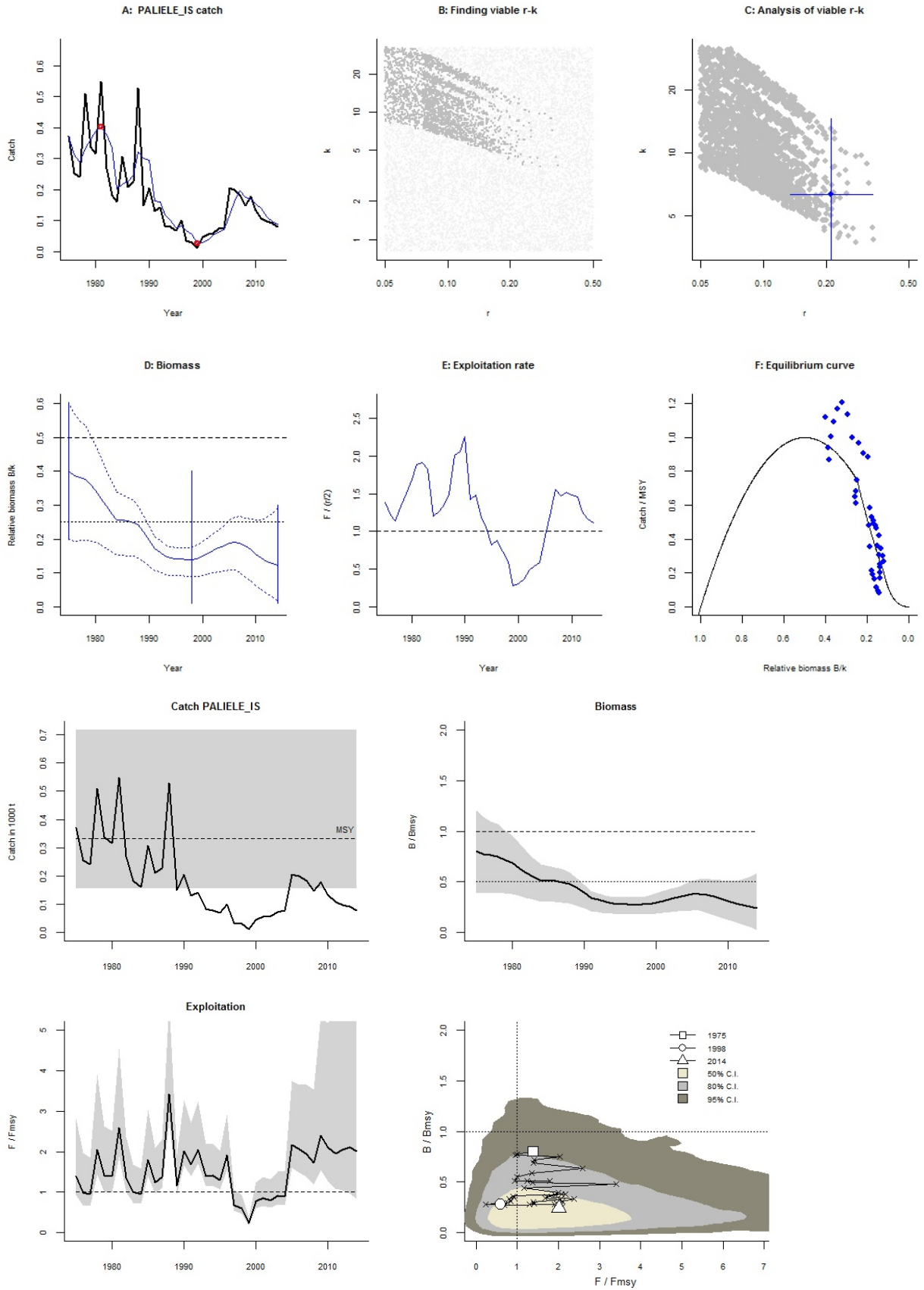
$F/F_{msy}$  = 2.02 , 2.5th perc = 0.835 , 97.5 perc = 16.5

Stock status and exploitation in 2014

Biomass = 0.761 ,  $B/B_{msy}$  = 0.243 , fishing mortality  $F$  = 0.104 ,  $F/F_{msy}$  = 2.02

Comment: Catch=landings from FishStat (Italy). RF final 0.3. GS OK

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Species: *Parapenaeus longirostris* , stock: PARELON\_IS  
Pink shrimp in Ionian Sea  
Source: STECF 16-08  
Region: Mediterranean , Ionian Sea  
Catch data used from years 1970 - 2014 , abundance = CPUE  
Prior initial relative biomass = 0.2 - 0.6 expert  
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert  
Prior final relative biomass = 0.01 - 0.4 expert  
Prior range for r = 0.6 - 1.5 default , prior range for k = 11.1 - 111  
Prior range of q = 0.000455 - 0.00144

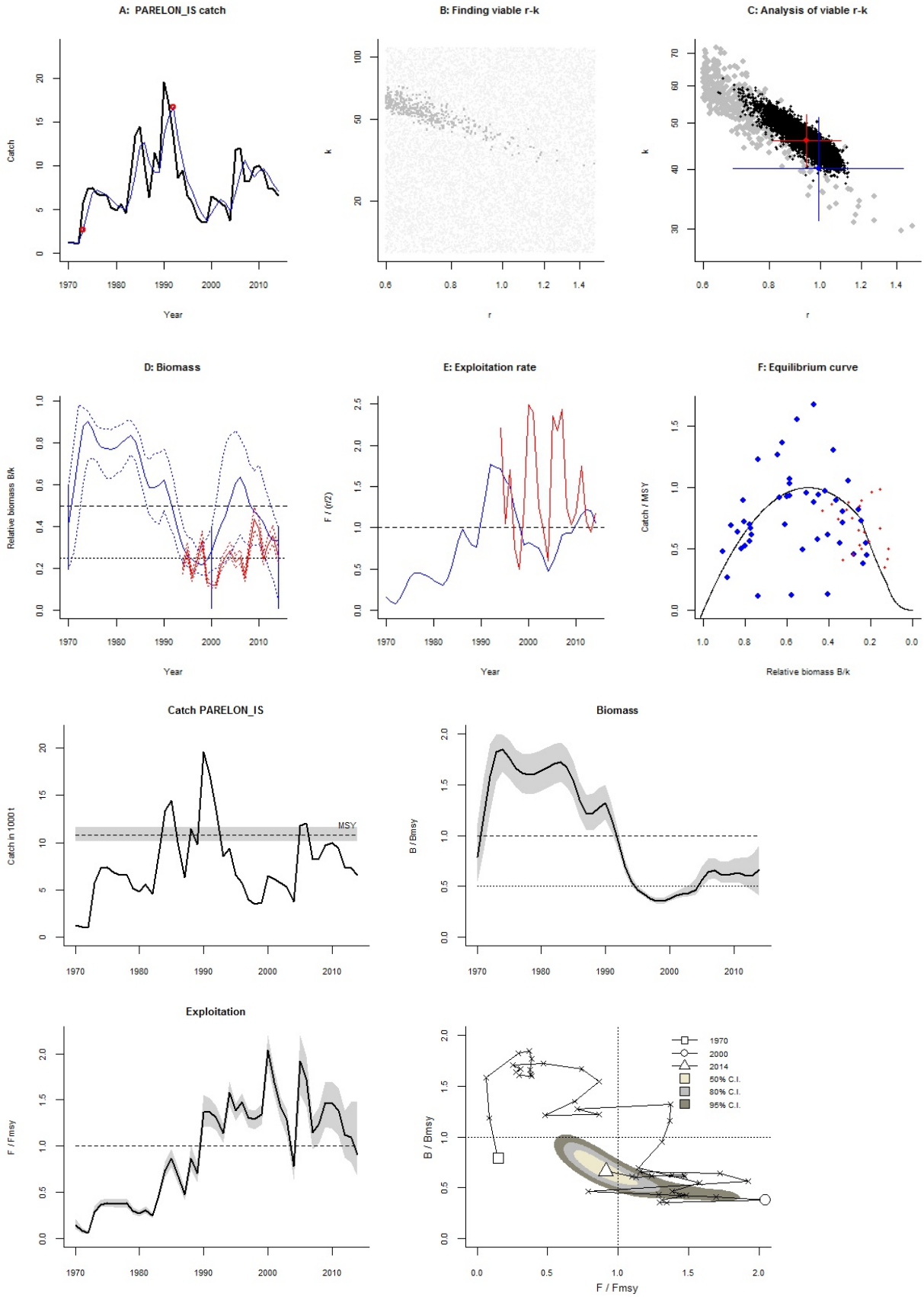
Results of CMSY analysis with altogether 471 viable trajectories for 439 r-k pairs  
r = 0.993 , 95% CL = 0.684 - 1.44 , k = 40.1 , 95% CL = 31.3 - 51.4  
MSY = 9.95 , 95% CL = 8.6 - 11.5  
Relative biomass last year = 0.334 k, 2.5th = 0.0515 , 97.5th = 0.398  
Exploitation F/(r/2) in last year = 1.06

Results from Bayesian Schaefer model using catch & CPUE  
r = 0.944 , 95% CL = 0.813 - 1.1 , k = 45.9 , 95% CL = 40.5 - 52  
MSY = 10.8 , 95% CL = 10.1 - 11.6  
Relative biomass in last year = 0.331 k, 2.5th perc = 0.205 , 97.5th perc = 0.45  
Exploitation F/(r/2) in last year = 0.914  
q = 0.00061 , lcl = 0.000509 , ucl = 0.000731

Results for Management (based on BSM analysis)  
Fmsy = 0.472 , 95% CL = 0.406 - 0.548 (if B > 1/2 Bmsy then Fmsy = 0.5 r)  
Fmsy = 0.472 , 95% CL = 0.406 - 0.548 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)  
MSY = 10.8 , 95% CL = 10.1 - 11.6  
Bmsy = 22.9 , 95% CL = 20.2 - 26  
Biomass in last year = 15.2 , 2.5th perc = 9.4 , 97.5 perc = 20.7  
B/Bmsy in last year = 0.662 , 2.5th perc = 0.41 , 97.5 perc = 0.9  
Fishing mortality in last year = 0.431 , 2.5th perc = 0.317 , 97.5 perc = 0.697  
F/Fmsy = 0.914 , 2.5th perc = 0.672 , 97.5 perc = 1.48

Stock status and exploitation in 2014  
Biomass = 15.2 , B/Bmsy = 0.662 , fishing mortality F = 0.431 , F/Fmsy = 0.914  
Comment: Catch=landings from FishStat (Italy+Greece), Biomass from Medits for GSA 19 SGMED 2015  
Table 5.2.11.6.1.3.1.1. GS OK

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Species: *Penaeus kerathurus* , stock: PENAKER\_IS

Caramote prawn in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1994 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert

Prior final relative biomass = 0.2 - 0.6 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 0.692 - 11.1

Results of CMSY analysis with altogether 3220 viable trajectories for 2974 r-k pairs

$r$  = 0.387 , 95% CL = 0.284 - 0.527 ,  $k$  = 2.09 , 95% CL = 1.55 - 2.81

MSY = 0.202 , 95% CL = 0.17 - 0.24

Relative biomass last year = 0.313  $k$ , 2.5th = 0.207 , 97.5th = 0.507

Exploitation  $F/(r/2)$  in last year = 4.37

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.193 , 95% CL = 0.142 - 0.264 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.193 , 95% CL = 0.142 - 0.264 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.202 , 95% CL = 0.17 - 0.24

$B_{msy}$  = 1.04 , 95% CL = 0.776 - 1.41

Biomass in last year = 0.655 , 2.5th perc = 0.433 , 97.5 perc = 1.06

$B/B_{msy}$  in last year = 0.626 , 2.5th perc = 0.415 , 97.5 perc = 1.01

Fishing mortality in last year = 1.17 , 2.5th perc = 0.723 , 97.5 perc = 1.77

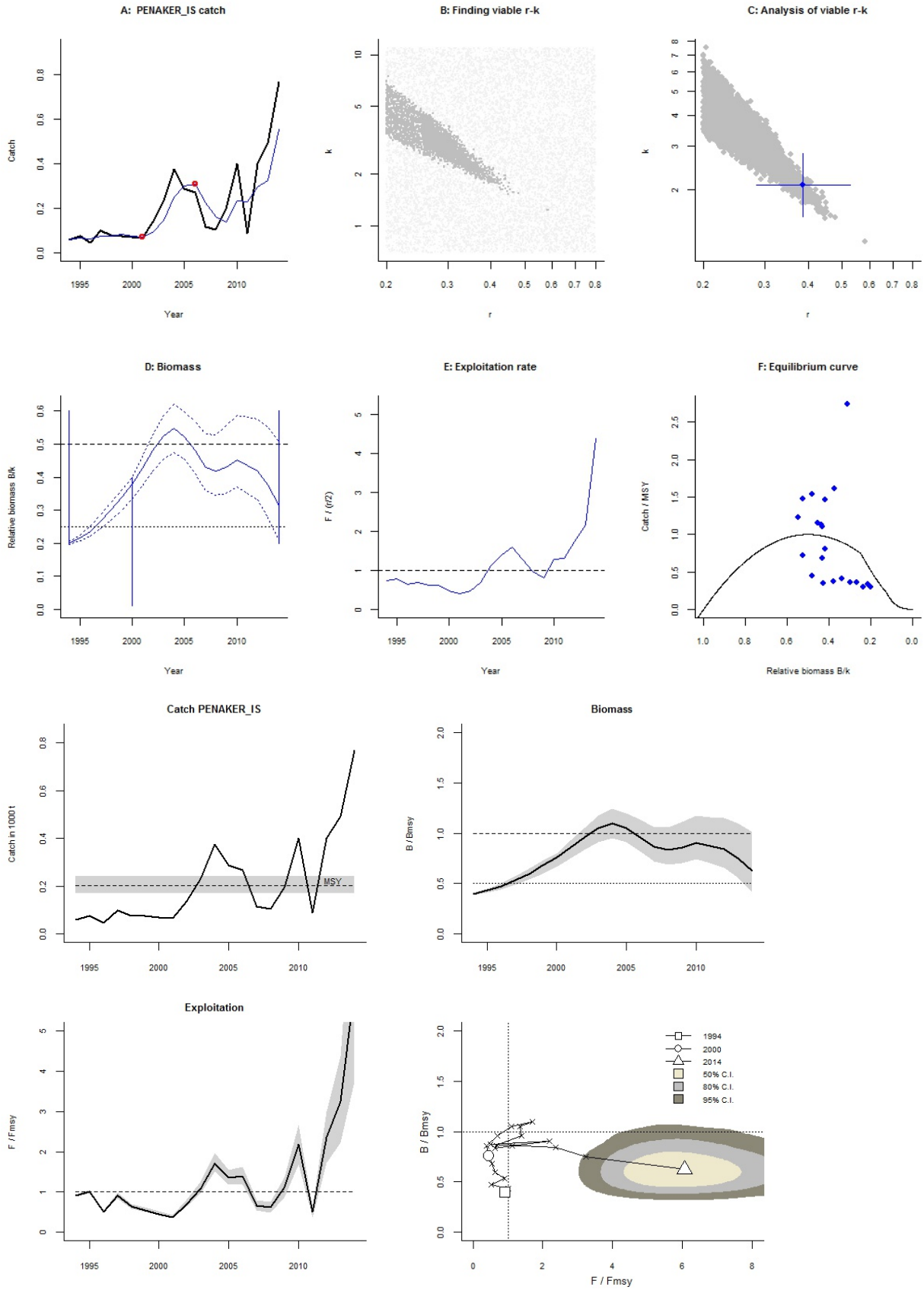
$F/F_{msy}$  = 6.06 , 2.5th perc = 3.74 , 97.5 perc = 9.15

Stock status and exploitation in 2014

Biomass = 0.655 ,  $B/B_{msy}$  = 0.626 , fishing mortality  $F$  = 1.17 ,  $F/F_{msy}$  = 6.06

Comment: Catch=landings from FishStat (Italy+Greece+Albania). GS final 0.2-0.6; scientific name changed. RF OK

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Species: *Scophthalmus maximus* , stock: PSETMAX\_IS

Turbot in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1970 - 2013 , abundance = None

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 default

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.25 - 0.82 expert , , prior range for  $k$  = 1.38 - 18.1

Results of CMSY analysis with altogether 580 viable trajectories for 521 r-k pairs

$r$  = 0.385 , 95% CL = 0.314 - 0.472 ,  $k$  = 4.25 , 95% CL = 3.37 - 5.36

MSY = 0.409 , 95% CL = 0.341 - 0.491

Relative biomass last year = 0.138  $k$ , 2.5th = 0.0201 , 97.5th = 0.294

Exploitation  $F/(r/2)$  in last year = 1.8

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.192 , 95% CL = 0.157 - 0.236 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.106 , 95% CL = 0.0869 - 0.13 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.409 , 95% CL = 0.341 - 0.491

$B_{msy}$  = 2.13 , 95% CL = 1.69 - 2.68

Biomass in last year = 0.588 , 2.5th perc = 0.0854 , 97.5 perc = 1.25

$B/B_{msy}$  in last year = 0.277 , 2.5th perc = 0.0402 , 97.5 perc = 0.589

Fishing mortality in last year = 0.274 , 2.5th perc = 0.129 , 97.5 perc = 1.88

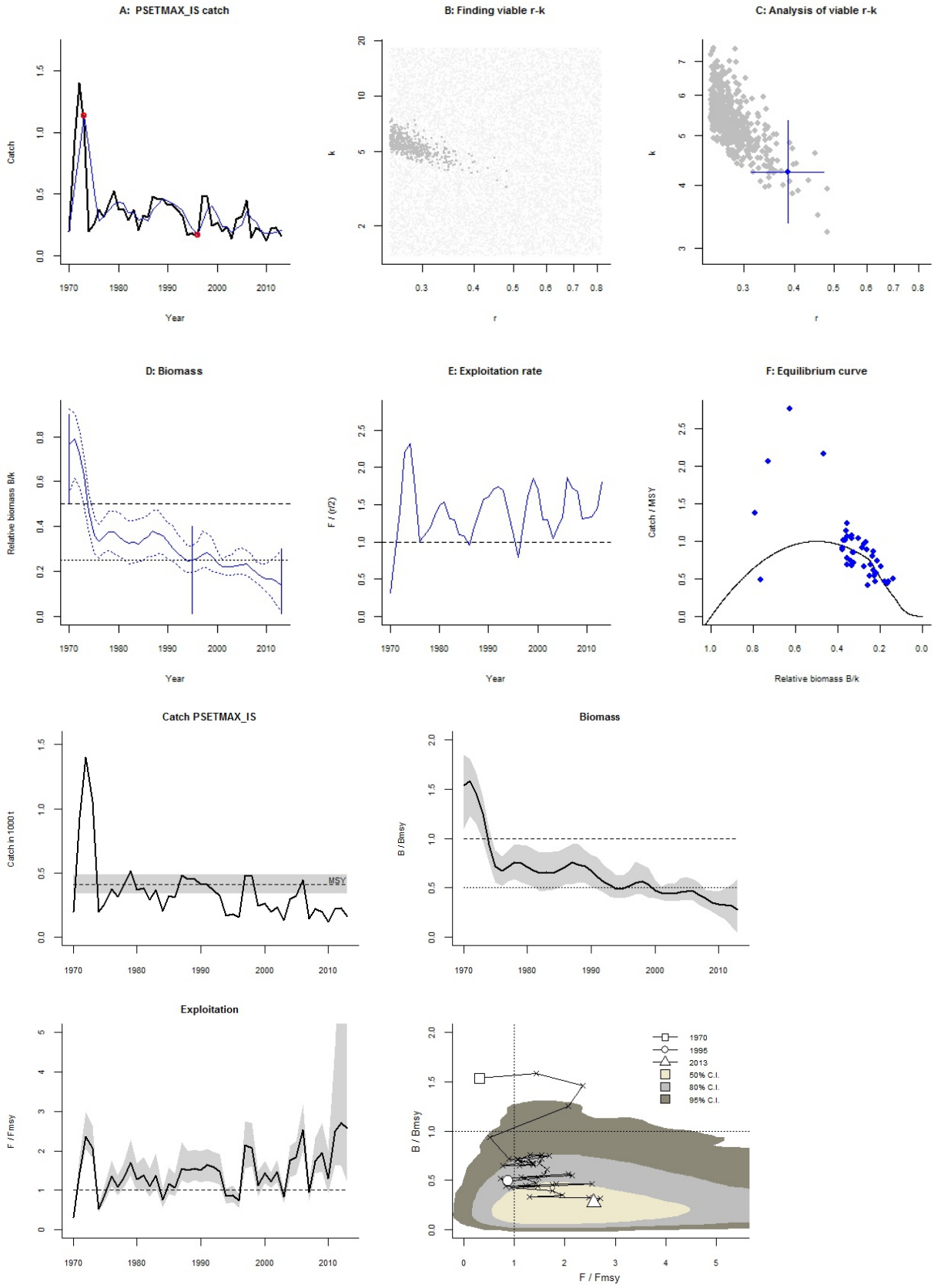
$F/F_{msy}$  = 2.57 , 2.5th perc = 1.21 , 97.5 perc = 17.7

Stock status and exploitation in 2014

Biomass = ,  $B/B_{msy}$  = , fishing mortality  $F$  = ,  $F/F_{msy}$  =

Comment: Catch=landings from FishStat. RF final 0.3. GS OK

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Species: *Sardina pilchardus* , stock: SARDPIL\_IS

Sardine in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1970 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.27 - 1.1 expert, , prior range for  $k$  = 14.5 - 237

Prior range of  $q$  = 0.000105 - 0.000426

Results of CMSY analysis with altogether 726 viable trajectories for 634 r-k pairs

$r$  = 0.538 , 95% CL = 0.391 - 0.74 ,  $k$  = 87.9 , 95% CL = 67.9 - 114

MSY = 11.8 , 95% CL = 10.9 - 12.8

Relative biomass last year = 0.0931  $k$ , 2.5th = 0.0148 , 97.5th = 0.283

Exploitation  $F/(r/2)$  in last year = 1.97

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.571 , 95% CL = 0.387 - 0.843 ,  $k$  = 84.1 , 95% CL = 60.4 - 117

MSY = 12 , 95% CL = 10.8 - 13.4

Relative biomass in last year = 0.182  $k$ , 2.5th perc = 0.0583 , 97.5th perc = 0.346

Exploitation  $F/(r/2)$  in last year = 1.18

$q$  = 0.000173 , lcl = 0.000128 , ucl = 0.000235

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.286 , 95% CL = 0.194 - 0.422 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.208 , 95% CL = 0.141 - 0.307 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 12 , 95% CL = 10.8 - 13.4

$B_{msy}$  = 42 , 95% CL = 30.2 - 58.5

Biomass in last year = 15.3 , 2.5th perc = 4.9 , 97.5 perc = 29.1

$B/B_{msy}$  in last year = 0.365 , 2.5th perc = 0.117 , 97.5 perc = 0.691

Fishing mortality in last year = 0.337 , 2.5th perc = 0.178 , 97.5 perc = 1.05

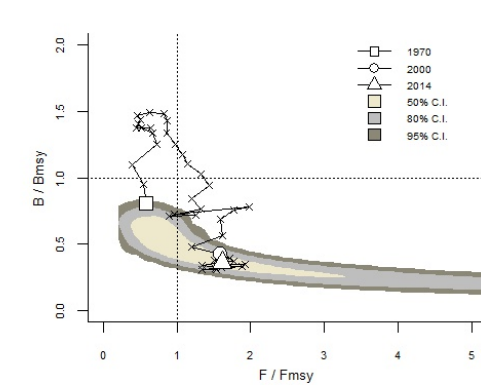
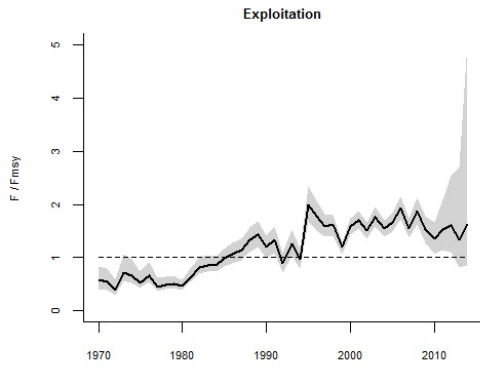
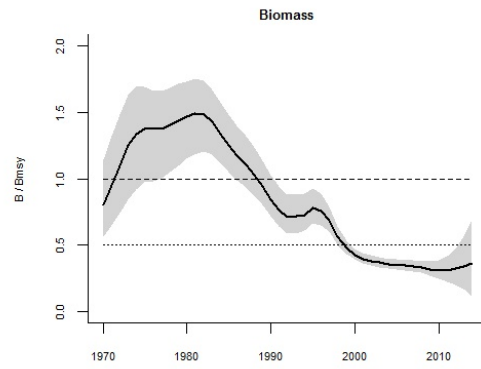
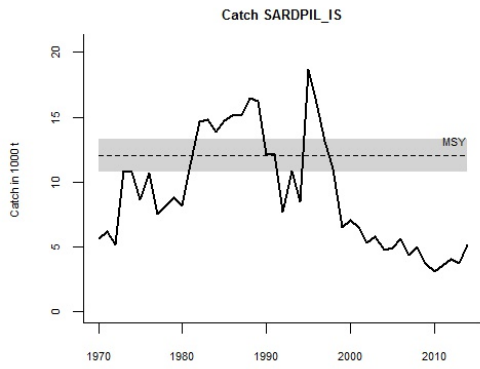
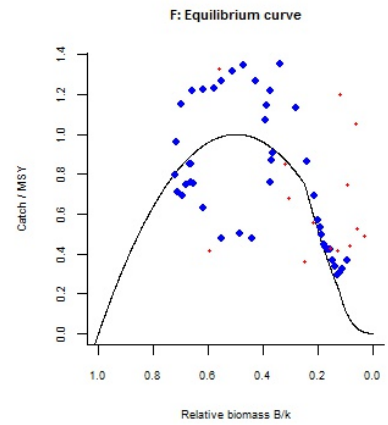
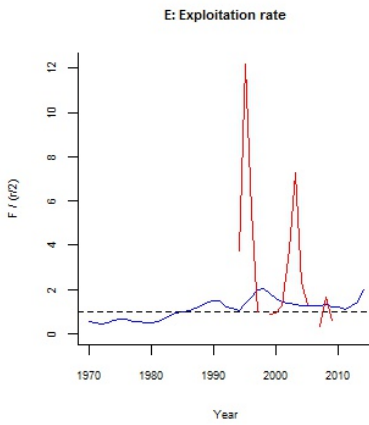
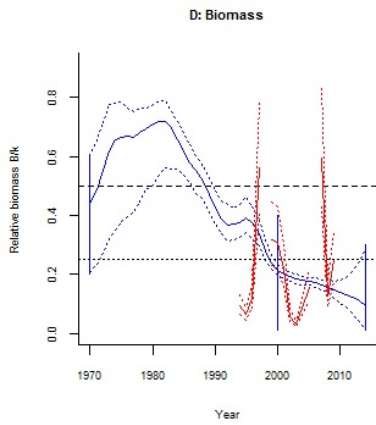
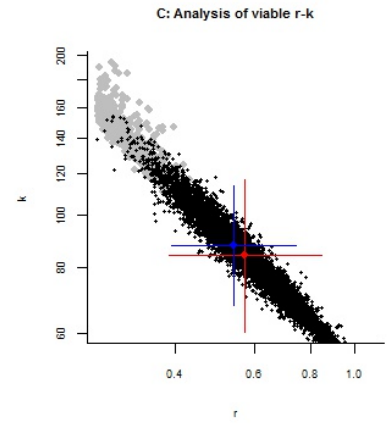
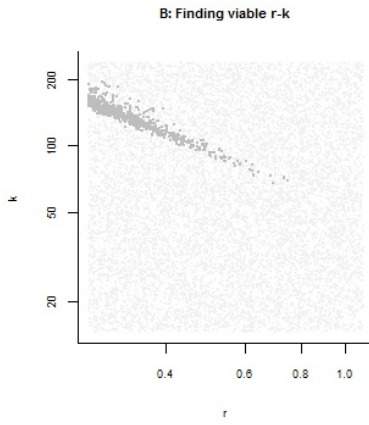
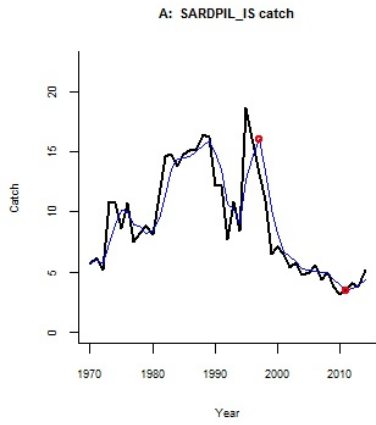
$F/F_{msy}$  = 1.62 , 2.5th perc = 0.852 , 97.5 perc = 5.05

Stock status and exploitation in 2014

Biomass = 15.3 ,  $B/B_{msy}$  = 0.365 , fishing mortality  $F$  = 0.337 ,  $F/F_{msy}$  = 1.62

Comment: Catch=landings from FishStat (Italy+Greece+Albania), Biomass from Medits for GSA 20. RF final 0.3. RF OK

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Species: *Scomber colias* , stock: SCOMPNE\_IS

Atlantic chub mackerel in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1996 - 2014 , abundance = None

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  $r$  = 0.31 - 1.2 expert, , prior range for  $k$  = 1.13 - 17.1

Results of CMSY analysis with altogether 3551 viable trajectories for 3050 r-k pairs

$r$  = 0.777 , 95% CL = 0.574 - 1.05 ,  $k$  = 4.09 , 95% CL = 2.9 - 5.76

MSY = 0.794 , 95% CL = 0.718 - 0.877

Relative biomass last year = 0.26  $k$ , 2.5th = 0.026 , 97.5th = 0.394

Exploitation  $F/(r/2)$  in last year = 2.05

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.388 , 95% CL = 0.287 - 0.525 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.388 , 95% CL = 0.287 - 0.525 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.794 , 95% CL = 0.718 - 0.877

$B_{msy}$  = 2.04 , 95% CL = 1.45 - 2.88

Biomass in last year = 1.06 , 2.5th perc = 0.106 , 97.5 perc = 1.61

$B/B_{msy}$  in last year = 0.52 , 2.5th perc = 0.0519 , 97.5 perc = 0.788

Fishing mortality in last year = 0.881 , 2.5th perc = 0.581 , 97.5 perc = 8.81

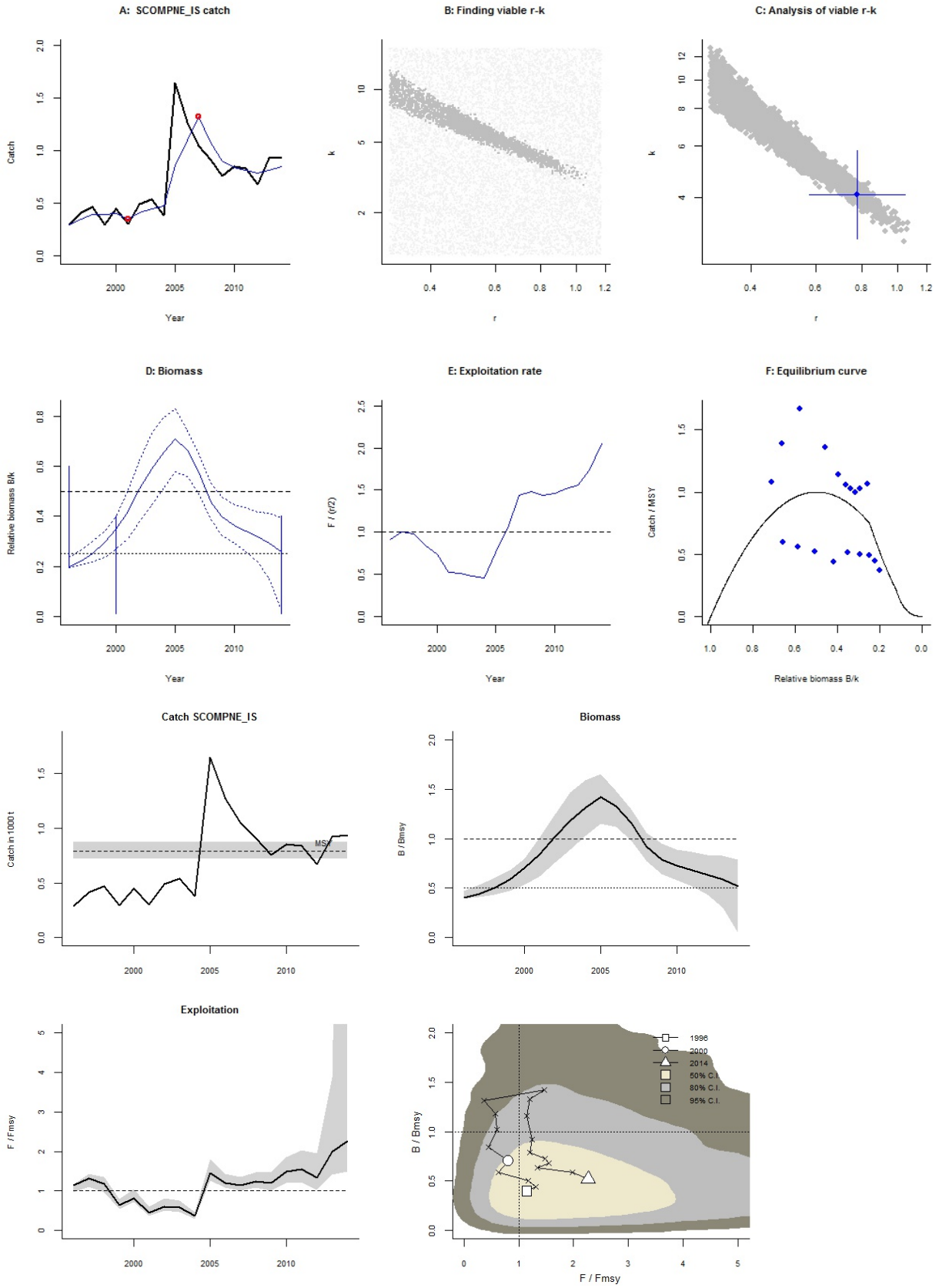
$F/F_{msy}$  = 2.27 , 2.5th perc = 1.5 , 97.5 perc = 22.7

Stock status and exploitation in 2014

Biomass = 1.06 ,  $B/B_{msy}$  = 0.52 , fishing mortality  $F$  = 0.881 ,  $F/F_{msy}$  = 2.27

Comment: Catch=landings from FishStat. GS OK

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Species: *Scomber scombrus* , stock: SCOMSCO\_IS

Atlantic mackerel in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1970 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.23 - 1 expert , , prior range for  $k$  = 5.52 - 96

Prior range of  $q$  =  $1.94e-05$  -  $8.1e-05$

Results of CMSY analysis with altogether 2138 viable trajectories for 1228 r-k pairs

$r$  = 0.657 , 95% CL = 0.461 - 0.937 ,  $k$  = 20.2 , 95% CL = 13.5 - 30.2

MSY = 3.32 , 95% CL = 2.91 - 3.8

Relative biomass last year = 0.119  $k$ , 2.5th = 0.0128 , 97.5th = 0.29

Exploitation  $F/(r/2)$  in last year = 0.737

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.525 , 95% CL = 0.319 - 0.862 ,  $k$  = 24.6 , 95% CL = 17.3 - 34.8

MSY = 3.22 , 95% CL = 2.68 - 3.87

Relative biomass in last year = 0.121  $k$ , 2.5th perc = 0.027 , 97.5th perc = 0.325

Exploitation  $F/(r/2)$  in last year = 0.63

$q$  =  $3.13e-05$  , lcl =  $2.26e-05$  , ucl =  $4.35e-05$

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.262 , 95% CL = 0.16 - 0.431 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.126 , 95% CL = 0.077 - 0.208 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 3.22 , 95% CL = 2.68 - 3.87

$B_{msy}$  = 12.3 , 95% CL = 8.67 - 17.4

Biomass in last year = 2.96 , 2.5th perc = 0.663 , 97.5 perc = 7.99

$B/B_{msy}$  in last year = 0.241 , 2.5th perc = 0.054 , 97.5 perc = 0.65

Fishing mortality in last year = 0.165 , 2.5th perc = 0.0612 , 97.5 perc = 0.737

$F/F_{msy}$  = 1.31 , 2.5th perc = 0.484 , 97.5 perc = 5.83

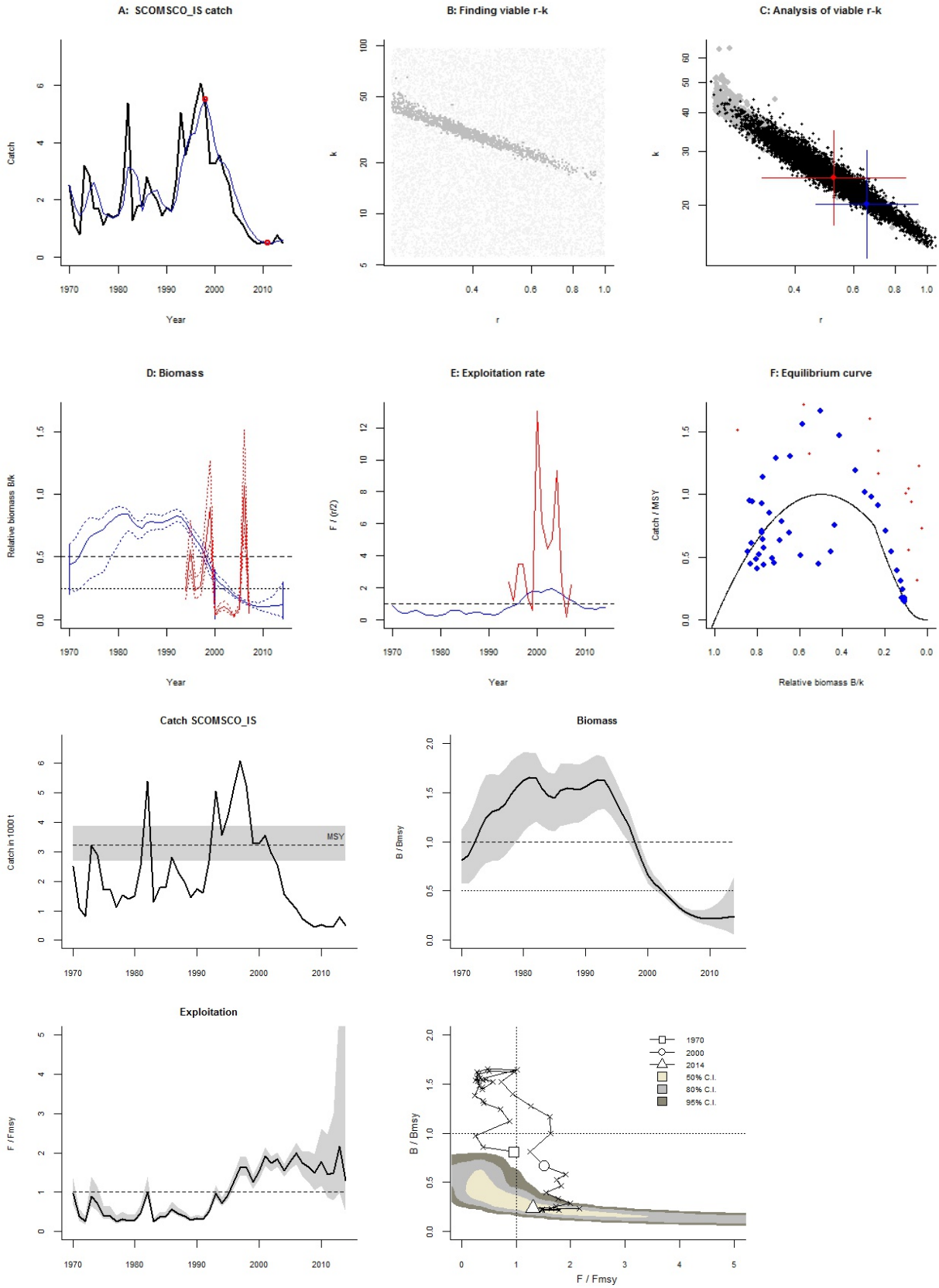
Stock status and exploitation in 2014

Biomass = 2.96 ,  $B/B_{msy}$  = 0.241 , fishing mortality  $F$  = 0.165 ,  $F/F_{msy}$  = 1.31

Comment: Catch=landings from FishStat (Greece, Italy, Albania), Biomass from Medits for GSAs 19+20.

RF final 0.3. GS OK

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Species: *Sepia officinalis* , stock: SEPIOFF\_IS

Common cuttlefish in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1970 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.2 - 0.6 in year 2002 default

Prior final relative biomass = 0.3 - 0.7 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 9.96 - 159

Results of CMSY analysis with altogether 2929 viable trajectories for 617 r-k pairs

$r = 0.566$  , 95% CL = 0.407 - 0.785 ,  $k = 41.5$  , 95% CL = 28.3 - 61

MSY = 5.87 , 95% CL = 5.25 - 6.56

Relative biomass last year = 0.381  $k$  , 2.5th = 0.304 , 97.5th = 0.529

Exploitation  $F/(r/2)$  in last year = 1.71

Results for Management (based on CMSY analysis)

$F_{msy} = 0.283$  , 95% CL = 0.204 - 0.392 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.283$  , 95% CL = 0.204 - 0.392 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 5.87 , 95% CL = 5.25 - 6.56

$B_{msy} = 20.8$  , 95% CL = 14.1 - 30.5

Biomass in last year = 15.8 , 2.5th perc = 12.6 , 97.5 perc = 22

$B/B_{msy}$  in last year = 0.763 , 2.5th perc = 0.608 , 97.5 perc = 1.06

Fishing mortality in last year = 0.405 , 2.5th perc = 0.292 , 97.5 perc = 0.508

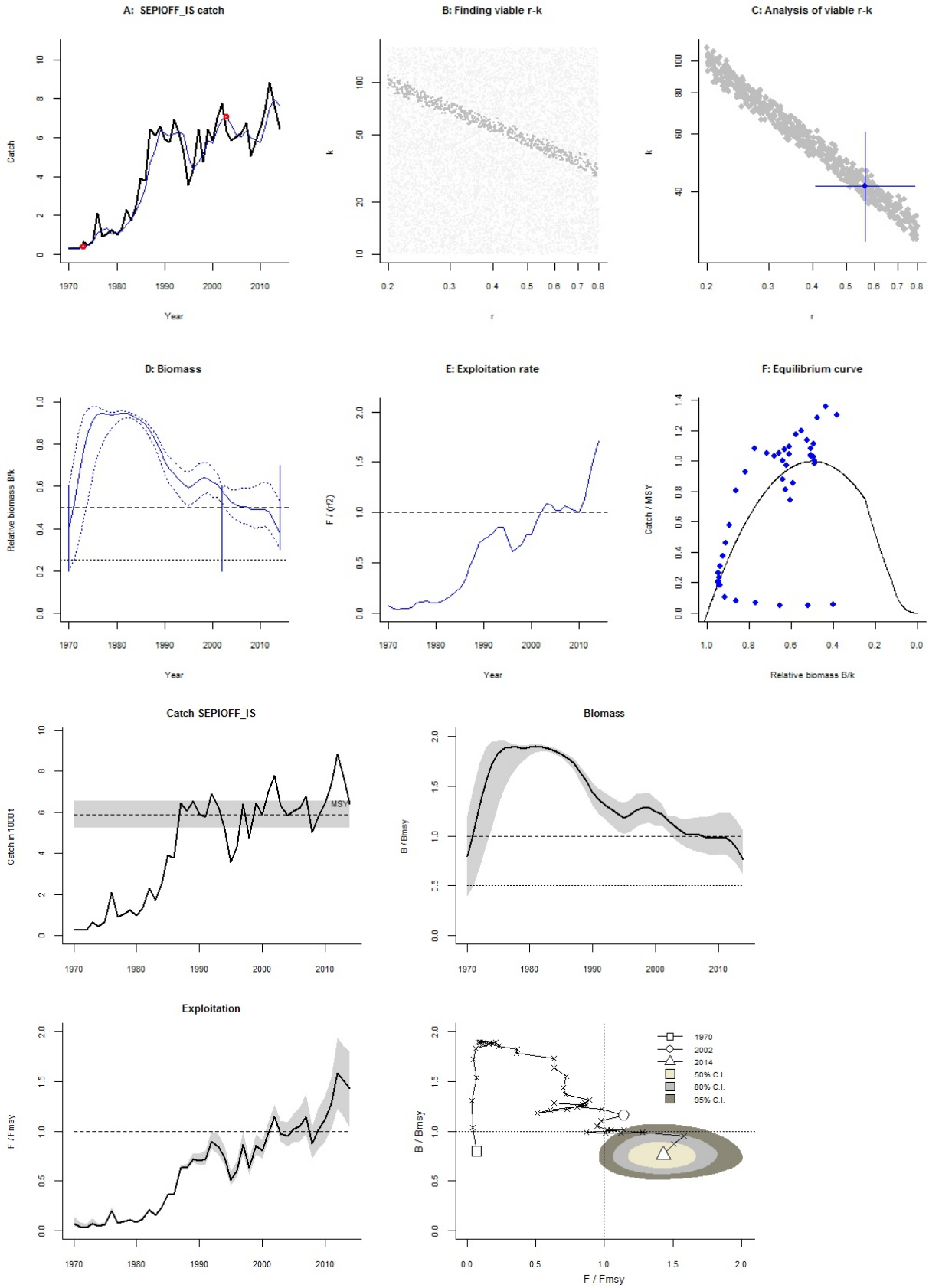
$F/F_{msy} = 1.43$  , 2.5th perc = 1.03 , 97.5 perc = 1.8

Stock status and exploitation in 2014

Biomass = 15.8 ,  $B/B_{msy} = 0.763$  , fishing mortality  $F = 0.405$  ,  $F/F_{msy} = 1.43$

Comment: Catch=landings from FishStat (Malta, Greece, Tunisia, Albania, Libya). RF final 0.3-0.7. GS  
OK

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Species: *Solea solea* , stock: SOLEVUL\_IS

Common sole in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1985 - 2014 , abundance = None

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 - 0.2 expert

Prior range for  $r$  = 0.21 - 1 expert, , prior range for  $k$  = 3.34 - 64.9

Results of CMSY analysis with altogether 1857 viable trajectories for 1737 r-k pairs

$r$  = 0.456 , 95% CL = 0.32 - 0.65 ,  $k$  = 26.3 , 95% CL = 14.3 - 48.3

MSY = 2.99 , 95% CL = 1.46 - 6.14

Relative biomass last year = 0.0652  $k$ , 2.5th = 0.0128 , 97.5th = 0.182

Exploitation  $F/(r/2)$  in last year = 0.559

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.228 , 95% CL = 0.16 - 0.325 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0595 , 95% CL = 0.0417 - 0.0848 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 2.99 , 95% CL = 1.46 - 6.14

$B_{msy}$  = 13.1 , 95% CL = 7.14 - 24.1

Biomass in last year = 1.71 , 2.5th perc = 0.335 , 97.5 perc = 4.78

$B/B_{msy}$  in last year = 0.13 , 2.5th perc = 0.0255 , 97.5 perc = 0.364

Fishing mortality in last year = 0.112 , 2.5th perc = 0.0399 , 97.5 perc = 0.57

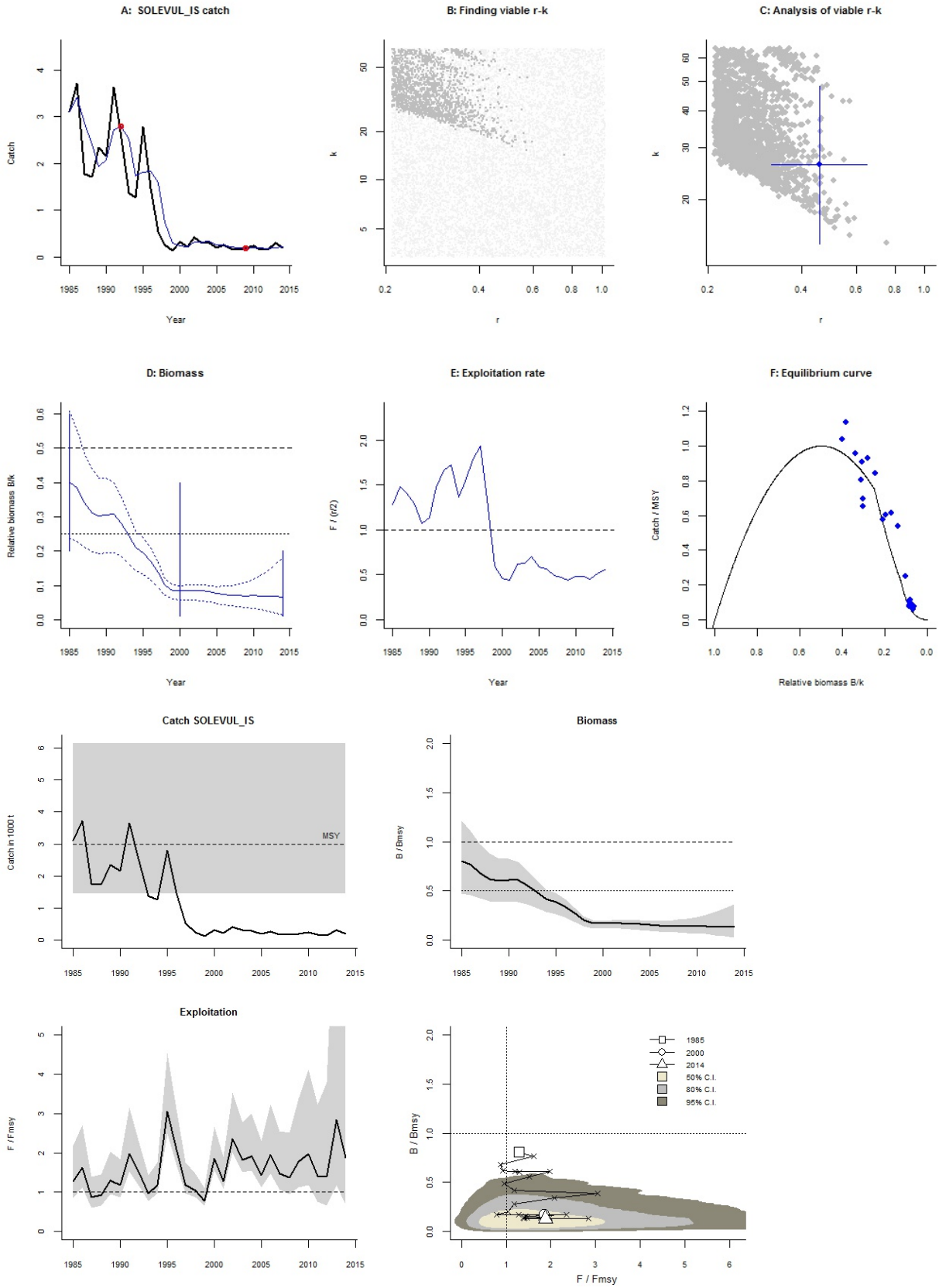
$F/F_{msy}$  = 1.88 , 2.5th perc = 0.672 , 97.5 perc = 9.58

Stock status and exploitation in 2014

Biomass = 1.71 ,  $B/B_{msy}$  = 0.13 , fishing mortality  $F$  = 0.112 ,  $F/F_{msy}$  = 1.88

Comment: Catch=landings from FishStat (Greece, Italy, Albania). RF start 1985, int 2000 0.01-0.4, final 0.2. GS OK

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Species: *Squilla mantis* , stock: SQUIMAN\_IS

Mantis shrimp in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1970 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 1.91 - 30.5

Prior range of  $q$  = 6.29e-05 - 0.000251

Results of CMSY analysis with altogether 227 viable trajectories for 224 r-k pairs

$r$  = 0.32 , 95% CL = 0.205 - 0.499 ,  $k$  = 13.2 , 95% CL = 9.54 - 18.2

MSY = 1.05 , 95% CL = 0.835 - 1.33

Relative biomass last year = 0.104  $k$ , 2.5th = 0.0208 , 97.5th = 0.361

Exploitation  $F/(r/2)$  in last year = 6.94

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.358 , 95% CL = 0.207 - 0.62 ,  $k$  = 9.83 , 95% CL = 6.28 - 15.4

MSY = 0.88 , 95% CL = 0.693 - 1.12

Relative biomass in last year = 0.257  $k$ , 2.5th perc = 0.138 , 97.5th perc = 0.436

Exploitation  $F/(r/2)$  in last year = 2.72

$q$  = 9.66e-05 , lcl = 6.92e-05 , ucl = 0.000135

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.179 , 95% CL = 0.103 - 0.31 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.179 , 95% CL = 0.103 - 0.31 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.88 , 95% CL = 0.693 - 1.12

$B_{msy}$  = 4.92 , 95% CL = 3.14 - 7.7

Biomass in last year = 2.52 , 2.5th perc = 1.36 , 97.5 perc = 4.29

$B/B_{msy}$  in last year = 0.513 , 2.5th perc = 0.277 , 97.5 perc = 0.872

Fishing mortality in last year = 0.487 , 2.5th perc = 0.287 , 97.5 perc = 0.903

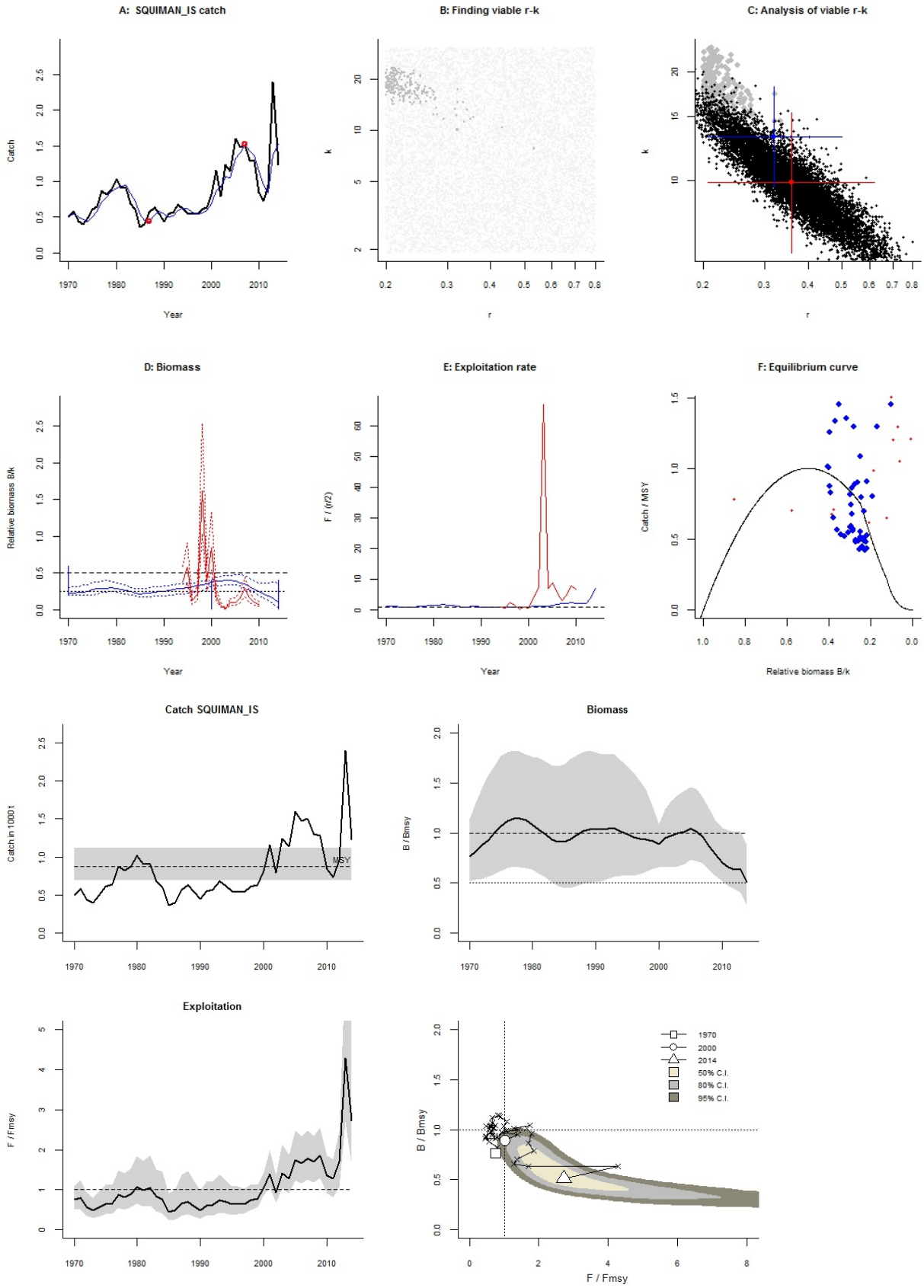
$F/F_{msy}$  = 2.72 , 2.5th perc = 1.6 , 97.5 perc = 5.04

Stock status and exploitation in 2014

Biomass = 2.52 ,  $B/B_{msy}$  = 0.513 , fishing mortality  $F$  = 0.487 ,  $F/F_{msy}$  = 2.72

Comment: Catch=landings from FishStat (Italy), Biomass from Medits for GSAs 19+20. GS OK

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Species: *Trachurus mediterraneus* , stock: TRACHMED\_IS

Mediterranean horse mackerel in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1995 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2004 expert

Prior final relative biomass = 0.01 - 0.2 expert

Prior range for  $r$  = 0.59 - 1.3 expert, , prior range for  $k$  = 0.444 - 4

Prior range of  $q$  = 0.00384 - 0.0115

Results of CMSY analysis with altogether 1118 viable trajectories for 1050 r-k pairs

$r = 1.04$  , 95% CL = 0.834 - 1.29 ,  $k = 1.83$  , 95% CL = 1.45 - 2.32

MSY = 0.476 , 95% CL = 0.426 - 0.532

Relative biomass last year = 0.106  $k$  , 2.5th = 0.0148 , 97.5th = 0.196

Exploitation  $F/(r/2)$  in last year = 2.71

Results from Bayesian Schaefer model using catch & CPUE

$r = 1.01$  , 95% CL = 0.81 - 1.25 ,  $k = 1.94$  , 95% CL = 1.57 - 2.39

MSY = 0.487 , 95% CL = 0.436 - 0.543

Relative biomass in last year = 0.19  $k$  , 2.5th perc = 0.126 , 97.5th perc = 0.246

Exploitation  $F/(r/2)$  in last year = 0.968

$q = 0.0059$  ,  $lcl = 0.00457$  ,  $ucl = 0.00763$

Results for Management (based on BSM analysis)

$F_{msy} = 0.503$  , 95% CL = 0.405 - 0.624 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.382$  , 95% CL = 0.308 - 0.474 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.487 , 95% CL = 0.436 - 0.543

$B_{msy} = 0.968$  , 95% CL = 0.785 - 1.19

Biomass in last year = 0.368 , 2.5th perc = 0.243 , 97.5 perc = 0.476

$B/B_{msy}$  in last year = 0.38 , 2.5th perc = 0.251 , 97.5 perc = 0.492

Fishing mortality in last year = 0.487 , 2.5th perc = 0.376 , 97.5 perc = 0.736

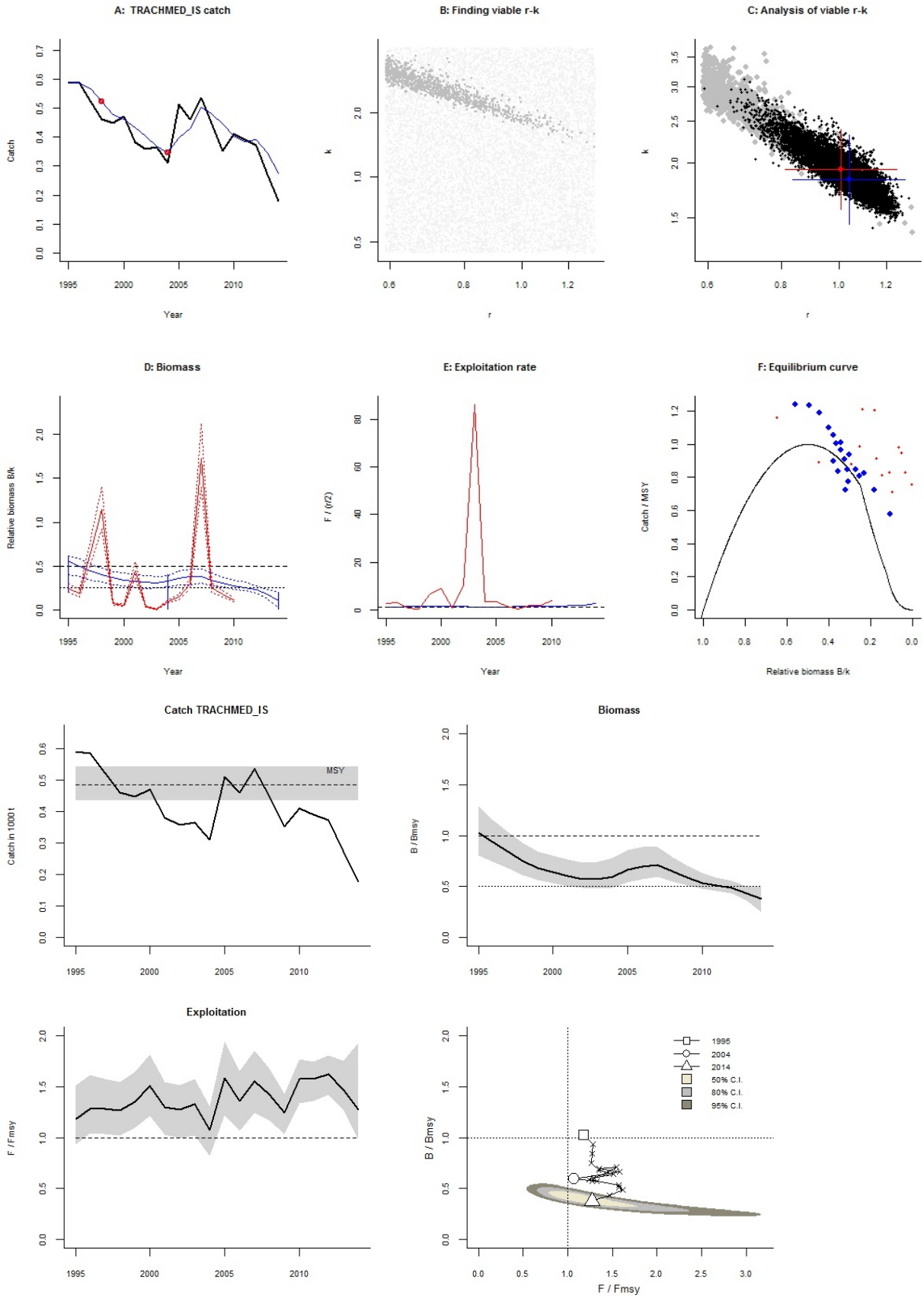
$F/F_{msy} = 1.27$  , 2.5th perc = 0.984 , 97.5 perc = 1.93

Stock status and exploitation in 2014

Biomass = 0.368 ,  $B/B_{msy} = 0.38$  , fishing mortality  $F = 0.487$  ,  $F/F_{msy} = 1.27$

Comment: Catch=landings from FishStat (Greece), Biomass from Medits for GSAs 19+20. RF start 1995, int 2004 0.01-0.4, final 0.2. GS OK

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Species: *Umbrina cirrosa* , stock: UMBRCIR\_IS

Shi drum in Ionian Sea

Source:

Region: Mediterranean , Ionian Sea

Catch data used from years 1995 - 2013 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 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  $r$  = 0.59 - 1.2 expert, , prior range for  $k$  = 1.21 - 9.88

Results of CMSY analysis with altogether 11216 viable trajectories for 1793 r-k pairs

$r$  = 1.01 , 95% CL = 0.851 - 1.19 ,  $k$  = 4.69 , 95% CL = 3.53 - 6.23

MSY = 1.18 , 95% CL = 0.943 - 1.48

Relative biomass last year = 0.366  $k$ , 2.5th = 0.21 , 97.5th = 0.56

Exploitation  $F/(r/2)$  in last year = 1.56

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.504 , 95% CL = 0.426 - 0.596 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.504 , 95% CL = 0.426 - 0.596 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.18 , 95% CL = 0.943 - 1.48

$B_{msy}$  = 2.34 , 95% CL = 1.77 - 3.11

Biomass in last year = 1.72 , 2.5th perc = 0.983 , 97.5 perc = 2.63

$B/B_{msy}$  in last year = 0.733 , 2.5th perc = 0.419 , 97.5 perc = 1.12

Fishing mortality in last year = 0.682 , 2.5th perc = 0.446 , 97.5 perc = 1.19

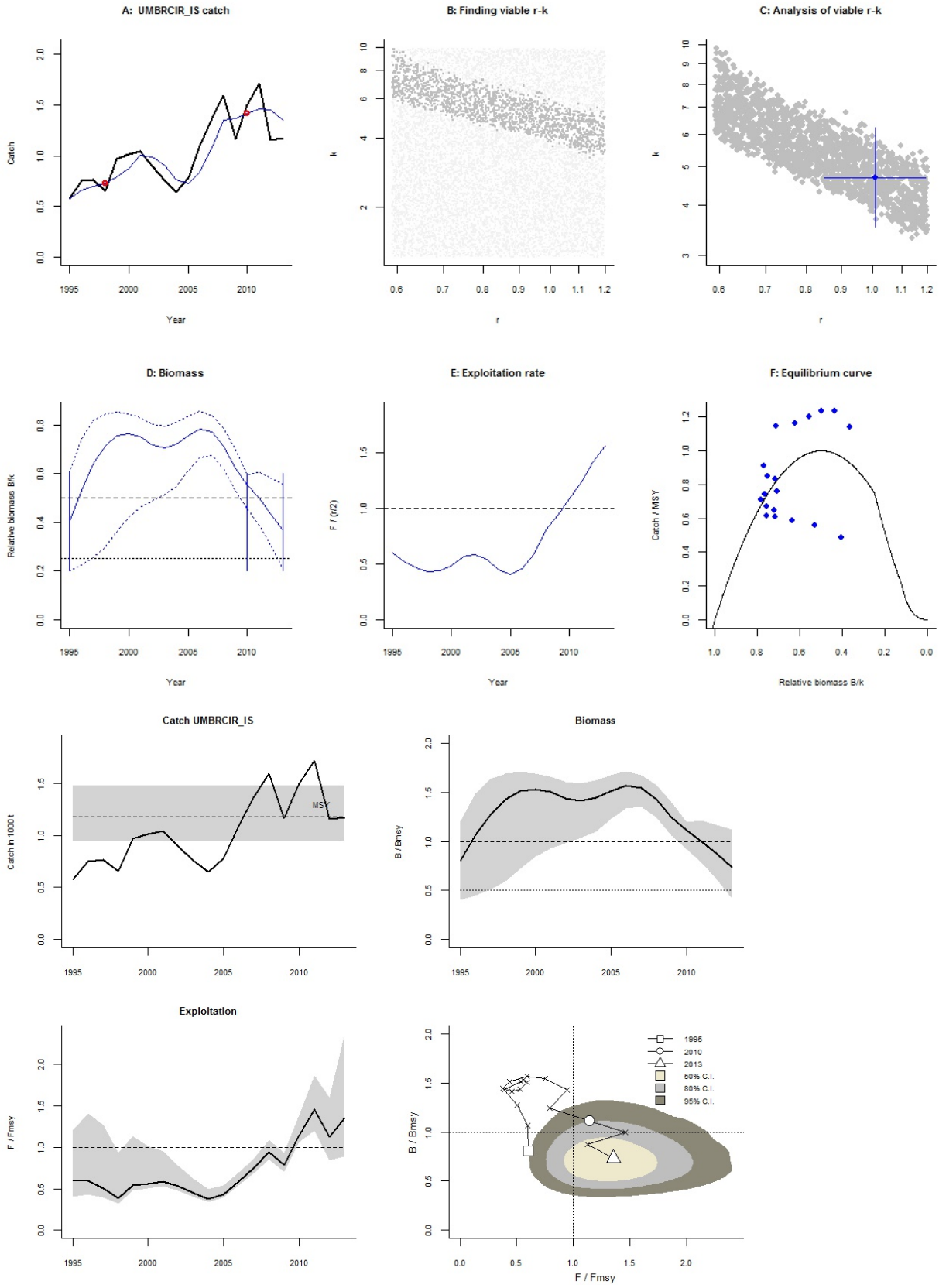
$F/F_{msy}$  = 1.35 , 2.5th perc = 0.886 , 97.5 perc = 2.37

Stock status and exploitation in 2014

Biomass = ,  $B/B_{msy}$  = , fishing mortality  $F$  = ,  $F/F_{msy}$  =

Comment: Catch=landings from FishStat. RF start 1995 0.2-0.6, int 2010 0.2-0.6, final 0.2-0.6. GS OK

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**Aegean Sea** (analyzed with CMSY\_O\_7m.R; data sources are indicated in the Comment field)

Species: *Atherina boyeri* , stock: ATHEBOY\_AL

Sand smelt in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1982 - 2014 , abundance = None

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.01 - 0.3 in year 2003 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.33 - 1.7 expert, , prior range for  $k$  = 0.526 - 11.1

Results of CMSY analysis with altogether 892 viable trajectories for 725 r-k pairs

$r$  = 0.687 , 95% CL = 0.516 - 0.916 ,  $k$  = 3.46 , 95% CL = 2.59 - 4.63

MSY = 0.595 , 95% CL = 0.537 - 0.659

Relative biomass last year = 0.093  $k$ , 2.5th = 0.0119 , 97.5th = 0.282

Exploitation  $F/(r/2)$  in last year = 0.346

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.344 , 95% CL = 0.258 - 0.458 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.128 , 95% CL = 0.0959 - 0.17 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.595 , 95% CL = 0.537 - 0.659

$B_{msy}$  = 1.73 , 95% CL = 1.3 - 2.31

Biomass in last year = 0.322 , 2.5th perc = 0.0411 , 97.5 perc = 0.977

$B/B_{msy}$  in last year = 0.186 , 2.5th perc = 0.0238 , 97.5 perc = 0.564

Fishing mortality in last year = 0.14 , 2.5th perc = 0.0461 , 97.5 perc = 1.09

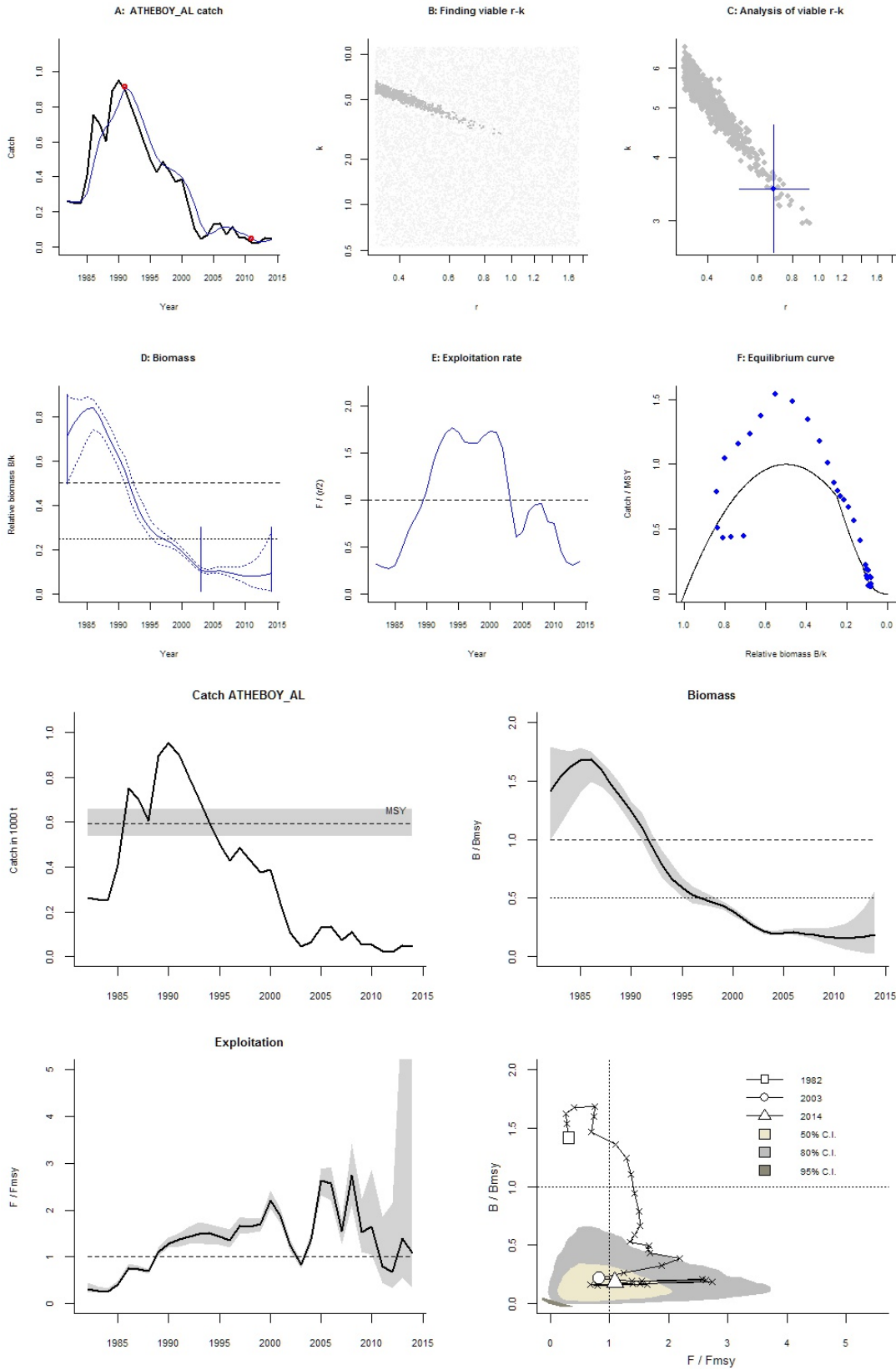
$F/F_{msy}$  = 1.09 , 2.5th perc = 0.36 , 97.5 perc = 8.56

Stock status and exploitation in 2014

Biomass = 0.322 ,  $B/B_{msy}$  = 0.186 , fishing mortality  $F$  = 0.14 ,  $F/F_{msy}$  = 1.09

Comment: Catch=landings from FishStat. RF int 2003 0.3, final 0.3, OK 04.10.16

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Species: *Belone belone* , stock: BELOBEL\_AL

Garfish in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1985 - 2014 , abundance = None

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  $r$  = 0.19 - 1 expert, , prior range for  $k$  = 0.443 - 9.33

Results of CMSY analysis with altogether 2604 viable trajectories for 2058 r-k pairs

$r = 0.47$  , 95% CL = 0.338 - 0.654 ,  $k = 2.2$  , 95% CL = 1.51 - 3.22

MSY = 0.259 , 95% CL = 0.218 - 0.308

Relative biomass last year = 0.112  $k$ , 2.5th = 0.0154 , 97.5th = 0.288

Exploitation  $F/(r/2)$  in last year = 1.19

Results for Management (based on CMSY analysis)

$F_{msy} = 0.235$  , 95% CL = 0.169 - 0.327 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.105$  , 95% CL = 0.0758 - 0.147 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.259 , 95% CL = 0.218 - 0.308

$B_{msy} = 1.1$  , 95% CL = 0.755 - 1.61

Biomass in last year = 0.247 , 2.5th perc = 0.0339 , 97.5 perc = 0.635

$B/B_{msy}$  in last year = 0.224 , 2.5th perc = 0.0307 , 97.5 perc = 0.576

Fishing mortality in last year = 0.231 , 2.5th perc = 0.0897 , 97.5 perc = 1.68

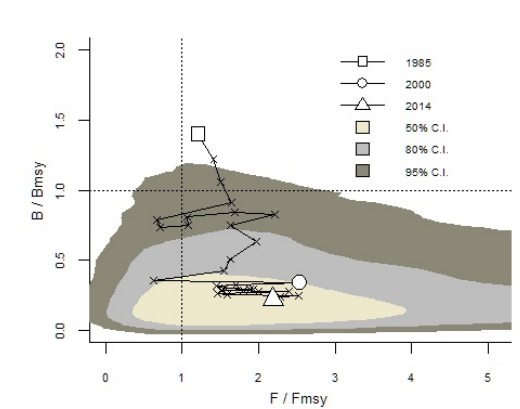
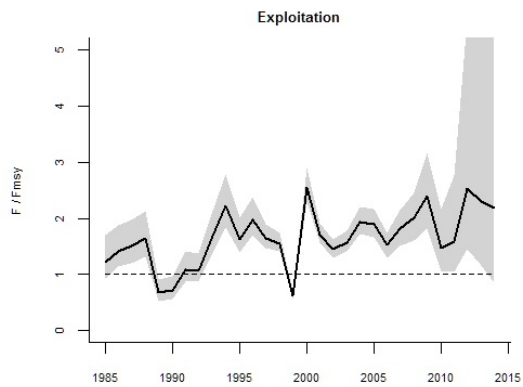
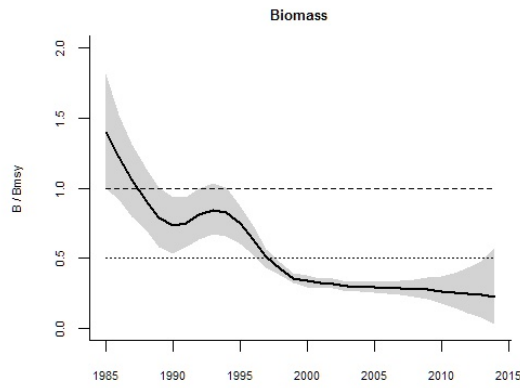
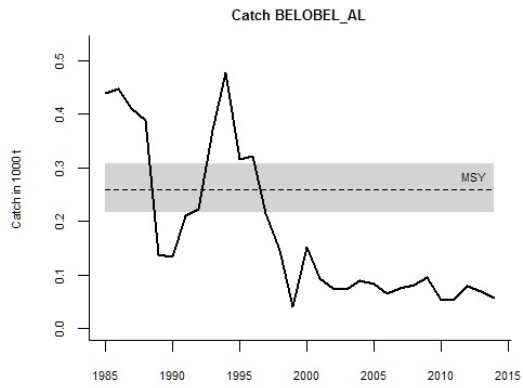
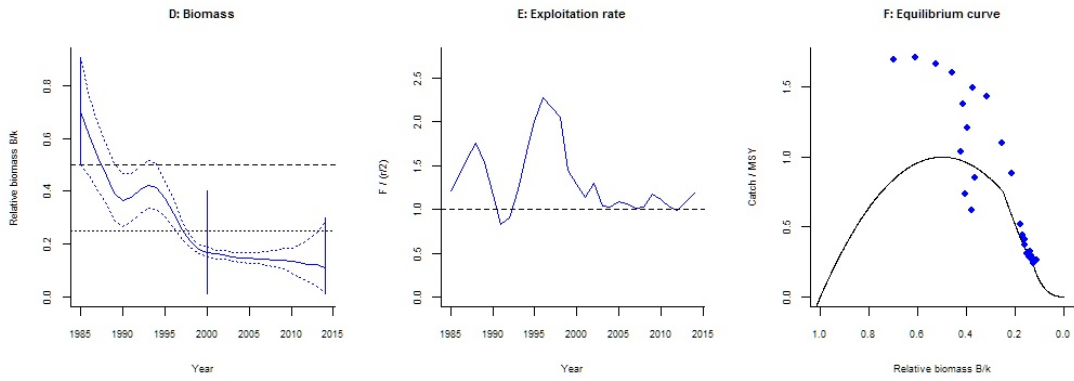
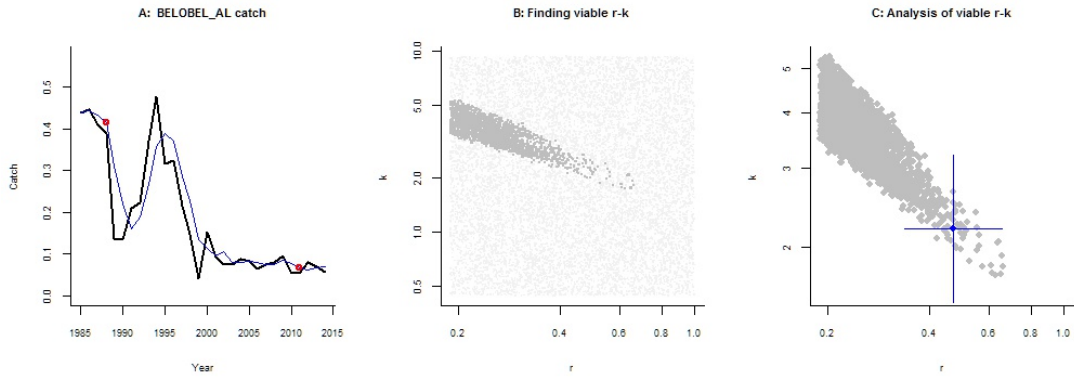
$F/F_{msy} = 2.19$  , 2.5th perc = 0.851 , 97.5 perc = 16

Stock status and exploitation in 2014

Biomass = 0.247 ,  $B/B_{msy} = 0.224$  , fishing mortality  $F = 0.231$  ,  $F/F_{msy} = 2.19$

Comment: Catch=landings from FishStat (Greece). RF int 2000 0.4, final 0.3, OK 04.10.16

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Species: *Boops boops* , stock: BOOPBOO\_AL

Bogue in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1982 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.31 - 1.1 expert, , prior range for  $k$  = 12.1 - 172

Prior range of  $q$  = 0.127 - 0.478

Results of CMSY analysis with altogether 392 viable trajectories for 382  $r$ - $k$  pairs

$r$  = 0.549 , 95% CL = 0.397 - 0.758 ,  $k$  = 64.9 , 95% CL = 48.2 - 87.3

MSY = 8.9 , 95% CL = 7.08 - 11.2

Relative biomass last year = 0.115  $k$ , 2.5th = 0.0173 , 97.5th = 0.284

Exploitation  $F/(r/2)$  in last year = 1.92

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.585 , 95% CL = 0.421 - 0.813 ,  $k$  = 58.1 , 95% CL = 43.7 - 77.4

MSY = 8.5 , 95% CL = 7.47 - 9.68

Relative biomass in last year = 0.256  $k$ , 2.5th perc = 0.103 , 97.5th perc = 0.364

Exploitation  $F/(r/2)$  in last year = 1.01

$q$  = 0.197 , lcl = 0.149 , ucl = 0.261

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.292 , 95% CL = 0.21 - 0.406 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.292 , 95% CL = 0.21 - 0.406 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 8.5 , 95% CL = 7.47 - 9.68

$B_{msy}$  = 29.1 , 95% CL = 21.9 - 38.7

Biomass in last year = 14.9 , 2.5th perc = 6.01 , 97.5 perc = 21.2

$B/B_{msy}$  in last year = 0.512 , 2.5th perc = 0.207 , 97.5 perc = 0.728

Fishing mortality in last year = 0.295 , 2.5th perc = 0.207 , 97.5 perc = 0.73

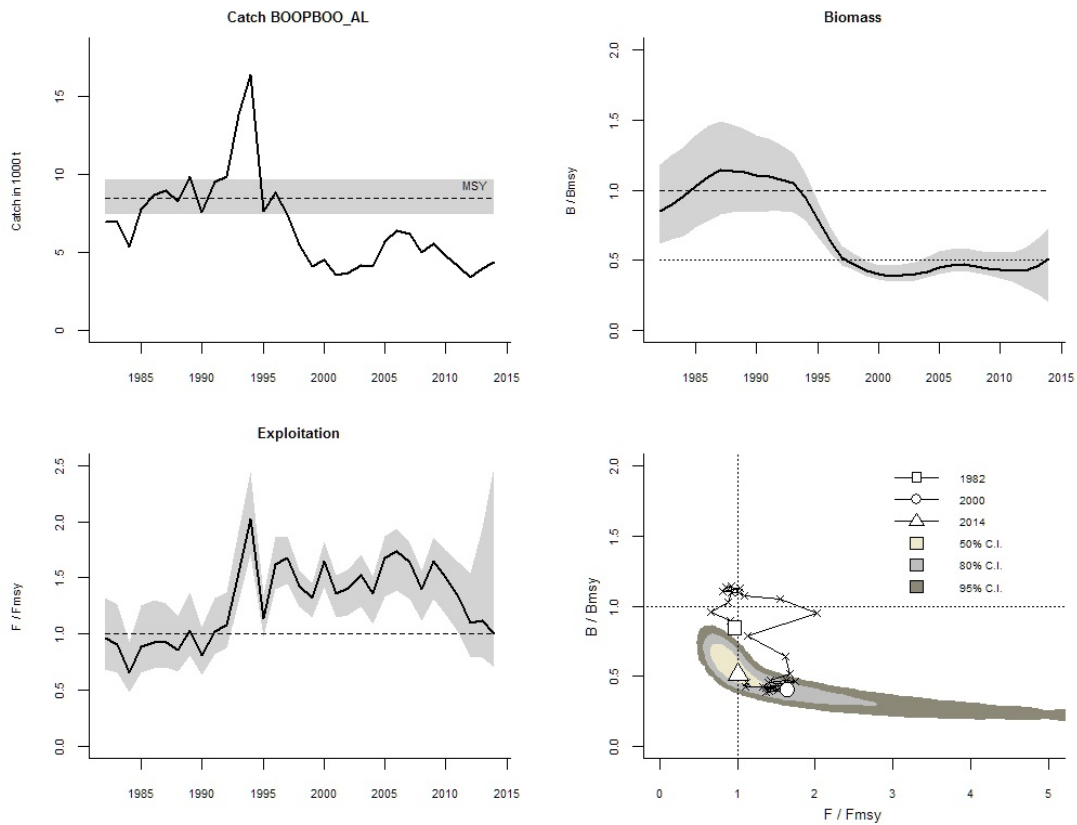
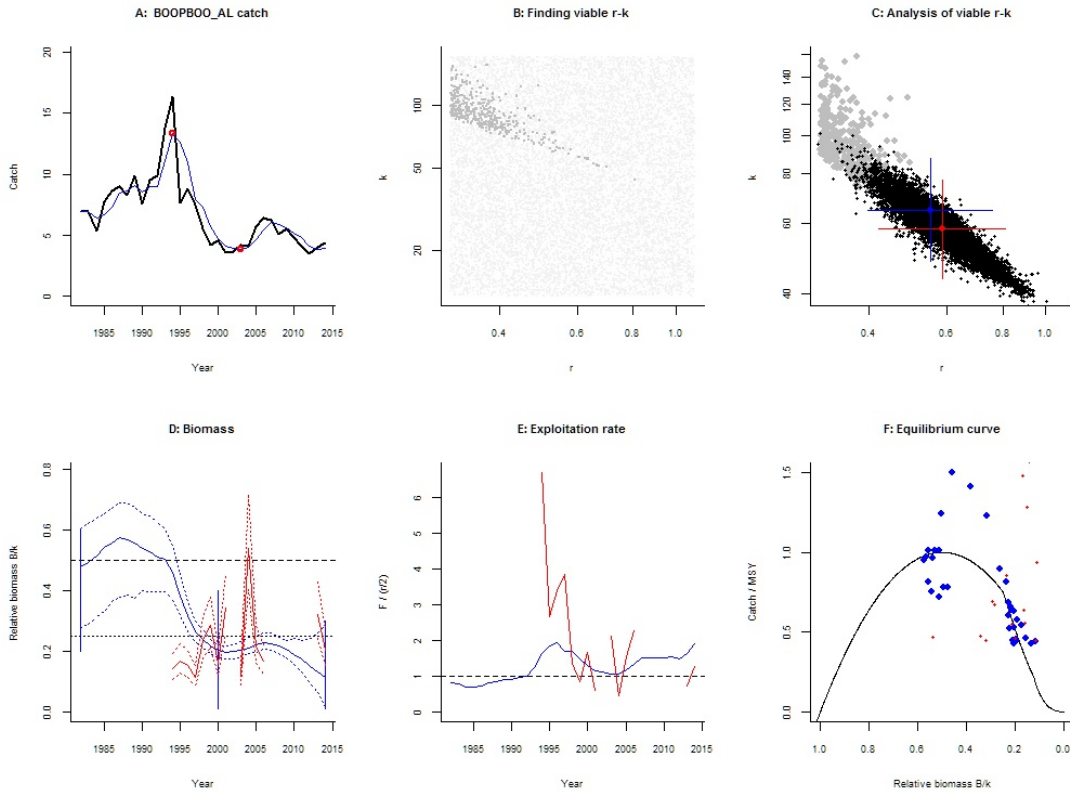
$F/F_{msy}$  = 1.01 , 2.5th perc = 0.709 , 97.5 perc = 2.5

Stock status and exploitation in 2014

Biomass = 14.9 ,  $B/B_{msy}$  = 0.512 , fishing mortality  $F$  = 0.295 ,  $F/F_{msy}$  = 1.01

Comment: Catch=landings from FishStat (Greece+Turkey). RF final 0.3, OK 04.10.16

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Species: *Dentex dentex* , stock: DENTDEN\_AL

Common dentex in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1970 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1998 default

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.15 - 0.73 expert , , prior range for  $k$  = 0.531 - 10.3

Results of CMSY analysis with altogether 1819 viable trajectories for 1488 r-k pairs

$r = 0.29$  , 95% CL = 0.228 - 0.369 ,  $k = 3.22$  , 95% CL = 2.16 - 4.79

MSY = 0.233 , 95% CL = 0.159 - 0.343

Relative biomass last year = 0.236  $k$  , 2.5th = 0.0333 , 97.5th = 0.299

Exploitation  $F/(r/2)$  in last year = 1.22

Results for Management (based on CMSY analysis)

$F_{msy} = 0.145$  , 95% CL = 0.114 - 0.185 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.137$  , 95% CL = 0.108 - 0.174 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.233 , 95% CL = 0.159 - 0.343

$B_{msy} = 1.61$  , 95% CL = 1.08 - 2.4

Biomass in last year = 0.758 , 2.5th perc = 0.107 , 97.5 perc = 0.962

$B/B_{msy}$  in last year = 0.472 , 2.5th perc = 0.0667 , 97.5 perc = 0.598

Fishing mortality in last year = 0.162 , 2.5th perc = 0.128 , 97.5 perc = 1.15

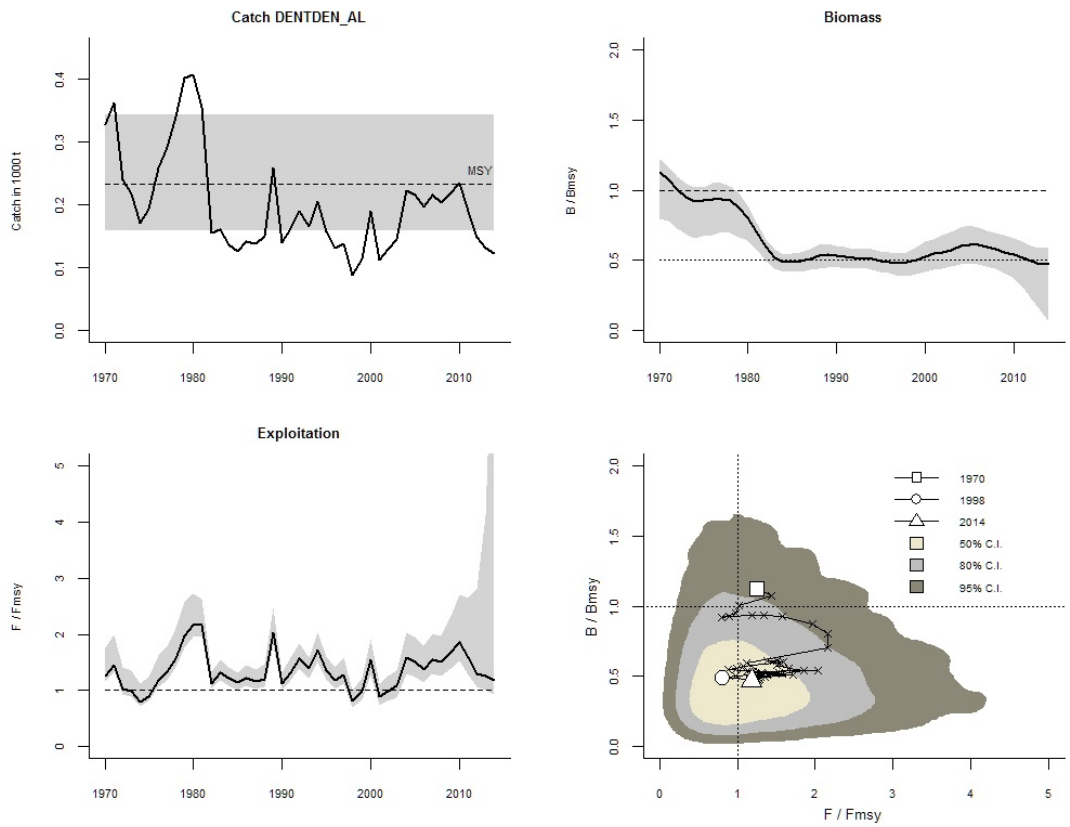
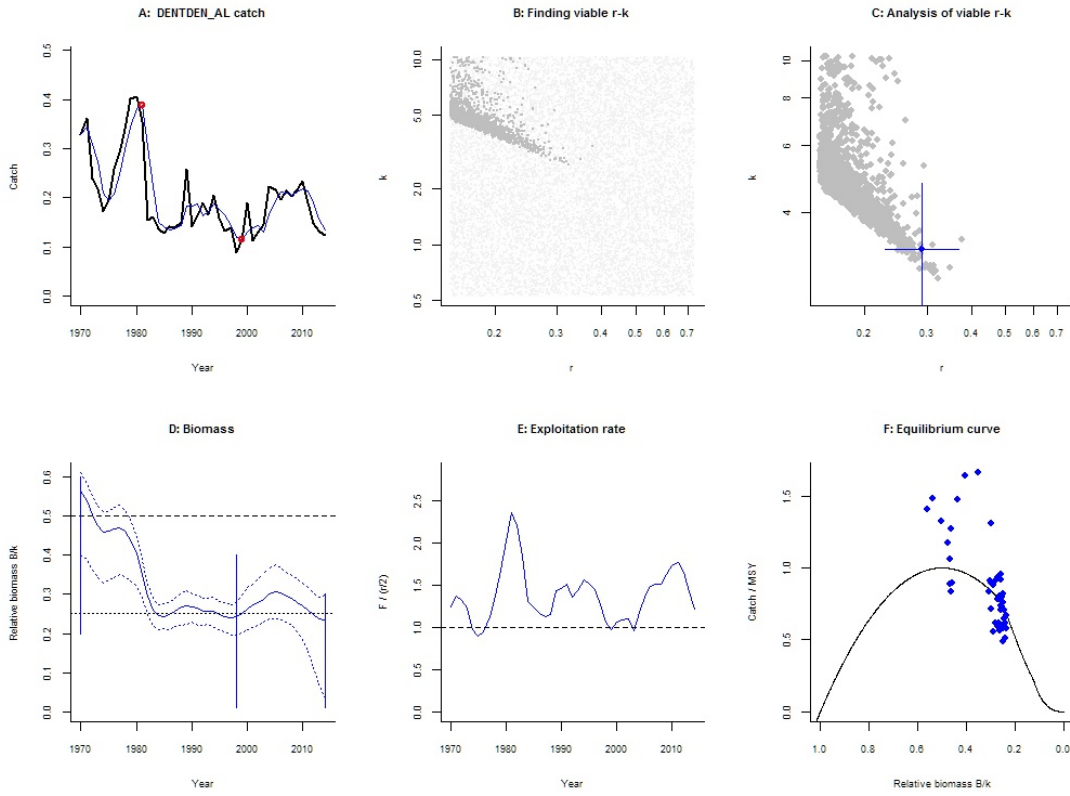
$F/F_{msy} = 1.18$  , 2.5th perc = 0.935 , 97.5 perc = 8.39

Stock status and exploitation in 2014

Biomass = 0.758 ,  $B/B_{msy} = 0.472$  , fishing mortality  $F = 0.162$  ,  $F/F_{msy} = 1.18$

Comment: Catch=landings from FishStat (Greece). RF final 0.3; OK 04.10.16

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Species: *Dentex macrophthalmus* , stock: DENTMAC\_AL

Large-eye dentex in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1982 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.5 - 0.9 in year 1996 default

Prior final relative biomass = 0.1 - 0.5 expert

Prior range for  $r$  = 0.38 - 1.3 expert, , prior range for  $k$  = 0.458 - 6.47

Results of CMSY analysis with altogether 4908 viable trajectories for 798 r-k pairs

$r = 0.98$  , 95% CL = 0.727 - 1.32 ,  $k = 1.72$  , 95% CL = 1.2 - 2.48

MSY = 0.422 , 95% CL = 0.373 - 0.478

Relative biomass last year = 0.421  $k$ , 2.5th = 0.145 , 97.5th = 0.497

Exploitation  $F/(r/2)$  in last year = 1.05

Results for Management (based on CMSY analysis)

$F_{msy} = 0.49$  , 95% CL = 0.363 - 0.661 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.49$  , 95% CL = 0.363 - 0.661 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.422 , 95% CL = 0.373 - 0.478

$B_{msy} = 0.862$  , 95% CL = 0.6 - 1.24

Biomass in last year = 0.725 , 2.5th perc = 0.251 , 97.5 perc = 0.857

$B/B_{msy}$  in last year = 0.842 , 2.5th perc = 0.291 , 97.5 perc = 0.995

Fishing mortality in last year = 0.531 , 2.5th perc = 0.449 , 97.5 perc = 1.54

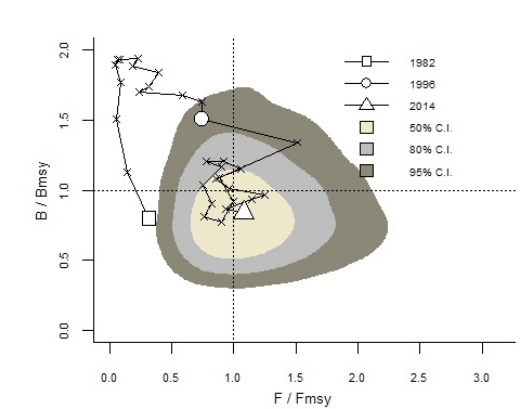
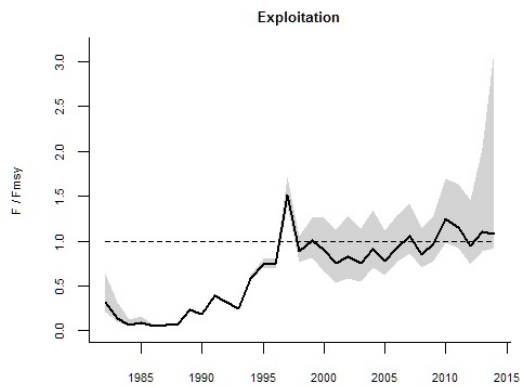
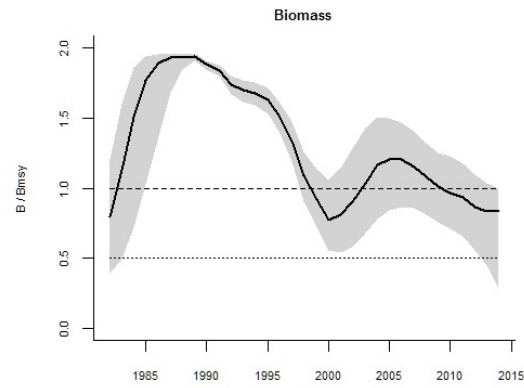
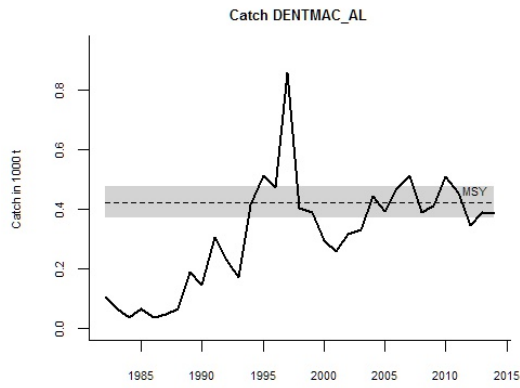
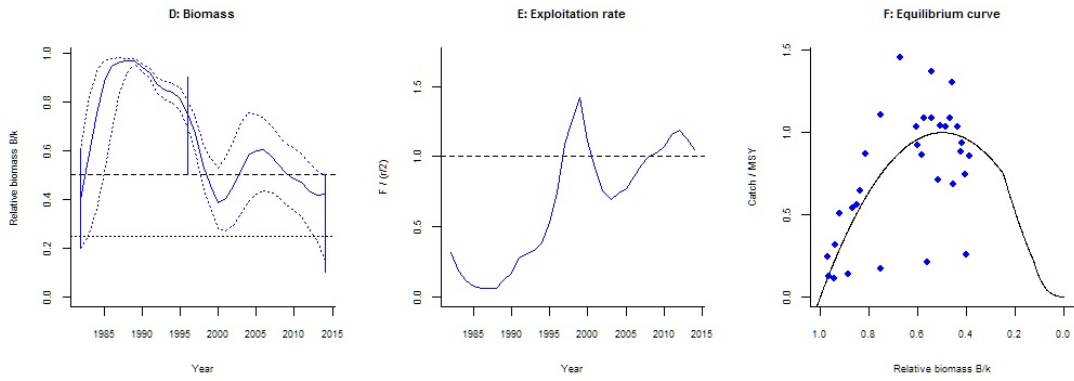
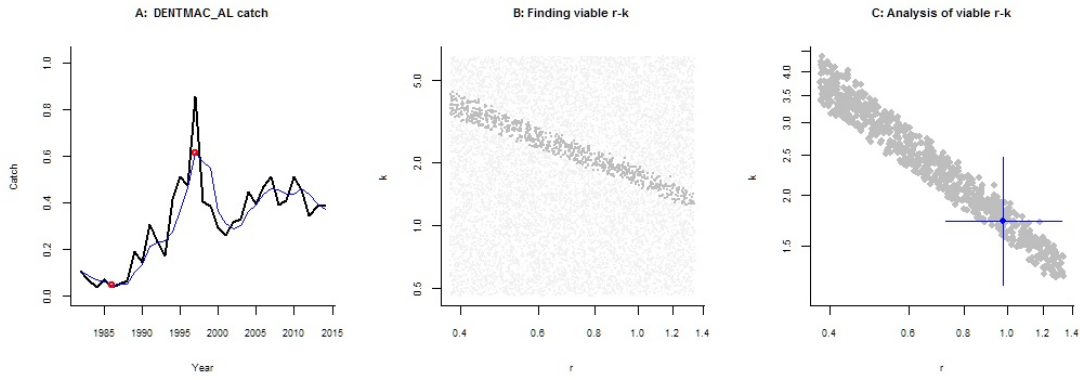
$F/F_{msy} = 1.08$  , 2.5th perc = 0.916 , 97.5 perc = 3.14

Stock status and exploitation in 2014

Biomass = 0.725 ,  $B/B_{msy} = 0.842$  , fishing mortality  $F = 0.531$  ,  $F/F_{msy} = 1.08$

Comment: Catch=landings from FishStat (Greece). RF final 0.1-0.5; OK 04.10.16

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Species: *Dicentrarchus labrax* , stock: DICELAB\_AL

European seabass in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1982 - 2014 , abundance = None

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.5 - 0.9 in year 2006 default

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.17 - 0.88 expert, , prior range for  $k$  = 1.06 - 21.9

Results of CMSY analysis with altogether 3314 viable trajectories for 618 r-k pairs

$r = 0.583$  , 95% CL = 0.395 - 0.86 ,  $k = 3.22$  , 95% CL = 1.95 - 5.34

MSY = 0.47 , 95% CL = 0.375 - 0.588

Relative biomass last year = 0.139  $k$ , 2.5th = 0.0175 , 97.5th = 0.294

Exploitation  $F/(r/2)$  in last year = 1.75

Results for Management (based on CMSY analysis)

$F_{msy} = 0.291$  , 95% CL = 0.197 - 0.43 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.162$  , 95% CL = 0.109 - 0.239 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.47 , 95% CL = 0.375 - 0.588

$B_{msy} = 1.61$  , 95% CL = 0.974 - 2.67

Biomass in last year = 0.447 , 2.5th perc = 0.0564 , 97.5 perc = 0.948

$B/B_{msy}$  in last year = 0.277 , 2.5th perc = 0.035 , 97.5 perc = 0.588

Fishing mortality in last year = 0.494 , 2.5th perc = 0.233 , 97.5 perc = 3.92

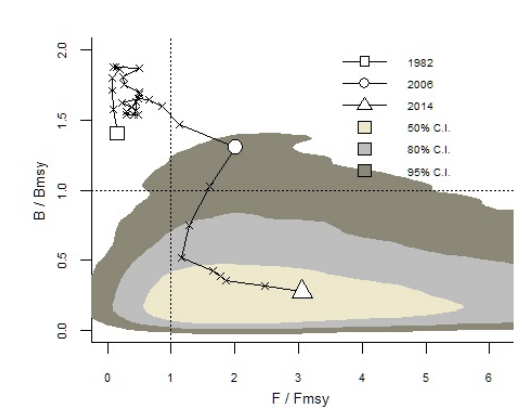
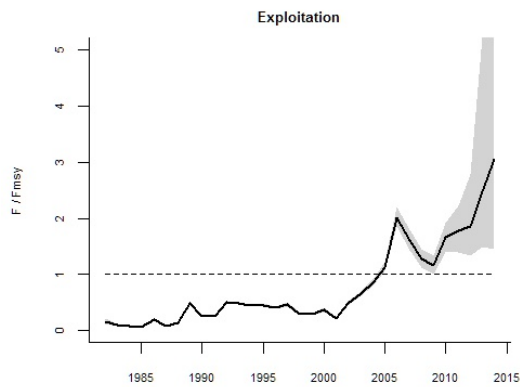
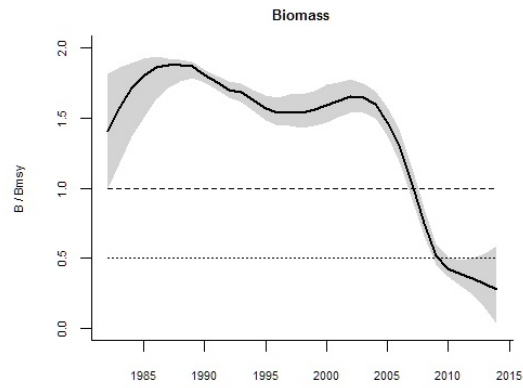
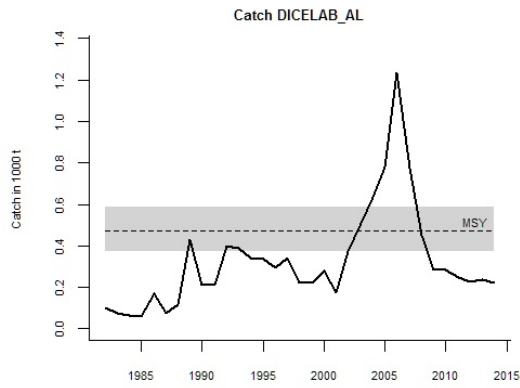
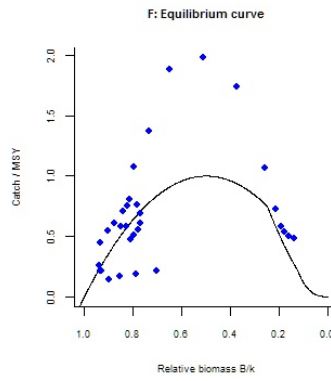
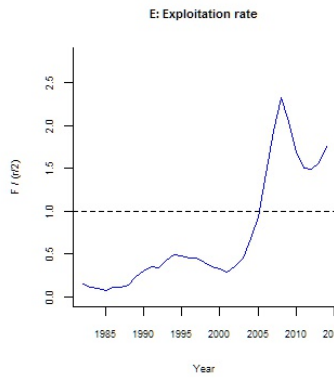
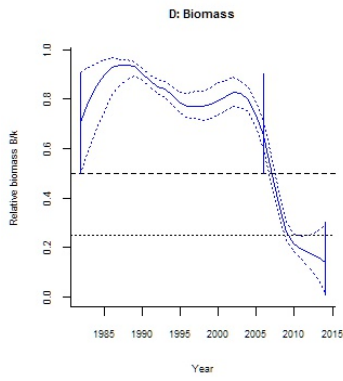
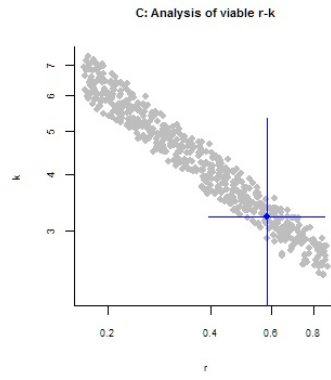
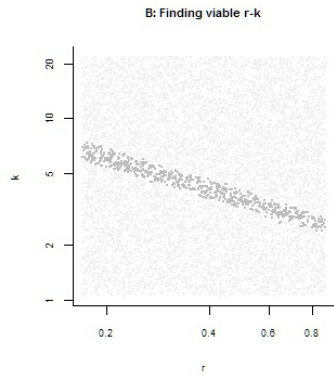
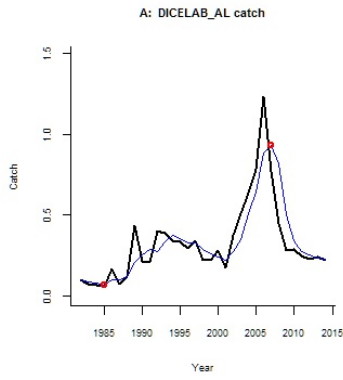
$F/F_{msy} = 3.06$  , 2.5th perc = 1.44 , 97.5 perc = 24.2

Stock status and exploitation in 2014

Biomass = 0.447 ,  $B/B_{msy} = 0.277$  , fishing mortality  $F = 0.494$  ,  $F/F_{msy} = 3.06$

Comment: Catch=landings from FishStat (Greece). RF start 0.5 0.9, final 0.3; OK 04.10.16

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Species: *Diplodus annularis* , stock: DIPLANN\_AL

Annular seabream in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1982 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.5 - 0.9 expert

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  $k$  = 0.8 - 12.8

Prior range of  $q$  = 7.2 - 28.8

Results of CMSY analysis with altogether 1976 viable trajectories for 1220 r-k pairs

$r$  = 0.449 , 95% CL = 0.325 - 0.621 ,  $k$  = 3.05 , 95% CL = 2.23 - 4.16

MSY = 0.342 , 95% CL = 0.308 - 0.38

Relative biomass last year = 0.145  $k$  , 2.5th = 0.0147 , 97.5th = 0.296

Exploitation  $F/(r/2)$  in last year = 1.54

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.402 , 95% CL = 0.277 - 0.583 ,  $k$  = 3.36 , 95% CL = 2.57 - 4.39

MSY = 0.338 , 95% CL = 0.284 - 0.402

Relative biomass in last year = 0.168  $k$  , 2.5th perc = 0.069 , 97.5th perc = 0.335

Exploitation  $F/(r/2)$  in last year = 0.988

$q$  = 11.4 , lcl = 8.51 , ucl = 15.2

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.201 , 95% CL = 0.139 - 0.291 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.135 , 95% CL = 0.0931 - 0.196 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.338 , 95% CL = 0.284 - 0.402

$B_{msy}$  = 1.68 , 95% CL = 1.29 - 2.2

Biomass in last year = 0.564 , 2.5th perc = 0.232 , 97.5 perc = 1.12

$B/B_{msy}$  in last year = 0.336 , 2.5th perc = 0.138 , 97.5 perc = 0.669

Fishing mortality in last year = 0.199 , 2.5th perc = 0.0996 , 97.5 perc = 0.483

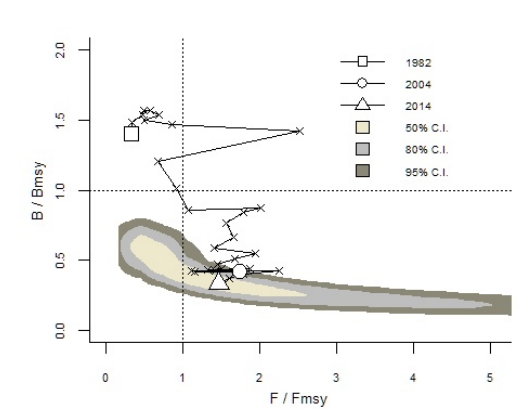
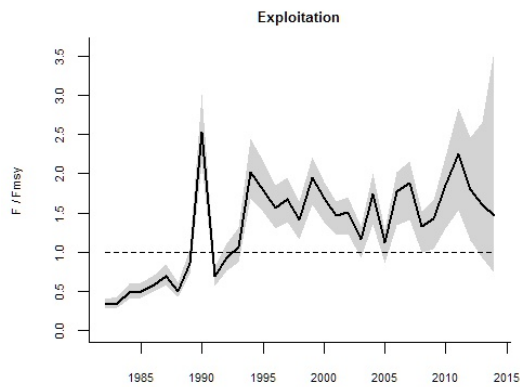
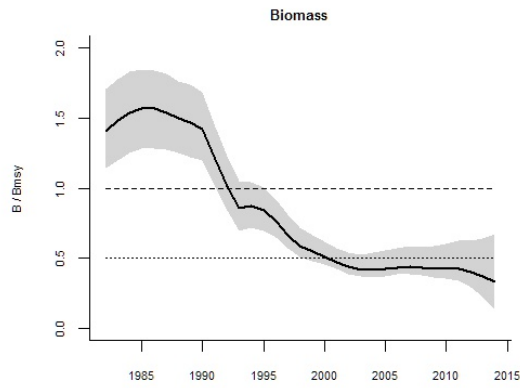
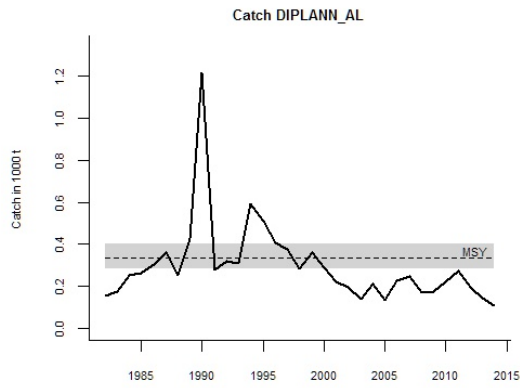
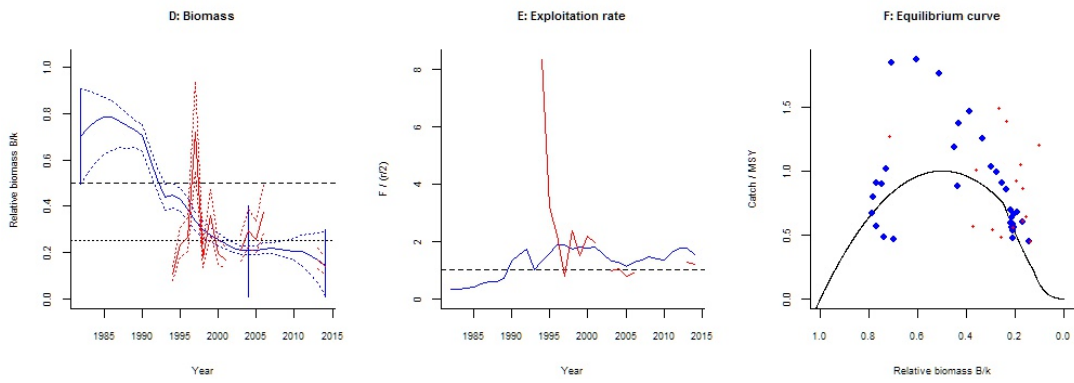
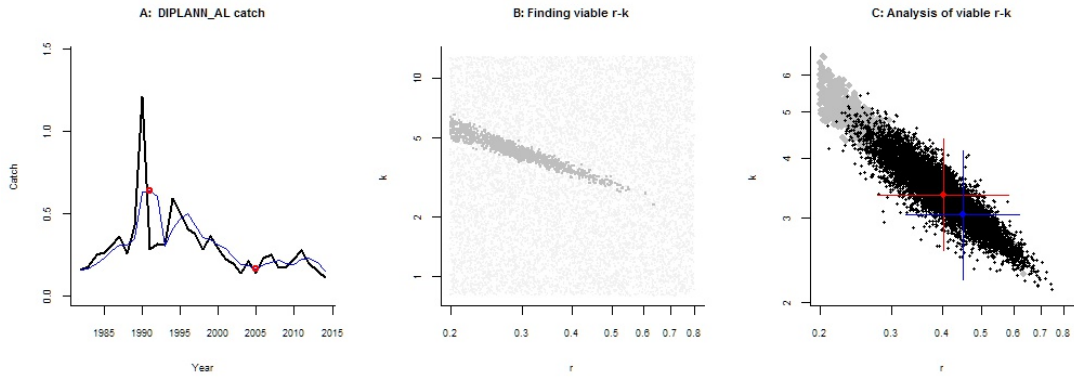
$F/F_{msy}$  = 1.47 , 2.5th perc = 0.738 , 97.5 perc = 3.58

Stock status and exploitation in 2014

Biomass = 0.564 ,  $B/B_{msy}$  = 0.336 , fishing mortality  $F$  = 0.199 ,  $F/F_{msy}$  = 1.47

Comment: Catch=landings from FishStat (Greece), Biomass estimates standardized relative to max value. RF final 0.3; OK 04.10.16

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Species: *Diplodus sargus* , stock: DIPLSAR\_AL

White seabream in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1982 - 2014 , abundance = None

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 - 0.3 expert

Prior range for  $r$  = 0.23 - 0.85 expert, , prior range for  $k$  = 0.605 - 8.95

Results of CMSY analysis with altogether 2545 viable trajectories for 1686 r-k pairs

$r$  = 0.535 , 95% CL = 0.381 - 0.752 ,  $k$  = 2.74 , 95% CL = 2 - 3.74

MSY = 0.366 , 95% CL = 0.333 - 0.402

Relative biomass last year = 0.136  $k$ , 2.5th = 0.0169 , 97.5th = 0.296

Exploitation  $F/(r/2)$  in last year = 1.52

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.268 , 95% CL = 0.19 - 0.376 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.146 , 95% CL = 0.104 - 0.205 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.366 , 95% CL = 0.333 - 0.402

$B_{msy}$  = 1.37 , 95% CL = 0.999 - 1.87

Biomass in last year = 0.372 , 2.5th perc = 0.0463 , 97.5 perc = 0.81

$B/B_{msy}$  in last year = 0.272 , 2.5th perc = 0.0338 , 97.5 perc = 0.592

Fishing mortality in last year = 0.365 , 2.5th perc = 0.168 , 97.5 perc = 2.94

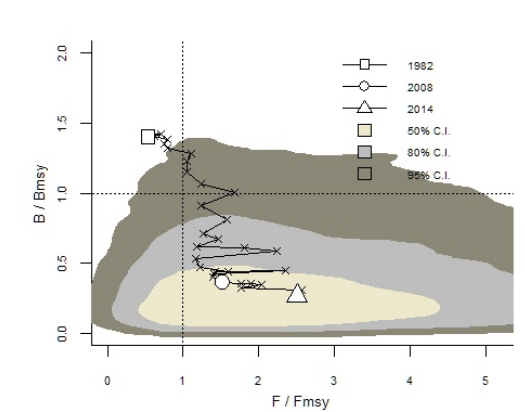
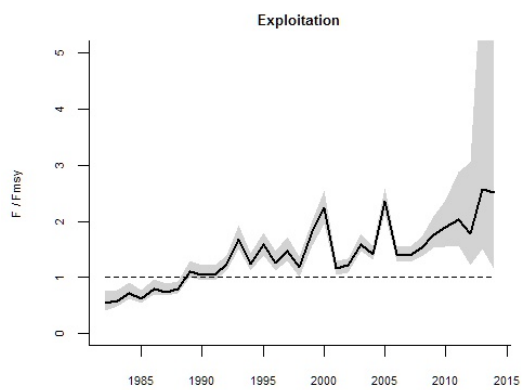
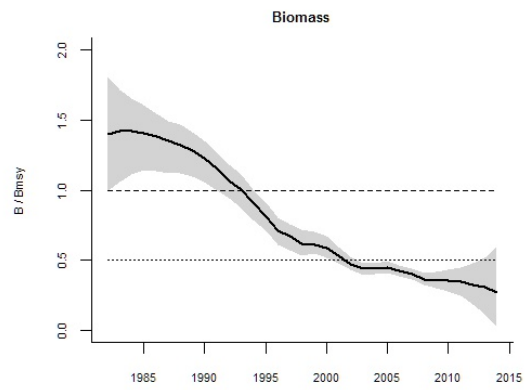
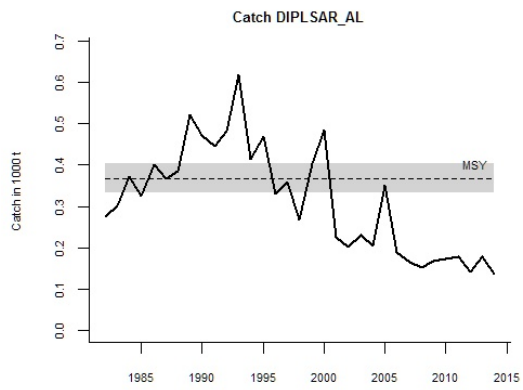
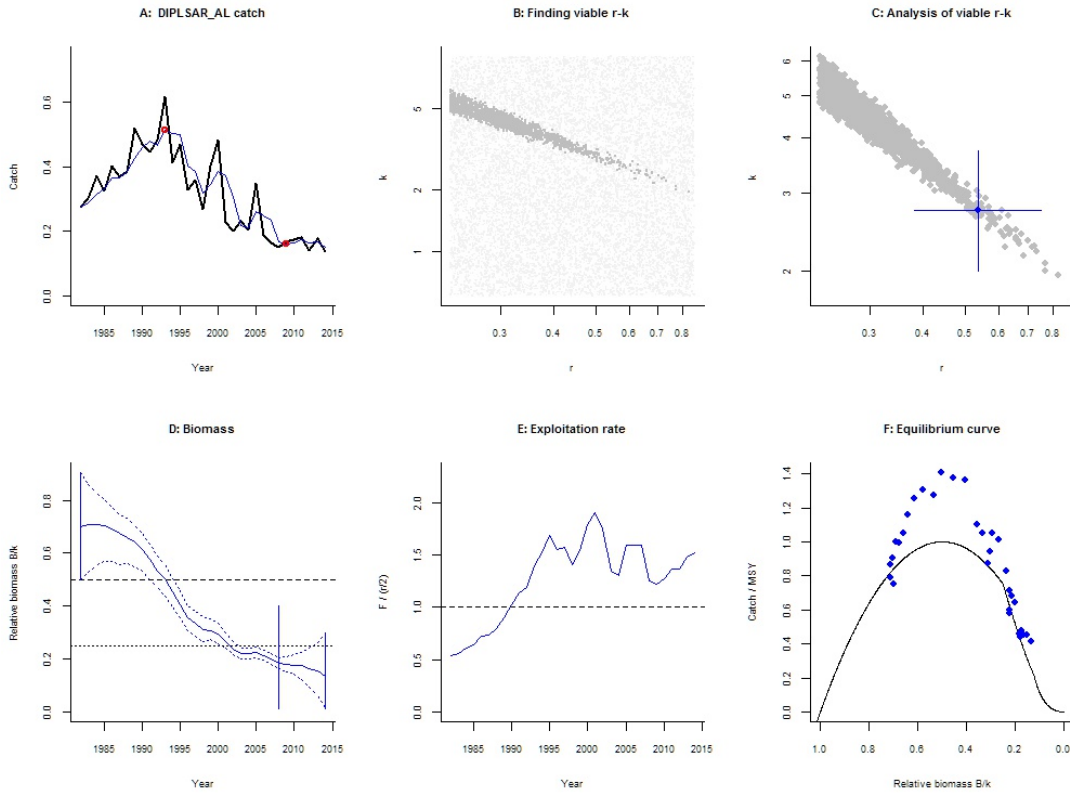
$F/F_{msy}$  = 2.51 , 2.5th perc = 1.15 , 97.5 perc = 20.2

Stock status and exploitation in 2014

Biomass = 0.372 ,  $B/B_{msy}$  = 0.272 , fishing mortality  $F$  = 0.365 ,  $F/F_{msy}$  = 2.51

Comment: Catch=landings from FishStat (Greece). RF final 0.3; OK 04.10.16

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Species: *Eledone moschata* , stock: ELEDMOS\_AL

Musky octopus in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1982 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.5 - 0.9 in year 1994 default

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 1.31 - 21

Prior range of  $q$  = 0.702 - 2.81

Results of CMSY analysis with altogether 2970 viable trajectories for 643 r-k pairs

$r$  = 0.57 , 95% CL = 0.413 - 0.785 ,  $k$  = 4.66 , 95% CL = 3.18 - 6.83

MSY = 0.664 , 95% CL = 0.601 - 0.734

Relative biomass last year = 0.298  $k$ , 2.5th = 0.0229 , 97.5th = 0.394

Exploitation  $F/(r/2)$  in last year = 1.19

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.538 , 95% CL = 0.38 - 0.761 ,  $k$  = 4.92 , 95% CL = 3.65 - 6.64

MSY = 0.661 , 95% CL = 0.597 - 0.733

Relative biomass in last year = 0.376  $k$ , 2.5th perc = 0.218 , 97.5th perc = 0.484

Exploitation  $F/(r/2)$  in last year = 0.864

$q$  = 1.11 , lcl = 0.828 , ucl = 1.48

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.269 , 95% CL = 0.19 - 0.38 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.269 , 95% CL = 0.19 - 0.38 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.661 , 95% CL = 0.597 - 0.733

$B_{msy}$  = 2.46 , 95% CL = 1.82 - 3.32

Biomass in last year = 1.85 , 2.5th perc = 1.07 , 97.5 perc = 2.38

$B/B_{msy}$  in last year = 0.752 , 2.5th perc = 0.436 , 97.5 perc = 0.969

Fishing mortality in last year = 0.232 , 2.5th perc = 0.18 , 97.5 perc = 0.401

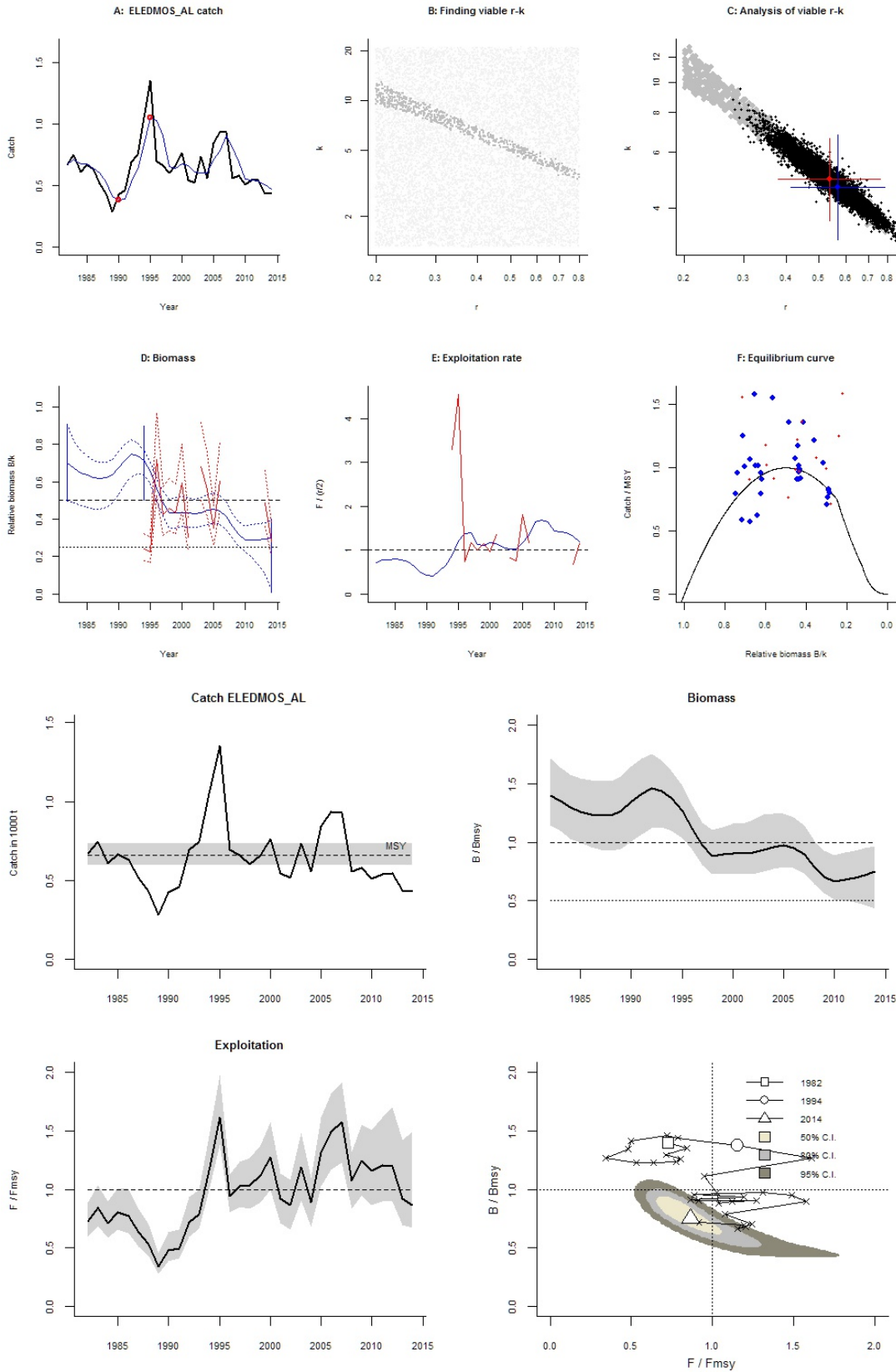
$F/F_{msy}$  = 0.864 , 2.5th perc = 0.671 , 97.5 perc = 1.49

Stock status and exploitation in 2014

Biomass = 1.85 ,  $B/B_{msy}$  = 0.752 , fishing mortality  $F$  = 0.232 ,  $F/F_{msy}$  = 0.864

Comment: Catch=landings from FishStat (Greece), Biomass estimates standardized relative to max value. RF final 0.4; OK 04.10.16

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Species: *Engraulis encrasicolus* , stock: ENGRENC\_AL

Anchovy in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1970 - 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 = 0.01 - 0.4 expert

Prior range for  $r$  = 0.26 - 1.2 expert, , prior range for  $k$  = 20.8 - 371

Prior range of  $q$  = 0.2 - 0.843

Results of CMSY analysis with altogether 2767 viable trajectories for 540 r-k pairs

$r$  = 0.799 , 95% CL = 0.559 - 1.14 ,  $k$  = 94.8 , 95% CL = 63.1 - 142

MSY = 18.9 , 95% CL = 17.1 - 20.9

Relative biomass last year = 0.255  $k$ , 2.5th = 0.0298 , 97.5th = 0.393

Exploitation  $F/(r/2)$  in last year = 1.96

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.837 , 95% CL = 0.604 - 1.16 ,  $k$  = 92.1 , 95% CL = 69.4 - 122

MSY = 19.3 , 95% CL = 16.5 - 22.5

Relative biomass in last year = 0.343  $k$ , 2.5th perc = 0.232 , 97.5th perc = 0.458

Exploitation  $F/(r/2)$  in last year = 1.54

$q$  = 0.315 , lcl = 0.242 , ucl = 0.411

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.418 , 95% CL = 0.302 - 0.58 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.418 , 95% CL = 0.302 - 0.58 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 19.3 , 95% CL = 16.5 - 22.5

$B_{msy}$  = 46 , 95% CL = 34.7 - 61.1

Biomass in last year = 31.6 , 2.5th perc = 21.3 , 97.5 perc = 42.2

$B/B_{msy}$  in last year = 0.685 , 2.5th perc = 0.463 , 97.5 perc = 0.916

Fishing mortality in last year = 0.644 , 2.5th perc = 0.482 , 97.5 perc = 0.953

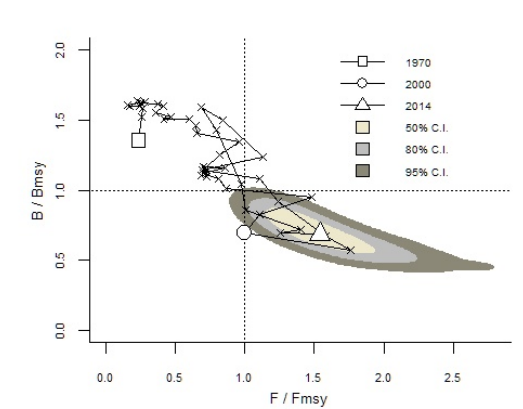
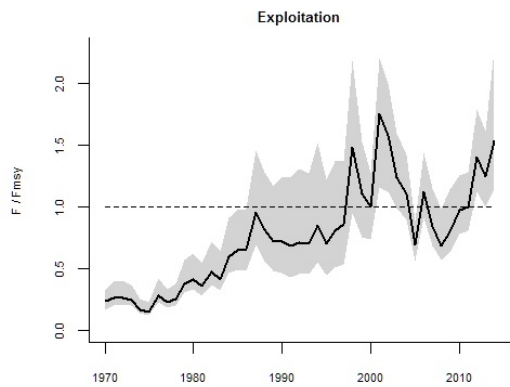
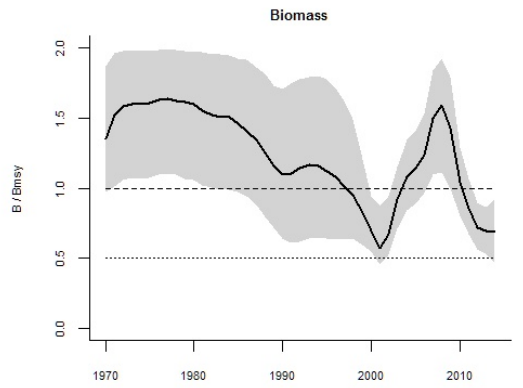
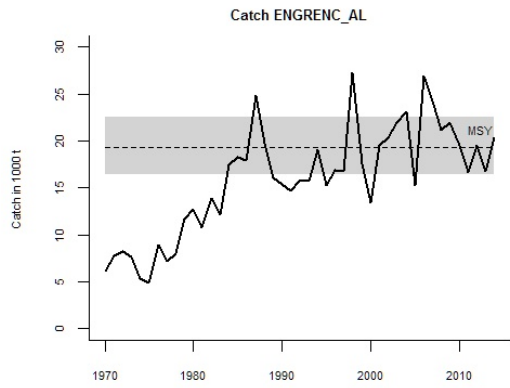
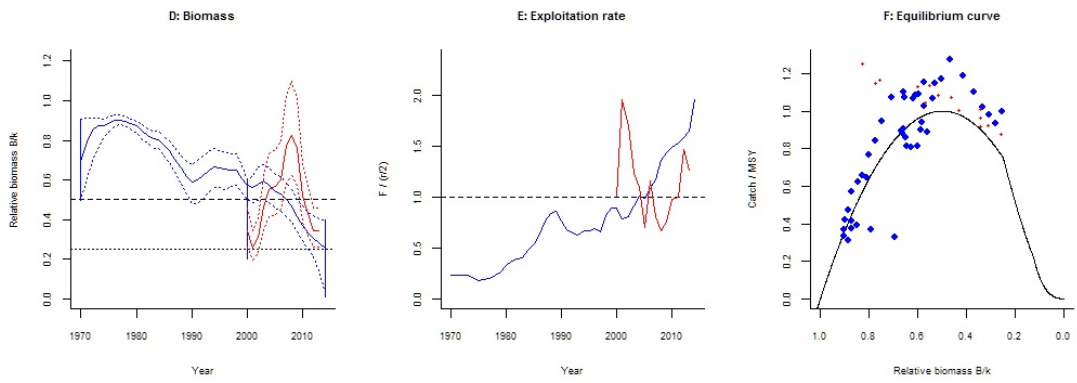
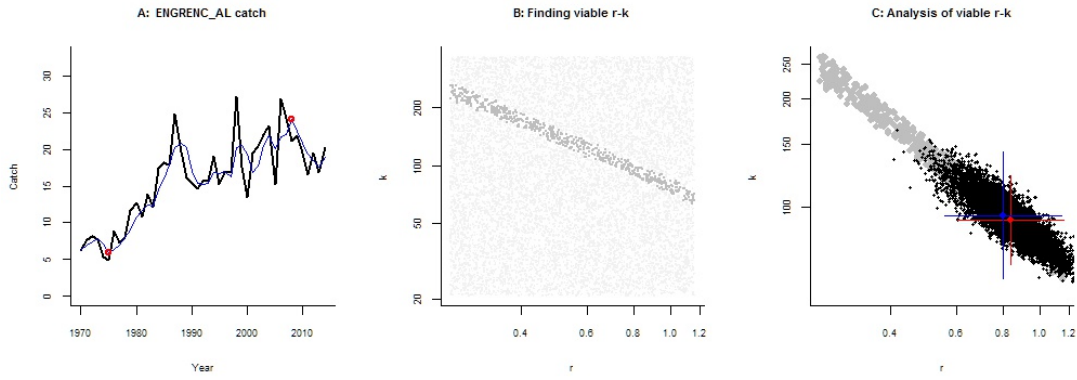
$F/F_{msy}$  = 1.54 , 2.5th perc = 1.15 , 97.5 perc = 2.28

Stock status and exploitation in 2014

Biomass = 31.6 ,  $B/B_{msy}$  = 0.685 , fishing mortality  $F$  = 0.644 ,  $F/F_{msy}$  = 1.54

Comment: Catch=landings from FishStat (Greece+Turkey), Biomass estimates standardized relative to max value; RF OK 04.10.16

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Species: *Epinephelus marginatus* , stock: EPINGUA\_AL

Dusky grouper in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1985 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1999 default

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.11 - 0.57 expert, , prior range for  $k$  = 0.287 - 5.94

Results of CMSY analysis with altogether 2893 viable trajectories for 1996 r-k pairs

$r$  = 0.343 , 95% CL = 0.234 - 0.502 ,  $k$  = 0.959 , 95% CL = 0.579 - 1.59

MSY = 0.0822 , 95% CL = 0.062 - 0.109

Relative biomass last year = 0.165  $k$ , 2.5th = 0.0201 , 97.5th = 0.298

Exploitation  $F/(r/2)$  in last year = 1.74

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.172 , 95% CL = 0.117 - 0.251 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.113 , 95% CL = 0.0775 - 0.166 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.0822 , 95% CL = 0.062 - 0.109

$B_{msy}$  = 0.479 , 95% CL = 0.289 - 0.794

Biomass in last year = 0.158 , 2.5th perc = 0.0193 , 97.5 perc = 0.286

$B/B_{msy}$  in last year = 0.331 , 2.5th perc = 0.0402 , 97.5 perc = 0.596

Fishing mortality in last year = 0.309 , 2.5th perc = 0.171 , 97.5 perc = 2.54

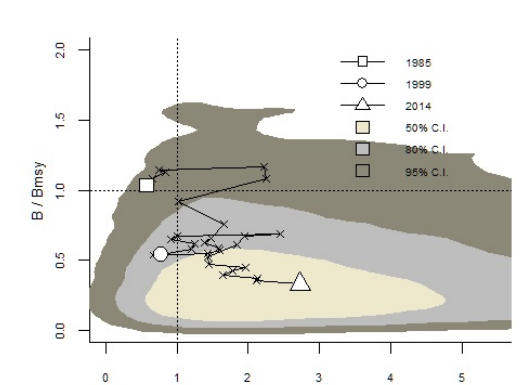
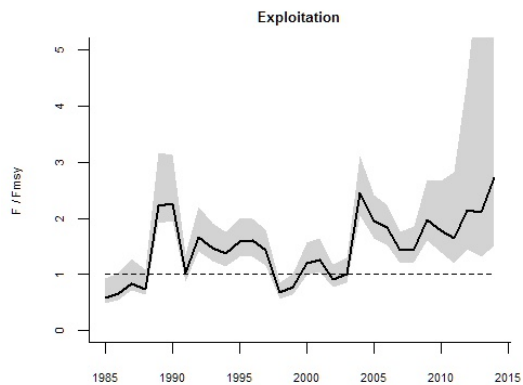
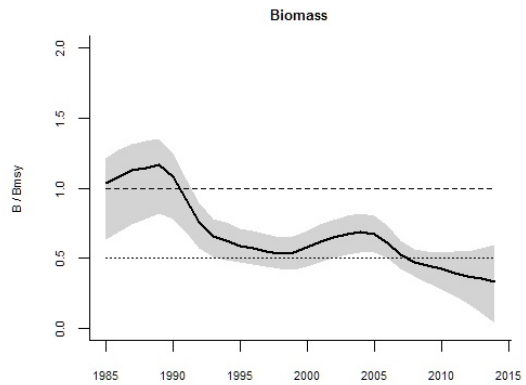
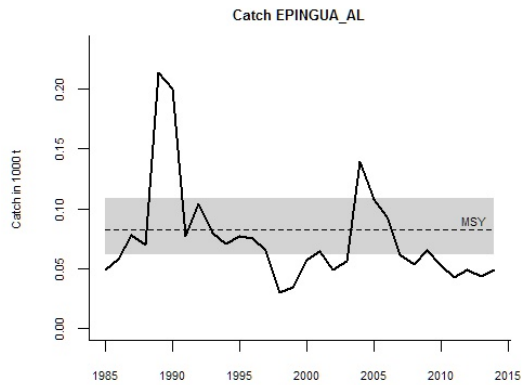
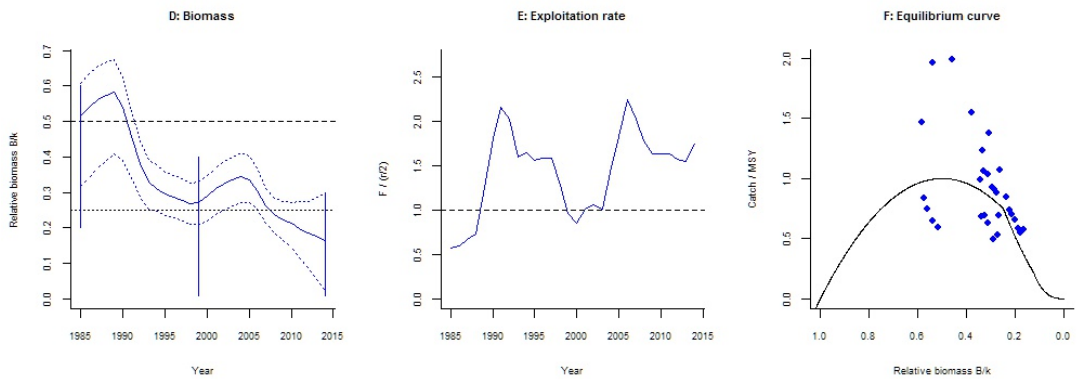
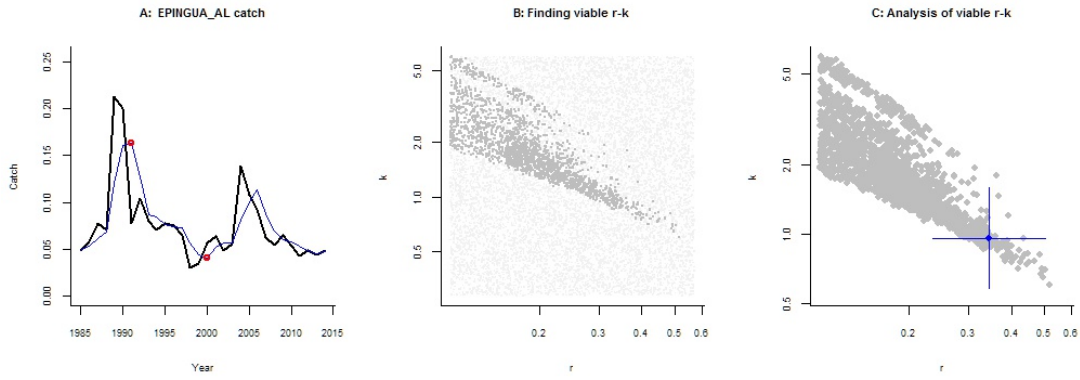
$F/F_{msy}$  = 2.73 , 2.5th perc = 1.51 , 97.5 perc = 22.4

Stock status and exploitation in 2014

Biomass = 0.158 ,  $B/B_{msy}$  = 0.331 , fishing mortality  $F$  = 0.309 ,  $F/F_{msy}$  = 2.73

Comment: Catch=landings from FishStat (Greece). RF final 0.3; OK 04.10.16

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Species: *Illex coindetii* , stock: ILLECOI\_AL

Shortfin squid in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1990 - 2014 , 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 = 0.2 - 0.6 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 1.52 - 24.3

Prior range of  $q$  = 1.09 - 4.36

Results of CMSY analysis with altogether 3365 viable trajectories for 1465 r-k pairs

$r$  = 0.566 , 95% CL = 0.407 - 0.785 ,  $k$  = 6.83 , 95% CL = 4.44 - 10.5

MSY = 0.966 , 95% CL = 0.79 - 1.18

Relative biomass last year = 0.414  $k$ , 2.5th = 0.211 , 97.5th = 0.586

Exploitation  $F/(r/2)$  in last year = 1.52

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.658 , 95% CL = 0.444 - 0.974 ,  $k$  = 5.97 , 95% CL = 4.36 - 8.16

MSY = 0.982 , 95% CL = 0.785 - 1.23

Relative biomass in last year = 0.519  $k$ , 2.5th perc = 0.287 , 97.5th perc = 0.678

Exploitation  $F/(r/2)$  in last year = 0.997

$q$  = 1.59 , lcl = 1.2 , ucl = 2.1

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.283 , 95% CL = 0.204 - 0.392 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.283 , 95% CL = 0.204 - 0.392 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.966 , 95% CL = 0.79 - 1.18

$B_{msy}$  = 3.42 , 95% CL = 2.22 - 5.26

Biomass in last year = 2.83 , 2.5th perc = 1.44 , 97.5 perc = 4.01

$B/B_{msy}$  in last year = 0.827 , 2.5th perc = 0.423 , 97.5 perc = 1.17

Fishing mortality in last year = 0.359 , 2.5th perc = 0.253 , 97.5 perc = 0.703

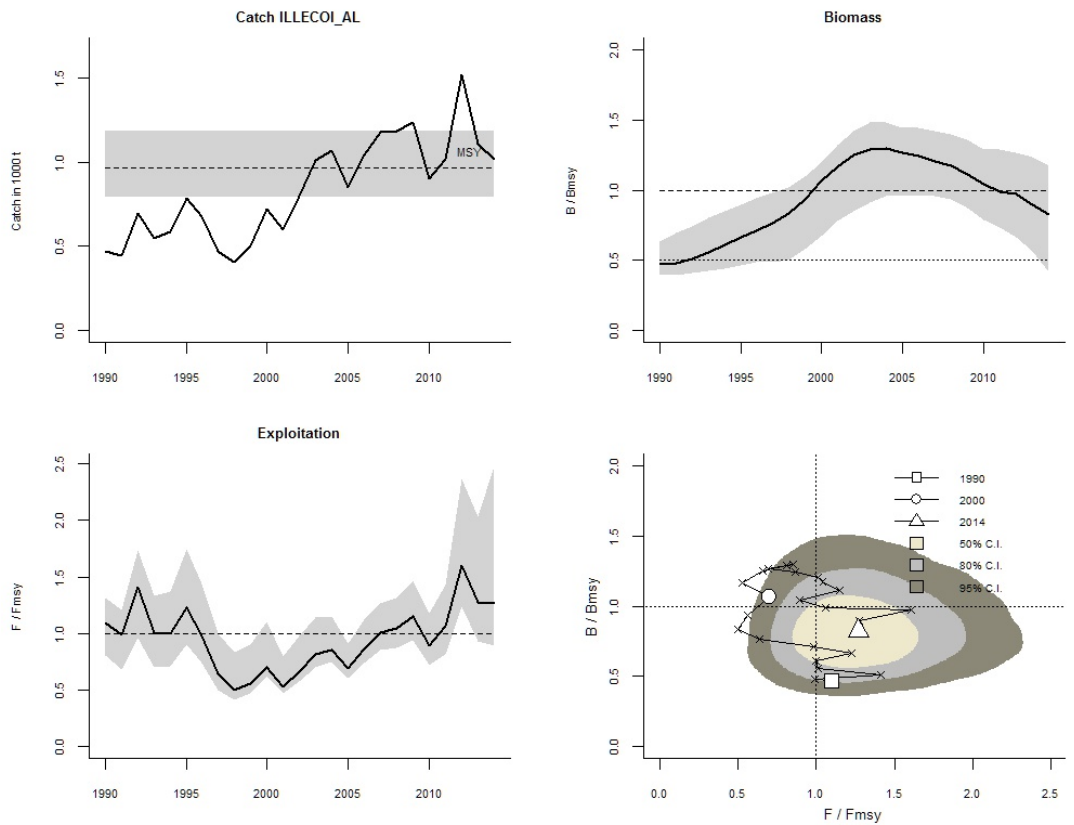
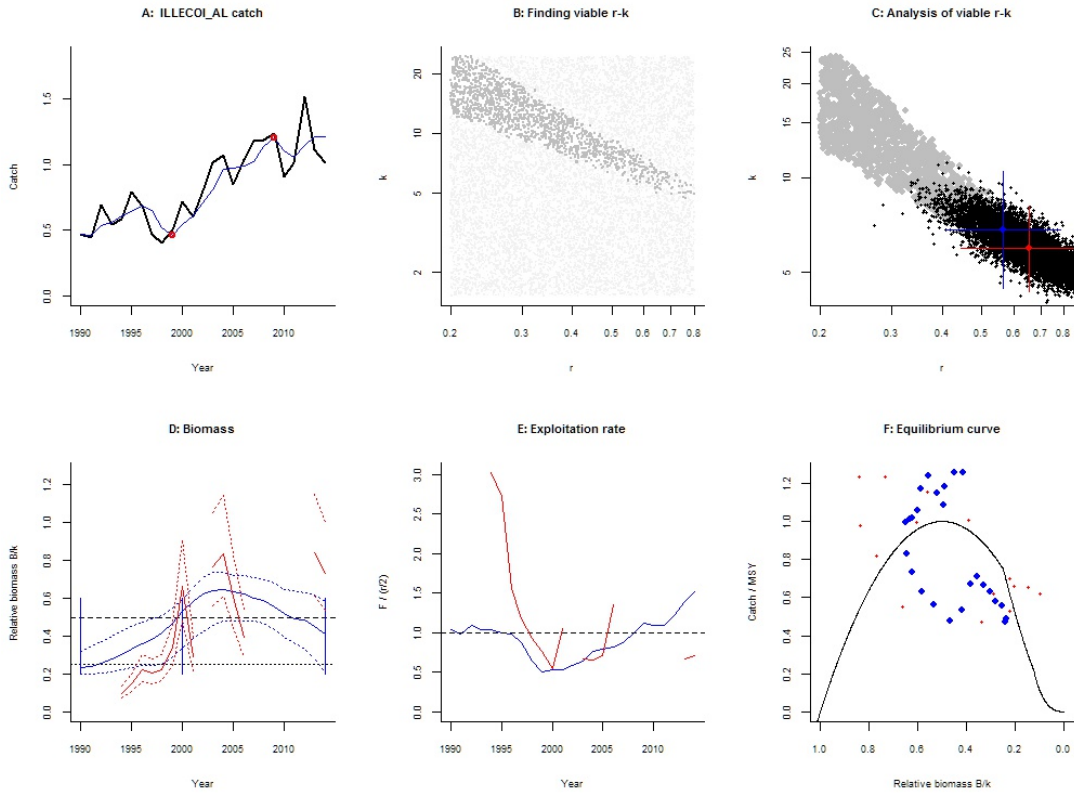
$F/F_{msy}$  = 1.27 , 2.5th perc = 0.896 , 97.5 perc = 2.49

Stock status and exploitation in 2014

Biomass = 2.83 ,  $B/B_{msy}$  = 0.827 , fishing mortality  $F$  = 0.359 ,  $F/F_{msy}$  = 1.27

Comment: Catch=landings from FishStat (Greece), Biomass estimates standardized relative to max value; RF OK 04.10.16

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Species: *Loligo vulgaris* , stock: LOLIVUL\_AL

European squid in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1980 - 2014 , 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  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 1.37 - 22

Prior range of  $q$  = 0.256 - 1.03

Results of CMSY analysis with altogether 3835 viable trajectories for 2178 r-k pairs

$r$  = 0.458 , 95% CL = 0.336 - 0.625 ,  $k$  = 5.3 , 95% CL = 3.86 - 7.28

MSY = 0.607 , 95% CL = 0.544 - 0.678

Relative biomass last year = 0.314  $k$  , 2.5th = 0.0361 , 97.5th = 0.397

Exploitation  $F/(r/2)$  in last year = 1.55

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.442 , 95% CL = 0.321 - 0.609 ,  $k$  = 5.57 , 95% CL = 4.24 - 7.32

MSY = 0.615 , 95% CL = 0.542 - 0.697

Relative biomass in last year = 0.283  $k$  , 2.5th perc = 0.143 , 97.5th perc = 0.44

Exploitation  $F/(r/2)$  in last year = 1.42

$q$  = 0.421 , lcl = 0.318 , ucl = 0.558

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.229 , 95% CL = 0.168 - 0.313 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.229 , 95% CL = 0.168 - 0.313 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.607 , 95% CL = 0.544 - 0.678

$B_{msy}$  = 2.65 , 95% CL = 1.93 - 3.64

Biomass in last year = 1.66 , 2.5th perc = 0.191 , 97.5 perc = 2.1

$B/B_{msy}$  in last year = 0.628 , 2.5th perc = 0.0722 , 97.5 perc = 0.795

Fishing mortality in last year = 0.297 , 2.5th perc = 0.235 , 97.5 perc = 2.58

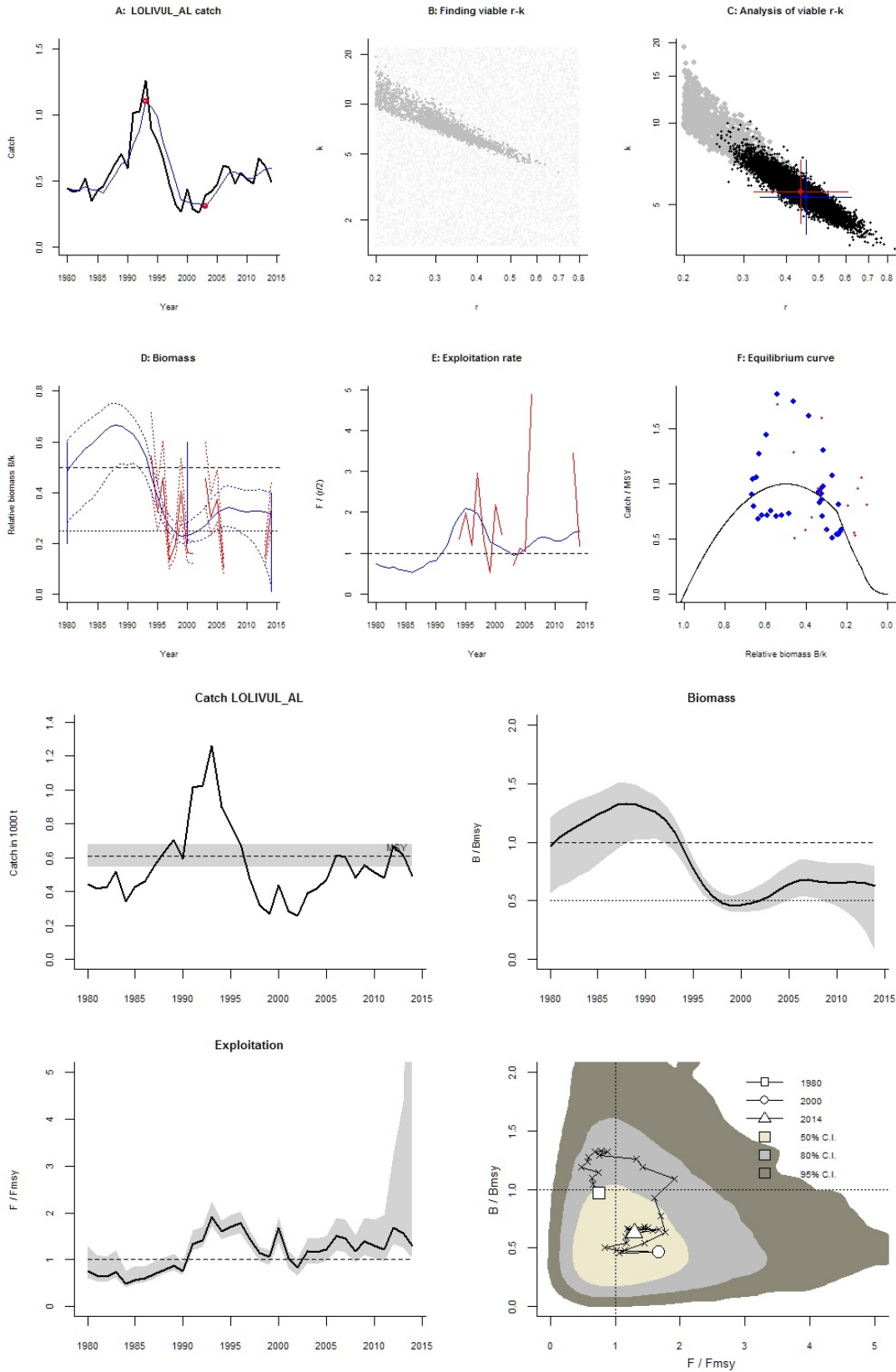
$F/F_{msy}$  = 1.29 , 2.5th perc = 1.02 , 97.5 perc = 11.3

Stock status and exploitation in 2014

Biomass = 1.66 ,  $B/B_{msy}$  = 0.628 , fishing mortality  $F$  = 0.297 ,  $F/F_{msy}$  = 1.29

Comment: Catch=landings from FishStat (Greece), Biomass estimates standardized relative to max value. RF OK 04.10.16

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Species: *Lophius budegassa* , stock: LOPHBUD\_AL

Blackbellied angler in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1982 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.2 - 0.6 in year 1995 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.2 - 0.54 expert, , prior range for  $k$  = 2.28 - 24.7

Prior range of  $q$  = 0.609 - 2

Results of CMSY analysis with altogether 1883 viable trajectories for 1043 r-k pairs

$r$  = 0.419 , 95% CL = 0.332 - 0.529 ,  $k$  = 7.88 , 95% CL = 5.79 - 10.7

MSY = 0.826 , 95% CL = 0.711 - 0.959

Relative biomass last year = 0.246  $k$ , 2.5th = 0.0267 , 97.5th = 0.388

Exploitation  $F/(r/2)$  in last year = 1.65

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.437 , 95% CL = 0.321 - 0.595 ,  $k$  = 7.66 , 95% CL = 5.8 - 10.1

MSY = 0.837 , 95% CL = 0.704 - 0.995

Relative biomass in last year = 0.302  $k$ , 2.5th perc = 0.211 , 97.5th perc = 0.415

Exploitation  $F/(r/2)$  in last year = 1.1

$q$  = 0.905 , lcl = 0.722 , ucl = 1.13

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.209 , 95% CL = 0.166 - 0.264 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.206 , 95% CL = 0.163 - 0.26 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.826 , 95% CL = 0.711 - 0.959

$B_{msy}$  = 3.94 , 95% CL = 2.89 - 5.37

Biomass in last year = 1.94 , 2.5th perc = 0.21 , 97.5 perc = 3.06

$B/B_{msy}$  in last year = 0.492 , 2.5th perc = 0.0534 , 97.5 perc = 0.776

Fishing mortality in last year = 0.287 , 2.5th perc = 0.182 , 97.5 perc = 2.65

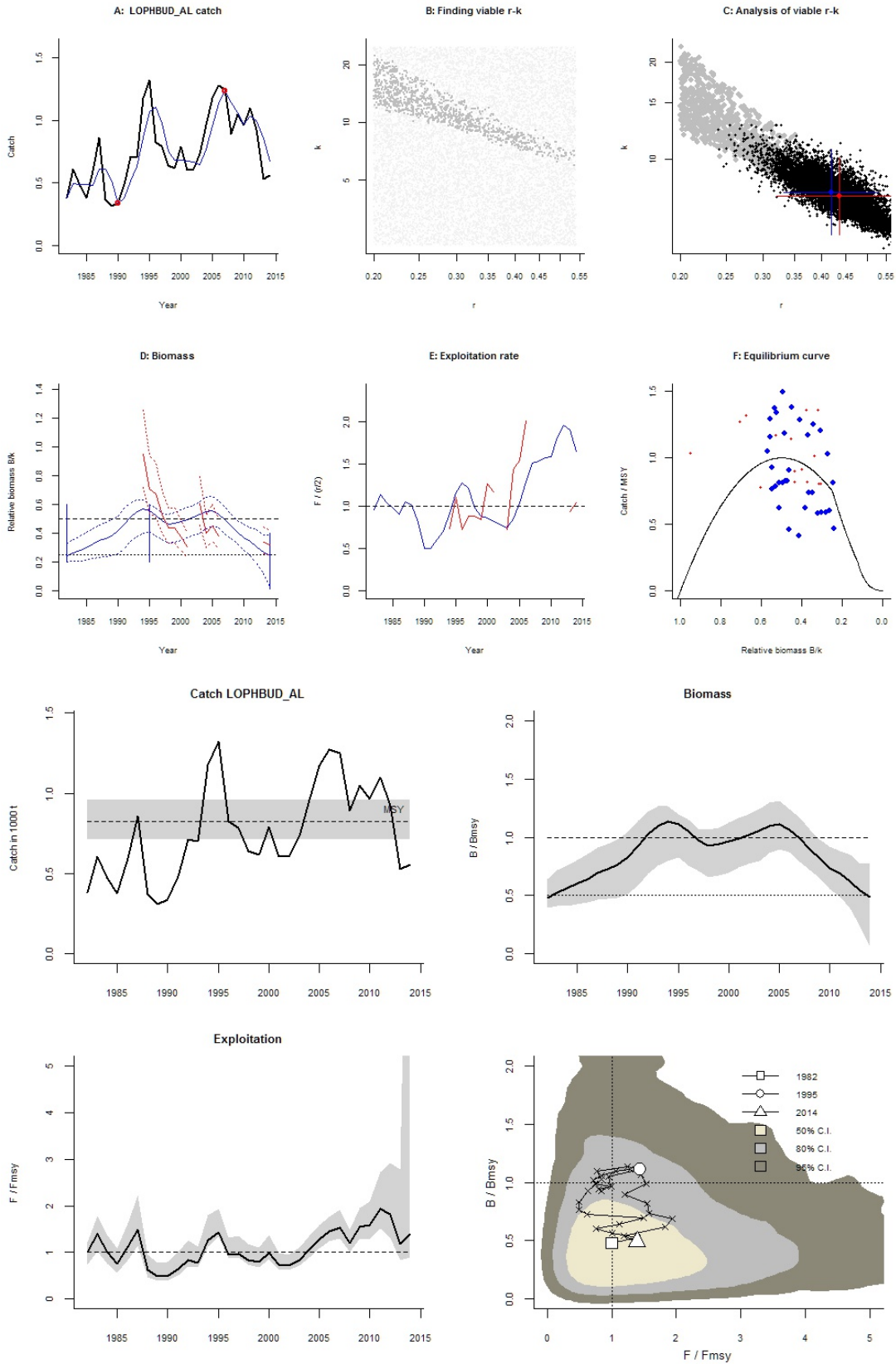
$F/F_{msy}$  = 1.39 , 2.5th perc = 0.884 , 97.5 perc = 12.8

Stock status and exploitation in 2014

Biomass = 1.94 ,  $B/B_{msy}$  = 0.492 , fishing mortality  $F$  = 0.287 ,  $F/F_{msy}$  = 1.39

Comment: Catch=landings from FishStat (Greece), Biomass estimates standardized relative to max value; RF OK 04.10.16

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Species: *Merluccius merluccius* , stock: MERLMER\_AL

Hake in Aegean Sea

Source: excel

Region: Mediterranean , Aegean Sea

Catch data used from years 1980 - 2014 , 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  $r$  = 0.22 - 0.95 expert, , prior range for  $k$  = 4.32 - 74.7

Prior range of  $q$  = 0.346 - 1.44

Results of CMSY analysis with altogether 2589 viable trajectories for 1486 r-k pairs

$r$  = 0.66 , 95% CL = 0.467 - 0.934 ,  $k$  = 19.4 , 95% CL = 13.1 - 28.6

MSY = 3.2 , 95% CL = 2.93 - 3.49

Relative biomass last year = 0.26  $k$ , 2.5th = 0.0334 , 97.5th = 0.393

Exploitation  $F/(r/2)$  in last year = 1.97

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.719 , 95% CL = 0.523 - 0.988 ,  $k$  = 18.2 , 95% CL = 13.4 - 24.6

MSY = 3.26 , 95% CL = 3.02 - 3.53

Relative biomass in last year = 0.354  $k$ , 2.5th perc = 0.252 , 97.5th perc = 0.443

Exploitation  $F/(r/2)$  in last year = 1.13

$q$  = 0.573 , lcl = 0.442 , ucl = 0.743

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.33 , 95% CL = 0.233 - 0.467 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.33 , 95% CL = 0.233 - 0.467 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 3.2 , 95% CL = 2.93 - 3.49

$B_{msy}$  = 9.68 , 95% CL = 6.54 - 14.3

Biomass in last year = 5.04 , 2.5th perc = 0.647 , 97.5 perc = 7.61

$B/B_{msy}$  in last year = 0.521 , 2.5th perc = 0.0669 , 97.5 perc = 0.786

Fishing mortality in last year = 0.518 , 2.5th perc = 0.343 , 97.5 perc = 4.03

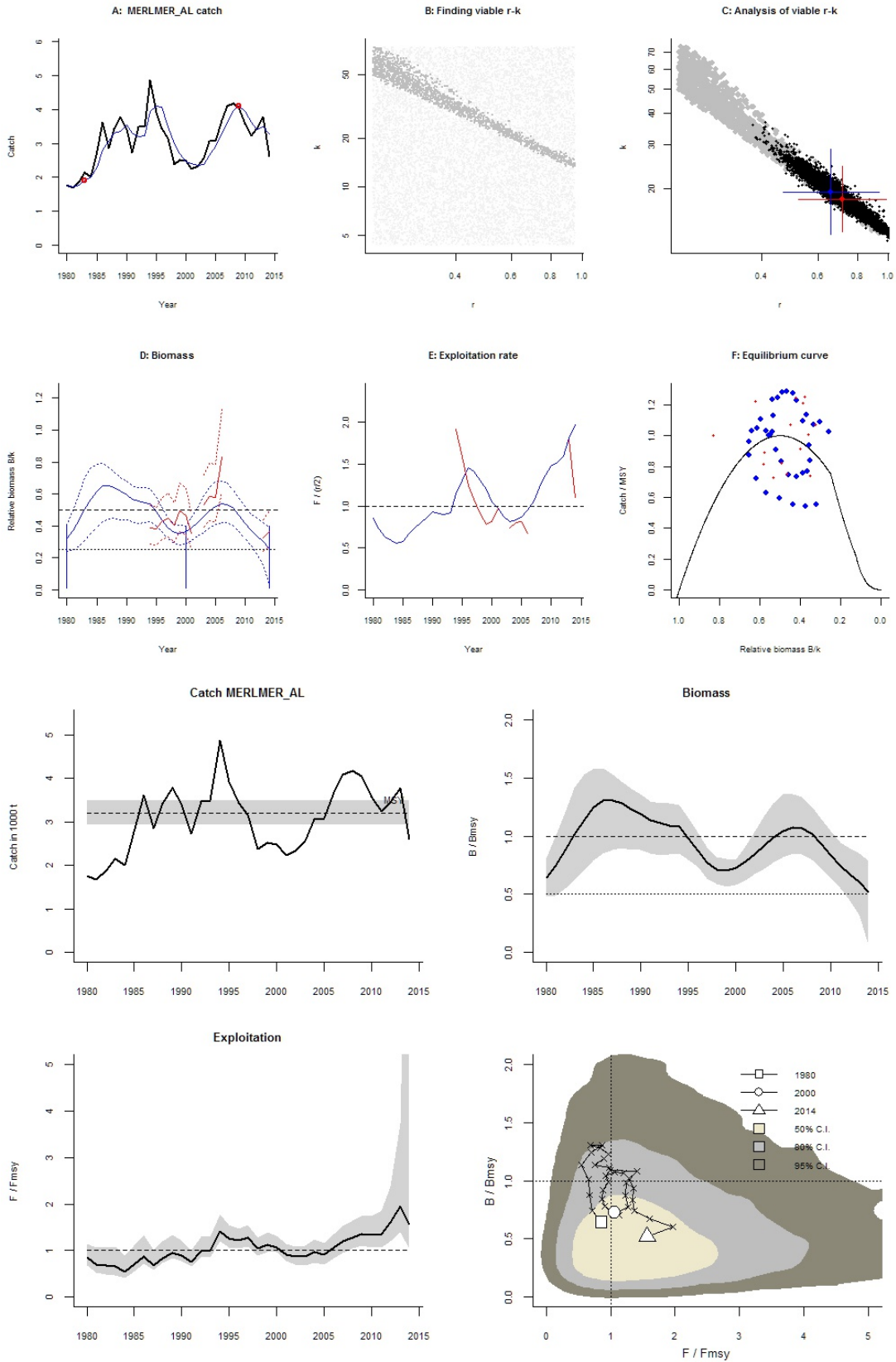
$F/F_{msy}$  = 1.57 , 2.5th perc = 1.04 , 97.5 perc = 12.2

Stock status and exploitation in 2014

Biomass = 5.04 ,  $B/B_{msy}$  = 0.521 , fishing mortality  $F$  = 0.518 ,  $F/F_{msy}$  = 1.57

Comment: Catch=landings from FishStat (Greece), Biomass estimates standardized relative to max value. OK RF 04.10.16

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Species: *Micromesistius poutassou* , stock: MICMPOU\_AL

Blue whiting in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1985 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.3 in year 1996 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.21 - 1.1 expert, , prior range for  $k$  = 1.68 - 35

Prior range of  $q$  = 2.73 - 12.4

Results of CMSY analysis with altogether 1698 viable trajectories for 1575 r-k pairs

$r$  = 0.44 , 95% CL = 0.299 - 0.649 ,  $k$  = 12 , 95% CL = 8.08 - 17.9

MSY = 1.32 , 95% CL = 0.969 - 1.81

Relative biomass last year = 0.14  $k$ , 2.5th = 0.0153 , 97.5th = 0.284

Exploitation  $F/(r/2)$  in last year = 1.96

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.492 , 95% CL = 0.336 - 0.72 ,  $k$  = 9.7 , 95% CL = 6.9 - 13.6

MSY = 1.19 , 95% CL = 1.03 - 1.38

Relative biomass in last year = 0.134  $k$ , 2.5th perc = 0.0732 , 97.5th perc = 0.312

Exploitation  $F/(r/2)$  in last year = 1.64

$q$  = 4.37 , lcl = 3.19 , ucl = 5.99

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.22 , 95% CL = 0.149 - 0.324 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.124 , 95% CL = 0.084 - 0.182 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.32 , 95% CL = 0.969 - 1.81

$B_{msy}$  = 6.01 , 95% CL = 4.04 - 8.94

Biomass in last year = 1.69 , 2.5th perc = 0.184 , 97.5 perc = 3.42

$B/B_{msy}$  in last year = 0.281 , 2.5th perc = 0.0306 , 97.5 perc = 0.568

Fishing mortality in last year = 0.31 , 2.5th perc = 0.153 , 97.5 perc = 2.84

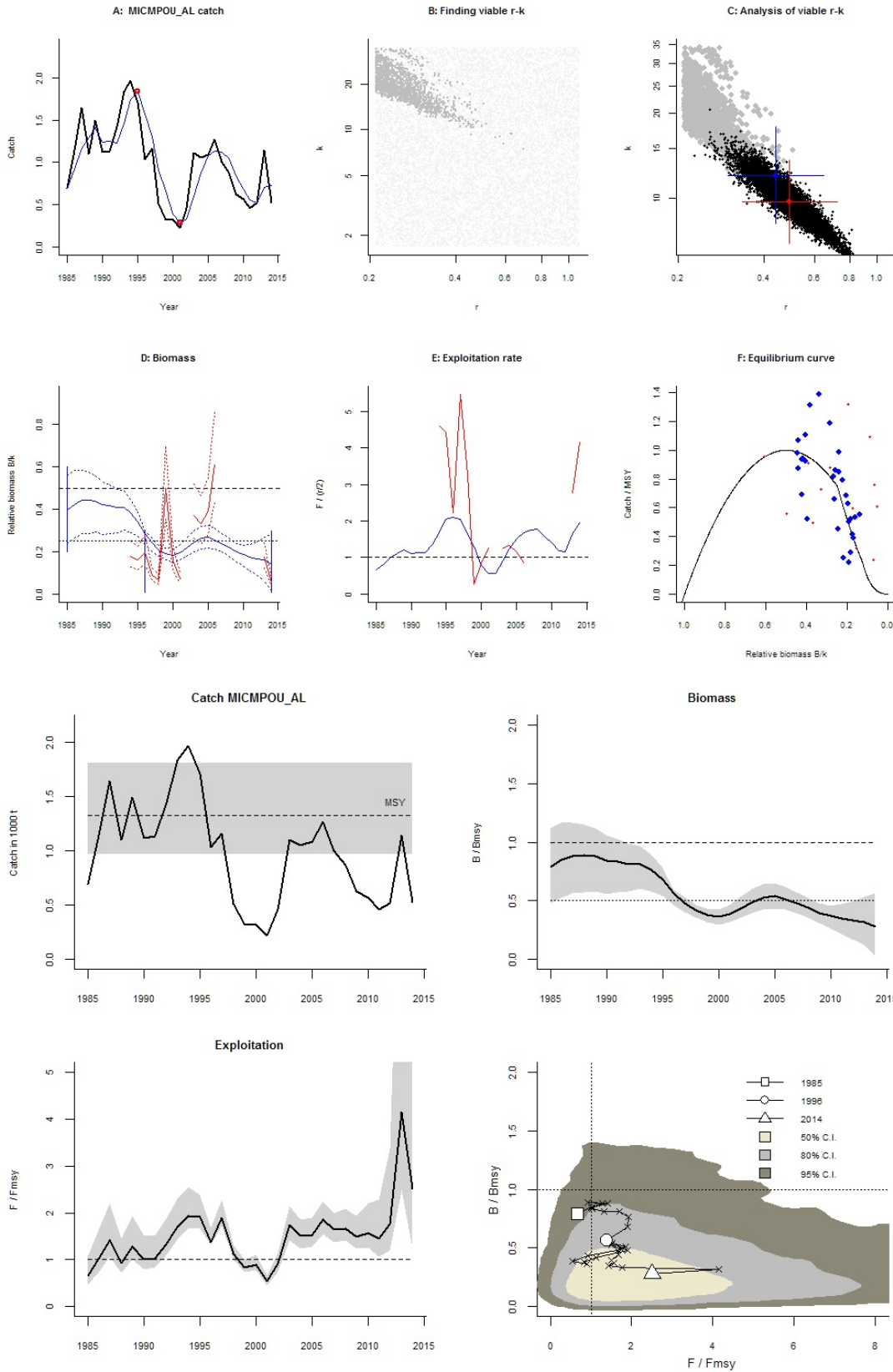
$F/F_{msy}$  = 2.51 , 2.5th perc = 1.24 , 97.5 perc = 23

Stock status and exploitation in 2014

Biomass = 1.69 ,  $B/B_{msy}$  = 0.281 , fishing mortality  $F$  = 0.31 ,  $F/F_{msy}$  = 2.51

Comment: Catch=landings from FishStat (Greece), Biomass estimates standardized relative to max value. RF final 0.3; OK 04.10.16

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Species: *Mullus barbatus* , stock: MULLBAR\_AL

Red mullet in Aegean Sea

Source: excel

Region: Mediterranean , Aegean Sea

Catch data used from years 1985 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.01 - 0.4 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert

Prior final relative biomass = 0.01 - 0.2 expert

Prior range for  $r$  = 0.22 - 1.2 expert, , prior range for  $k$  = 3.34 - 75.9

Prior range of  $q$  = 0.605 - 2.88

Results of CMSY analysis with altogether 644 viable trajectories for 627 r-k pairs

$r$  = 0.434 , 95% CL = 0.267 - 0.706 ,  $k$  = 32.1 , 95% CL = 20.9 - 49.4

MSY = 3.49 , 95% CL = 2.29 - 5.32

Relative biomass last year = 0.101  $k$ , 2.5th = 0.0163 , 97.5th = 0.195

Exploitation  $F/(r/2)$  in last year = 2.8

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.526 , 95% CL = 0.367 - 0.754 ,  $k$  = 24.3 , 95% CL = 16.9 - 34.9

MSY = 3.2 , 95% CL = 2.55 - 4.01

Relative biomass in last year = 0.195  $k$ , 2.5th perc = 0.112 , 97.5th perc = 0.252

Exploitation  $F/(r/2)$  in last year = 1.54

$q$  = 0.993 , lcl = 0.722 , ucl = 1.36

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.263 , 95% CL = 0.183 - 0.377 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.205 , 95% CL = 0.143 - 0.294 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 3.2 , 95% CL = 2.55 - 4.01

$B_{msy}$  = 12.2 , 95% CL = 8.46 - 17.5

Biomass in last year = 4.75 , 2.5th perc = 2.72 , 97.5 perc = 6.14

$B/B_{msy}$  in last year = 0.39 , 2.5th perc = 0.224 , 97.5 perc = 0.505

Fishing mortality in last year = 0.404 , 2.5th perc = 0.313 , 97.5 perc = 0.705

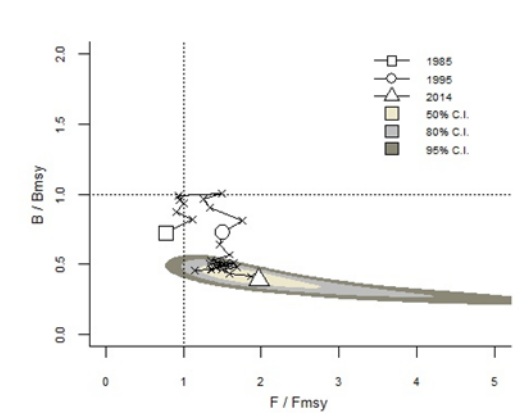
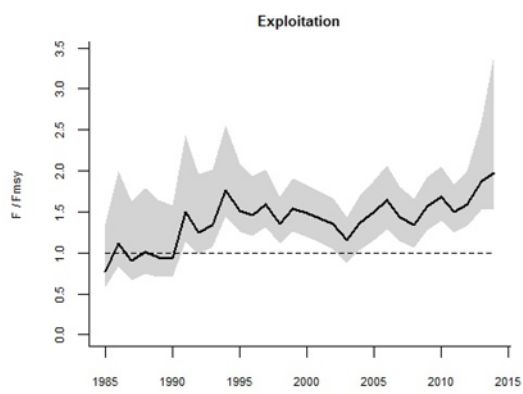
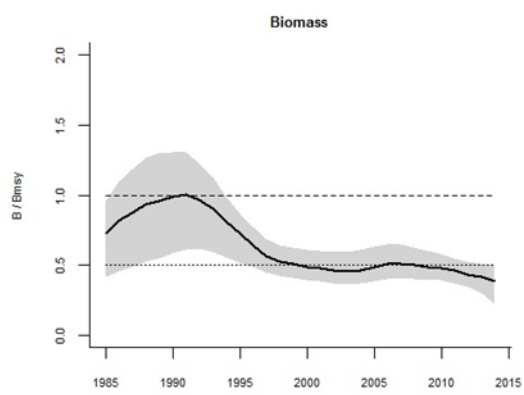
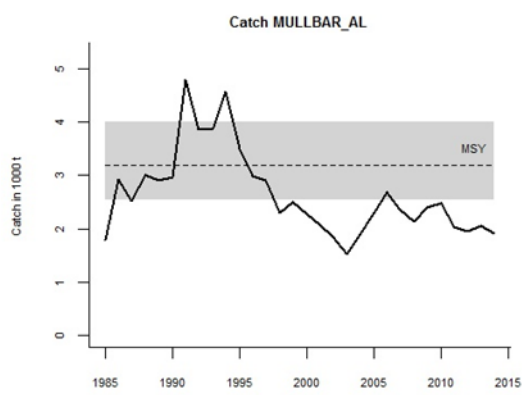
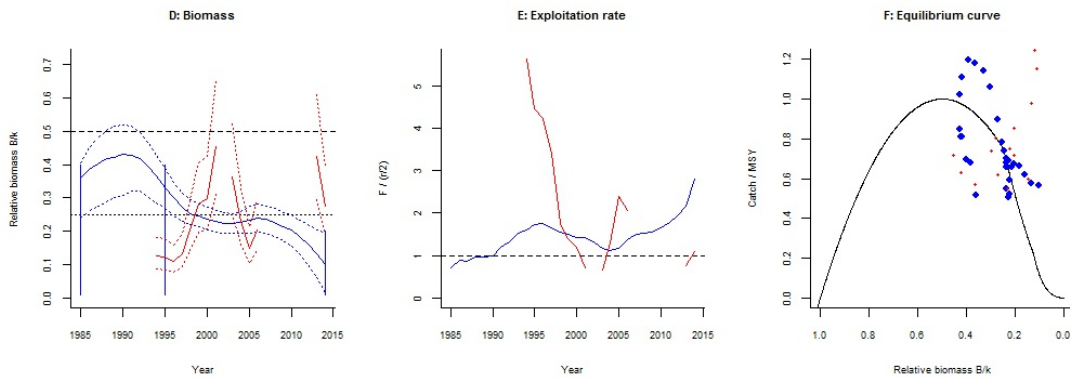
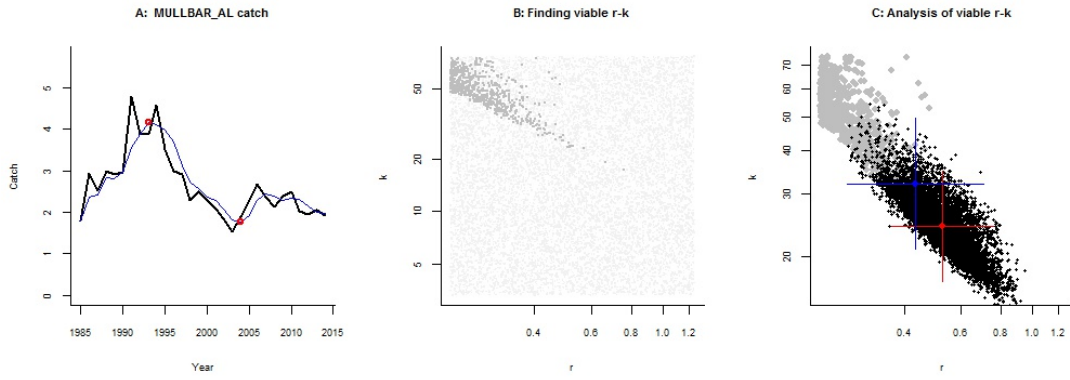
$F/F_{msy}$  = 1.97 , 2.5th perc = 1.52 , 97.5 perc = 3.43

Stock status and exploitation in 2014

Biomass = 4.75 ,  $B/B_{msy}$  = 0.39 , fishing mortality  $F$  = 0.404 ,  $F/F_{msy}$  = 1.97

Comment: Catch=landings from FishStat (Greece+Turkey), Biomass estimates standardized relative to max value. RF OK 04.10.16

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Species: *Mullus surmuletus* , stock: MULLSUR\_AL

Surmulet in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1985 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.46 - 1.6 expert, , prior range for  $k$  = 1.8 - 24.8

Prior range of  $q$  = 0.588 - 2.18

Results of CMSY analysis with altogether 194 viable trajectories for 189 r-k pairs

$r = 0.674$  , 95% CL = 0.393 - 1.15 ,  $k = 12.4$  , 95% CL = 10.1 - 15.3

MSY = 2.09 , 95% CL = 1.82 - 2.41

Relative biomass last year = 0.224  $k$  , 2.5th = 0.0523 , 97.5th = 0.297

Exploitation  $F/(r/2)$  in last year = 1.61

Results from Bayesian Schaefer model using catch & CPUE

$r = 0.833$  , 95% CL = 0.642 - 1.08 ,  $k = 10.3$  , 95% CL = 7.99 - 13.3

MSY = 2.14 , 95% CL = 1.94 - 2.37

Relative biomass in last year = 0.27  $k$  , 2.5th perc = 0.158 , 97.5th perc = 0.354

Exploitation  $F/(r/2)$  in last year = 1.28

$q = 0.866$  , lcl = 0.672 , ucl = 1.11

Results for Management (based on CMSY analysis)

$F_{msy} = 0.337$  , 95% CL = 0.197 - 0.577 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.302$  , 95% CL = 0.176 - 0.518 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 2.09 , 95% CL = 1.82 - 2.41

$B_{msy} = 6.21$  , 95% CL = 5.06 - 7.63

Biomass in last year = 2.79 , 2.5th perc = 0.649 , 97.5 perc = 3.69

$B/B_{msy}$  in last year = 0.449 , 2.5th perc = 0.105 , 97.5 perc = 0.594

Fishing mortality in last year = 0.529 , 2.5th perc = 0.4 , 97.5 perc = 2.27

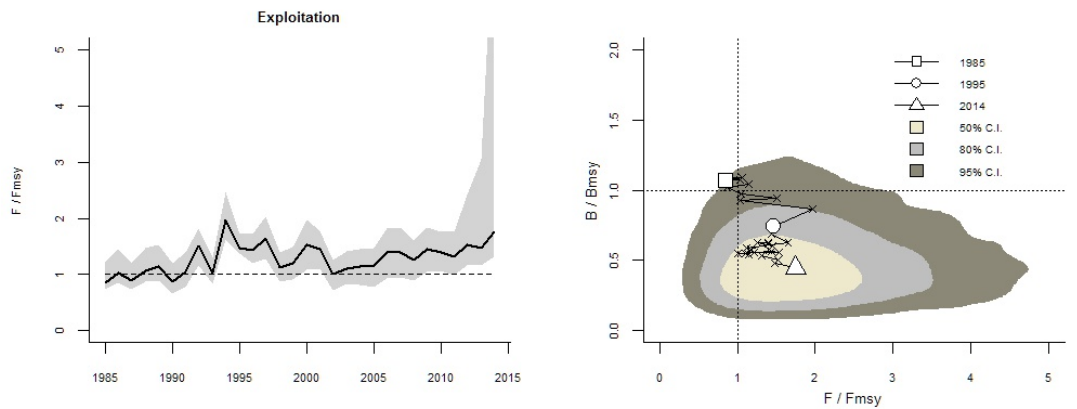
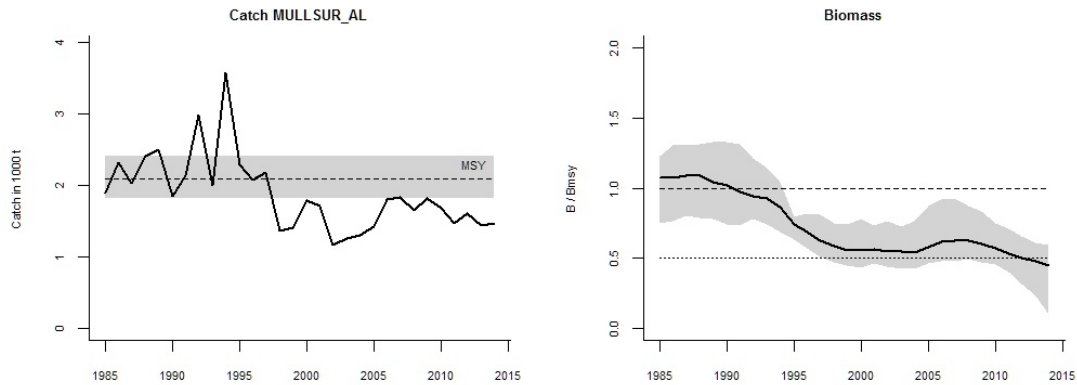
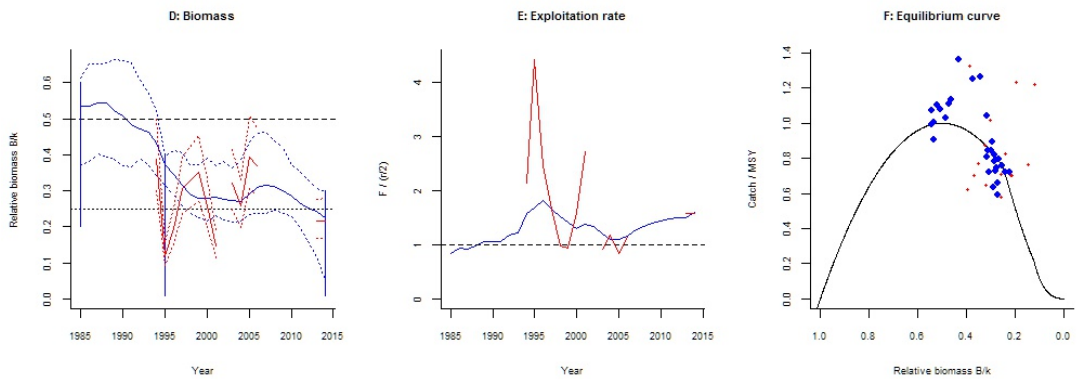
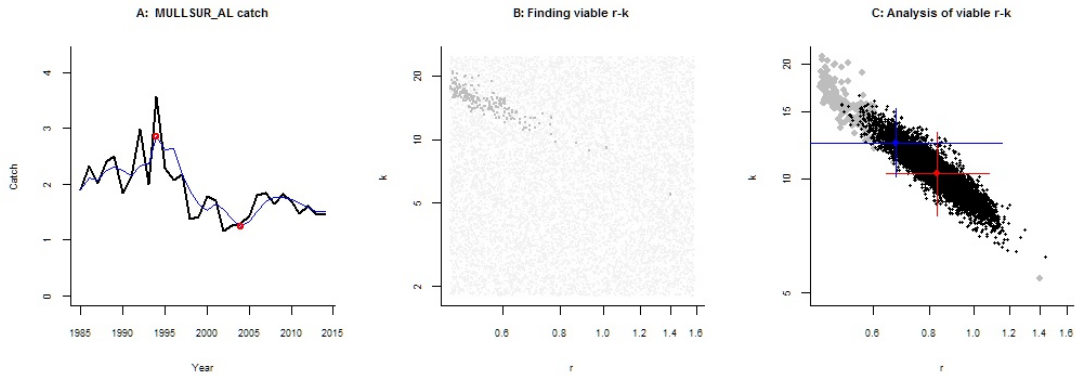
$F/F_{msy} = 1.75$  , 2.5th perc = 1.32 , 97.5 perc = 7.51

Stock status and exploitation in 2014

Biomass = 2.79 ,  $B/B_{msy} = 0.449$  , fishing mortality  $F = 0.529$  ,  $F/F_{msy} = 1.75$

Comment: Catch=landings from FishStat (Greece+Turkey), Biomass estimates standardized relative to max value. RF final 0.3; OK 04.10.16

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Species: *Nephrops norvegicus* , stock: NEPRNOR\_AL  
Norway lobster in Aegean Sea  
Source: excel  
Region: Mediterranean , Aegean Sea  
Catch data used from years 1970 - 2014 , abundance = CPUE  
Prior initial relative biomass = 0.2 - 0.6 expert  
Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert  
Prior final relative biomass = 0.01 - 0.2 expert  
Prior range for r = 0.2 - 0.8 default , prior range for k = 1.68 - 26.9  
Prior range of q = 0.364 - 1.45

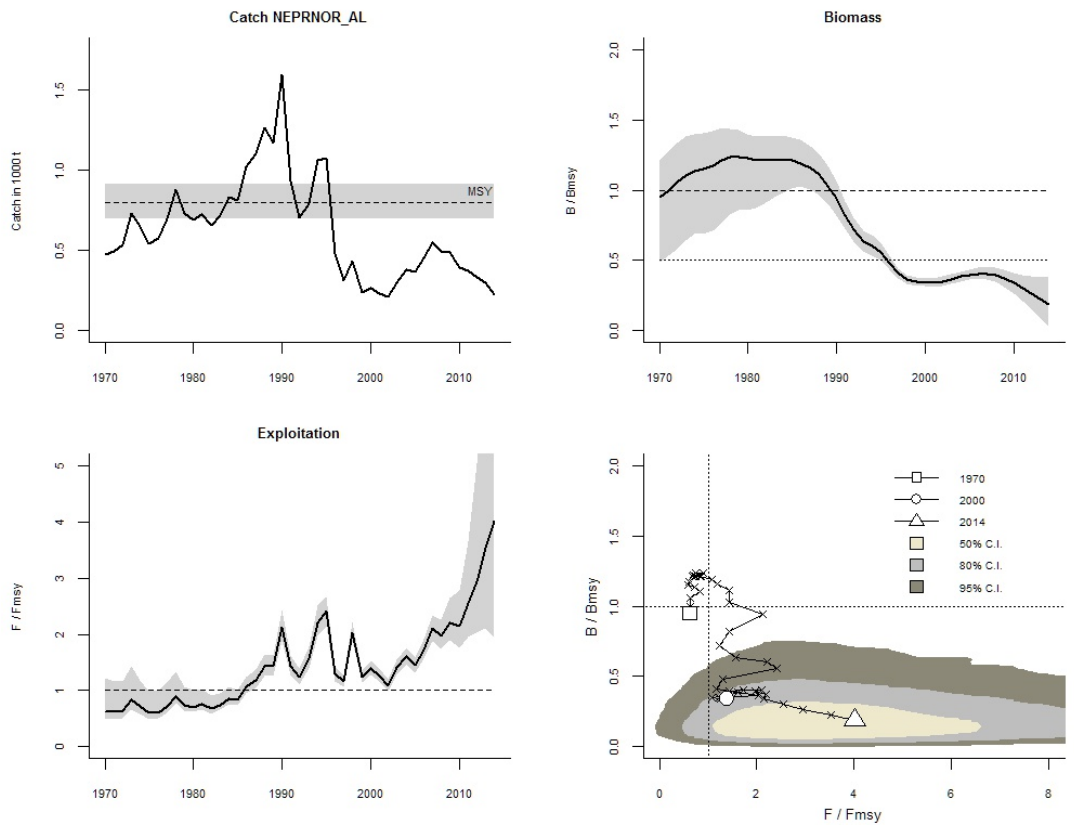
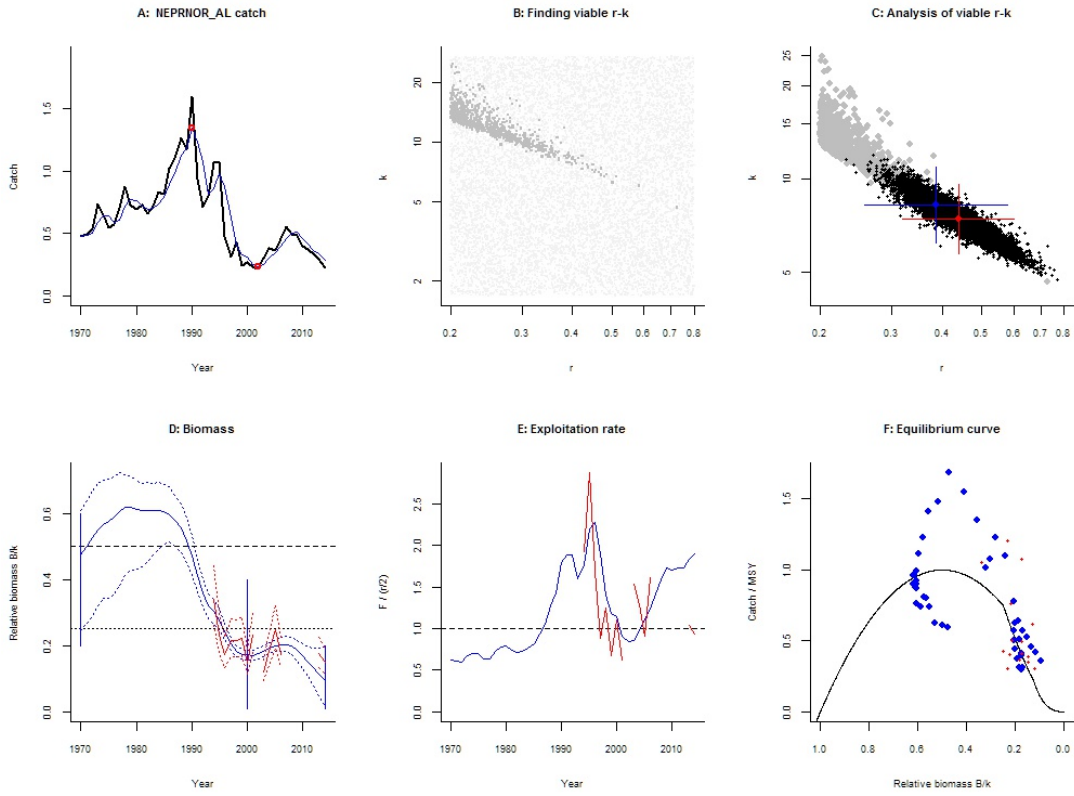
Results of CMSY analysis with altogether 982 viable trajectories for 896 r-k pairs  
r = 0.387 , 95% CL = 0.258 - 0.58 , k = 8.25 , 95% CL = 6.22 - 11  
MSY = 0.798 , 95% CL = 0.698 - 0.913  
Relative biomass last year = 0.0943 k, 2.5th = 0.0176 , 97.5th = 0.196  
Exploitation F/(r/2) in last year = 1.9

Results from Bayesian Schaefer model using catch & CPUE  
r = 0.439 , 95% CL = 0.319 - 0.603 , k = 7.42 , 95% CL = 5.73 - 9.6  
MSY = 0.814 , 95% CL = 0.719 - 0.921  
Relative biomass in last year = 0.155 k, 2.5th perc = 0.102 , 97.5th perc = 0.215  
Exploitation F/(r/2) in last year = 0.902  
q = 0.562 , lcl = 0.429 , ucl = 0.736

Results for Management (based on CMSY analysis)  
Fmsy = 0.193 , 95% CL = 0.129 - 0.29 (if B > 1/2 Bmsy then Fmsy = 0.5 r)  
Fmsy = 0.073 , 95% CL = 0.0487 - 0.109 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)  
MSY = 0.798 , 95% CL = 0.698 - 0.913  
Bmsy = 4.13 , 95% CL = 3.11 - 5.48  
Biomass in last year = 0.778 , 2.5th perc = 0.145 , 97.5 perc = 1.62  
B/Bmsy in last year = 0.189 , 2.5th perc = 0.0351 , 97.5 perc = 0.392  
Fishing mortality in last year = 0.293 , 2.5th perc = 0.141 , 97.5 perc = 1.57  
F/Fmsy = 4.01 , 2.5th perc = 1.93 , 97.5 perc = 21.6

Stock status and exploitation in 2014  
Biomass = 0.778 , B/Bmsy = 0.189 , fishing mortality F = 0.293 , F/Fmsy = 4.01  
Comment: Catch=landings from FishStat (Greece), Biomass estimates standardized relative to max value. RF OK 04.10.16

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Species: *Octopus vulgaris* , stock: OCTOVUL\_AL

Common octopus in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1990 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.01 - 0.4 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.4 - 1 expert, , prior range for  $k$  = 3.6 - 36

Prior range of  $q$  = 0.476 - 1.51

Results of CMSY analysis with altogether 1143 viable trajectories for 1067 r-k pairs

$r$  = 0.703 , 95% CL = 0.506 - 0.976 ,  $k$  = 19.5 , 95% CL = 15 - 25.3

MSY = 3.42 , 95% CL = 2.91 - 4.02

Relative biomass last year = 0.254  $k$ , 2.5th = 0.0191 , 97.5th = 0.392

Exploitation  $F/(r/2)$  in last year = 1.07

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.824 , 95% CL = 0.649 - 1.05 ,  $k$  = 15.8 , 95% CL = 12 - 20.7

MSY = 3.25 , 95% CL = 2.77 - 3.81

Relative biomass in last year = 0.329  $k$ , 2.5th perc = 0.181 , 97.5th perc = 0.455

Exploitation  $F/(r/2)$  in last year = 0.932

$q$  = 0.752 , lcl = 0.597 , ucl = 0.947

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.351 , 95% CL = 0.253 - 0.488 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.351 , 95% CL = 0.253 - 0.488 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 3.42 , 95% CL = 2.91 - 4.02

$B_{msy}$  = 9.73 , 95% CL = 7.49 - 12.6

Biomass in last year = 4.94 , 2.5th perc = 0.371 , 97.5 perc = 7.63

$B/B_{msy}$  in last year = 0.508 , 2.5th perc = 0.0381 , 97.5 perc = 0.784

Fishing mortality in last year = 0.403 , 2.5th perc = 0.261 , 97.5 perc = 5.37

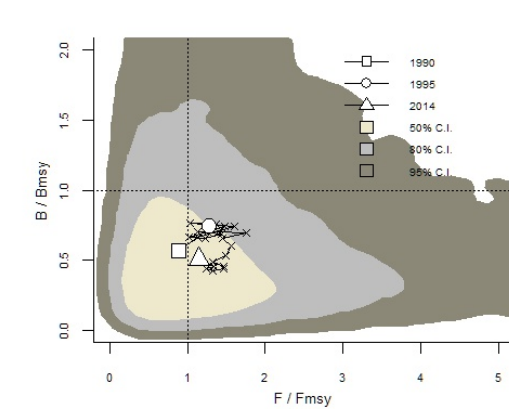
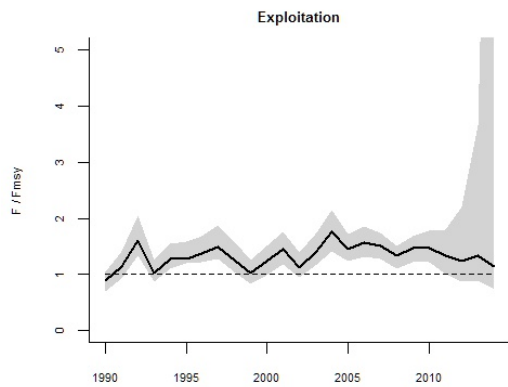
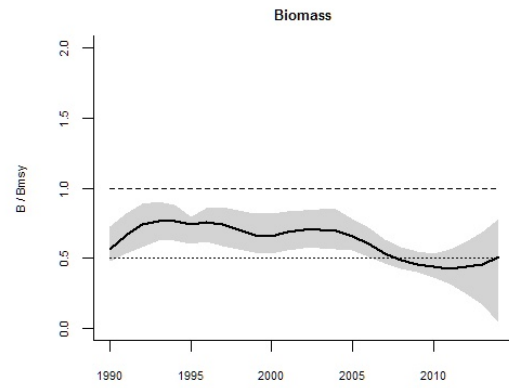
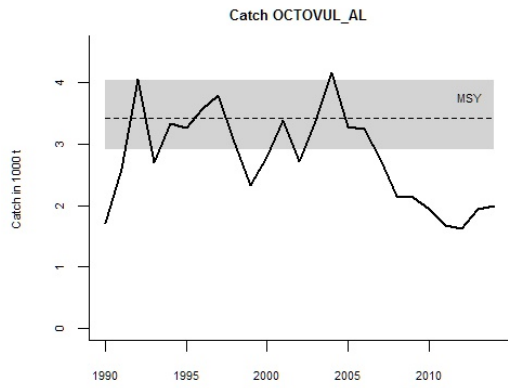
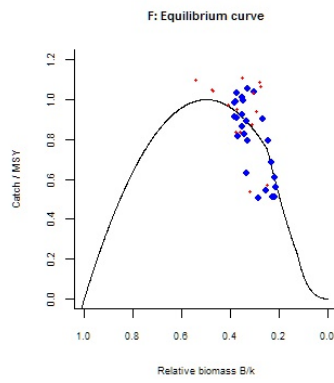
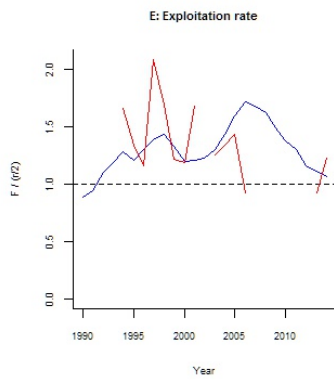
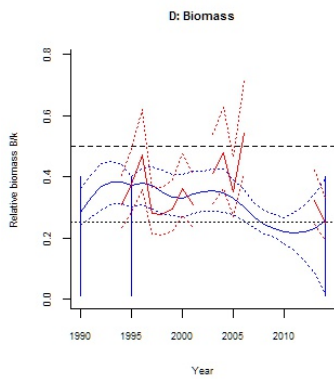
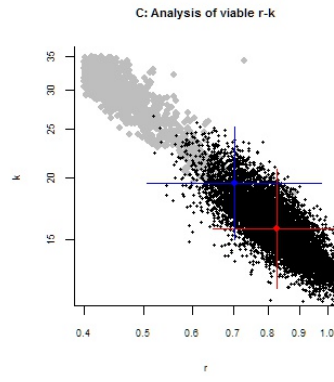
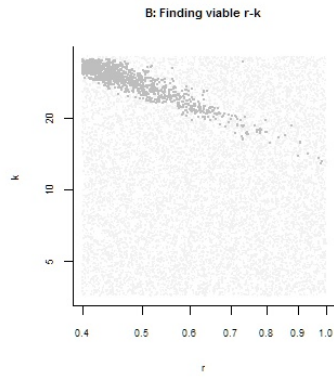
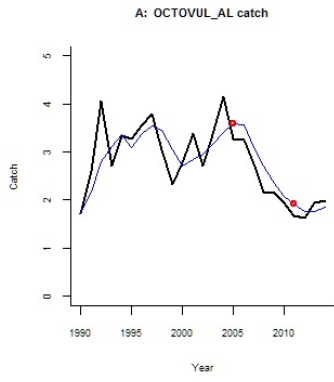
$F/F_{msy}$  = 1.15 , 2.5th perc = 0.743 , 97.5 perc = 15.3

Stock status and exploitation in 2014

Biomass = 4.94 ,  $B/B_{msy}$  = 0.508 , fishing mortality  $F$  = 0.403 ,  $F/F_{msy}$  = 1.15

Comment: Catch=landings from FishStat (Greece+Turkey), Biomass estimates standardized relative to max value. RF OK 04.10.16

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Species: *Pagellus erythrinus* , stock: PAGEERY\_AL

Common pandora in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1970 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.22 - 0.97 expert , , prior range for  $k$  = 0.962 - 17

Prior range of  $q$  = 2.34 - 9.82

Results of CMSY analysis with altogether 1705 viable trajectories for 1369 r-k pairs

$r$  = 0.462 , 95% CL = 0.268 - 0.797 ,  $k$  = 5.62 , 95% CL = 4.2 - 7.5

MSY = 0.648 , 95% CL = 0.583 - 0.721

Relative biomass last year = 0.308  $k$  , 2.5th = 0.0223 , 97.5th = 0.398

Exploitation  $F/(r/2)$  in last year = 1.09

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.473 , 95% CL = 0.34 - 0.657 ,  $k$  = 5.52 , 95% CL = 4.04 - 7.53

MSY = 0.652 , 95% CL = 0.58 - 0.733

Relative biomass in last year = 0.387  $k$  , 2.5th perc = 0.217 , 97.5th perc = 0.493

Exploitation  $F/(r/2)$  in last year = 0.835

$q$  = 3.43 , lcl = 2.49 , ucl = 4.74

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.231 , 95% CL = 0.134 - 0.399 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.231 , 95% CL = 0.134 - 0.399 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.648 , 95% CL = 0.583 - 0.721

$B_{msy}$  = 2.81 , 95% CL = 2.1 - 3.75

Biomass in last year = 1.73 , 2.5th perc = 0.125 , 97.5 perc = 2.23

$B/B_{msy}$  in last year = 0.615 , 2.5th perc = 0.0446 , 97.5 perc = 0.796

Fishing mortality in last year = 0.244 , 2.5th perc = 0.188 , 97.5 perc = 3.37

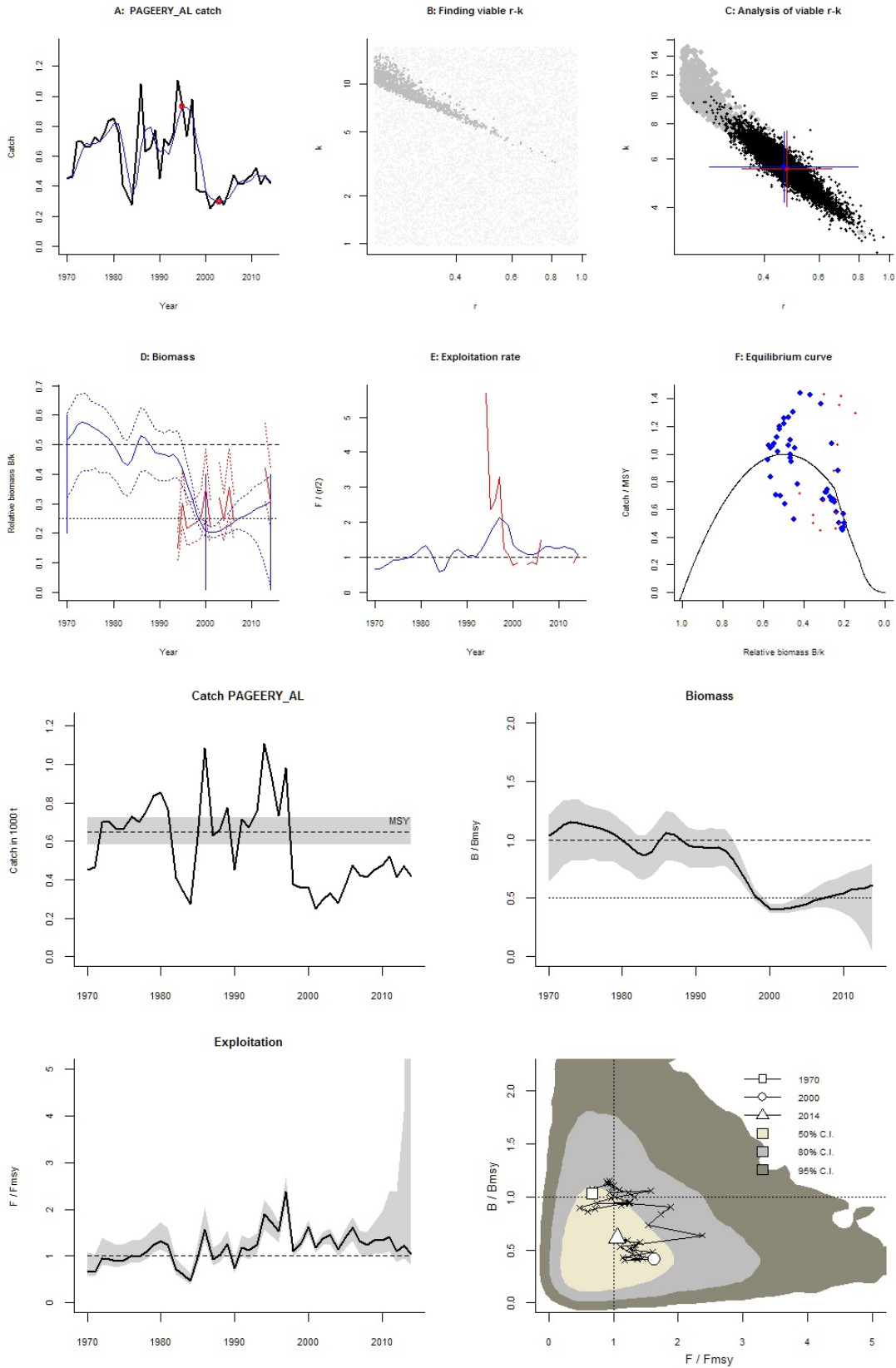
$F/F_{msy}$  = 1.06 , 2.5th perc = 0.816 , 97.5 perc = 14.6

Stock status and exploitation in 2014

Biomass = 1.73 ,  $B/B_{msy}$  = 0.615 , fishing mortality  $F$  = 0.244 ,  $F/F_{msy}$  = 1.06

Comment: Catch=landings from FishStat (Greece), Biomass estimates standardized relative to max value. RF OK 04.10.16

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Species: *Pagrus pagrus* , stock: PAGRPAG\_AL

Red porgy in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1985 - 2014 , abundance = None

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  $r$  = 0.27 - 0.86 expert, , prior range for  $k$  = 1.35 - 17.2

Results of CMSY analysis with altogether 1531 viable trajectories for 1171 r-k pairs

$r$  = 0.517 , 95% CL = 0.381 - 0.701 ,  $k$  = 6.06 , 95% CL = 4.53 - 8.1

MSY = 0.783 , 95% CL = 0.662 - 0.927

Relative biomass last year = 0.308  $k$ , 2.5th = 0.0486 , 97.5th = 0.397

Exploitation  $F/(r/2)$  in last year = 1.26

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.258 , 95% CL = 0.191 - 0.35 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.258 , 95% CL = 0.191 - 0.35 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.783 , 95% CL = 0.662 - 0.927

$B_{msy}$  = 3.03 , 95% CL = 2.27 - 4.05

Biomass in last year = 1.87 , 2.5th perc = 0.295 , 97.5 perc = 2.41

$B/B_{msy}$  in last year = 0.617 , 2.5th perc = 0.0972 , 97.5 perc = 0.795

Fishing mortality in last year = 0.337 , 2.5th perc = 0.262 , 97.5 perc = 2.14

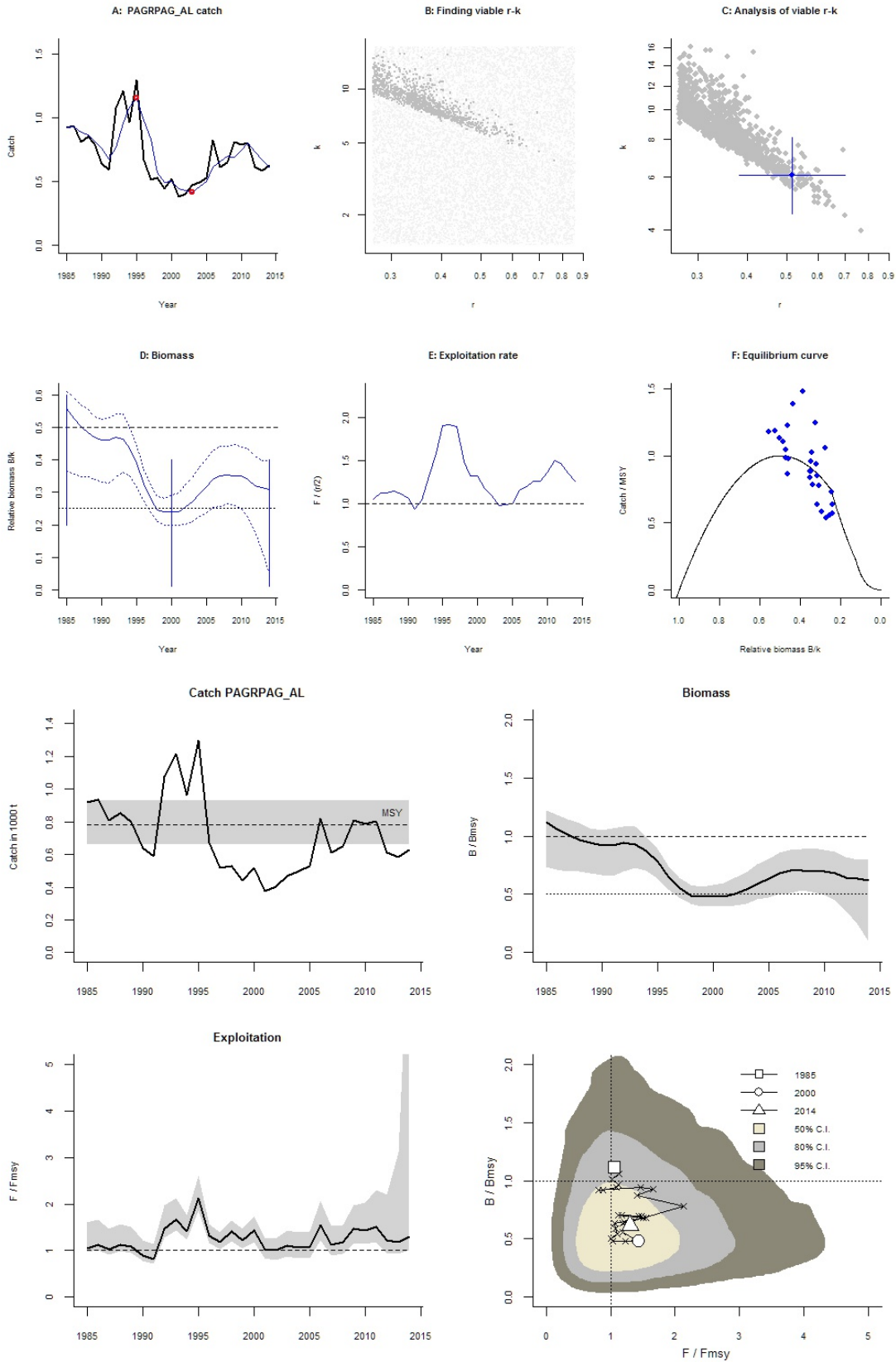
$F/F_{msy}$  = 1.3 , 2.5th perc = 1.01 , 97.5 perc = 8.27

Stock status and exploitation in 2014

Biomass = 1.87 ,  $B/B_{msy}$  = 0.617 , fishing mortality  $F$  = 0.337 ,  $F/F_{msy}$  = 1.3

Comment: Catch=landings from FishStat (Greece+Turkey). RF OK 04.10.16

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Species: *Palinurus elephas* , stock: PALIELE\_AL

Common spiny lobster in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1982 - 2014 , abundance = None

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.1 - 0.5 in year 2000 expert

Prior final relative biomass = 0.1 - 0.5 expert

Prior range for  $r$  = 0.05 - 0.5 default , prior range for  $k$  = 0.563 - 22.5

Results of CMSY analysis with altogether 6460 viable trajectories for 1290 r-k pairs

$r$  = 0.278 , 95% CL = 0.162 - 0.478 ,  $k$  = 1.76 , 95% CL = 0.926 - 3.35

MSY = 0.122 , 95% CL = 0.1 - 0.149

Relative biomass last year = 0.385  $k$  , 2.5th = 0.123 , 97.5th = 0.496

Exploitation  $F/(r/2)$  in last year = 1.15

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.139 , 95% CL = 0.0809 - 0.239 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.139 , 95% CL = 0.0809 - 0.239 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.122 , 95% CL = 0.1 - 0.149

$B_{msy}$  = 0.88 , 95% CL = 0.463 - 1.67

Biomass in last year = 0.678 , 2.5th perc = 0.217 , 97.5 perc = 0.874

$B/B_{msy}$  in last year = 0.77 , 2.5th perc = 0.246 , 97.5 perc = 0.993

Fishing mortality in last year = 0.171 , 2.5th perc = 0.133 , 97.5 perc = 0.535

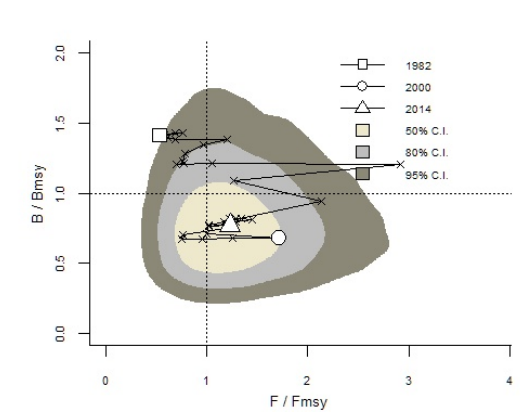
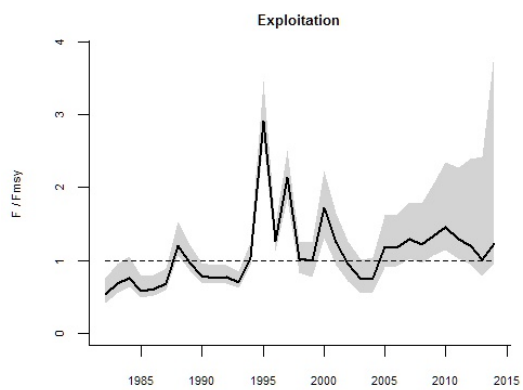
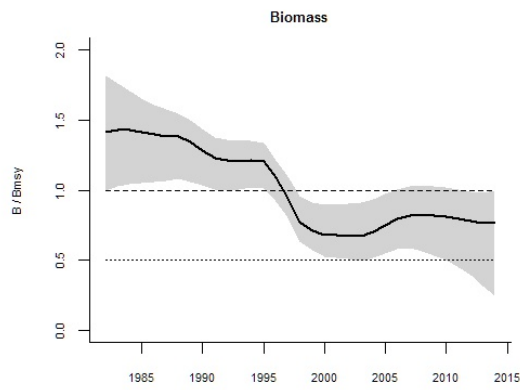
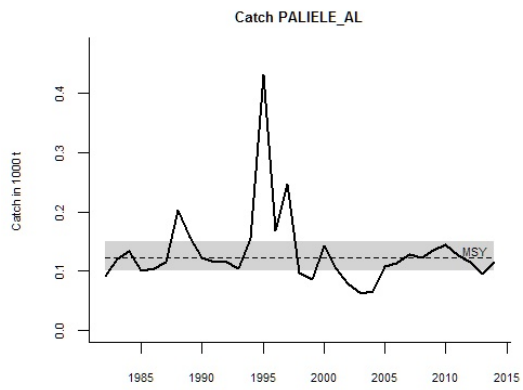
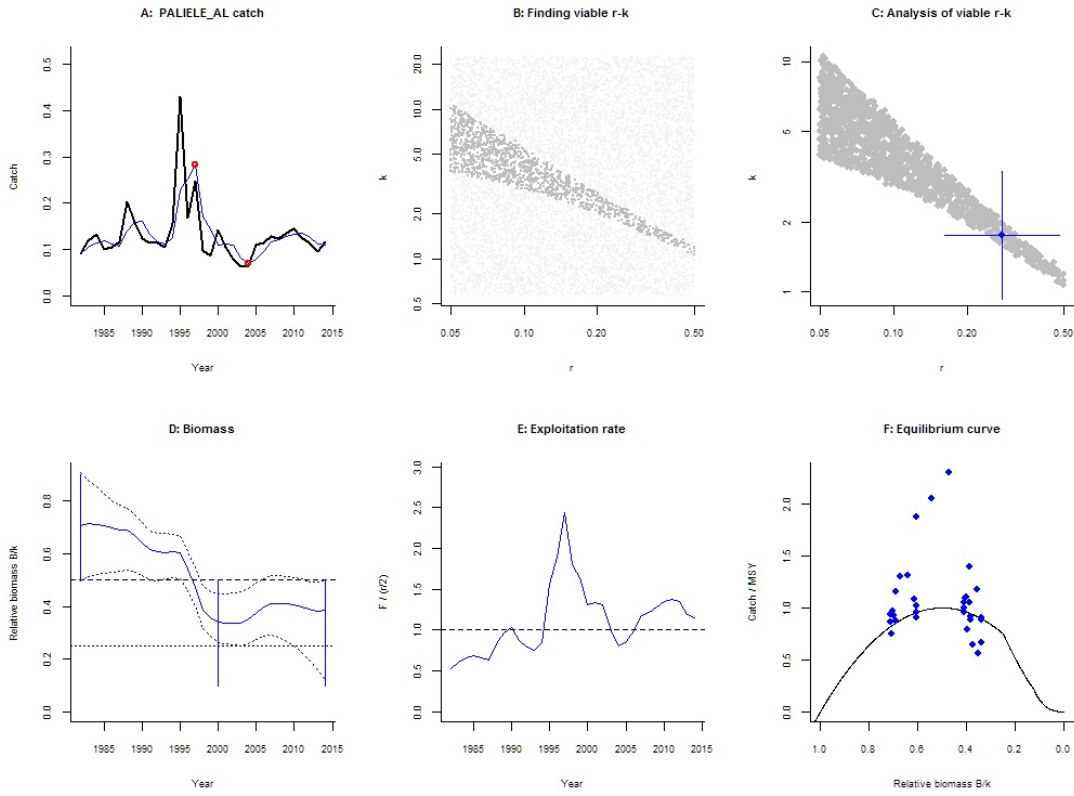
$F/F_{msy}$  = 1.23 , 2.5th perc = 0.955 , 97.5 perc = 3.85

Stock status and exploitation in 2014

Biomass = 0.678 ,  $B/B_{msy}$  = 0.77 , fishing mortality  $F$  = 0.171 ,  $F/F_{msy}$  = 1.23

Comment: Catch=landings from FishStat (Greece). RF int 0.1-0.5, final 0.1-0.5; OK 04.10.16

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Species: *Parapenaeus longirostris* , stock: PARELON\_AL

Pink shrimp in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1970 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.6 - 1.5 default , prior range for  $k$  = 0.961 - 9.61

Prior range of  $q$  = 1.15 - 3.63

Results of CMSY analysis with altogether 696 viable trajectories for 624 r-k pairs

$r = 1$  , 95% CL = 0.808 - 1.24 ,  $k = 4.58$  , 95% CL = 3.78 - 5.55

MSY = 1.14 , 95% CL = 1.08 - 1.21

Relative biomass last year = 0.177  $k$  , 2.5th = 0.0195 , 97.5th = 0.294

Exploitation  $F/(r/2)$  in last year = 2.09

Results from Bayesian Schaefer model using catch & CPUE

$r = 0.994$  , 95% CL = 0.819 - 1.21 ,  $k = 4.63$  , 95% CL = 3.88 - 5.52

MSY = 1.15 , 95% CL = 1.08 - 1.23

Relative biomass in last year = 0.301  $k$  , 2.5th perc = 0.201 , 97.5th perc = 0.378

Exploitation  $F/(r/2)$  in last year = 1.08

$q = 1.72$  ,  $lcl = 1.37$  ,  $ucl = 2.17$

Results for Management (based on CMSY analysis)

$F_{msy} = 0.5$  , 95% CL = 0.404 - 0.619 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.353$  , 95% CL = 0.285 - 0.437 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.14 , 95% CL = 1.08 - 1.21

$B_{msy} = 2.29$  , 95% CL = 1.89 - 2.77

Biomass in last year = 0.808 , 2.5th perc = 0.0891 , 97.5 perc = 1.35

$B/B_{msy}$  in last year = 0.353 , 2.5th perc = 0.0389 , 97.5 perc = 0.588

Fishing mortality in last year = 0.927 , 2.5th perc = 0.557 , 97.5 perc = 8.4

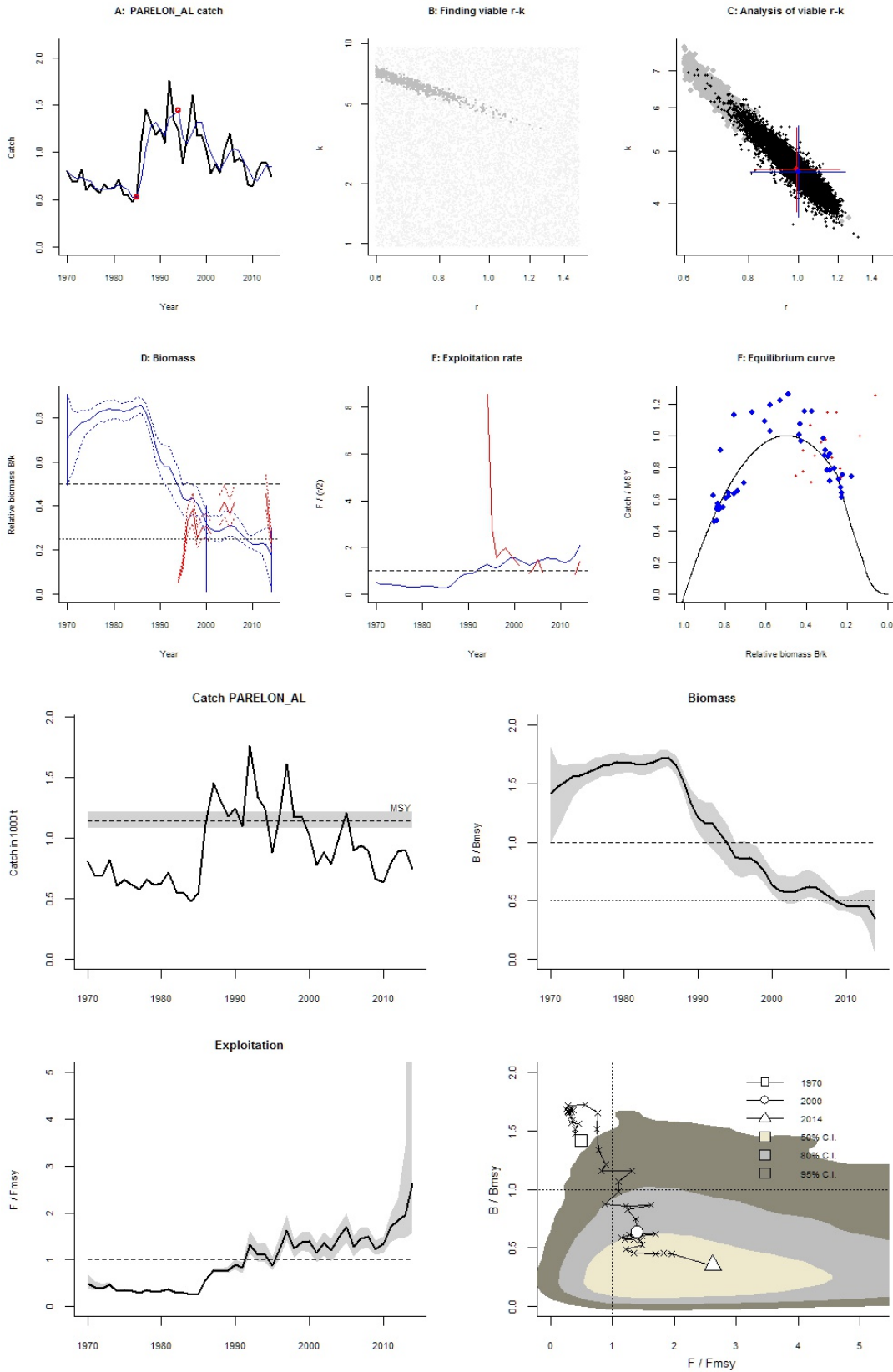
$F/F_{msy} = 2.62$  , 2.5th perc = 1.58 , 97.5 perc = 23.8

Stock status and exploitation in 2014

Biomass = 0.808 ,  $B/B_{msy} = 0.353$  , fishing mortality  $F = 0.927$  ,  $F/F_{msy} = 2.62$

Comment: Catch=landings from FishStat (Greece), Biomass estimates standardized relative to max value. RF int 2000 0.01-0.4, final 0.01-0.3; OK 04.10.16

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Species: *Melicertus kerathurus* , stock: PENAKER\_AL

Caramote prawn in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1982 - 2014 , abundance = None

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.5 - 0.9 in year 2006 default

Prior final relative biomass = 0.1 - 0.5 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 3.88 - 62.1

Results of CMSY analysis with altogether 10854 viable trajectories for 1304 r-k pairs

$r = 0.566$  , 95% CL = 0.407 - 0.785 ,  $k = 13.7$  , 95% CL = 8.95 - 21

MSY = 1.94 , 95% CL = 1.6 - 2.35

Relative biomass last year = 0.363  $k$ , 2.5th = 0.121 , 97.5th = 0.495

Exploitation  $F/(r/2)$  in last year = 1.17

Results for Management (based on CMSY analysis)

$F_{msy} = 0.283$  , 95% CL = 0.204 - 0.392 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.283$  , 95% CL = 0.204 - 0.392 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.94 , 95% CL = 1.6 - 2.35

$B_{msy} = 6.86$  , 95% CL = 4.48 - 10.5

Biomass in last year = 4.98 , 2.5th perc = 1.66 , 97.5 perc = 6.79

$B/B_{msy}$  in last year = 0.726 , 2.5th perc = 0.242 , 97.5 perc = 0.991

Fishing mortality in last year = 0.291 , 2.5th perc = 0.213 , 97.5 perc = 0.876

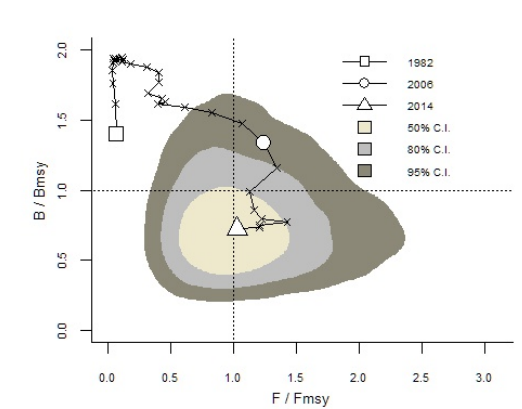
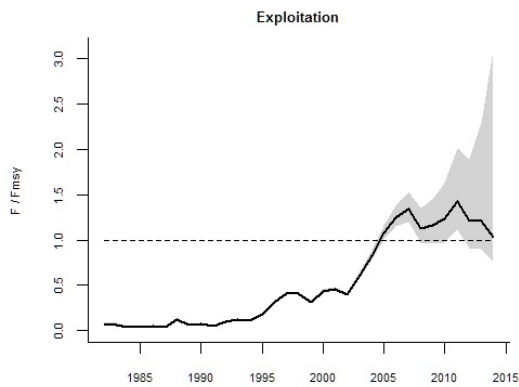
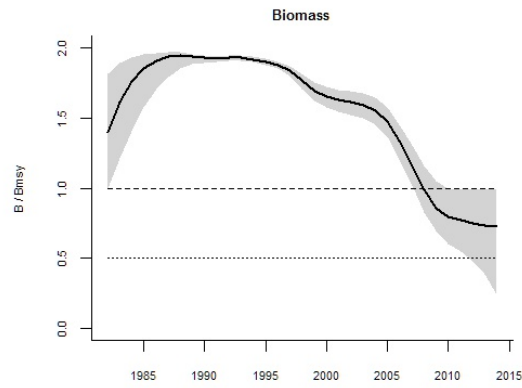
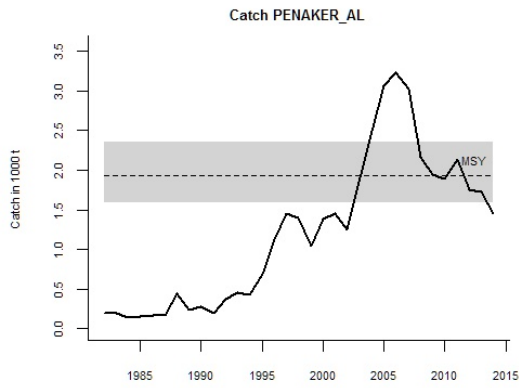
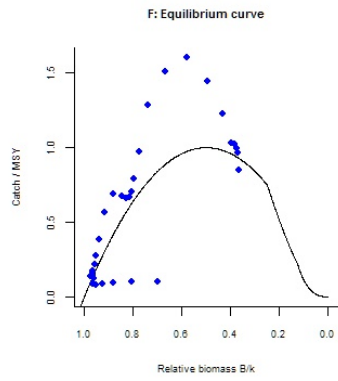
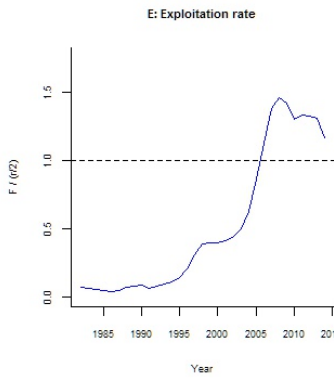
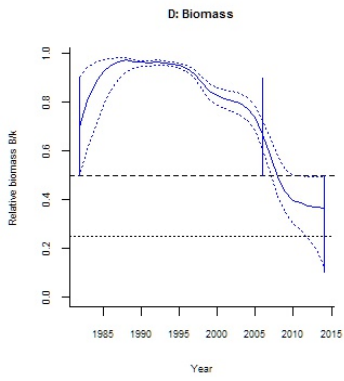
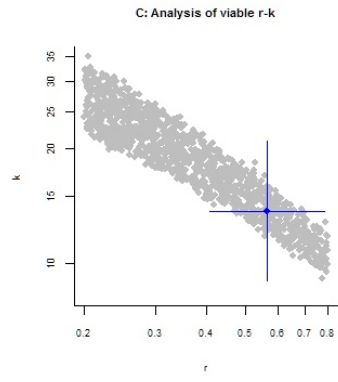
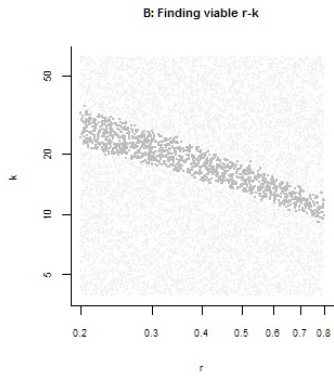
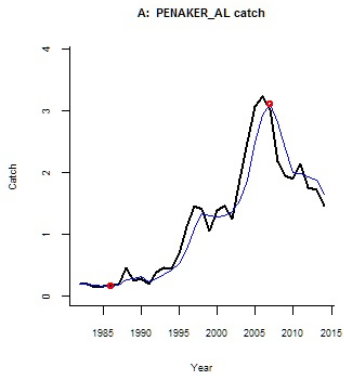
$F/F_{msy} = 1.03$  , 2.5th perc = 0.755 , 97.5 perc = 3.1

Stock status and exploitation in 2014

Biomass = 4.98 ,  $B/B_{msy} = 0.726$  , fishing mortality  $F = 0.291$  ,  $F/F_{msy} = 1.03$

Comment: Catch=landings from FishStat (Greece). RF final 0.1-0.5; OK 04.10.16

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Species: *Pomatomus saltatrix* , stock: POMTSAL\_AL

Bluefish in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1982 - 2014 , abundance = None

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.5 - 0.9 in year 2002 default

Prior final relative biomass = 0.01 - 0.4 , default

Prior range for  $r$  = 0.37 - 0.9 expert, , prior range for  $k$  = 0.513 - 4.99

Results of CMSY analysis with altogether 1185 viable trajectories for 980 r-k pairs

$r = 0.71$  , 95% CL = 0.577 - 0.873 ,  $k = 1.41$  , 95% CL = 1.1 - 1.81

MSY = 0.25 , 95% CL = 0.23 - 0.271

Relative biomass last year = 0.185  $k$ , 2.5th = 0.0182 , 97.5th = 0.392

Exploitation  $F/(r/2)$  in last year = 1.14

Results for Management (based on CMSY analysis)

$F_{msy} = 0.355$  , 95% CL = 0.289 - 0.436 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.262$  , 95% CL = 0.213 - 0.323 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.25 , 95% CL = 0.23 - 0.271

$B_{msy} = 0.704$  , 95% CL = 0.549 - 0.903

Biomass in last year = 0.26 , 2.5th perc = 0.0257 , 97.5 perc = 0.552

$B/B_{msy}$  in last year = 0.37 , 2.5th perc = 0.0365 , 97.5 perc = 0.783

Fishing mortality in last year = 0.423 , 2.5th perc = 0.199 , 97.5 perc = 4.28

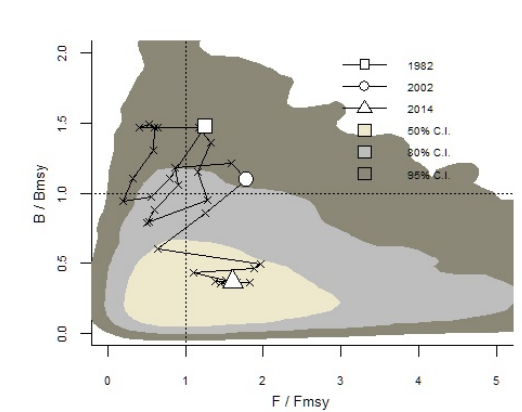
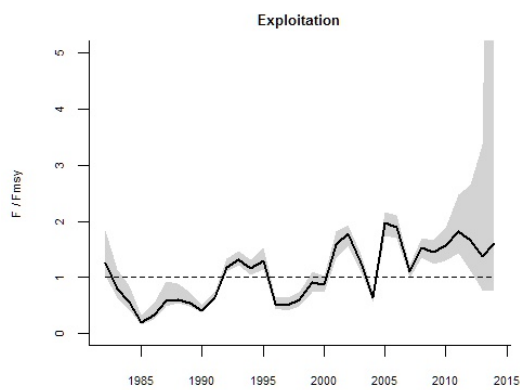
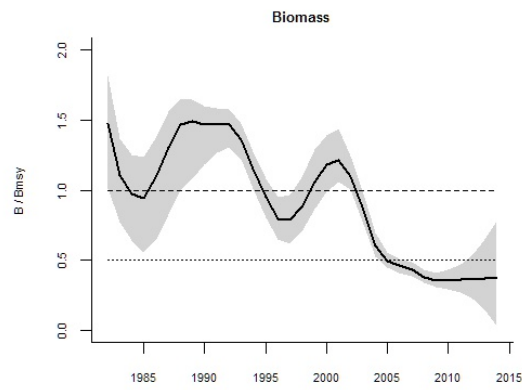
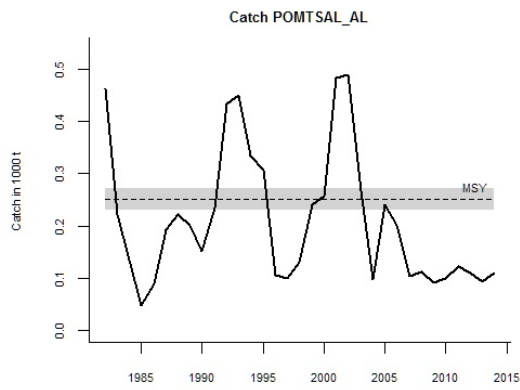
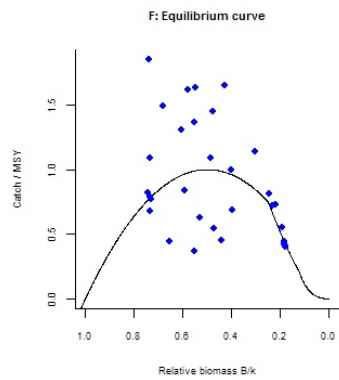
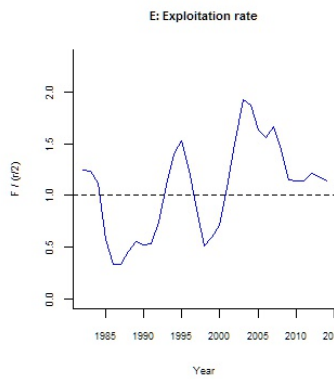
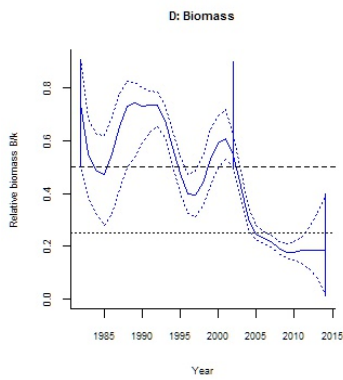
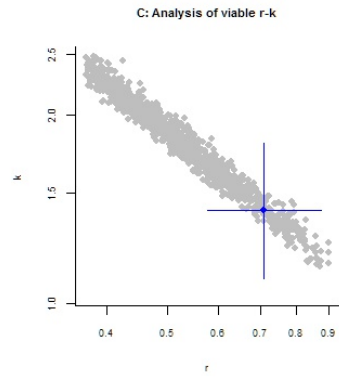
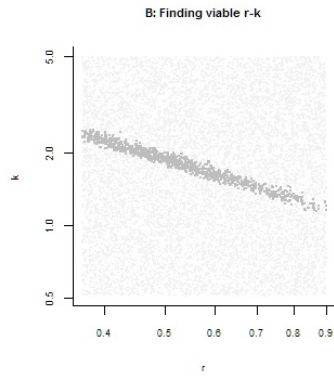
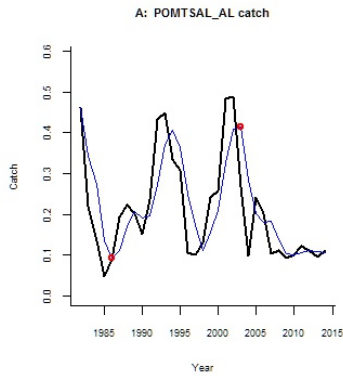
$F/F_{msy} = 1.61$  , 2.5th perc = 0.76 , 97.5 perc = 16.3

Stock status and exploitation in 2014

Biomass = 0.26 ,  $B/B_{msy} = 0.37$  , fishing mortality  $F = 0.423$  ,  $F/F_{msy} = 1.61$

Comment: Catch=landings from FishStat (Greece). RF OK 04.10.16

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Species: *Scophthalmus maximus* , stock: PSETMAX\_AL

Turbot in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1982 - 2014 , abundance = None

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1997 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.25 - 0.82 expert , , prior range for  $k$  = 0.255 - 3.35

Results of CMSY analysis with altogether 4336 viable trajectories for 1739 r-k pairs

$r = 0.497$  , 95% CL = 0.389 - 0.634 ,  $k = 0.747$  , 95% CL = 0.57 - 0.978

MSY = 0.0927 , 95% CL = 0.0838 - 0.102

Relative biomass last year = 0.305  $k$  , 2.5th = 0.0344 , 97.5th = 0.396

Exploitation  $F/(r/2)$  in last year = 1.24

Results for Management (based on CMSY analysis)

$F_{msy} = 0.248$  , 95% CL = 0.195 - 0.317 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.248$  , 95% CL = 0.195 - 0.317 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.0927 , 95% CL = 0.0838 - 0.102

$B_{msy} = 0.373$  , 95% CL = 0.285 - 0.489

Biomass in last year = 0.228 , 2.5th perc = 0.0257 , 97.5 perc = 0.295

$B/B_{msy}$  in last year = 0.611 , 2.5th perc = 0.0689 , 97.5 perc = 0.791

Fishing mortality in last year = 0.36 , 2.5th perc = 0.278 , 97.5 perc = 3.19

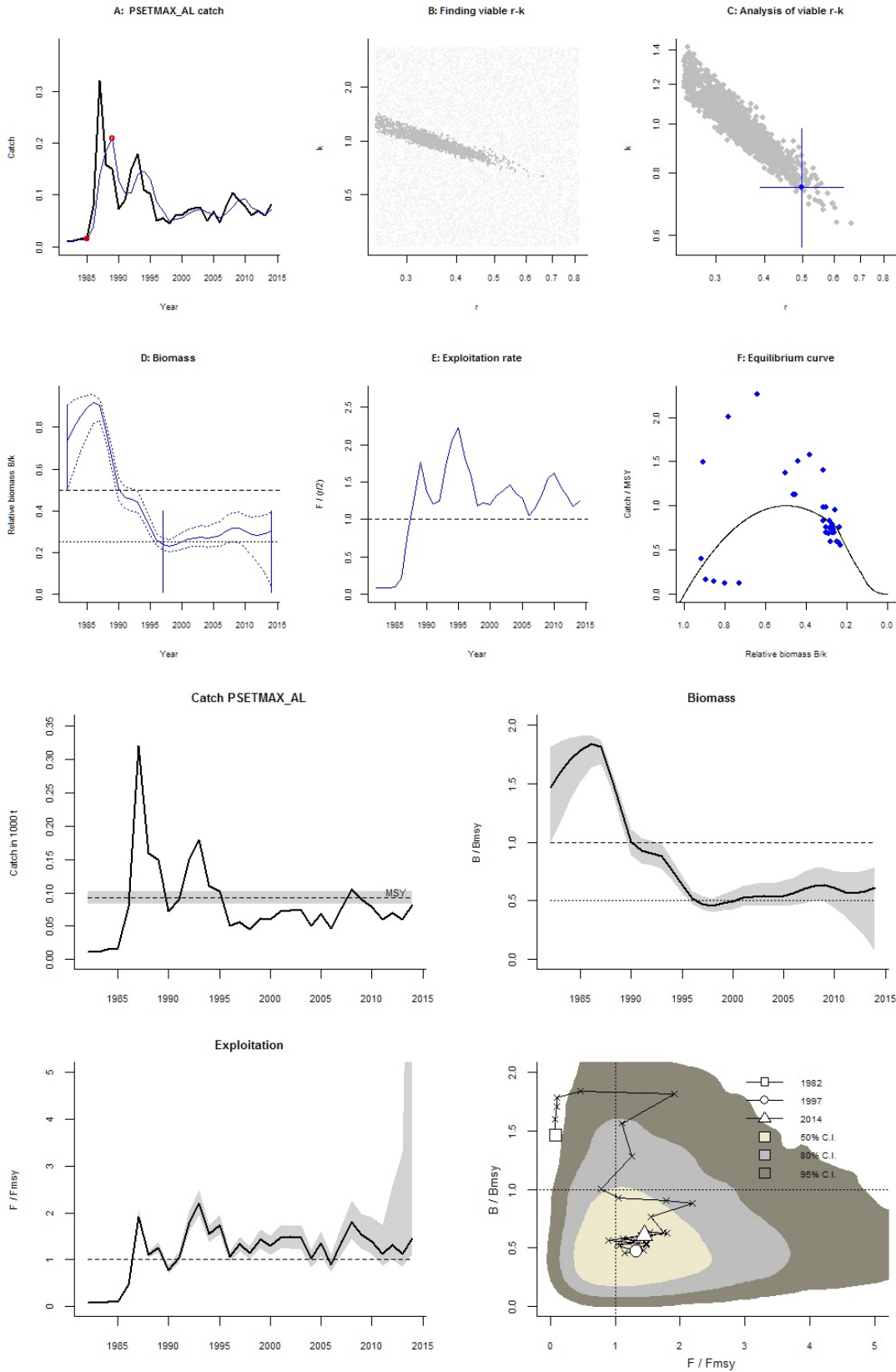
$F/F_{msy} = 1.45$  , 2.5th perc = 1.12 , 97.5 perc = 12.8

Stock status and exploitation in 2014

Biomass = 0.228 ,  $B/B_{msy} = 0.611$  , fishing mortality  $F = 0.36$  ,  $F/F_{msy} = 1.45$

Comment: Catch=landings from FishStat (Greece). RF int 1997 0.01-0.4, final 0.01-0.4; OK 04.10.16

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Species: *Raja clavata* , stock: RAJACLA\_AL

Thornback ray in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1982 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.2 - 0.6 in year 1995 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.02 - 0.9 expert, , prior range for  $k$  = 1.17 - 211

Prior range of  $q$  = 0.546 - 7.32

Results of CMSY analysis with altogether 10720 viable trajectories for 3744 r-k pairs

$r$  = 0.263 , 95% CL = 0.116 - 0.596 ,  $k$  = 9.96 , 95% CL = 3.39 - 29.2

MSY = 0.654 , 95% CL = 0.395 - 1.08

Relative biomass last year = 0.285  $k$ , 2.5th = 0.0241 , 97.5th = 0.397

Exploitation  $F/(r/2)$  in last year = 1.15

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.167 , 95% CL = 0.085 - 0.328 ,  $k$  = 14.2 , 95% CL = 7.63 - 26.3

MSY = 0.592 , 95% CL = 0.442 - 0.793

Relative biomass in last year = 0.285  $k$ , 2.5th perc = 0.173 , 97.5th perc = 0.434

Exploitation  $F/(r/2)$  in last year = 1.09

$q$  = 1.01 , lcl = 0.64 , ucl = 1.6

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.131 , 95% CL = 0.0578 - 0.298 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.131 , 95% CL = 0.0578 - 0.298 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.654 , 95% CL = 0.395 - 1.08

$B_{msy}$  = 4.98 , 95% CL = 1.7 - 14.6

Biomass in last year = 2.84 , 2.5th perc = 0.24 , 97.5 perc = 3.95

$B/B_{msy}$  in last year = 0.571 , 2.5th perc = 0.0483 , 97.5 perc = 0.793

Fishing mortality in last year = 0.129 , 2.5th perc = 0.0932 , 97.5 perc = 1.53

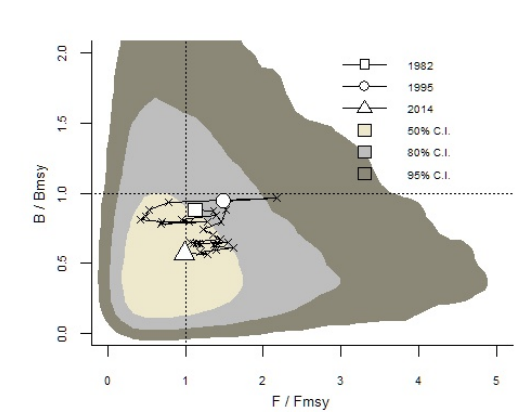
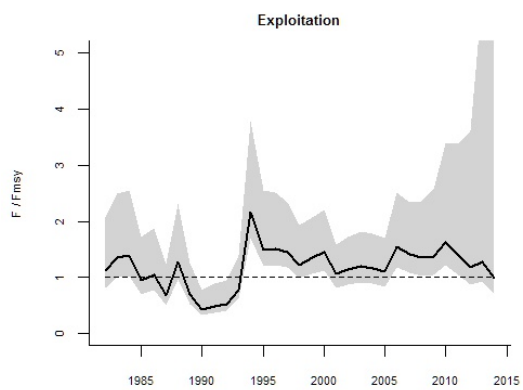
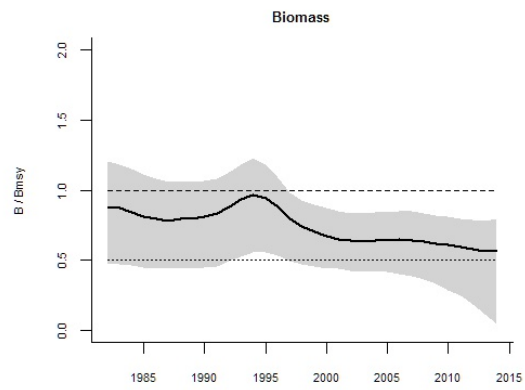
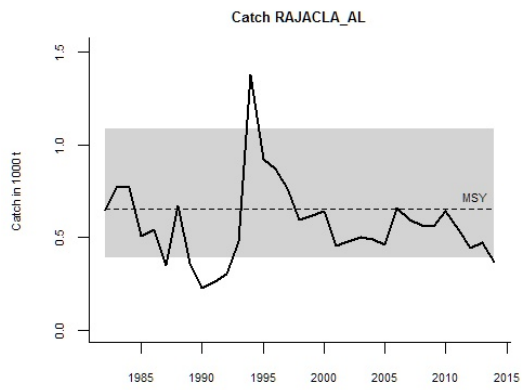
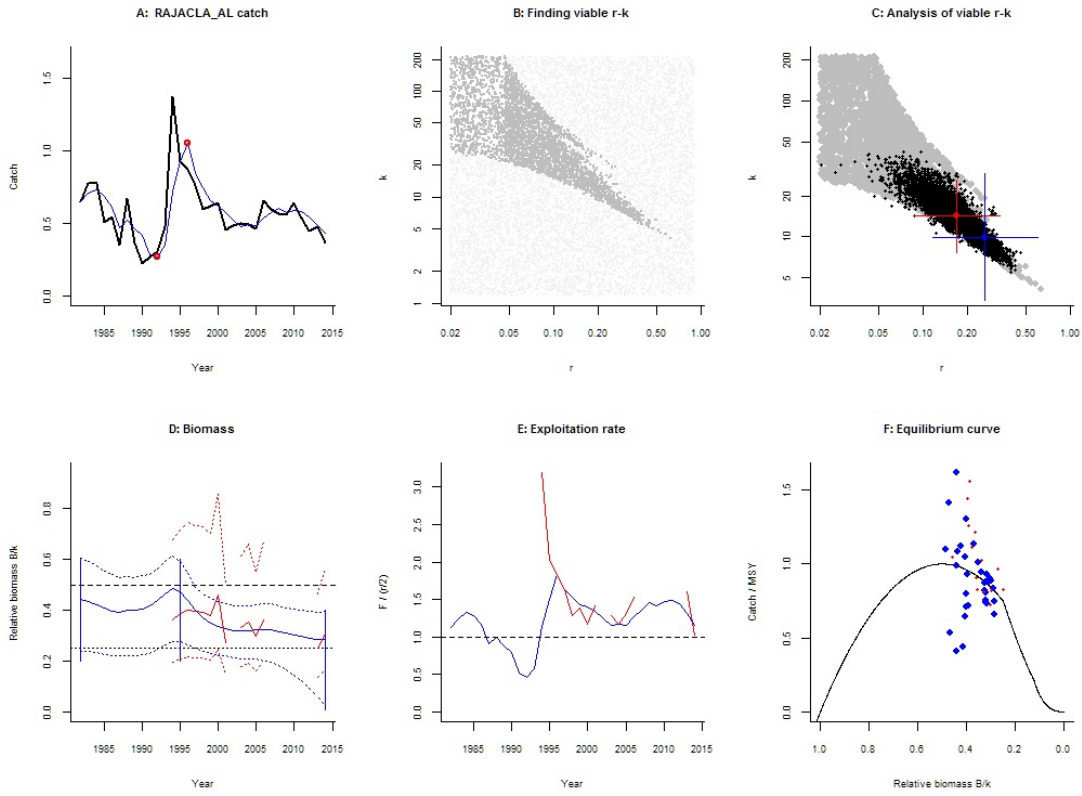
$F/F_{msy}$  = 0.986 , 2.5th perc = 0.71 , 97.5 perc = 11.7

Stock status and exploitation in 2014

Biomass = 2.84 ,  $B/B_{msy}$  = 0.571 , fishing mortality  $F$  = 0.129 ,  $F/F_{msy}$  = 0.986

Comment: Catch=landings from FishStat (Greece+Turkey), Biomass estimates standardized relative to max value. RF final 0.01-0.4; OK 04.10.16

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Species: *Sardina pilchardus* , stock: SARDPIL\_AL

Sardine in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1980 - 2014 , 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  $r$  = 0.27 - 1.1 expert, , prior range for  $k$  = 35.3 - 576

Prior range of  $q$  = 0.0674 - 0.272

Results of CMSY analysis with altogether 1860 viable trajectories for 1165 r-k pairs

$r$  = 0.589 , 95% CL = 0.415 - 0.834 ,  $k$  = 173 , 95% CL = 129 - 232

MSY = 25.4 , 95% CL = 23.1 - 27.9

Relative biomass last year = 0.332  $k$ , 2.5th = 0.0371 , 97.5th = 0.394

Exploitation  $F/(r/2)$  in last year = 0.946

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.512 , 95% CL = 0.341 - 0.769 ,  $k$  = 188 , 95% CL = 130 - 272

MSY = 24.1 , 95% CL = 20.3 - 28.6

Relative biomass in last year = 0.111  $k$ , 2.5th perc = 0.0738 , 97.5th perc = 0.211

Exploitation  $F/(r/2)$  in last year = 3.38

$q$  = 0.0876 , lcl = 0.0686 , ucl = 0.112

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.294 , 95% CL = 0.208 - 0.417 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.294 , 95% CL = 0.208 - 0.417 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 25.4 , 95% CL = 23.1 - 27.9

$B_{msy}$  = 86.3 , 95% CL = 64.3 - 116

Biomass in last year = 57.4 , 2.5th perc = 6.4 , 97.5 perc = 68.1

$B/B_{msy}$  in last year = 0.665 , 2.5th perc = 0.0741 , 97.5 perc = 0.788

Fishing mortality in last year = 0.316 , 2.5th perc = 0.266 , 97.5 perc = 2.83

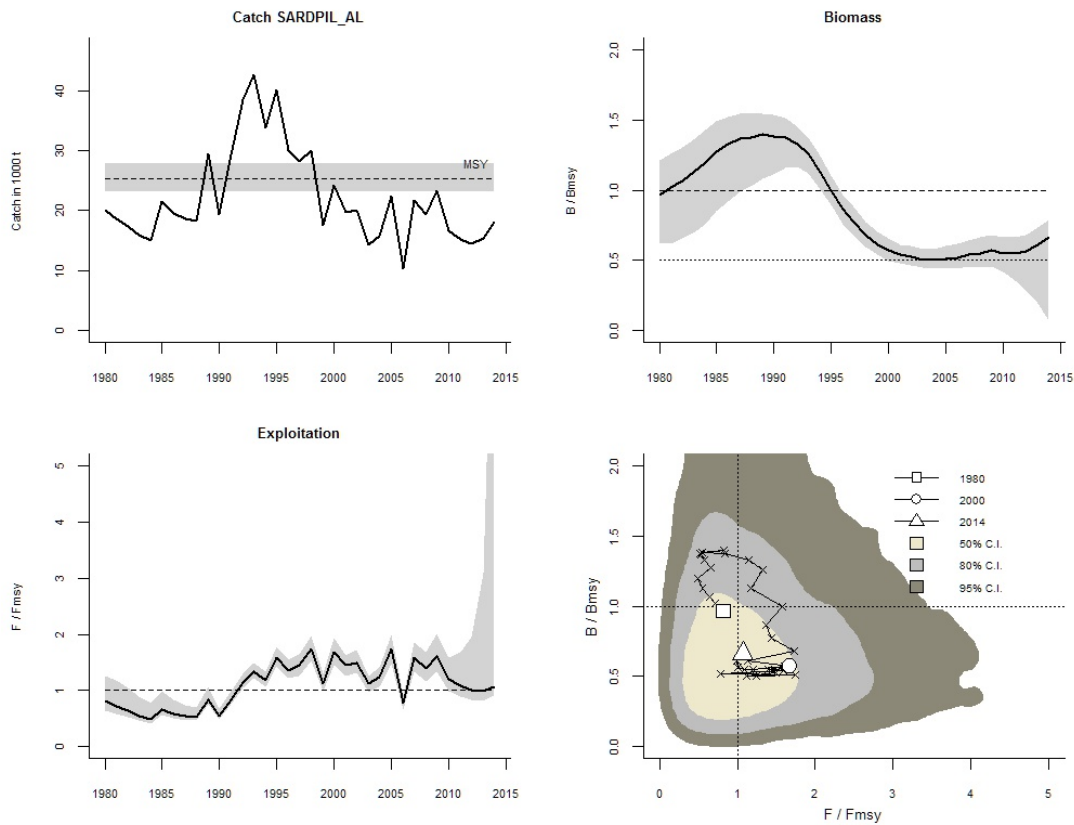
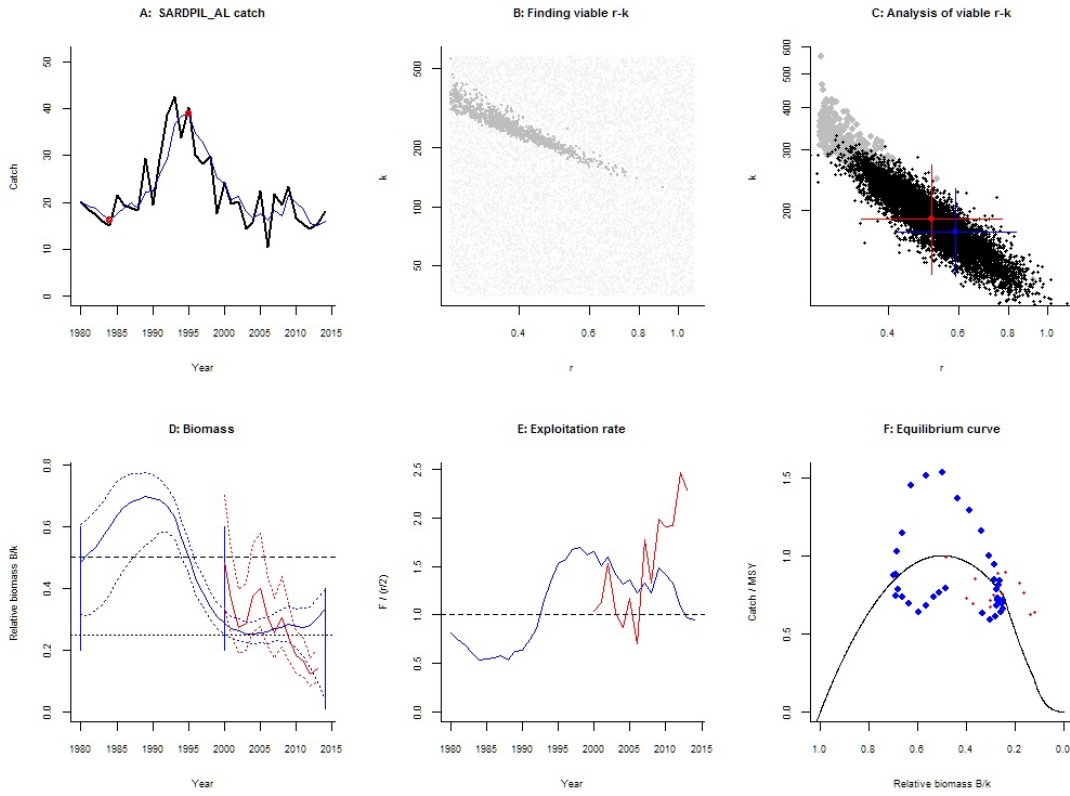
$F/F_{msy}$  = 1.07 , 2.5th perc = 0.905 , 97.5 perc = 9.63

Stock status and exploitation in 2014

Biomass = 57.4 ,  $B/B_{msy}$  = 0.665 , fishing mortality  $F$  = 0.316 ,  $F/F_{msy}$  = 1.07

Comment: Catch=landings from FishStat (Greece+Turkey), Biomass estimates standardized relative to max value. RF int 2000, final 0.01-0.4

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Species: *Sardinella aurita* , stock: SARIAUR\_AL

Round sardinella in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1982 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.4 - 0.8 in year 2008 expert

Prior final relative biomass = 0.1 - 0.5 expert

Prior range for  $r$  = 0.24 - 1.3 expert, , prior range for  $k$  = 3.08 - 64.7

Results of CMSY analysis with altogether 7833 viable trajectories for 1056 r-k pairs

$r$  = 0.831 , 95% CL = 0.56 - 1.23 ,  $k$  = 13.4 , 95% CL = 8.22 - 21.9

MSY = 2.78 , 95% CL = 2.31 - 3.35

Relative biomass last year = 0.375  $k$ , 2.5th = 0.125 , 97.5th = 0.495

Exploitation  $F/(r/2)$  in last year = 1.03

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.416 , 95% CL = 0.28 - 0.616 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.416 , 95% CL = 0.28 - 0.616 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 2.78 , 95% CL = 2.31 - 3.35

$B_{msy}$  = 6.7 , 95% CL = 4.11 - 10.9

Biomass in last year = 5.03 , 2.5th perc = 1.68 , 97.5 perc = 6.64

$B/B_{msy}$  in last year = 0.751 , 2.5th perc = 0.25 , 97.5 perc = 0.991

Fishing mortality in last year = 0.479 , 2.5th perc = 0.363 , 97.5 perc = 1.44

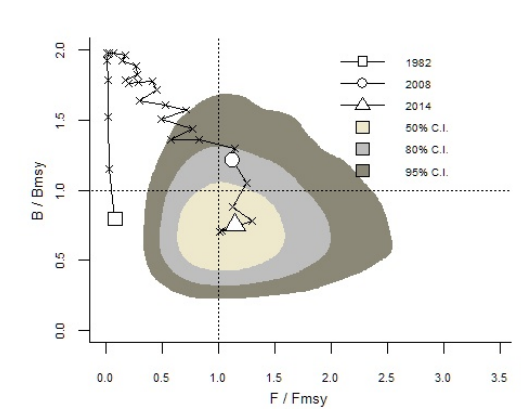
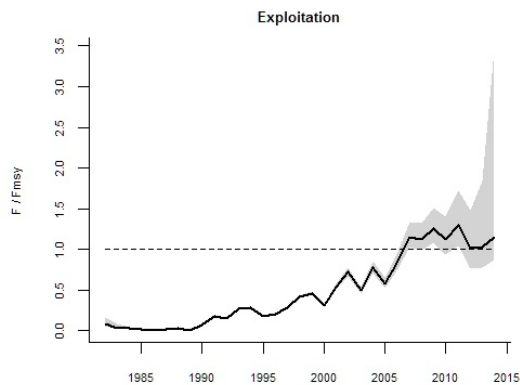
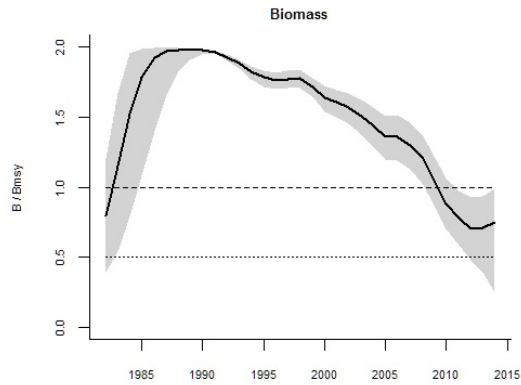
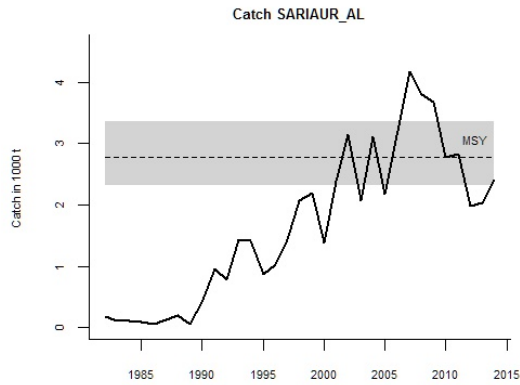
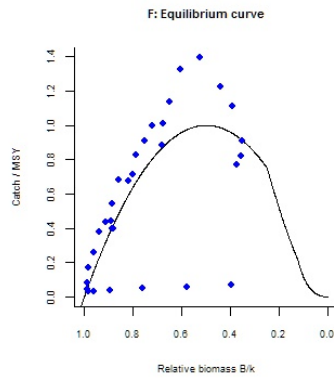
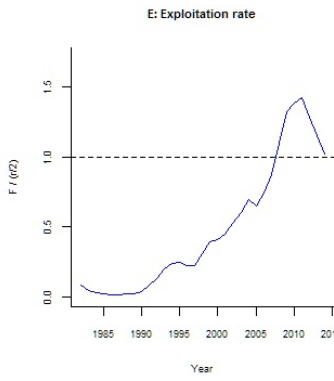
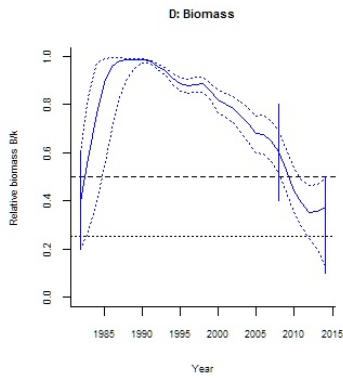
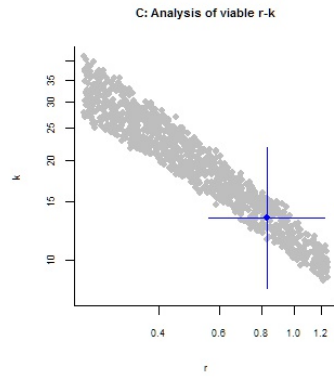
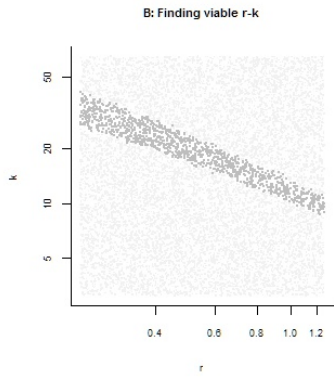
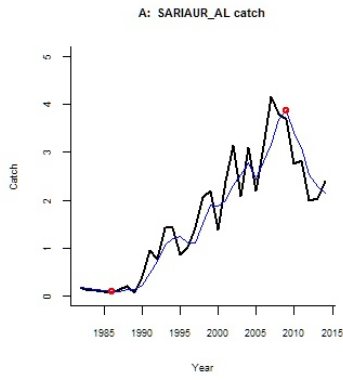
$F/F_{msy}$  = 1.15 , 2.5th perc = 0.873 , 97.5 perc = 3.46

Stock status and exploitation in 2014

Biomass = 5.03 ,  $B/B_{msy}$  = 0.751 , fishing mortality  $F$  = 0.479 ,  $F/F_{msy}$  = 1.15

Comment: Catch=landings from FishStat (Greece+Turkey). RF int 2008 0.4-0.8, final 0.1-0.5

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Species: *Sarpa salpa* , stock: SARPSAL\_AL

Salema in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1982 - 2014 , abundance = None

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  $r$  = 0.55 - 1 expert, , prior range for  $k$  = 0.75 - 5.45

Results of CMSY analysis with altogether 268 viable trajectories for 262 r-k pairs

$r = 0.736$  , 95% CL = 0.602 - 0.901 ,  $k = 2.49$  , 95% CL = 2.05 - 3.03

MSY = 0.458 , 95% CL = 0.376 - 0.558

Relative biomass last year = 0.151  $k$  , 2.5th = 0.0192 , 97.5th = 0.293

Exploitation  $F/(r/2)$  in last year = 1.47

Results for Management (based on CMSY analysis)

$F_{msy} = 0.368$  , 95% CL = 0.301 - 0.45 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.223$  , 95% CL = 0.182 - 0.272 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.458 , 95% CL = 0.376 - 0.558

$B_{msy} = 1.25$  , 95% CL = 1.02 - 1.51

Biomass in last year = 0.376 , 2.5th perc = 0.0478 , 97.5 perc = 0.73

$B/B_{msy}$  in last year = 0.302 , 2.5th perc = 0.0384 , 97.5 perc = 0.587

Fishing mortality in last year = 0.478 , 2.5th perc = 0.247 , 97.5 perc = 3.77

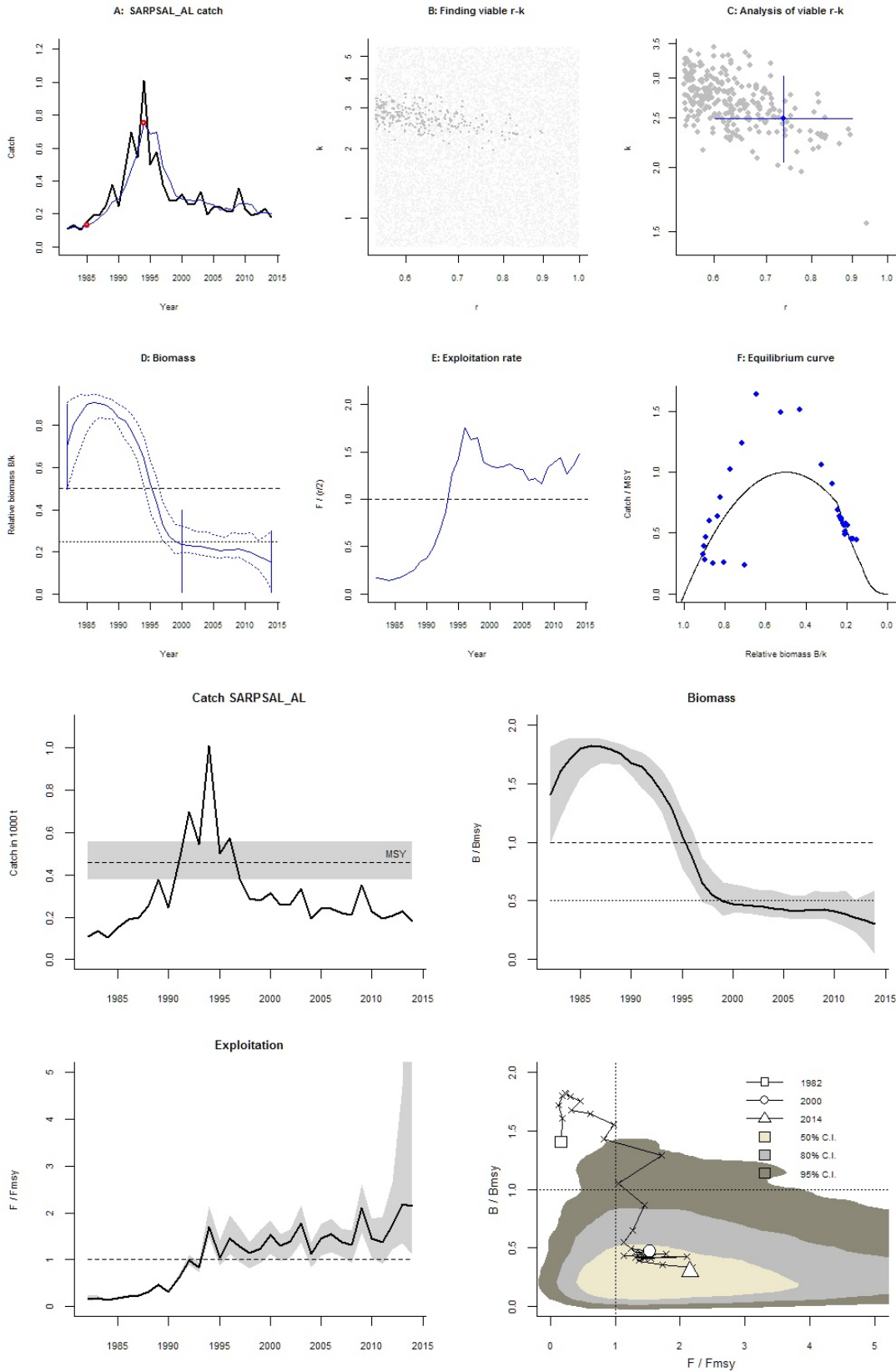
$F/F_{msy} = 2.15$  , 2.5th perc = 1.11 , 97.5 perc = 16.9

Stock status and exploitation in 2014

Biomass = 0.376 ,  $B/B_{msy} = 0.302$  , fishing mortality  $F = 0.478$  ,  $F/F_{msy} = 2.15$

Comment: Catch=landings from FishStat (Greece). int 2000 0.01-0.4, final 0.01-0.3; OK 04.10.16

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Species: *Scomber colias* , stock: SCOMPNE\_AL

Atlantic chub mackerel in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1990 - 2014 , abundance = None

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  $r$  = 0.31 - 1.2 expert, , prior range for  $k$  = 14.4 - 218

Results of CMSY analysis with altogether 1263 viable trajectories for 1126 r-k pairs

$r$  = 0.628 , 95% CL = 0.438 - 0.9 ,  $k$  = 56.5 , 95% CL = 41.9 - 76.1

MSY = 8.87 , 95% CL = 7.64 - 10.3

Relative biomass last year = 0.132  $k$ , 2.5th = 0.0183 , 97.5th = 0.284

Exploitation  $F/(r/2)$  in last year = 1.1

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.314 , 95% CL = 0.219 - 0.45 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.165 , 95% CL = 0.115 - 0.237 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 8.87 , 95% CL = 7.64 - 10.3

$B_{msy}$  = 28.2 , 95% CL = 20.9 - 38.1

Biomass in last year = 7.43 , 2.5th perc = 1.03 , 97.5 perc = 16.1

$B/B_{msy}$  in last year = 0.263 , 2.5th perc = 0.0365 , 97.5 perc = 0.569

Fishing mortality in last year = 0.301 , 2.5th perc = 0.139 , 97.5 perc = 2.17

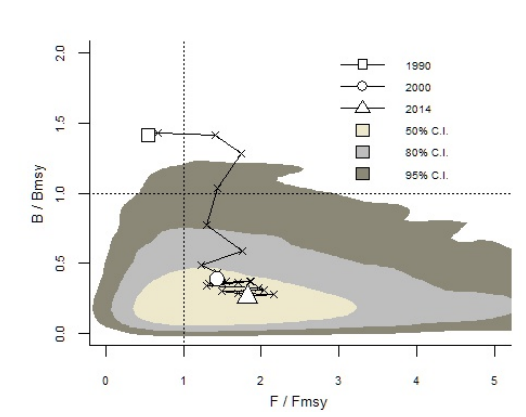
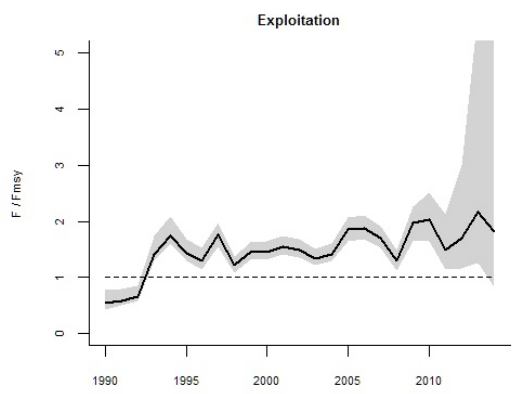
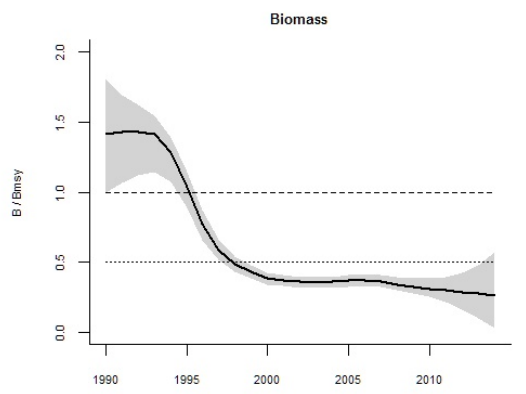
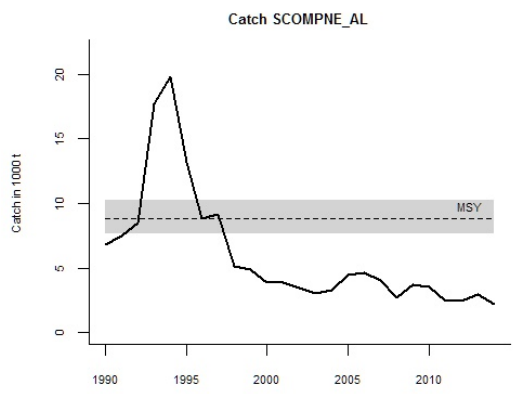
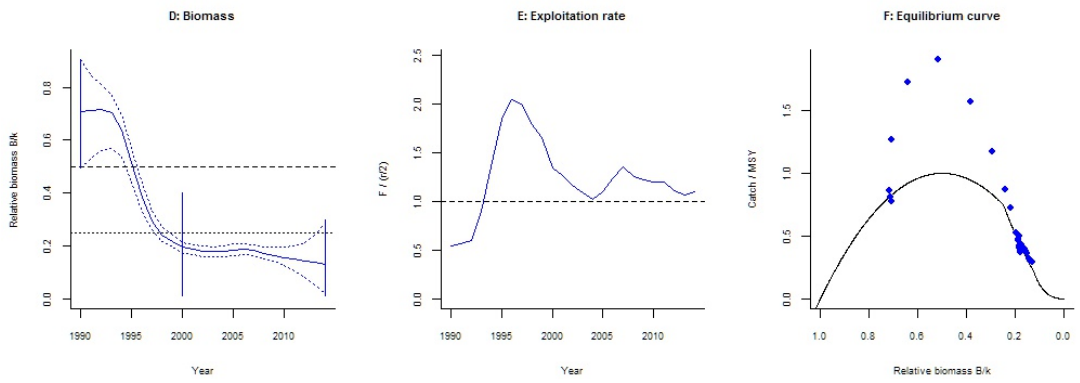
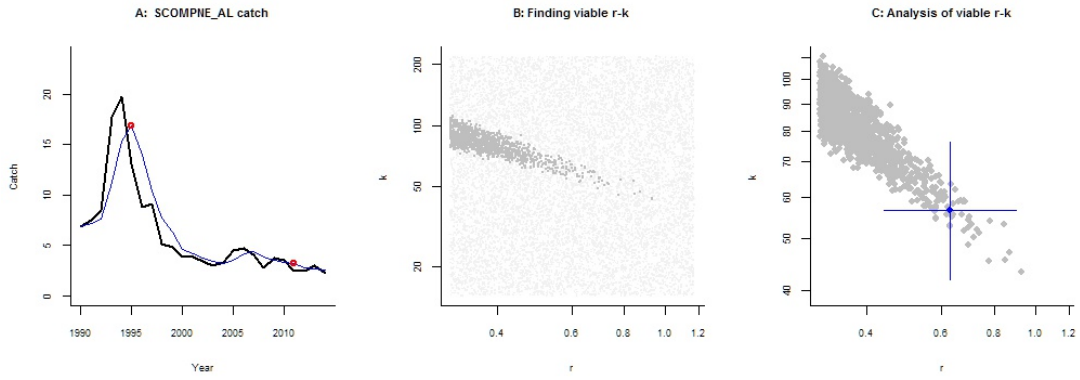
$F/F_{msy}$  = 1.82 , 2.5th perc = 0.843 , 97.5 perc = 13.1

Stock status and exploitation in 2014

Biomass = 7.43 ,  $B/B_{msy}$  = 0.263 , fishing mortality  $F$  = 0.301 ,  $F/F_{msy}$  = 1.82

Comment: Catch=landings from FishStat (Greece+Turkey). RF int 2000 0.01-0.4, final 0.01-0.3; OK  
04.10.16

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Species: *Scomber scombrus* , stock: SCOMSCO\_AL

Atlantic mackerel in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1990 - 2014 , abundance = None

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 - 0.2 expert

Prior range for  $r$  = 0.23 - 1 expert, , prior range for  $k$  = 3.98 - 69.2

Results of CMSY analysis with altogether 2022 viable trajectories for 1864 r-k pairs

$r = 0.494$  , 95% CL = 0.373 - 0.655 ,  $k = 14.6$  , 95% CL = 10 - 21.4

MSY = 1.81 , 95% CL = 1.38 - 2.37

Relative biomass last year = 0.0831  $k$ , 2.5th = 0.0124 , 97.5th = 0.196

Exploitation  $F/(r/2)$  in last year = 0.599

Results for Management (based on CMSY analysis)

$F_{msy} = 0.247$  , 95% CL = 0.186 - 0.328 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.0821$  , 95% CL = 0.0619 - 0.109 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.81 , 95% CL = 1.38 - 2.37

$B_{msy} = 7.32$  , 95% CL = 5.01 - 10.7

Biomass in last year = 1.22 , 2.5th perc = 0.182 , 97.5 perc = 2.87

$B/B_{msy}$  in last year = 0.166 , 2.5th perc = 0.0248 , 97.5 perc = 0.392

Fishing mortality in last year = 0.0896 , 2.5th perc = 0.038 , 97.5 perc = 0.6

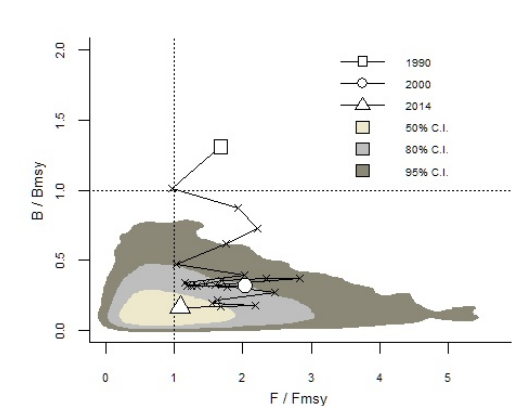
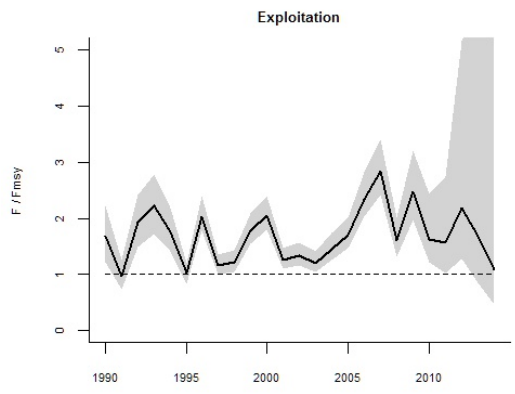
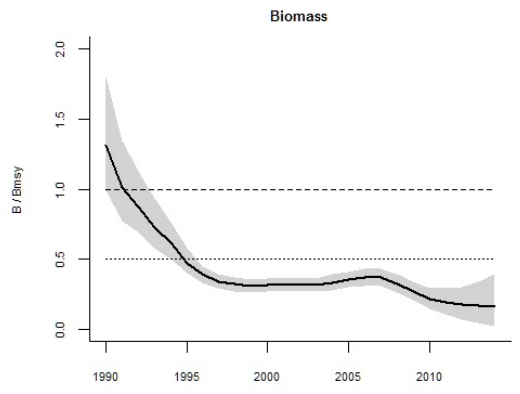
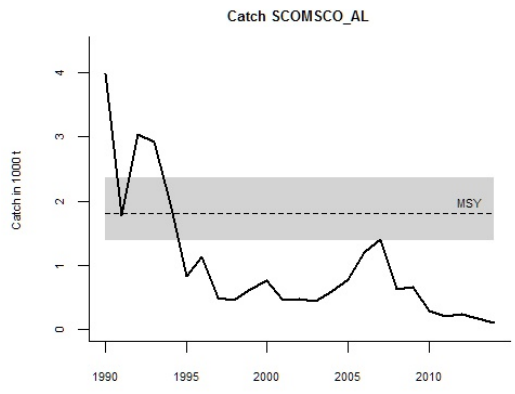
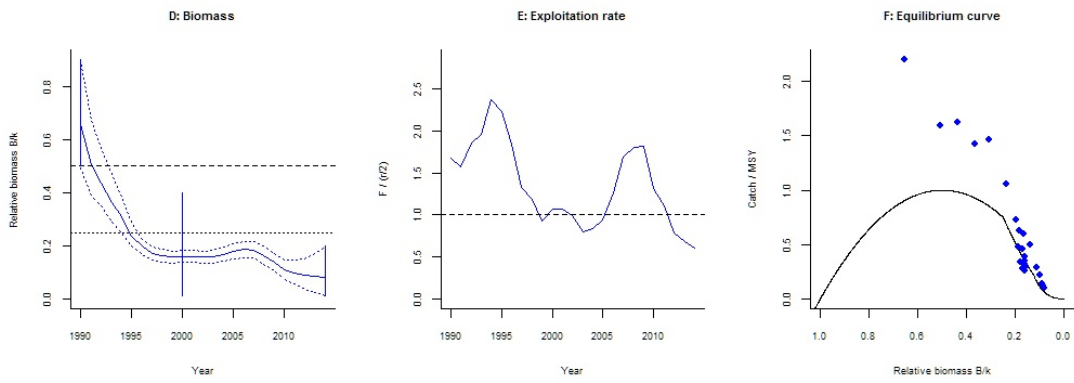
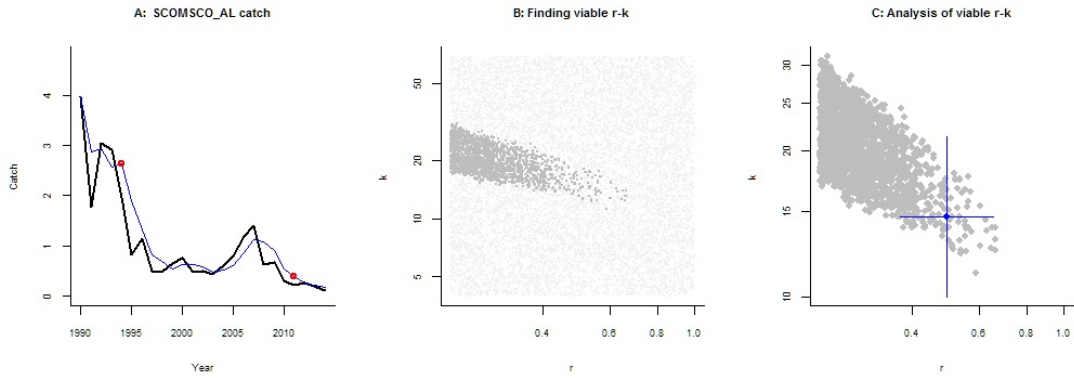
$F/F_{msy} = 1.09$  , 2.5th perc = 0.462 , 97.5 perc = 7.31

Stock status and exploitation in 2014

Biomass = 1.22 ,  $B/B_{msy} = 0.166$  , fishing mortality  $F = 0.0896$  ,  $F/F_{msy} = 1.09$

Comment: Catch=landings from FishStat (Greece+Turkey). RF int 0.01-0.4, final 0.01-0.2, OK 04.10.16

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Species: *Sepia officinalis* , stock: SEPIOFF\_AL

Common cuttlefish in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1970 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.2 - 0.6 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  $k$  = 2.93 - 46.8

Prior range of  $q$  = 0.181 - 0.726

Results of CMSY analysis with altogether 2722 viable trajectories for 524 r-k pairs

$r$  = 0.564 , 95% CL = 0.405 - 0.785 ,  $k$  = 12.4 , 95% CL = 8.35 - 18.4

MSY = 1.75 , 95% CL = 1.57 - 1.95

Relative biomass last year = 0.312  $k$  , 2.5th = 0.0261 , 97.5th = 0.396

Exploitation  $F/(r/2)$  in last year = 1.04

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.554 , 95% CL = 0.382 - 0.805 ,  $k$  = 12.5 , 95% CL = 9.13 - 17.1

MSY = 1.73 , 95% CL = 1.56 - 1.92

Relative biomass in last year = 0.35  $k$  , 2.5th perc = 0.123 , 97.5th perc = 0.485

Exploitation  $F/(r/2)$  in last year = 0.851

$q$  = 0.296 , lcl = 0.22 , ucl = 0.398

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.282 , 95% CL = 0.203 - 0.393 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.282 , 95% CL = 0.203 - 0.393 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.75 , 95% CL = 1.57 - 1.95

$B_{msy}$  = 6.2 , 95% CL = 4.18 - 9.21

Biomass in last year = 3.87 , 2.5th perc = 0.323 , 97.5 perc = 4.92

$B/B_{msy}$  in last year = 0.624 , 2.5th perc = 0.0521 , 97.5 perc = 0.793

Fishing mortality in last year = 0.266 , 2.5th perc = 0.21 , 97.5 perc = 3.19

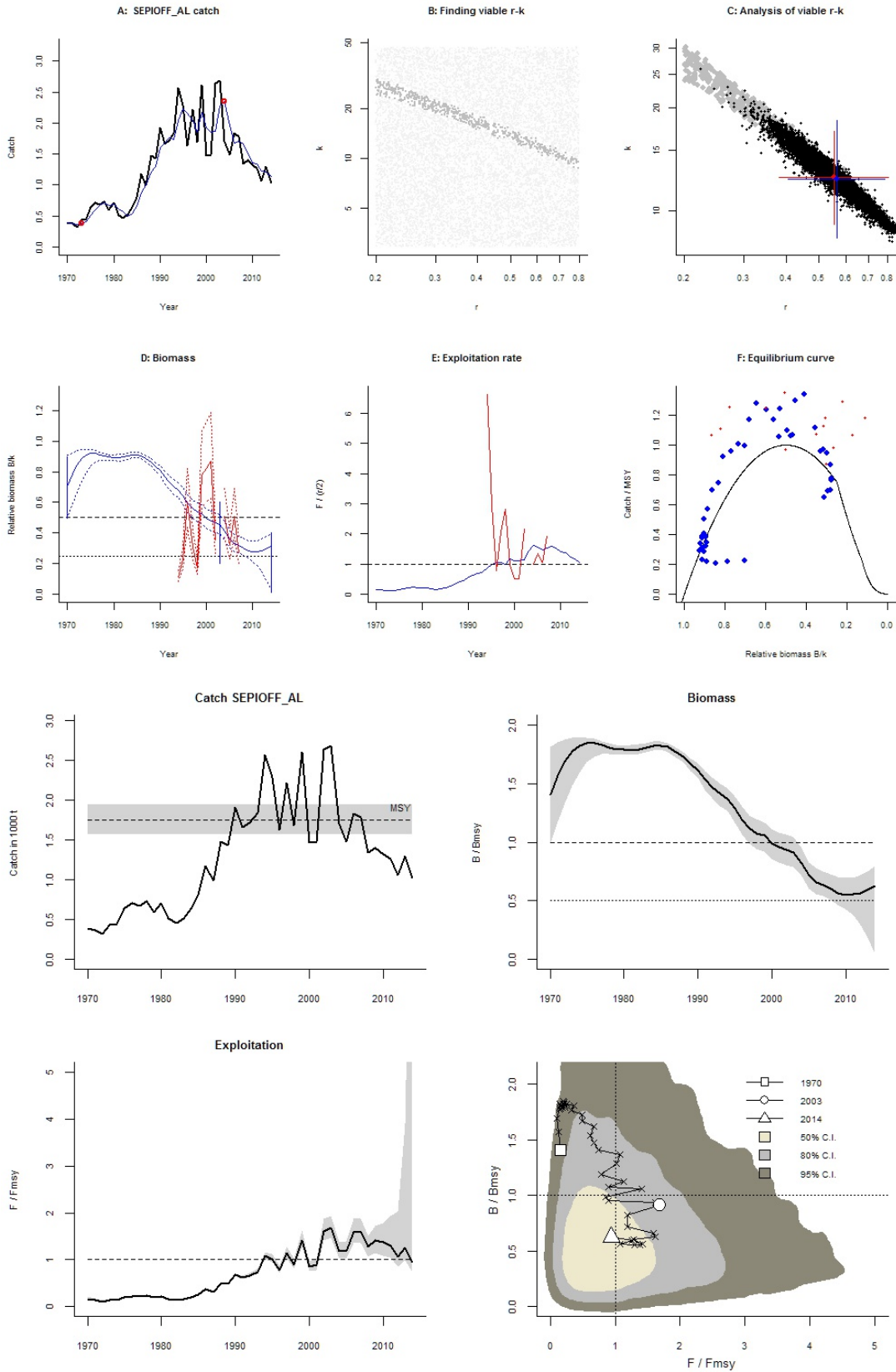
$F/F_{msy}$  = 0.944 , 2.5th perc = 0.744 , 97.5 perc = 11.3

Stock status and exploitation in 2014

Biomass = 3.87 ,  $B/B_{msy}$  = 0.624 , fishing mortality  $F$  = 0.266 ,  $F/F_{msy}$  = 0.944

Comment: Catch=landings from FishStat (Greece). RF final 0.01-0.4; OK 04.10.16

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Species: *Solea solea* , stock: SOLEVUL\_AL

Common sole in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1970 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 default

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.21 - 1 expert, , prior range for  $k$  = 2.15 - 41.7

Prior range of  $q$  = 0.23 - 1.01

Results of CMSY analysis with altogether 1623 viable trajectories for 1298 r-k pairs

$r$  = 0.497 , 95% CL = 0.319 - 0.772 ,  $k$  = 10.3 , 95% CL = 7.37 - 14.4

MSY = 1.28 , 95% CL = 1.14 - 1.44

Relative biomass last year = 0.133  $k$ , 2.5th = 0.0158 , 97.5th = 0.291

Exploitation  $F/(r/2)$  in last year = 1.63

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.487 , 95% CL = 0.342 - 0.692 ,  $k$  = 10.7 , 95% CL = 8.24 - 13.8

MSY = 1.3 , 95% CL = 1.12 - 1.51

Relative biomass in last year = 0.222  $k$ , 2.5th perc = 0.112 , 97.5th perc = 0.339

Exploitation  $F/(r/2)$  in last year = 0.727

$q$  = 0.352 , lcl = 0.261 , ucl = 0.474

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.248 , 95% CL = 0.16 - 0.386 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.132 , 95% CL = 0.0849 - 0.205 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.28 , 95% CL = 1.14 - 1.44

$B_{msy}$  = 5.15 , 95% CL = 3.68 - 7.21

Biomass in last year = 1.37 , 2.5th perc = 0.163 , 97.5 perc = 3

$B/B_{msy}$  in last year = 0.266 , 2.5th perc = 0.0316 , 97.5 perc = 0.582

Fishing mortality in last year = 0.307 , 2.5th perc = 0.14 , 97.5 perc = 2.58

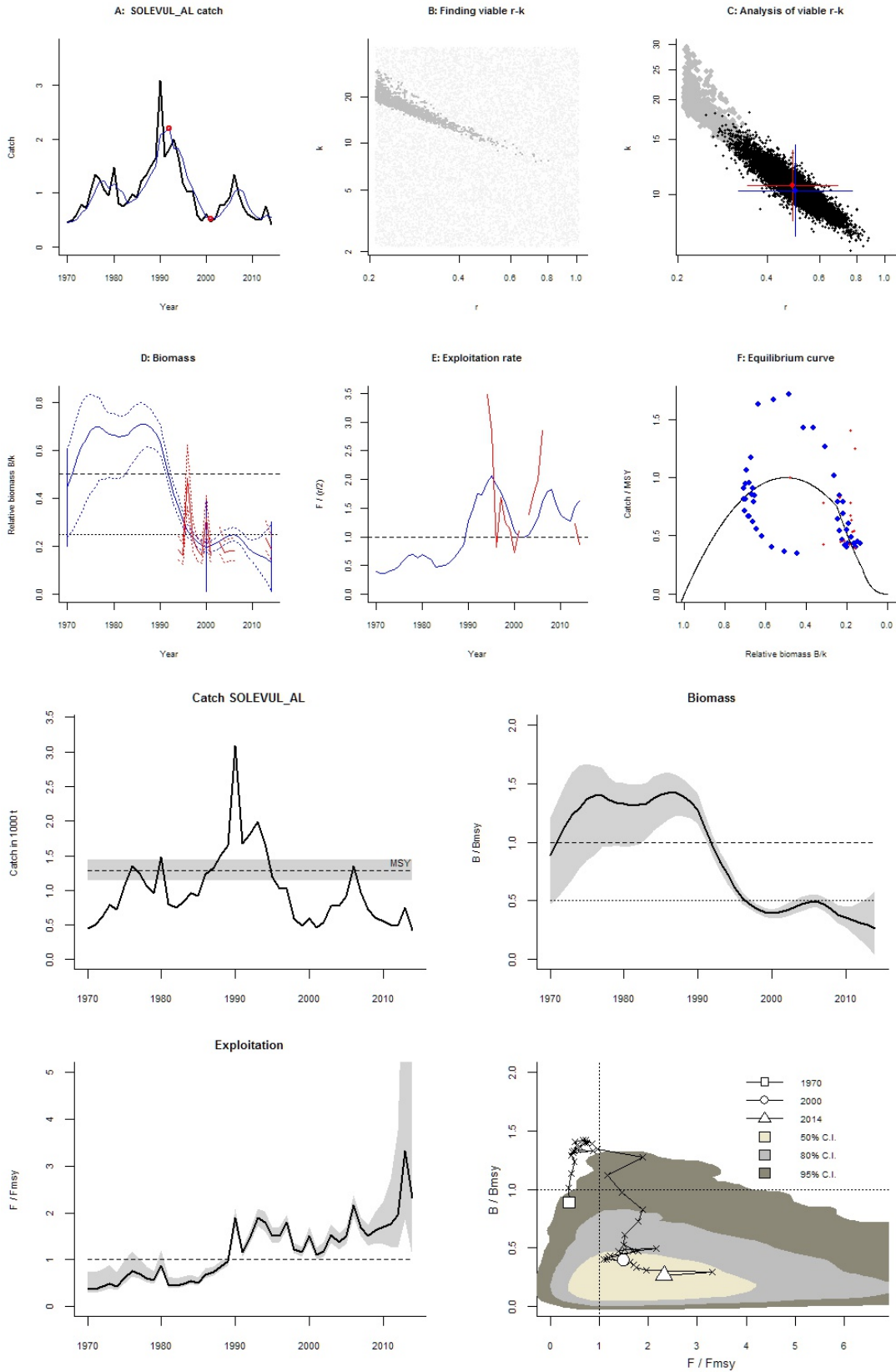
$F/F_{msy}$  = 2.32 , 2.5th perc = 1.06 , 97.5 perc = 19.6

Stock status and exploitation in 2014

Biomass = 1.37 ,  $B/B_{msy}$  = 0.266 , fishing mortality  $F$  = 0.307 ,  $F/F_{msy}$  = 2.32

Comment: Catch=landings from FishStat (Greece). RF final 0.3; OK 04.10.16

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Species: *Spicara smaris* , stock: SPICSMA\_AL

Picarel in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1970 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 10.2 - 163

Prior range of  $q$  = 0.603 - 2.41

Results of CMSY analysis with altogether 1017 viable trajectories for 940 r-k pairs

$r = 0.407$  , 95% CL = 0.261 - 0.634 ,  $k = 63.1$  , 95% CL = 45.8 - 86.9

MSY = 6.41 , 95% CL = 5.47 - 7.53

Relative biomass last year = 0.107  $k$  , 2.5th = 0.0156 , 97.5th = 0.284

Exploitation  $F/(r/2)$  in last year = 1.01

Results from Bayesian Schaefer model using catch & CPUE

$r = 0.417$  , 95% CL = 0.283 - 0.614 ,  $k = 62.4$  , 95% CL = 43.2 - 90.3

MSY = 6.51 , 95% CL = 5.66 - 7.48

Relative biomass in last year = 0.17  $k$  , 2.5th perc = 0.0424 , 97.5th perc = 0.338

Exploitation  $F/(r/2)$  in last year = 0.574

$q = 1.01$  ,  $lcl = 0.742$  ,  $ucl = 1.37$

Results for Management (based on CMSY analysis)

$F_{msy} = 0.203$  , 95% CL = 0.13 - 0.317 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.0868$  , 95% CL = 0.0557 - 0.135 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 6.41 , 95% CL = 5.47 - 7.53

$B_{msy} = 31.6$  , 95% CL = 22.9 - 43.5

Biomass in last year = 6.74 , 2.5th perc = 0.982 , 97.5 perc = 17.9

$B/B_{msy}$  in last year = 0.214 , 2.5th perc = 0.0311 , 97.5 perc = 0.568

Fishing mortality in last year = 0.189 , 2.5th perc = 0.071 , 97.5 perc = 1.3

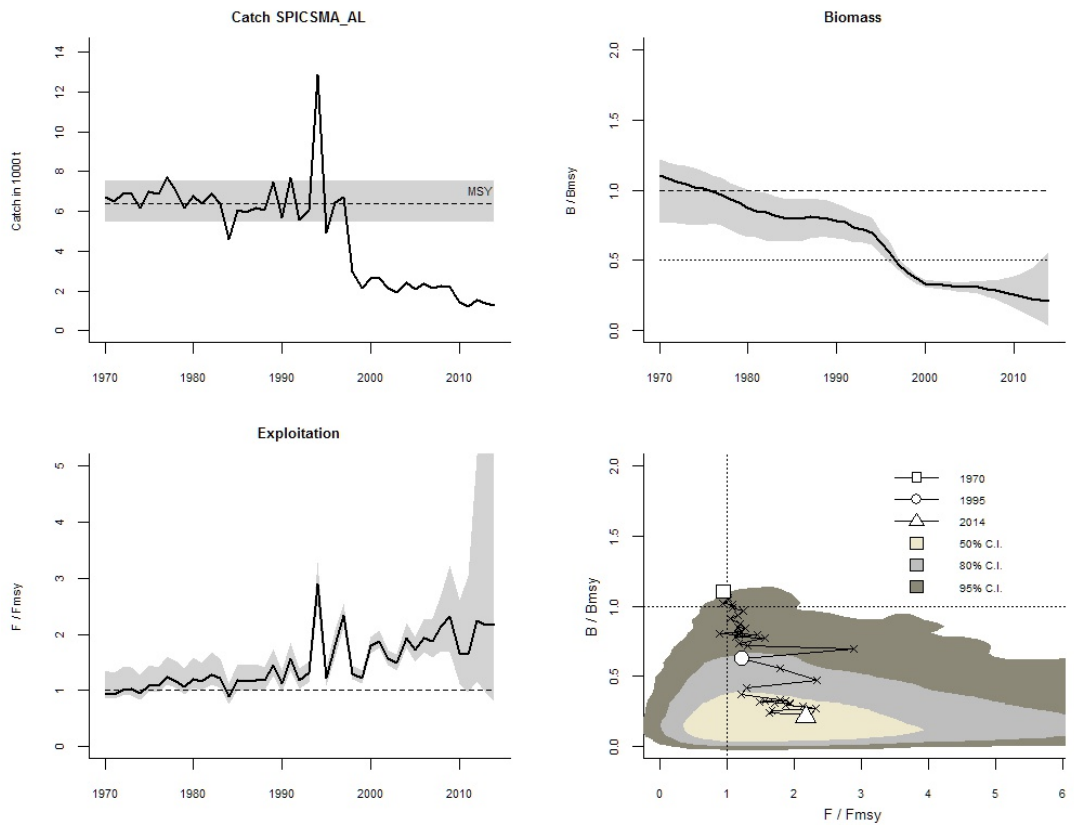
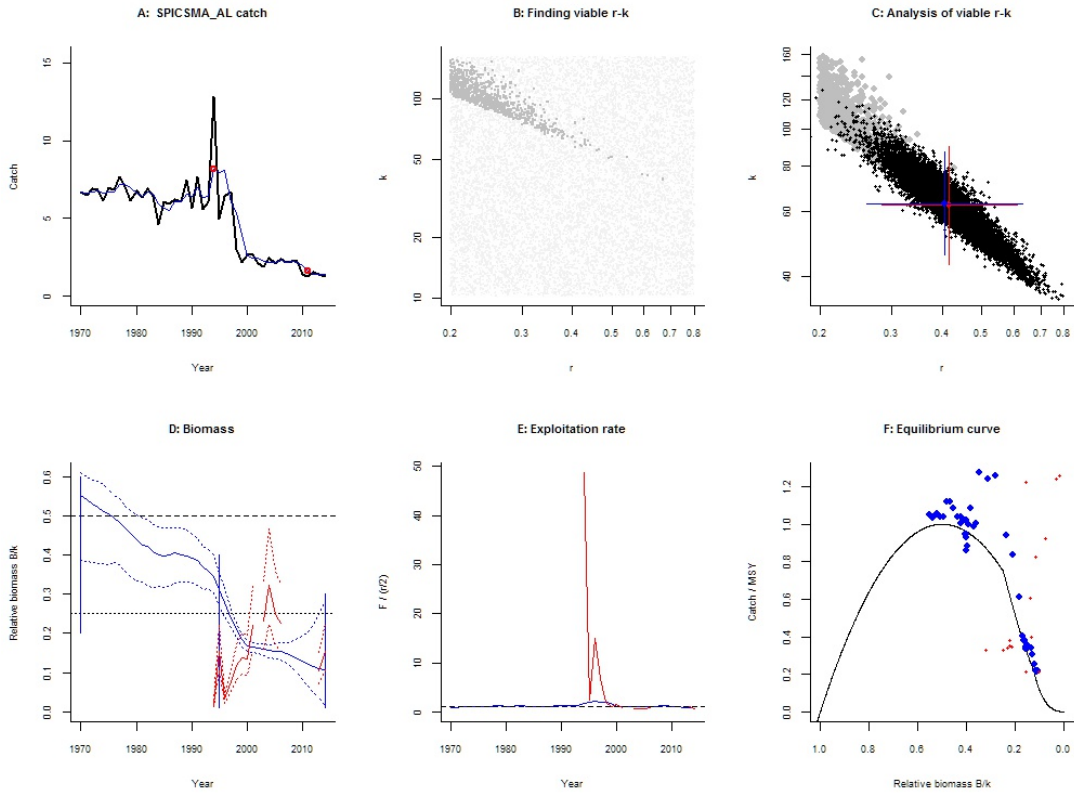
$F/F_{msy} = 2.18$  , 2.5th perc = 0.818 , 97.5 perc = 15

Stock status and exploitation in 2014

Biomass = 6.74 ,  $B/B_{msy} = 0.214$  , fishing mortality  $F = 0.189$  ,  $F/F_{msy} = 2.18$

Comment: Catch=landings from FishStat (Greece). RF int 1995 0.01-0.4, final 0.01-0.3; OK 04.10.16

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Species: *Spondyliosoma cantharus* , stock: SPODCAN\_AL

Black seabream in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1972 - 2014 , abundance = None

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  $r$  = 0.24 - 1.0 expert, , prior range for  $k$  = 0.442 - 7.74

Results of CMSY analysis with altogether 1630 viable trajectories for 1113 r-k pairs

$r$  = 0.517 , 95% CL = 0.301 - 0.887 ,  $k$  = 2.27 , 95% CL = 1.68 - 3.08

MSY = 0.294 , 95% CL = 0.269 - 0.321

Relative biomass last year = 0.115  $k$ , 2.5th = 0.0145 , 97.5th = 0.286

Exploitation  $F/(r/2)$  in last year = 1.38

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.258 , 95% CL = 0.151 - 0.443 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.118 , 95% CL = 0.0691 - 0.203 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.294 , 95% CL = 0.269 - 0.321

$B_{msy}$  = 1.14 , 95% CL = 0.839 - 1.54

Biomass in last year = 0.26 , 2.5th perc = 0.033 , 97.5 perc = 0.65

$B/B_{msy}$  in last year = 0.229 , 2.5th perc = 0.029 , 97.5 perc = 0.572

Fishing mortality in last year = 0.307 , 2.5th perc = 0.123 , 97.5 perc = 2.43

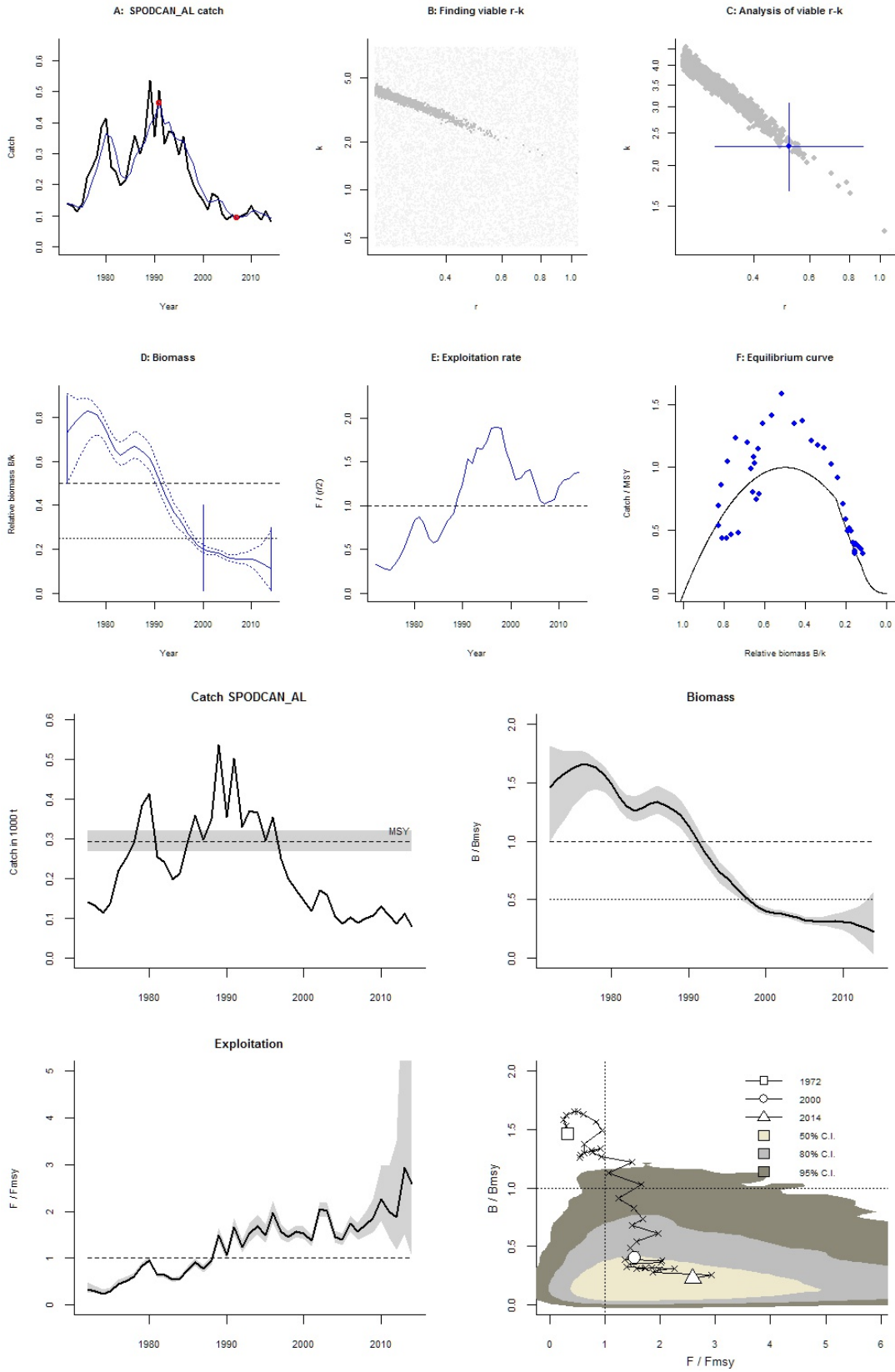
$F/F_{msy}$  = 2.59 , 2.5th perc = 1.04 , 97.5 perc = 20.5

Stock status and exploitation in 2014

Biomass = 0.26 ,  $B/B_{msy}$  = 0.229 , fishing mortality  $F$  = 0.307 ,  $F/F_{msy}$  = 2.59

Comment: Catch=landings from FishStat (Greece). RF int 2000 0.01-0.4, final 0.01-0.3; OK 04.10.16

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Species: *Squalus acanthias* , stock: SQUAACA\_AL

Picked dogfish in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1982 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.5 - 0.9 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  $r$  = 0.05 - 0.5 default , prior range for  $k$  = 0.49 - 19.6

Prior range of  $q$  = 5.25 - 33.2

Results of CMSY analysis with altogether 4115 viable trajectories for 1009 r-k pairs

$r$  = 0.258 , 95% CL = 0.142 - 0.469 ,  $k$  = 2.1 , 95% CL = 1.13 - 3.91

MSY = 0.135 , 95% CL = 0.11 - 0.166

Relative biomass last year = 0.275  $k$  , 2.5th = 0.0225 , 97.5th = 0.395

Exploitation  $F/(r/2)$  in last year = 1.14

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.195 , 95% CL = 0.109 - 0.349 ,  $k$  = 2.62 , 95% CL = 1.74 - 3.95

MSY = 0.128 , 95% CL = 0.0967 - 0.169

Relative biomass in last year = 0.292  $k$  , 2.5th perc = 0.124 , 97.5th perc = 0.448

Exploitation  $F/(r/2)$  in last year = 1.38

$q$  = 9.32 , lcl = 6.44 , ucl = 13.5

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.129 , 95% CL = 0.0709 - 0.234 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.129 , 95% CL = 0.0709 - 0.234 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.135 , 95% CL = 0.11 - 0.166

$B_{msy}$  = 1.05 , 95% CL = 0.564 - 1.96

Biomass in last year = 0.577 , 2.5th perc = 0.0473 , 97.5 perc = 0.829

$B/B_{msy}$  in last year = 0.549 , 2.5th perc = 0.045 , 97.5 perc = 0.789

Fishing mortality in last year = 0.178 , 2.5th perc = 0.124 , 97.5 perc = 2.18

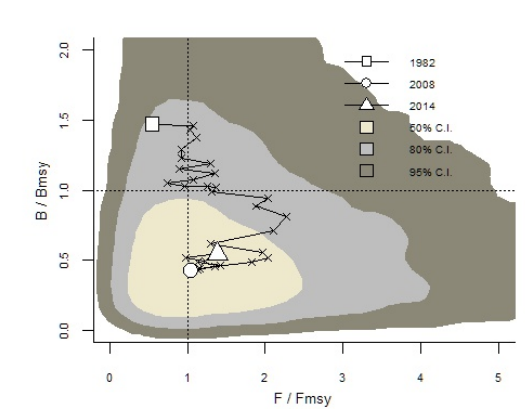
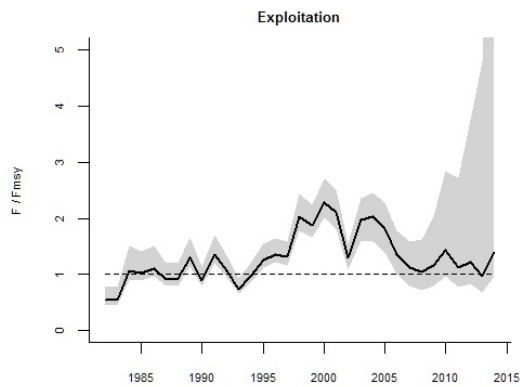
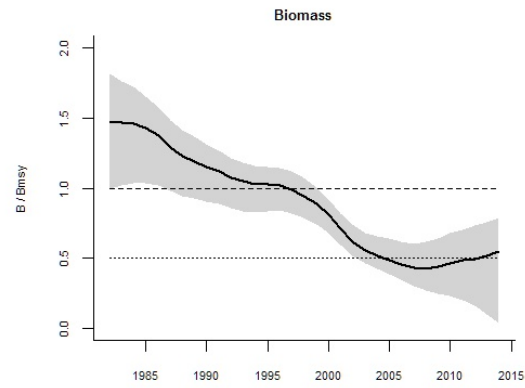
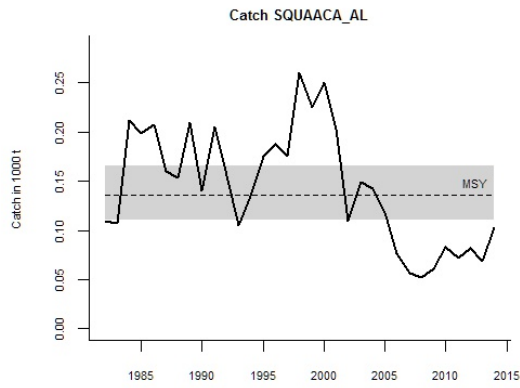
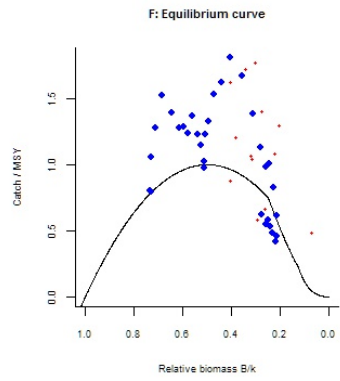
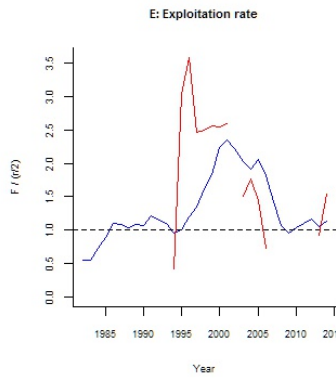
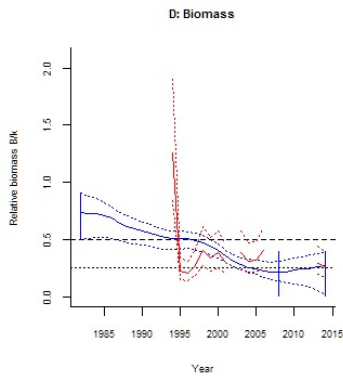
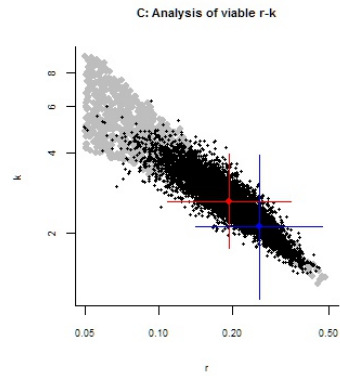
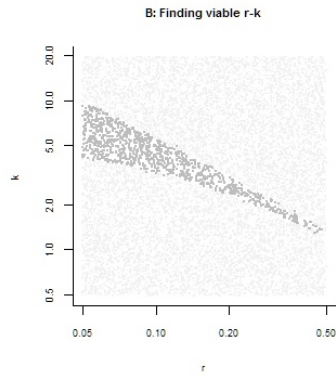
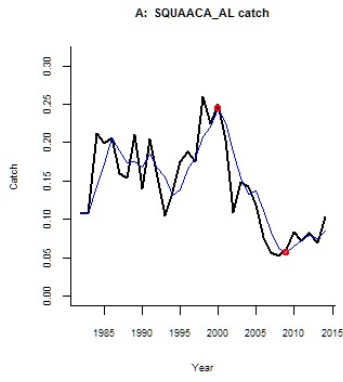
$F/F_{msy}$  = 1.38 , 2.5th perc = 0.963 , 97.5 perc = 16.9

Stock status and exploitation in 2014

Biomass = 0.577 ,  $B/B_{msy}$  = 0.549 , fishing mortality  $F$  = 0.178 ,  $F/F_{msy}$  = 1.38

Comment: Catch=landings from FishStat (Greece), Biomass estimates standardized relative to max value. RF int 2008 0.01-0.4, final 0.01-0.4; OK 04.10.16

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Species: *Trachurus mediterraneus* , stock: TRACHMED\_AL

Mediterranean horse mackerel in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1975 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.2 - 0.6 in year 1995 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 12.1 - 194

Prior range of  $q$  = 0.0526 - 0.21

Results of CMSY analysis with altogether 1720 viable trajectories for 1526 r-k pairs

$r$  = 0.438 , 95% CL = 0.303 - 0.634 ,  $k$  = 70.7 , 95% CL = 49.6 - 101

MSY = 7.75 , 95% CL = 6.47 - 9.29

Relative biomass last year = 0.174  $k$  , 2.5th = 0.0213 , 97.5th = 0.384

Exploitation  $F/(r/2)$  in last year = 0.753

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.481 , 95% CL = 0.328 - 0.707 ,  $k$  = 64.8 , 95% CL = 44.8 - 93.8

MSY = 7.8 , 95% CL = 6.81 - 8.94

Relative biomass in last year = 0.261  $k$  , 2.5th perc = 0.0666 , 97.5th perc = 0.446

Exploitation  $F/(r/2)$  in last year = 0.423

$q$  = 0.0839 , lcl = 0.062 , ucl = 0.114

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.219 , 95% CL = 0.151 - 0.317 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.152 , 95% CL = 0.105 - 0.22 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 7.75 , 95% CL = 6.47 - 9.29

$B_{msy}$  = 35.4 , 95% CL = 24.8 - 50.4

Biomass in last year = 12.3 , 2.5th perc = 1.5 , 97.5 perc = 27.2

$B/B_{msy}$  in last year = 0.348 , 2.5th perc = 0.0425 , 97.5 perc = 0.768

Fishing mortality in last year = 0.14 , 2.5th perc = 0.0633 , 97.5 perc = 1.14

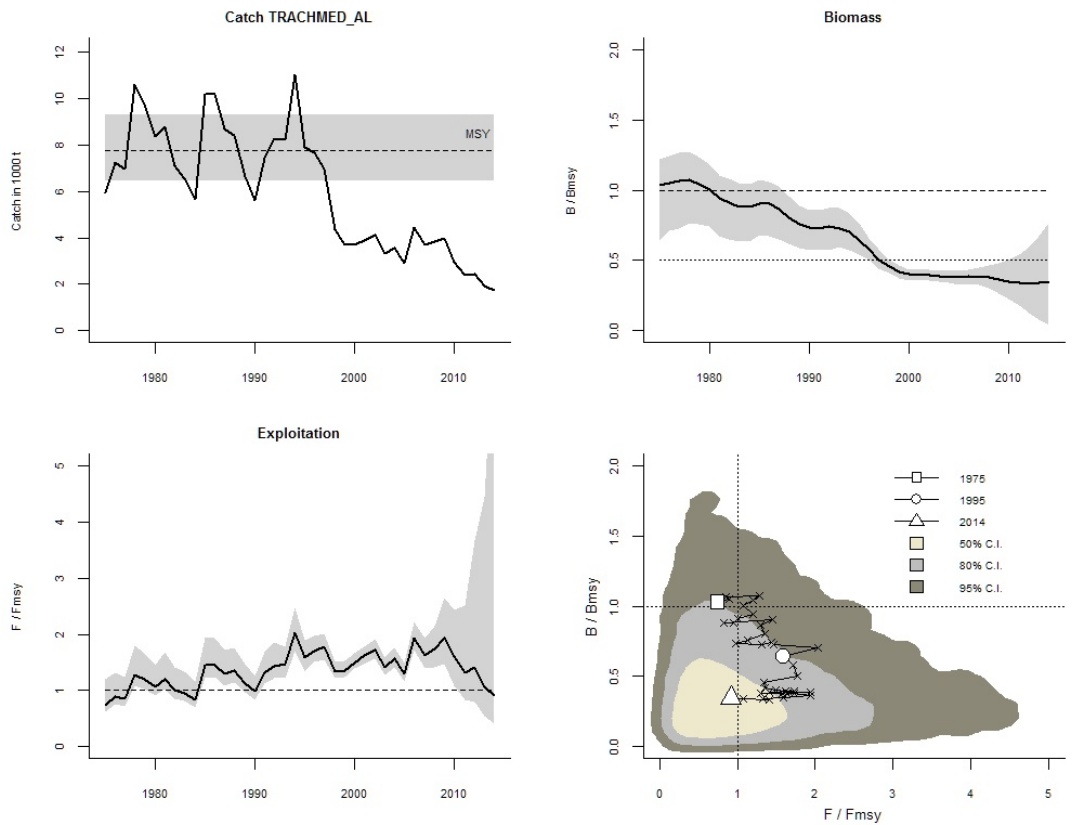
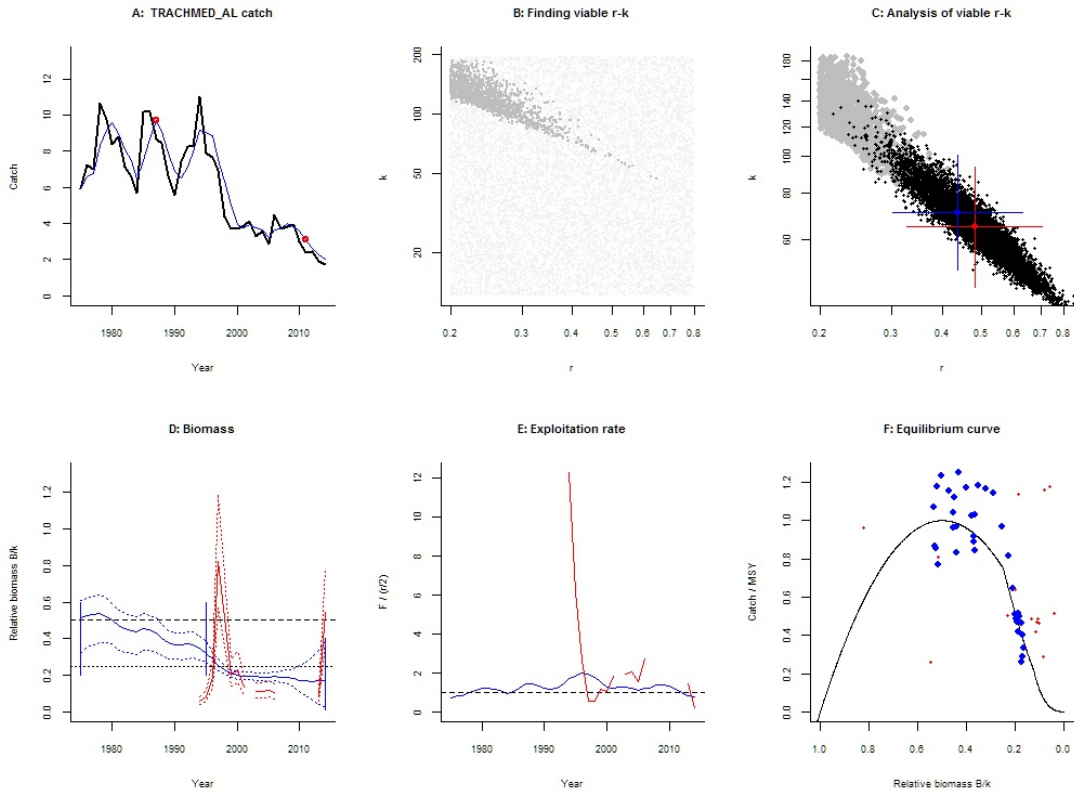
$F/F_{msy}$  = 0.918 , 2.5th perc = 0.416 , 97.5 perc = 7.51

Stock status and exploitation in 2014

Biomass = 12.3 ,  $B/B_{msy}$  = 0.348 , fishing mortality  $F$  = 0.14 ,  $F/F_{msy}$  = 0.918

Comment: Catch=landings from FishStat (Greece+Turkey), Biomass estimates standardized relative to max value; RF OK 04.10.16

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Species: *Trachurus trachurus* , stock: TRACTRA\_AL

Atlantic horse mackerel in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1982 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2000 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.22 - 0.98 expert, , prior range for  $k$  = 2.55 - 45.4

Prior range of  $q$  = 0.516 - 2.18

Results of CMSY analysis with altogether 1206 viable trajectories for 616 r-k pairs

$r = 0.66$  , 95% CL = 0.458 - 0.953 ,  $k = 9.8$  , 95% CL = 6.57 - 14.6

MSY = 1.62 , 95% CL = 1.46 - 1.8

Relative biomass last year = 0.306  $k$  , 2.5th = 0.0284 , 97.5th = 0.397

Exploitation  $F/(r/2)$  in last year = 0.911

Results from Bayesian Schaefer model using catch & CPUE

$r = 0.643$  , 95% CL = 0.436 - 0.947 ,  $k = 10.4$  , 95% CL = 7.29 - 14.9

MSY = 1.68 , 95% CL = 1.53 - 1.84

Relative biomass in last year = 0.416  $k$  , 2.5th perc = 0.277 , 97.5th perc = 0.517

Exploitation  $F/(r/2)$  in last year = 0.502

$q = 0.822$  , lcl = 0.607 , ucl = 1.11

Results for Management (based on CMSY analysis)

$F_{msy} = 0.33$  , 95% CL = 0.229 - 0.476 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.33$  , 95% CL = 0.229 - 0.476 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.62 , 95% CL = 1.46 - 1.8

$B_{msy} = 4.9$  , 95% CL = 3.28 - 7.31

Biomass in last year = 3 , 2.5th perc = 0.278 , 97.5 perc = 3.89

$B/B_{msy}$  in last year = 0.613 , 2.5th perc = 0.0567 , 97.5 perc = 0.793

Fishing mortality in last year = 0.233 , 2.5th perc = 0.18 , 97.5 perc = 2.52

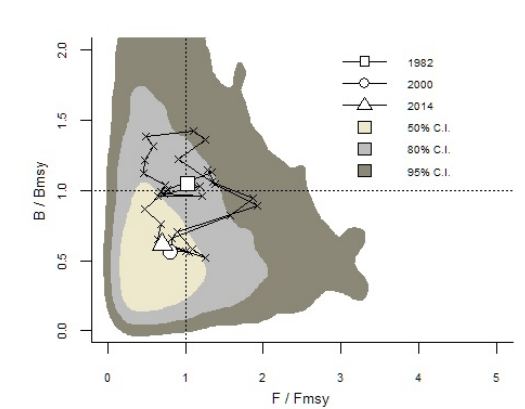
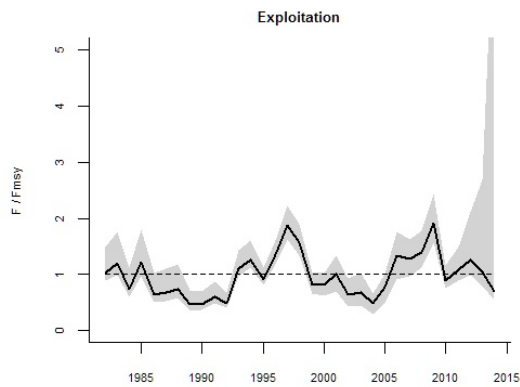
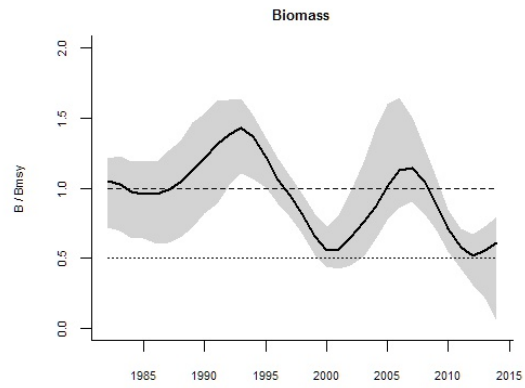
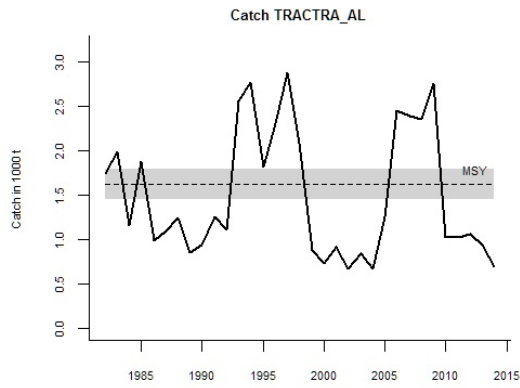
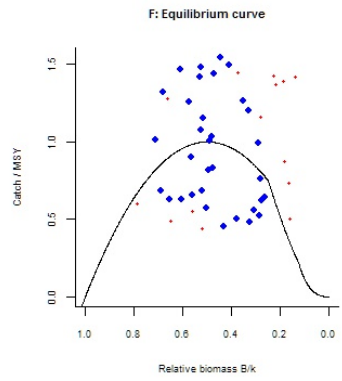
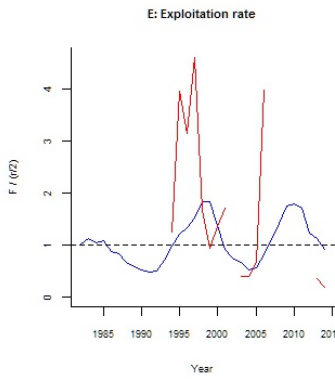
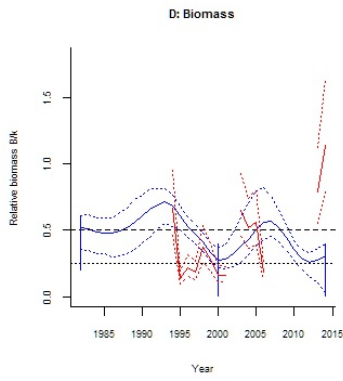
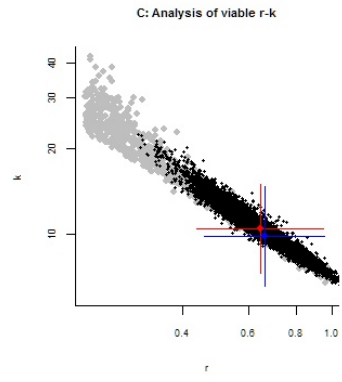
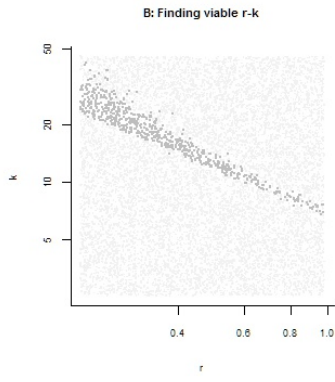
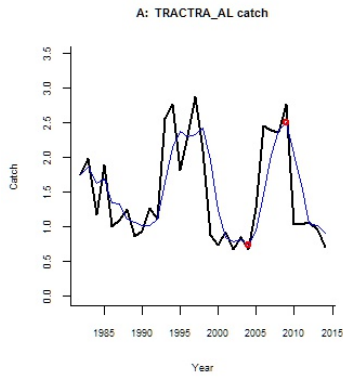
$F/F_{msy} = 0.706$  , 2.5th perc = 0.546 , 97.5 perc = 7.63

Stock status and exploitation in 2014

Biomass = 3 ,  $B/B_{msy} = 0.613$  , fishing mortality  $F = 0.233$  ,  $F/F_{msy} = 0.706$

Comment: Catch=landings from FishStat (Greece+Turkey), Biomass estimates standardized relative to max value. RF OK 04.10.16

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Species: *Umbrina cirrosa* , stock: UMBRCIR\_AL

Shi drum in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1982 - 2014 , abundance = None

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2007 default

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.59 - 1.2 expert, , prior range for  $k$  = 0.0461 - 0.375

Results of CMSY analysis with altogether 700 viable trajectories for 647 r-k pairs

$r = 0.963$  , 95% CL = 0.777 - 1.19 ,  $k = 0.18$  , 95% CL = 0.148 - 0.219

MSY = 0.0434 , 95% CL = 0.0398 - 0.0472

Relative biomass last year = 0.128  $k$  , 2.5th = 0.0162 , 97.5th = 0.293

Exploitation  $F/(r/2)$  in last year = 1.62

Results for Management (based on CMSY analysis)

$F_{msy} = 0.482$  , 95% CL = 0.389 - 0.597 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy} = 0.247$  , 95% CL = 0.199 - 0.305 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.0434 , 95% CL = 0.0398 - 0.0472

$B_{msy} = 0.09$  , 95% CL = 0.0739 - 0.11

Biomass in last year = 0.023 , 2.5th perc = 0.00291 , 97.5 perc = 0.0527

$B/B_{msy}$  in last year = 0.256 , 2.5th perc = 0.0323 , 97.5 perc = 0.585

Fishing mortality in last year = 0.608 , 2.5th perc = 0.266 , 97.5 perc = 4.81

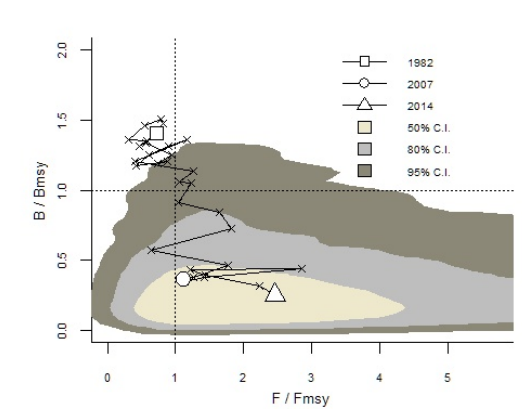
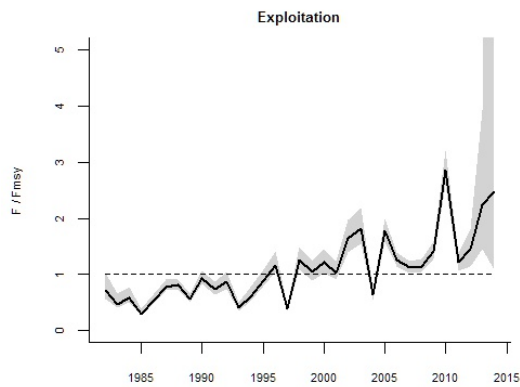
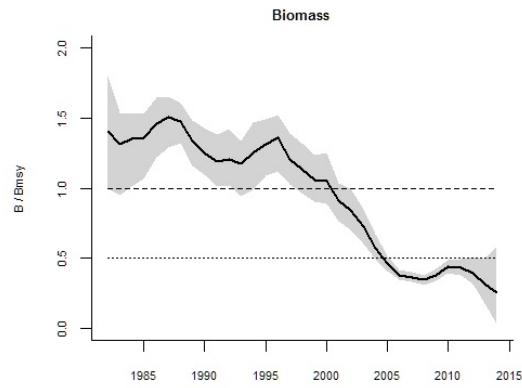
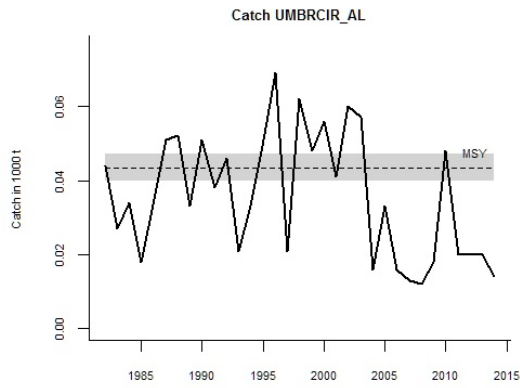
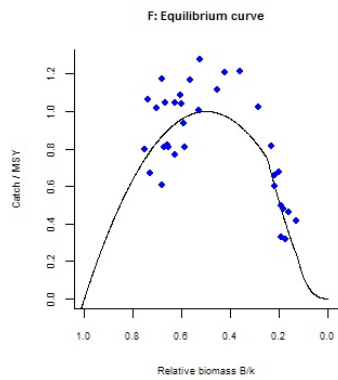
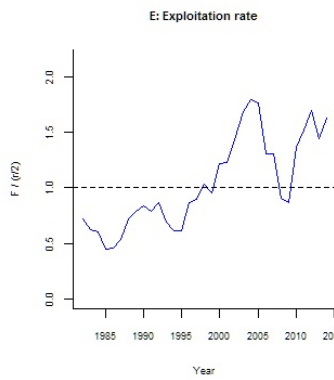
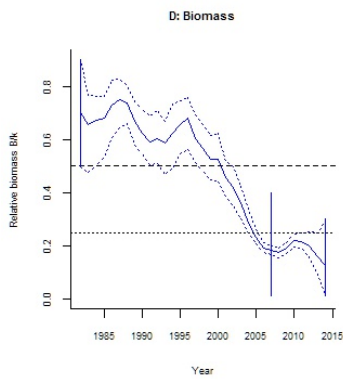
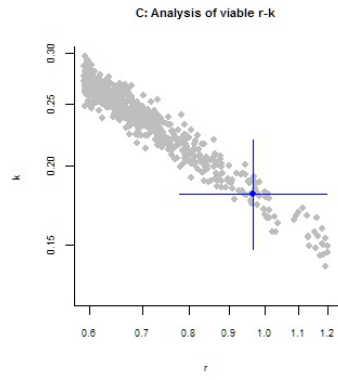
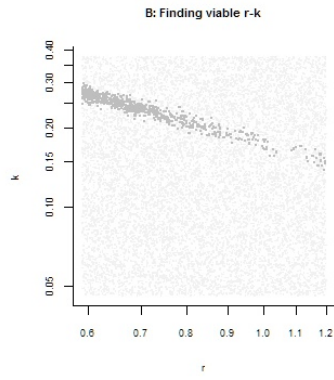
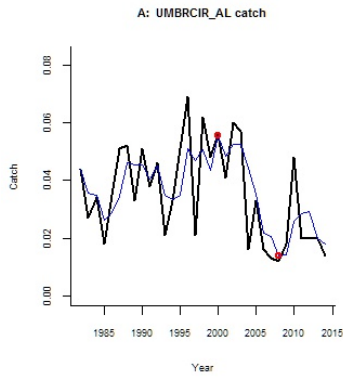
$F/F_{msy} = 2.46$  , 2.5th perc = 1.08 , 97.5 perc = 19.5

Stock status and exploitation in 2014

Biomass = 0.023 ,  $B/B_{msy} = 0.256$  , fishing mortality  $F = 0.608$  ,  $F/F_{msy} = 2.46$

Comment: Catch=landings from FishStat (Greece). RF final 0.3; OK 04.10.16

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Species: *Zeus faber* , stock: ZEUSFAB\_AL

John Dory in Aegean Sea

Source:

Region: Mediterranean , Aegean Sea

Catch data used from years 1982 - 2014 , 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 - 0.4 expert

Prior range for  $r$  = 0.29 - 1 expert, , prior range for  $k$  = 0.483 - 6.67

Prior range of  $q$  = 1.67 - 6.2

Results of CMSY analysis with altogether 1280 viable trajectories for 1056 r-k pairs

$r$  = 0.769 , 95% CL = 0.602 - 0.982 ,  $k$  = 1.61 , 95% CL = 1.16 - 2.23

MSY = 0.31 , 95% CL = 0.264 - 0.363

Relative biomass last year = 0.238  $k$ , 2.5th = 0.021 , 97.5th = 0.392

Exploitation  $F/(r/2)$  in last year = 1.89

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.736 , 95% CL = 0.544 - 0.996 ,  $k$  = 1.71 , 95% CL = 1.33 - 2.2

MSY = 0.315 , 95% CL = 0.281 - 0.353

Relative biomass in last year = 0.406  $k$ , 2.5th perc = 0.29 , 97.5th perc = 0.491

Exploitation  $F/(r/2)$  in last year = 1.05

$q$  = 2.31 , lcl = 1.81 , ucl = 2.95

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.385 , 95% CL = 0.301 - 0.491 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.365 , 95% CL = 0.286 - 0.467 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.31 , 95% CL = 0.264 - 0.363

$B_{msy}$  = 0.805 , 95% CL = 0.581 - 1.11

Biomass in last year = 0.382 , 2.5th perc = 0.0337 , 97.5 perc = 0.632

$B/B_{msy}$  in last year = 0.475 , 2.5th perc = 0.0419 , 97.5 perc = 0.785

Fishing mortality in last year = 0.703 , 2.5th perc = 0.426 , 97.5 perc = 7.98

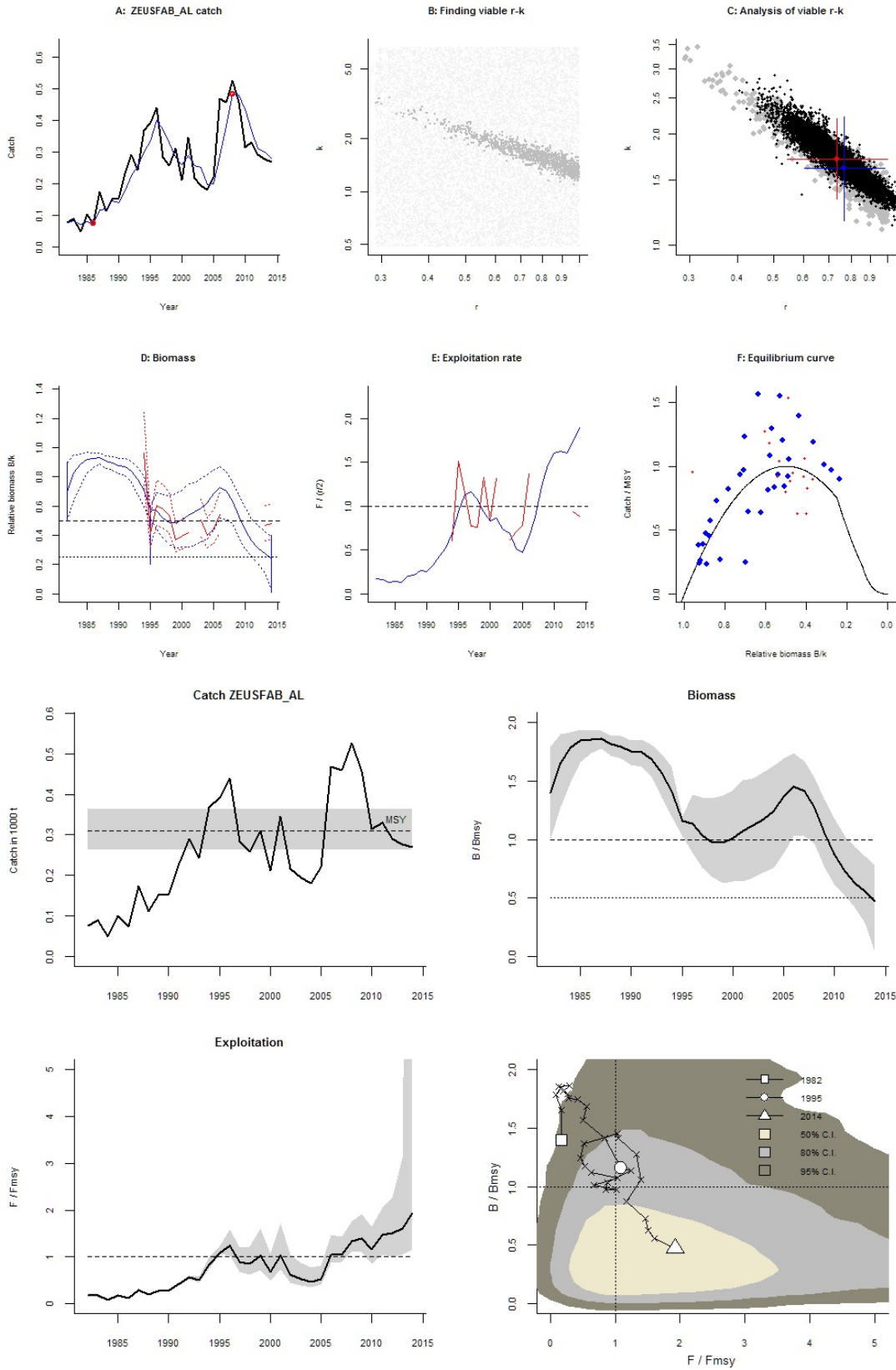
$F/F_{msy}$  = 1.92 , 2.5th perc = 1.17 , 97.5 perc = 21.8

Stock status and exploitation in 2014

Biomass = 0.382 ,  $B/B_{msy}$  = 0.475 , fishing mortality  $F$  = 0.703 ,  $F/F_{msy}$  = 1.92

Comment: Catch=landings from FishStat (Greece+Turkey), Biomass estimates standardized relative to max value. RF OK 04.10.16

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**Cyprus** (analyzed with CMSY\_O\_7m.R; see Comment for data sources)

Species: *Boops boops* , stock: BOOPBOO\_CY

Bogue in Cypriot waters

Source: excel

Region: Mediterranean , Cyprus

Catch data used from years 1990 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2003 default

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.31 - 1.1 expert, , prior range for  $k$  = 0.257 - 3.65

Results of CMSY analysis with altogether 1251 viable trajectories for 873 r-k pairs

$r$  = 0.715 , 95% CL = 0.48 - 1.07 ,  $k$  = 1.34 , 95% CL = 0.967 - 1.86

MSY = 0.24 , 95% CL = 0.213 - 0.27

Relative biomass last year = 0.17  $k$ , 2.5th = 0.0175 , 97.5th = 0.295

Exploitation  $F/(r/2)$  in last year = 1.2

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.358 , 95% CL = 0.24 - 0.533 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.244 , 95% CL = 0.164 - 0.363 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.24 , 95% CL = 0.213 - 0.27

$B_{msy}$  = 0.67 , 95% CL = 0.484 - 0.929

Biomass in last year = 0.228 , 2.5th perc = 0.0234 , 97.5 perc = 0.396

$B/B_{msy}$  in last year = 0.341 , 2.5th perc = 0.035 , 97.5 perc = 0.591

Fishing mortality in last year = 0.486 , 2.5th perc = 0.28 , 97.5 perc = 4.73

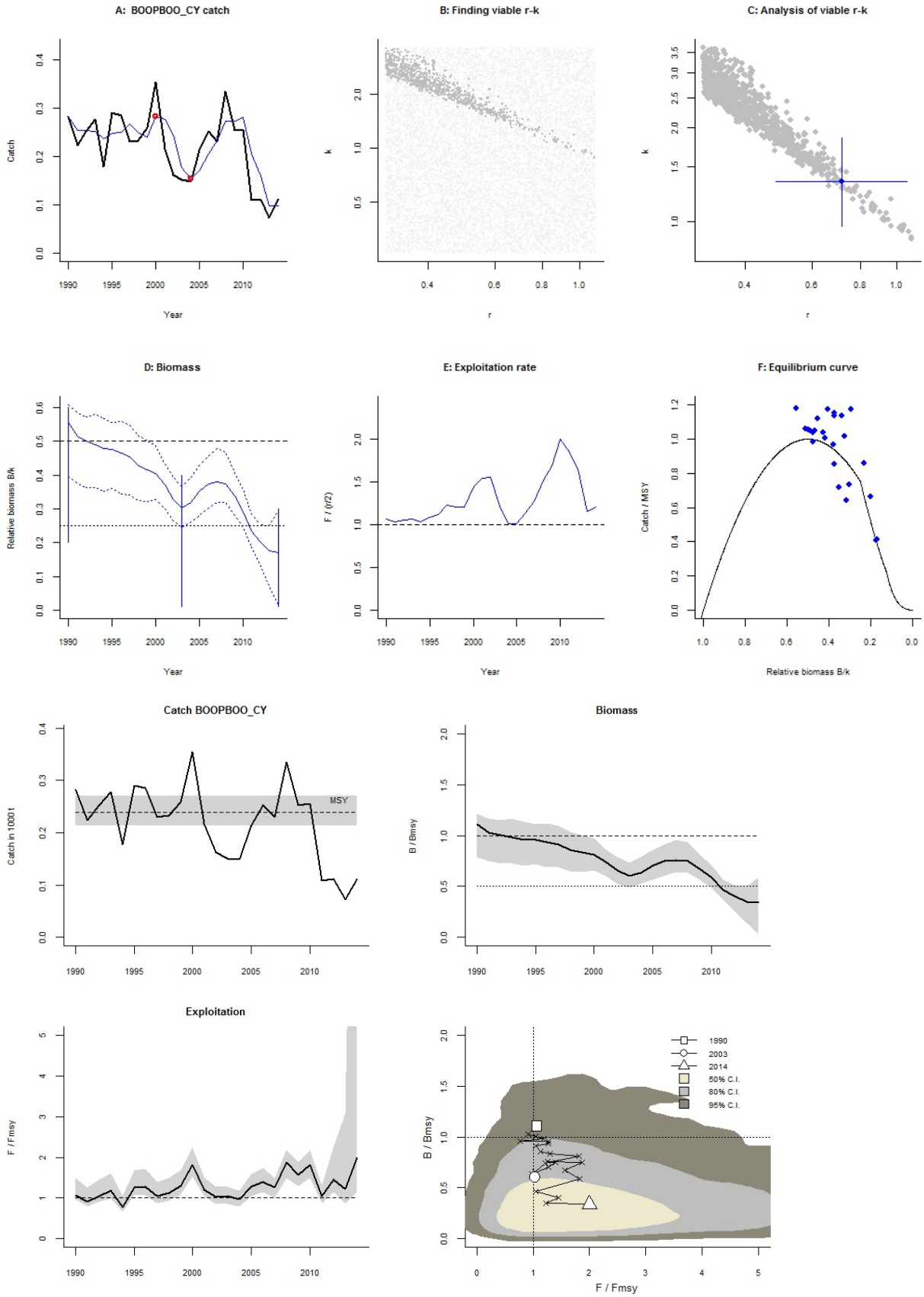
$F/F_{msy}$  = 2 , 2.5th perc = 1.15 , 97.5 perc = 19.4

Stock status and exploitation in 2014

Biomass = 0.228 ,  $B/B_{msy}$  = 0.341 , fishing mortality  $F$  = 0.486 ,  $F/F_{msy}$  = 2

Comment: Catch=landings from FishStat Based on Cypriot catches only. RF final 0.3. GS OK

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Species: *Dentex dentex* , stock: DENTDEN\_CY

Common dentex in Cypriot waters

Source:

Region: Mediterranean , Cyprus

Catch data used from years 1972 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2010 default

Prior final relative biomass = 0.01 - 0.2 expert

Prior range for  $r$  = 0.15 - 0.73 expert, , prior range for  $k$  = 0.0598 - 1.16

Results of CMSY analysis with altogether 2033 viable trajectories for 1801 r-k pairs

$r$  = 0.335 , 95% CL = 0.238 - 0.469 ,  $k$  = 0.328 , 95% CL = 0.224 - 0.481

MSY = 0.0274 , 95% CL = 0.0213 - 0.0354

Relative biomass last year = 0.0886  $k$ , 2.5th = 0.0143 , 97.5th = 0.196

Exploitation  $F/(r/2)$  in last year = 1.23

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.167 , 95% CL = 0.119 - 0.235 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0593 , 95% CL = 0.0423 - 0.0832 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.0274 , 95% CL = 0.0213 - 0.0354

$B_{msy}$  = 0.164 , 95% CL = 0.112 - 0.24

Biomass in last year = 0.0291 , 2.5th perc = 0.00469 , 97.5 perc = 0.0643

$B/B_{msy}$  in last year = 0.177 , 2.5th perc = 0.0286 , 97.5 perc = 0.392

Fishing mortality in last year = 0.138 , 2.5th perc = 0.0622 , 97.5 perc = 0.852

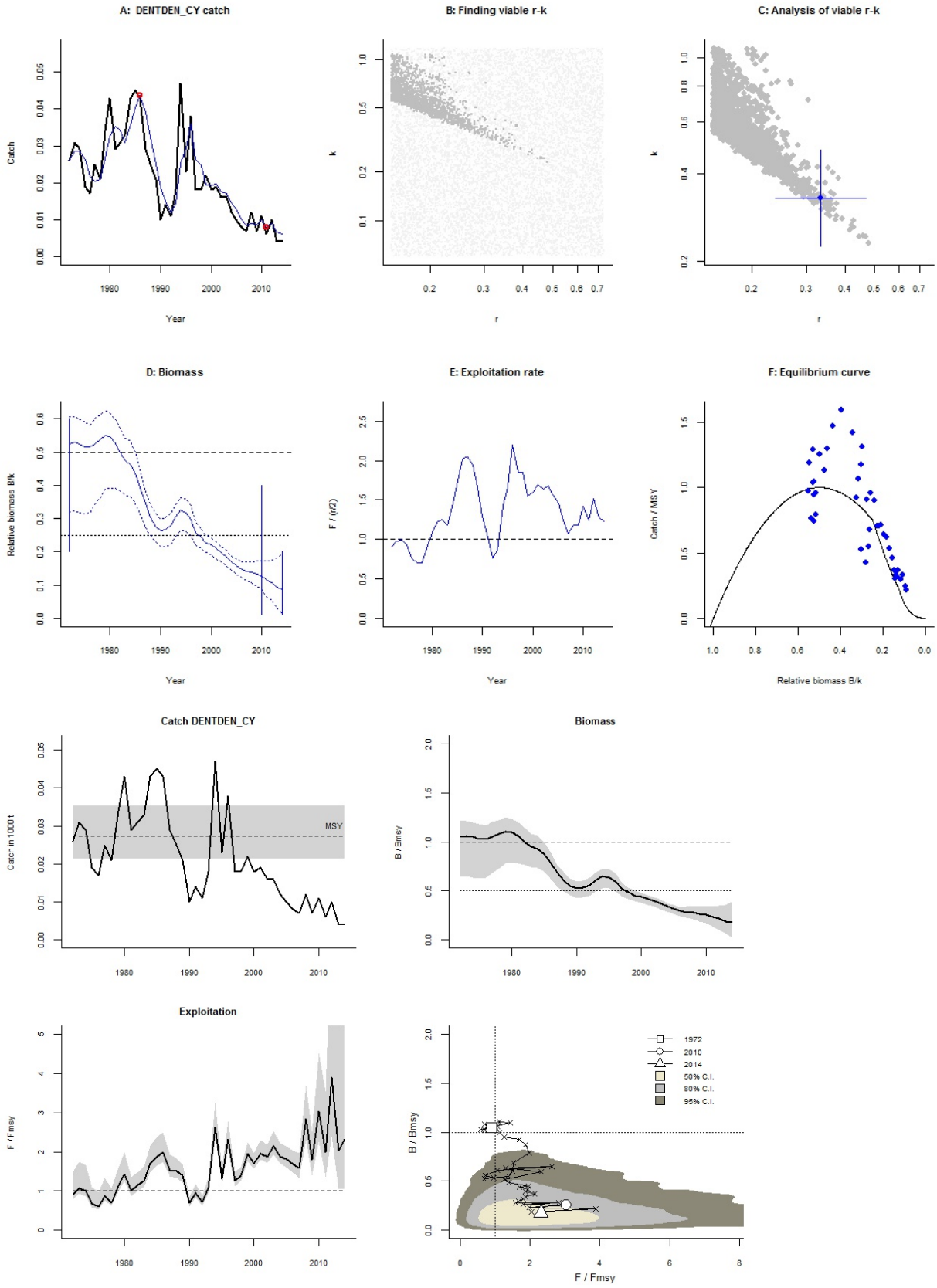
$F/F_{msy}$  = 2.32 , 2.5th perc = 1.05 , 97.5 perc = 14.4

Stock status and exploitation in 2014

Biomass = 0.0291 ,  $B/B_{msy}$  = 0.177 , fishing mortality  $F$  = 0.138 ,  $F/F_{msy}$  = 2.32

Comment: Catch=landings from FishStat Based on Cypriot catches only. RF final 0.2. GS OK

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Species: *Mullus barbatus* , stock: MULLBAR\_CY

Red mullet in Cypriot waters

Source: Colloca et al 2013

Region: Mediterranean , Cyprus

Catch data used from years 1980 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.22 - 1.2 expert, , prior range for  $k$  = 0.123 - 2.8

Prior range of  $q$  = 0.0311 - 0.148

Results of CMSY analysis with altogether 1905 viable trajectories for 1587 r-k pairs

$r$  = 0.599 , 95% CL = 0.4 - 0.897 ,  $k$  = 0.792 , 95% CL = 0.535 - 1.17

MSY = 0.119 , 95% CL = 0.103 - 0.137

Relative biomass last year = 0.125  $k$ , 2.5th = 0.0134 , 97.5th = 0.294

Exploitation  $F/(r/2)$  in last year = 0.913

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.614 , 95% CL = 0.371 - 1.02 ,  $k$  = 0.771 , 95% CL = 0.489 - 1.21

MSY = 0.118 , 95% CL = 0.106 - 0.132

Relative biomass in last year = 0.149  $k$ , 2.5th perc = 0.0282 , 97.5th perc = 0.335

Exploitation  $F/(r/2)$  in last year = 0.91

$q$  = 0.0531 , lcl = 0.0367 , ucl = 0.0768

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.307 , 95% CL = 0.185 - 0.508 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.182 , 95% CL = 0.11 - 0.302 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.118 , 95% CL = 0.106 - 0.132

$B_{msy}$  = 0.385 , 95% CL = 0.245 - 0.607

Biomass in last year = 0.115 , 2.5th perc = 0.0218 , 97.5 perc = 0.258

$B/B_{msy}$  in last year = 0.297 , 2.5th perc = 0.0564 , 97.5 perc = 0.67

Fishing mortality in last year = 0.279 , 2.5th perc = 0.124 , 97.5 perc = 1.47

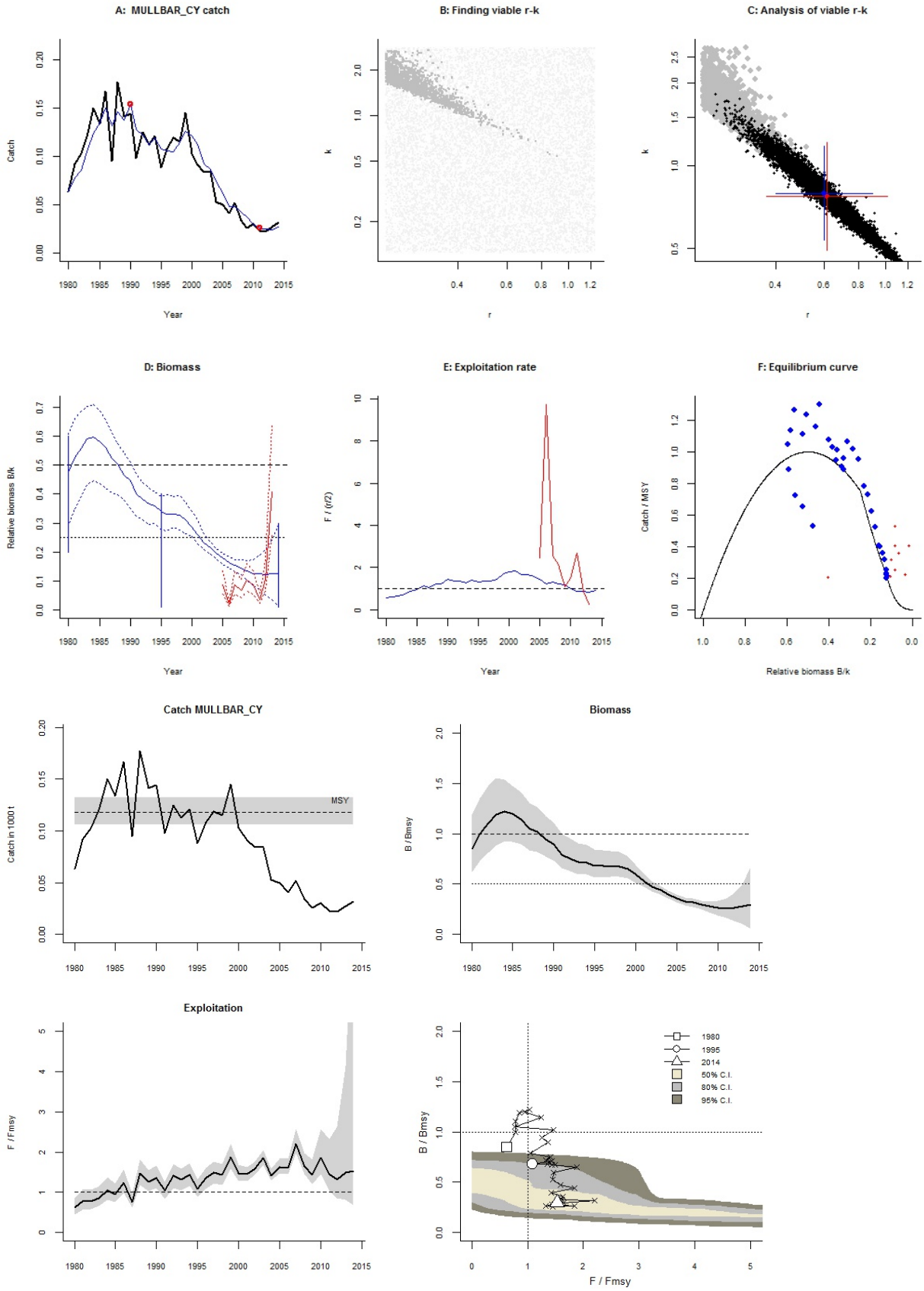
$F/F_{msy}$  = 1.53 , 2.5th perc = 0.679 , 97.5 perc = 8.06

Stock status and exploitation in 2014

Biomass = 0.115 ,  $B/B_{msy}$  = 0.297 , fishing mortality  $F$  = 0.279 ,  $F/F_{msy}$  = 1.53

Comment: Catch=landings from FishStat Based on Cypriot catches only, CPUE from MEDITS. GS final 0.3

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Species: *Mullus surmuletus* , stock: MULLSUR\_CY

Surmullet in Cypriot waters

Source: excel

Region: Mediterranean , Cyprus

Catch data used from years 1980 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.01 - 0.4 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.46 - 1.6 expert, , prior range for  $k$  = 0.144 - 1.98

Prior range of  $q$  = 0.0033 - 0.0122

Results of CMSY analysis with altogether 34 viable trajectories for 34  $r$ - $k$  pairs

$r$  = 0.622 , 95% CL = 0.445 - 0.87 ,  $k$  = 1.16 , 95% CL = 0.975 - 1.37

MSY = 0.18 , 95% CL = 0.157 - 0.207

Relative biomass last year = 0.125  $k$ , 2.5th = 0.0147 , 97.5th = 0.373

Exploitation  $F/(r/2)$  in last year = 0.718

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.888 , 95% CL = 0.607 - 1.3 ,  $k$  = 0.816 , 95% CL = 0.58 - 1.15

MSY = 0.181 , 95% CL = 0.167 - 0.197

Relative biomass in last year = 0.105  $k$ , 2.5th perc = 0.0129 , 97.5th perc = 0.425

Exploitation  $F/(r/2)$  in last year = 0.921

$q$  = 0.00545 , lcl = 0.00398 , ucl = 0.00747

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.444 , 95% CL = 0.304 - 0.649 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.186 , 95% CL = 0.127 - 0.272 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.181 , 95% CL = 0.167 - 0.197

$B_{msy}$  = 0.408 , 95% CL = 0.29 - 0.575

Biomass in last year = 0.0857 , 2.5th perc = 0.0105 , 97.5 perc = 0.347

$B/B_{msy}$  in last year = 0.21 , 2.5th perc = 0.0258 , 97.5 perc = 0.85

Fishing mortality in last year = 0.409 , 2.5th perc = 0.101 , 97.5 perc = 3.32

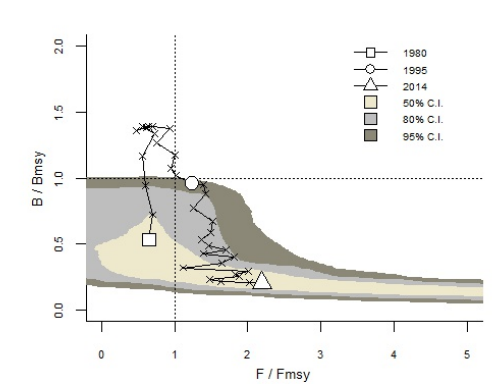
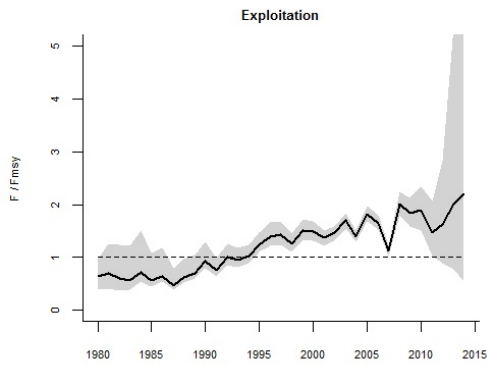
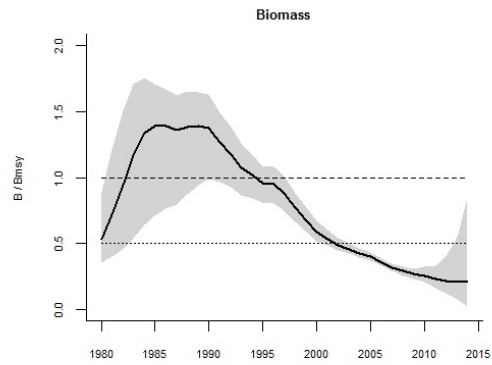
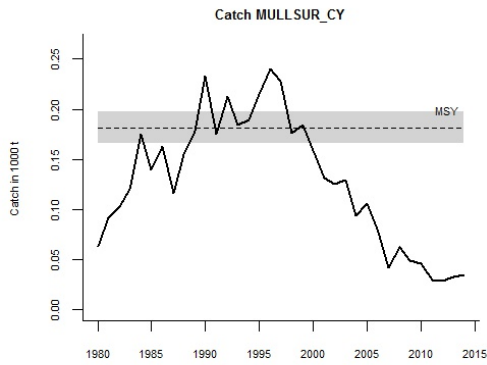
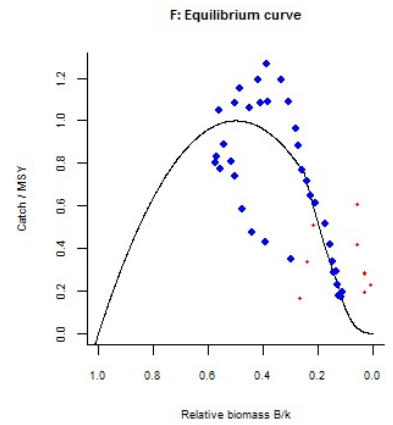
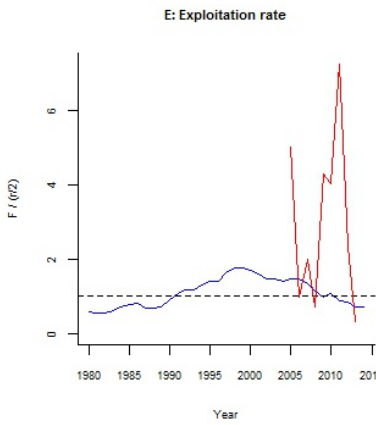
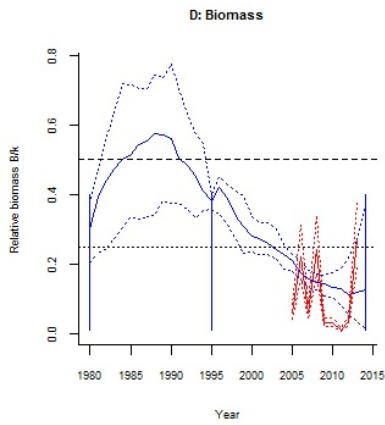
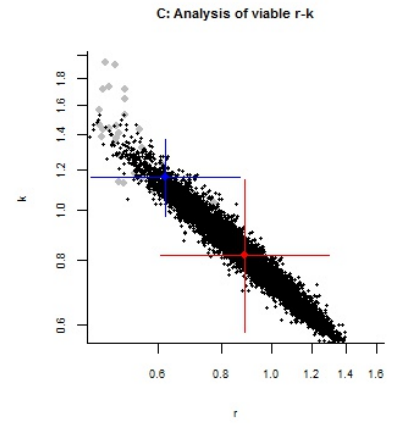
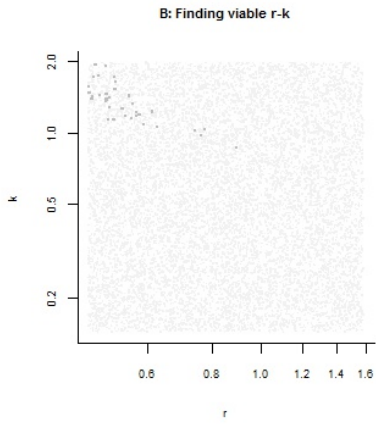
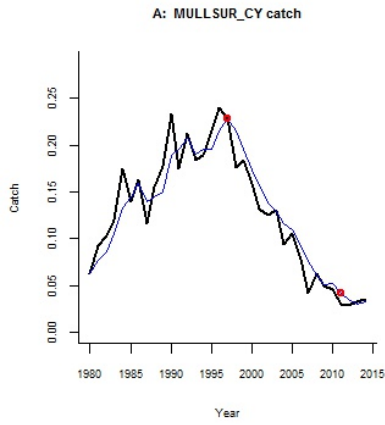
$F/F_{msy}$  = 2.19 , 2.5th perc = 0.542 , 97.5 perc = 17.8

Stock status and exploitation in 2014

Biomass = 0.0857 ,  $B/B_{msy}$  = 0.21 , fishing mortality  $F$  = 0.409 ,  $F/F_{msy}$  = 2.19

Comment: Catch=landings from FishStat Based on Cypriot catches only, CPUE from MEDITS. GS OK

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Species: *Pagellus acarne* , stock: PAGEACA\_CY

Axillary seabream in Cypriot waters

Source:

Region: Mediterranean , Cyprus

Catch data used from years 1972 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.01 - 0.4 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.28 - 1.1 expert, , prior range for  $k$  = 0.0364 - 0.562

Prior range of  $q$  = 0.0789 - 0.31

Results of CMSY analysis with altogether 1387 viable trajectories for 1138 r-k pairs

$r$  = 0.613 , 95% CL = 0.442 - 0.85 ,  $k$  = 0.179 , 95% CL = 0.134 - 0.239

MSY = 0.0274 , 95% CL = 0.0253 - 0.0297

Relative biomass last year = 0.291  $k$  , 2.5th = 0.0369 , 97.5th = 0.396

Exploitation  $F/(r/2)$  in last year = 2.21

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.587 , 95% CL = 0.377 - 0.913 ,  $k$  = 0.188 , 95% CL = 0.132 - 0.269

MSY = 0.0276 , 95% CL = 0.0243 - 0.0313

Relative biomass in last year = 0.291  $k$  , 2.5th perc = 0.0119 , 97.5th perc = 0.463

Exploitation  $F/(r/2)$  in last year = 1.62

$q$  = 0.134 ,  $lcl$  = 0.0968 ,  $ucl$  = 0.185

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.293 , 95% CL = 0.189 - 0.456 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.293 , 95% CL = 0.189 - 0.456 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.0276 , 95% CL = 0.0243 - 0.0313

$B_{msy}$  = 0.0941 , 95% CL = 0.0658 - 0.135

Biomass in last year = 0.0548 , 2.5th perc = 0.00223 , 97.5 perc = 0.0872

$B/B_{msy}$  in last year = 0.583 , 2.5th perc = 0.0237 , 97.5 perc = 0.927

Fishing mortality in last year = 0.474 , 2.5th perc = 0.298 , 97.5 perc = 11.6

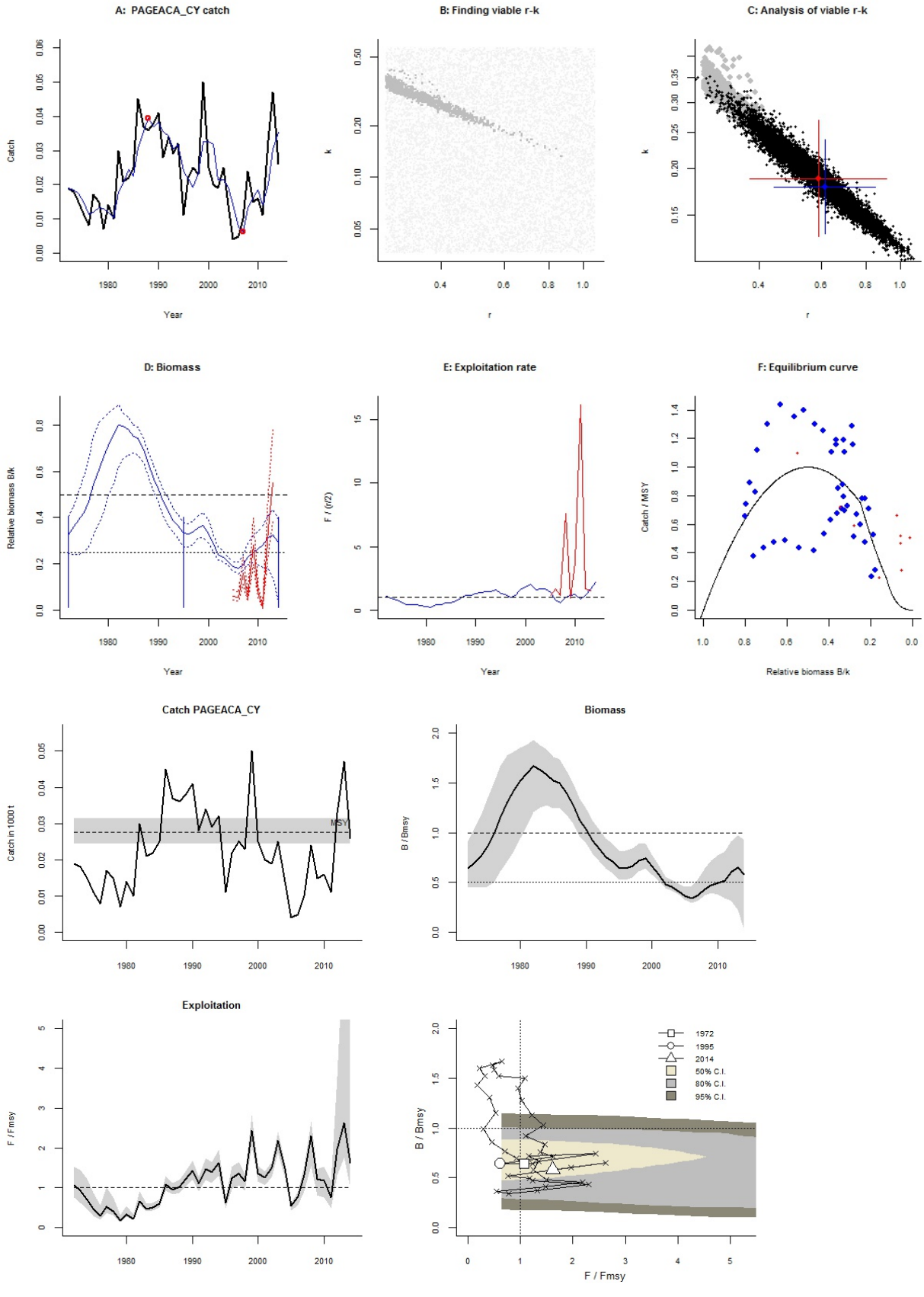
$F/F_{msy}$  = 1.62 , 2.5th perc = 1.02 , 97.5 perc = 39.6

Stock status and exploitation in 2014

Biomass = 0.0548 ,  $B/B_{msy}$  = 0.583 , fishing mortality  $F$  = 0.474 ,  $F/F_{msy}$  = 1.62

Comment: Catch=landings from FishStat Based on Cypriot catches only, CPUE from MEDITS. GS OK

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Species: *Pagellus erythrinus* , stock: PAGEERY\_CY

Common pandora in Cypriot waters

Source:

Region: Mediterranean , Cyprus

Catch data used from years 1970 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1995 expert

Prior final relative biomass = 0.01 - 0.4 expert

Prior range for  $r$  = 0.22 - 0.97 expert , , prior range for  $k$  = 0.0732 - 1.29

Prior range of  $q$  = 0.0547 - 0.23

Results of CMSY analysis with altogether 349 viable trajectories for 336 r-k pairs

$r$  = 0.382 , 95% CL = 0.32 - 0.456 ,  $k$  = 0.532 , 95% CL = 0.392 - 0.722

MSY = 0.0508 , 95% CL = 0.0396 - 0.0652

Relative biomass last year = 0.224  $k$ , 2.5th = 0.0346 , 97.5th = 0.36

Exploitation  $F/(r/2)$  in last year = 0.557

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.467 , 95% CL = 0.281 - 0.776 ,  $k$  = 0.425 , 95% CL = 0.266 - 0.68

MSY = 0.0496 , 95% CL = 0.0407 - 0.0605

Relative biomass in last year = 0.114  $k$ , 2.5th perc = 0.0182 , 97.5th perc = 0.391

Exploitation  $F/(r/2)$  in last year = 1.06

$q$  = 0.0787 ,  $lcl$  = 0.0569 ,  $ucl$  = 0.109

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.233 , 95% CL = 0.14 - 0.388 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.107 , 95% CL = 0.0642 - 0.178 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.0496 , 95% CL = 0.0407 - 0.0605

$B_{msy}$  = 0.213 , 95% CL = 0.133 - 0.34

Biomass in last year = 0.0487 , 2.5th perc = 0.00776 , 97.5 perc = 0.166

$B/B_{msy}$  in last year = 0.229 , 2.5th perc = 0.0365 , 97.5 perc = 0.781

Fishing mortality in last year = 0.246 , 2.5th perc = 0.0722 , 97.5 perc = 1.55

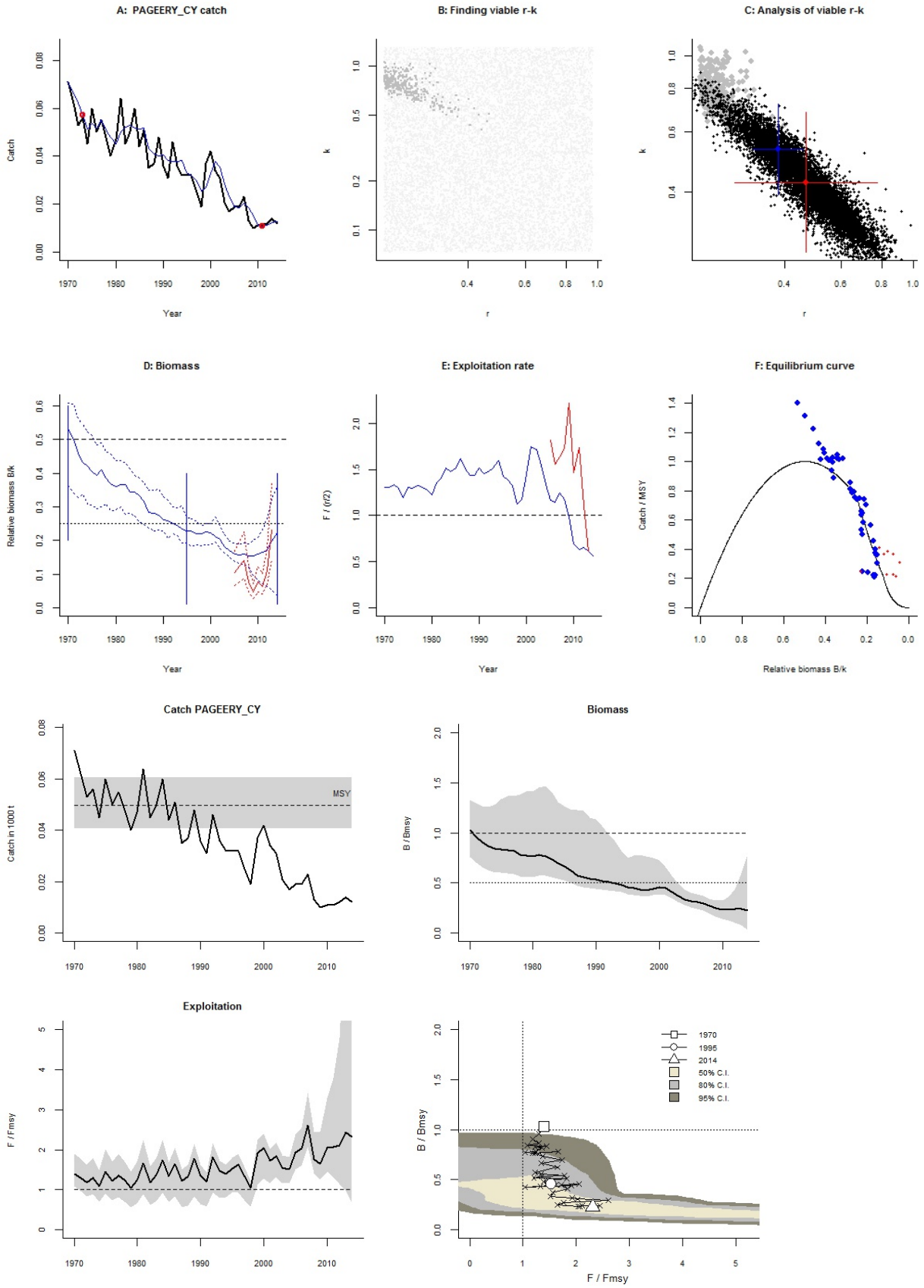
$F/F_{msy}$  = 2.31 , 2.5th perc = 0.676 , 97.5 perc = 14.5

Stock status and exploitation in 2014

Biomass = 0.0487 ,  $B/B_{msy}$  = 0.229 , fishing mortality  $F$  = 0.246 ,  $F/F_{msy}$  = 2.31

Comment: Catch=landings from FishStat Based on Cypriot catches only, CPUE from MEDITS. GS OK

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Species: *Pagrus pagrus* , stock: PAGRPAG\_CY

Red porgy in Cypriot waters

Source:

Region: Mediterranean , Cyprus

Catch data used from years 1972 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.5 - 0.9 in year 1994 default

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.27 - 0.86 expert, , prior range for  $k$  = 0.0849 - 1.08

Results of CMSY analysis with altogether 2175 viable trajectories for 1662 r-k pairs

$r$  = 0.537 , 95% CL = 0.369 - 0.78 ,  $k$  = 0.27 , 95% CL = 0.204 - 0.357

MSY = 0.0362 , 95% CL = 0.032 - 0.041

Relative biomass last year = 0.122  $k$ , 2.5th = 0.0149 , 97.5th = 0.292

Exploitation  $F/(r/2)$  in last year = 0.947

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.268 , 95% CL = 0.185 - 0.39 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.13 , 95% CL = 0.0898 - 0.19 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.0362 , 95% CL = 0.032 - 0.041

$B_{msy}$  = 0.135 , 95% CL = 0.102 - 0.178

Biomass in last year = 0.0328 , 2.5th perc = 0.00402 , 97.5 perc = 0.0789

$B/B_{msy}$  in last year = 0.243 , 2.5th perc = 0.0298 , 97.5 perc = 0.585

Fishing mortality in last year = 0.274 , 2.5th perc = 0.114 , 97.5 perc = 2.24

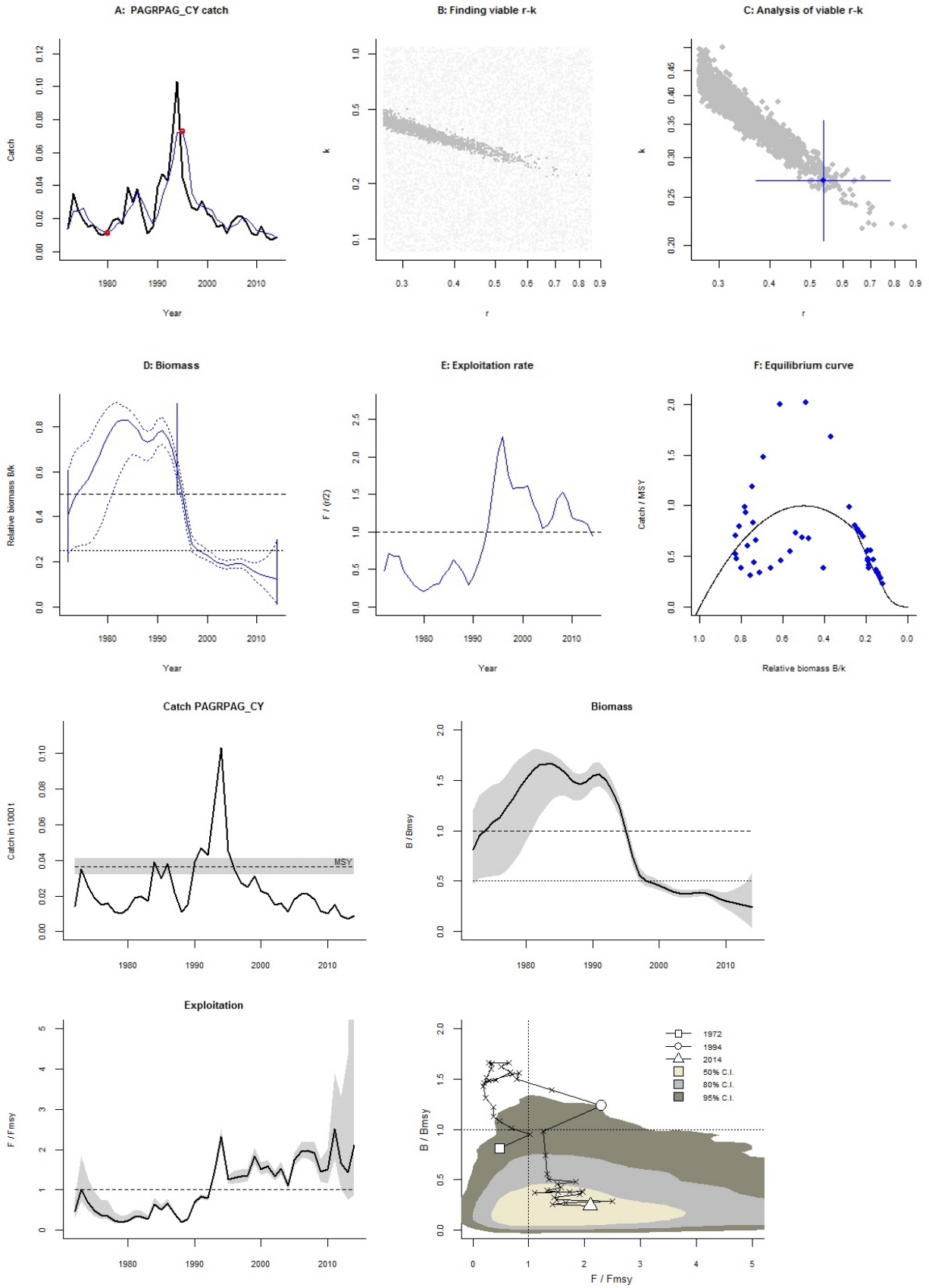
$F/F_{msy}$  = 2.1 , 2.5th perc = 0.875 , 97.5 perc = 17.2

Stock status and exploitation in 2014

Biomass = 0.0328 ,  $B/B_{msy}$  = 0.243 , fishing mortality  $F$  = 0.274 ,  $F/F_{msy}$  = 2.1

Comment: Catch=landings from FishStat Based on Cypriot catches only. RF final 0.3. GS OK

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Species: *Sepia officinalis* , stock: SEPIOFF\_CY

Common cuttlefish in Cypriot waters

Source:

Region: Mediterranean , Cyprus

Catch data used from years 1970 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2010 default

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.2 - 0.8 default , prior range for  $k$  = 0.227 - 3.63

Results of CMSY analysis with altogether 2475 viable trajectories for 1377 r-k pairs

$r$  = 0.533 , 95% CL = 0.374 - 0.758 ,  $k$  = 0.797 , 95% CL = 0.553 - 1.15

MSY = 0.106 , 95% CL = 0.0948 - 0.119

Relative biomass last year = 0.116  $k$ , 2.5th = 0.0138 , 97.5th = 0.29

Exploitation  $F/(r/2)$  in last year = 0.906

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.266 , 95% CL = 0.187 - 0.379 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.124 , 95% CL = 0.087 - 0.176 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.106 , 95% CL = 0.0948 - 0.119

$B_{msy}$  = 0.398 , 95% CL = 0.276 - 0.575

Biomass in last year = 0.0926 , 2.5th perc = 0.011 , 97.5 perc = 0.231

$B/B_{msy}$  in last year = 0.232 , 2.5th perc = 0.0277 , 97.5 perc = 0.581

Fishing mortality in last year = 0.238 , 2.5th perc = 0.0951 , 97.5 perc = 1.99

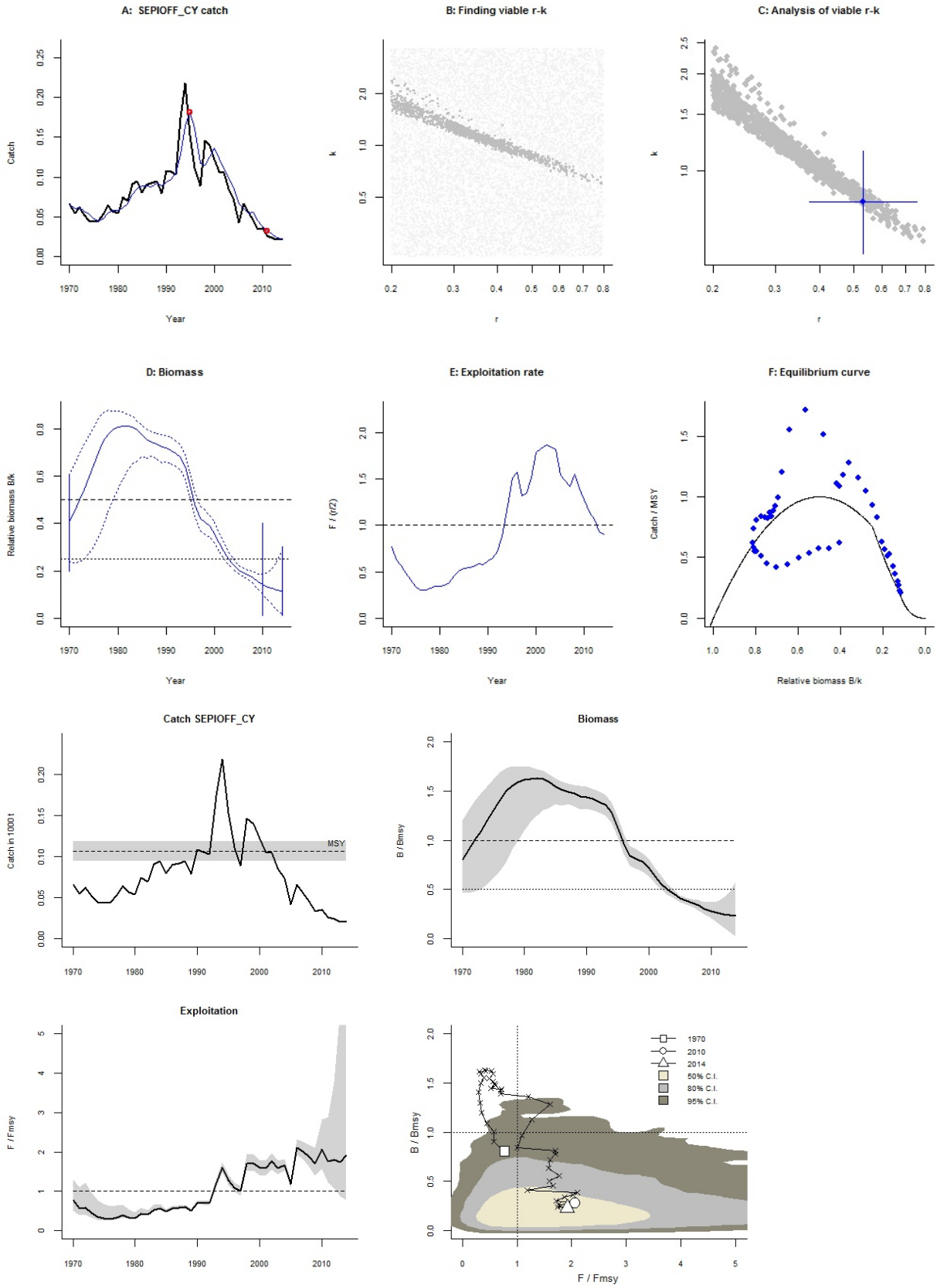
$F/F_{msy}$  = 1.92 , 2.5th perc = 0.768 , 97.5 perc = 16.1

Stock status and exploitation in 2014

Biomass = 0.0926 ,  $B/B_{msy}$  = 0.232 , fishing mortality  $F$  = 0.238 ,  $F/F_{msy}$  = 1.92

Comment: Catch=landings from FishStat Based on Cypriot catches only. RF final 0.3. GS OK

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Species: *Seriola dumerili* , stock: SERIDUM\_CY

Greater amberjack in Cypriot waters

Source:

Region: Mediterranean , Cyprus

Catch data used from years 1970 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1989 default

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.44 - 0.84 expert , , prior range for  $k$  = 0.0472 - 0.361

Results of CMSY analysis with altogether 347 viable trajectories for 341 r-k pairs

$r$  = 0.617 , 95% CL = 0.49 - 0.778 ,  $k$  = 0.129 , 95% CL = 0.106 - 0.157

MSY = 0.0199 , 95% CL = 0.017 - 0.0233

Relative biomass last year = 0.145  $k$  , 2.5th = 0.0154 , 97.5th = 0.293

Exploitation  $F/(r/2)$  in last year = 1.68

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.309 , 95% CL = 0.245 - 0.389 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.179 , 95% CL = 0.142 - 0.225 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 0.0199 , 95% CL = 0.017 - 0.0233

$B_{msy}$  = 0.0645 , 95% CL = 0.0531 - 0.0784

Biomass in last year = 0.0187 , 2.5th perc = 0.00199 , 97.5 perc = 0.0379

$B/B_{msy}$  in last year = 0.289 , 2.5th perc = 0.0308 , 97.5 perc = 0.587

Fishing mortality in last year = 0.428 , 2.5th perc = 0.211 , 97.5 perc = 4.02

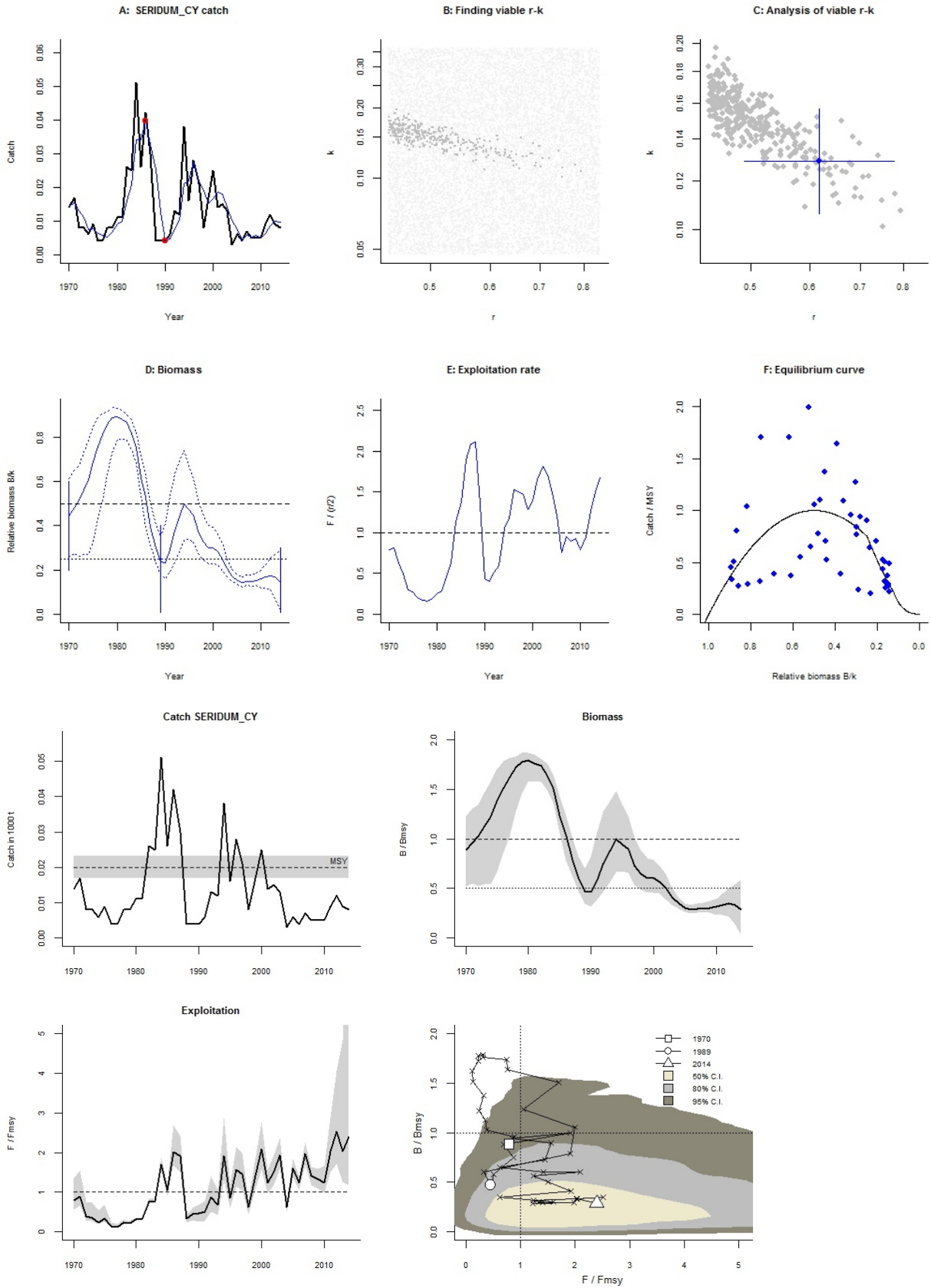
$F/F_{msy}$  = 2.4 , 2.5th perc = 1.18 , 97.5 perc = 22.5

Stock status and exploitation in 2014

Biomass = 0.0187 ,  $B/B_{msy}$  = 0.289 , fishing mortality  $F$  = 0.428 ,  $F/F_{msy}$  = 2.4

Comment: Catch=landings from FishStat Based on Cypriot catches only. RF final 0.3. GS OK

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Species: *Spicara smaris* , stock: SPICSMA\_CY

Picarel in Cypriot waters

Source: excel

Region: Mediterranean , Cyprus

Catch data used from years 1980 - 2014 , abundance = None

Prior initial relative biomass = 0.2 - 0.6 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 2010 default

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for r = 0.2 - 0.8 default , prior range for k = 1.08 - 17.2

Results of CMSY analysis with altogether 2552 viable trajectories for 2039 r-k pairs

r = 0.487 , 95% CL = 0.339 - 0.698 , k = 5.34 , 95% CL = 3.79 - 7.51

MSY = 0.649 , 95% CL = 0.576 - 0.732

Relative biomass last year = 0.115 k, 2.5th = 0.0136 , 97.5th = 0.287

Exploitation F/(r/2) in last year = 0.691

Results for Management (based on CMSY analysis)

Fmsy = 0.243 , 95% CL = 0.17 - 0.349 (if B > 1/2 Bmsy then Fmsy = 0.5 r)

Fmsy = 0.112 , 95% CL = 0.0779 - 0.16 (r and Fmsy are linearly reduced if B < 1/2 Bmsy)

MSY = 0.649 , 95% CL = 0.576 - 0.732

Bmsy = 2.67 , 95% CL = 1.9 - 3.75

Biomass in last year = 0.613 , 2.5th perc = 0.0727 , 97.5 perc = 1.53

B/Bmsy in last year = 0.23 , 2.5th perc = 0.0273 , 97.5 perc = 0.573

Fishing mortality in last year = 0.178 , 2.5th perc = 0.0713 , 97.5 perc = 1.5

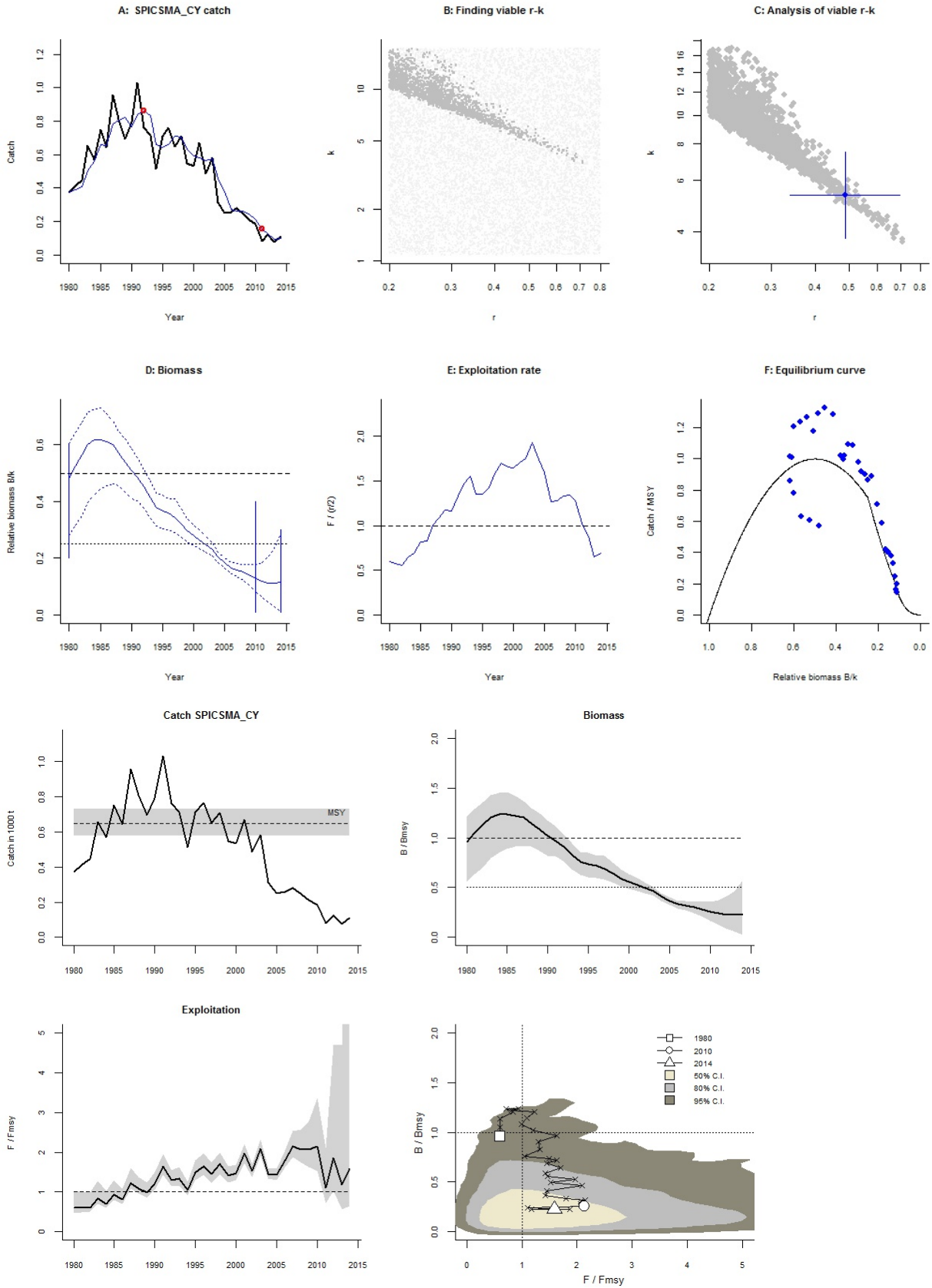
F/Fmsy = 1.59 , 2.5th perc = 0.638 , 97.5 perc = 13.4

Stock status and exploitation in 2014

Biomass = 0.613 , B/Bmsy = 0.23 , fishing mortality F = 0.178 , F/Fmsy = 1.59

Comment: Catch=landings from FishStat Based on Cypriot catches only. GS final 0.3

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**Black Sea** (analyzed with CMSY\_O\_7l.R)

Species: *Sprattus sprattus* , stock: Spr\_BS

Black Sea sprat

Source: [https://stecf.jrc.ec.europa.eu/documents/43805/1208033/2015-10\\_STECF+15-16+-+Black+Sea+assessments\\_JRC98095.pdf](https://stecf.jrc.ec.europa.eu/documents/43805/1208033/2015-10_STECF+15-16+-+Black+Sea+assessments_JRC98095.pdf)

Region: Mediterranean , Black Sea

Catch data used from years 1995 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 default

Prior intermediate rel. biomass= 0.5 - 0.9 in year 2010 default

Prior final relative biomass = 0.2 - 0.6 , default

Prior range for  $r$  = 0.2 - 1.2 expert , , prior range for  $k$  = 85.1 - 2025

Prior range of  $q$  = 1.48 - 7.22

Results of CMSY analysis with altogether 12726 viable trajectories for 1974  $r$ - $k$  pairs

$r$  = 0.76 , 95% CL = 0.498 - 1.16 ,  $k$  = 347 , 95% CL = 194 - 619

MSY = 65.9 , 95% CL = 48.5 - 89.6

Relative biomass last year = 0.459  $k$ , 2.5th = 0.214 , 97.5th = 0.596

Exploitation  $F/(r/2)$  in last year = 0.665

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.797 , 95% CL = 0.587 - 1.08 ,  $k$  = 322 , 95% CL = 247 - 421

MSY = 64.3 , 95% CL = 53.4 - 77.3

Relative biomass in last year = 0.549  $k$ , 2.5th perc = 0.422 , 97.5th perc = 0.654

Exploitation  $F/(r/2)$  in last year = 0.827

$q$  = 2.31 , lcl = 1.73 , ucl = 3.1

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.399 , 95% CL = 0.294 - 0.542 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.399 , 95% CL = 0.294 - 0.542 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 64.3 , 95% CL = 53.4 - 77.3

$B_{msy}$  = 161 , 95% CL = 124 - 210

Biomass in last year = 177 , 2.5th perc = 136 , 97.5 perc = 211

$B/B_{msy}$  in last year = 1.1 , 2.5th perc = 0.843 , 97.5 perc = 1.31

Fishing mortality in last year = 0.33 , 2.5th perc = 0.277 , 97.5 perc = 0.429

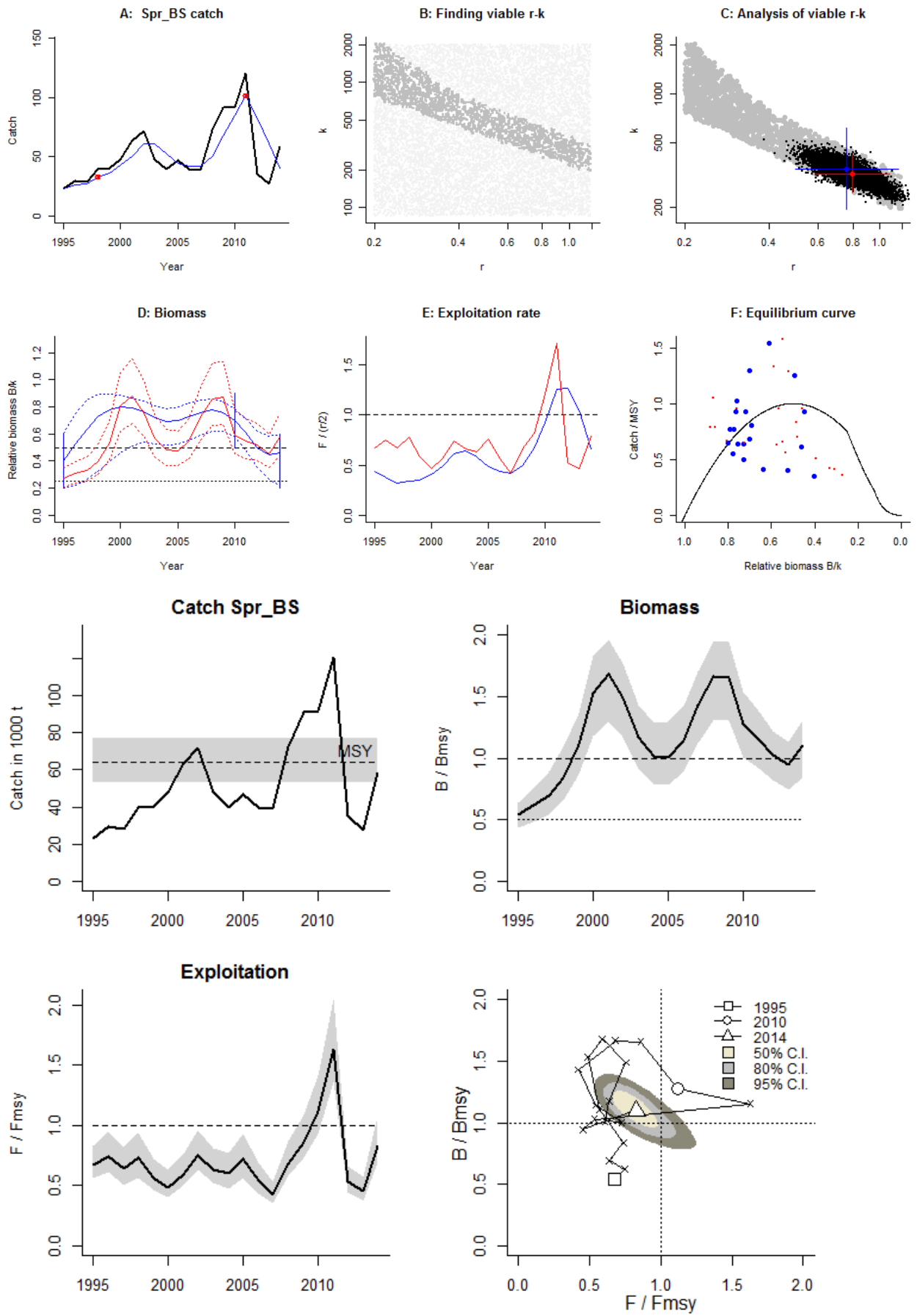
$F/F_{msy}$  = 0.827 , 2.5th perc = 0.695 , 97.5 perc = 1.08

Stock status and exploitation in 2014

Biomass = 177 ,  $B/B_{msy}$  = 1.1 , fishing mortality  $F$  = 0.33 ,  $F/F_{msy}$  = 0.827

Comment: Landings. RF OK

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Species: *Mullus barbatus barbatus* , stock: RMullet\_BS

Red mullet in Black Sea

Source: [https://stecf.jrc.ec.europa.eu/documents/43805/1208033/2015-10\\_STECF+15-16+-+Black+Sea+assessments\\_JRC98095.pdf](https://stecf.jrc.ec.europa.eu/documents/43805/1208033/2015-10_STECF+15-16+-+Black+Sea+assessments_JRC98095.pdf)

Region: Mediterranean , Black Sea

Catch data used from years 1990 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 default

Prior intermediate rel. biomass= 0.1 - 0.5 in year 2007 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.56 - 1.3 expert, , prior range for  $k$  = 3.38 - 31.6

Prior range of  $q$  = 0.455 - 1.39

Results of CMSY analysis with altogether 416 viable trajectories for 405 r-k pairs

$r$  = 0.958 , 95% CL = 0.724 - 1.27 ,  $k$  = 12.8 , 95% CL = 9.89 - 16.7

MSY = 3.08 , 95% CL = 2.65 - 3.57

Relative biomass last year = 0.237  $k$ , 2.5th = 0.0378 , 97.5th = 0.298

Exploitation  $F/(r/2)$  in last year = 2.26

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.854 , 95% CL = 0.712 - 1.02 ,  $k$  = 15 , 95% CL = 12.8 - 17.6

MSY = 3.21 , 95% CL = 2.76 - 3.73

Relative biomass in last year = 0.278  $k$ , 2.5th perc = 0.235 , 97.5th perc = 0.322

Exploitation  $F/(r/2)$  in last year = 2.19

$q$  = 0.628 , lcl = 0.555 , ucl = 0.711

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.427 , 95% CL = 0.356 - 0.512 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.427 , 95% CL = 0.356 - 0.512 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 3.21 , 95% CL = 2.76 - 3.73

$B_{msy}$  = 7.5 , 95% CL = 6.42 - 8.78

Biomass in last year = 4.17 , 2.5th perc = 3.53 , 97.5 perc = 4.83

$B/B_{msy}$  in last year = 0.556 , 2.5th perc = 0.471 , 97.5 perc = 0.644

Fishing mortality in last year = 0.935 , 2.5th perc = 0.807 , 97.5 perc = 1.1

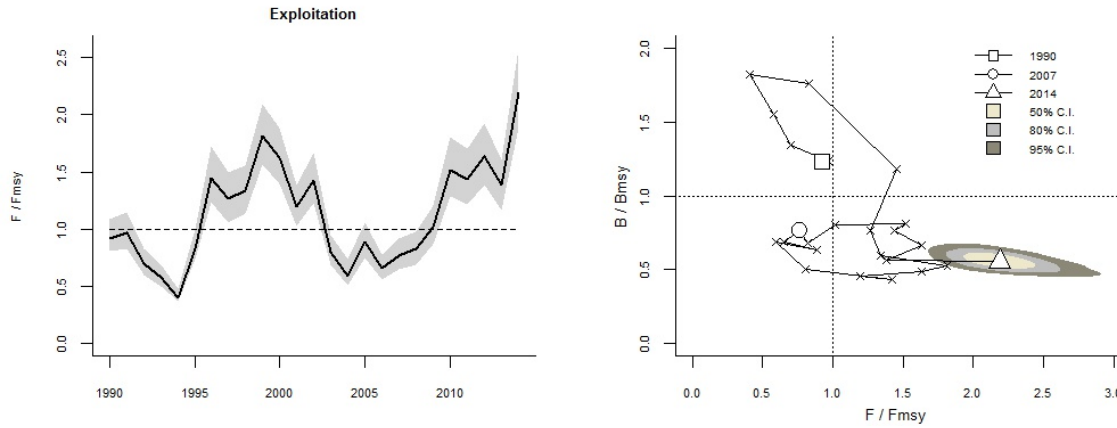
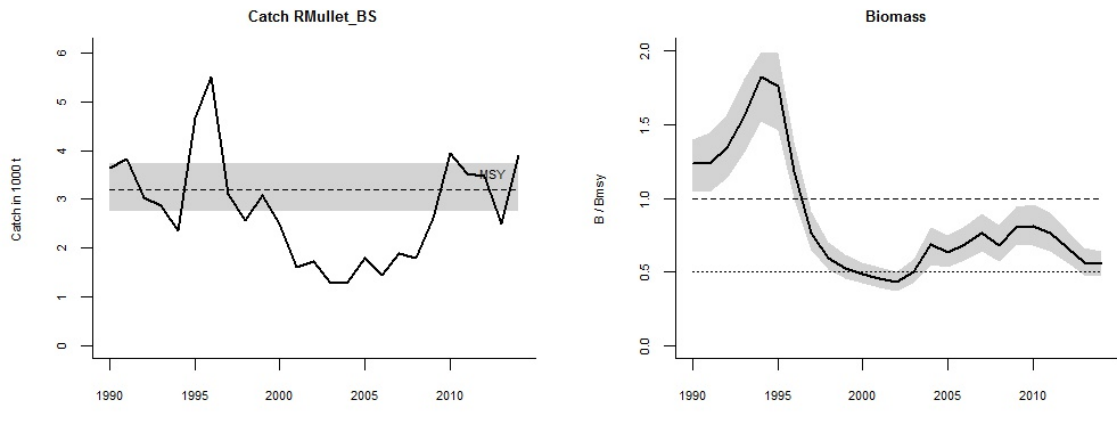
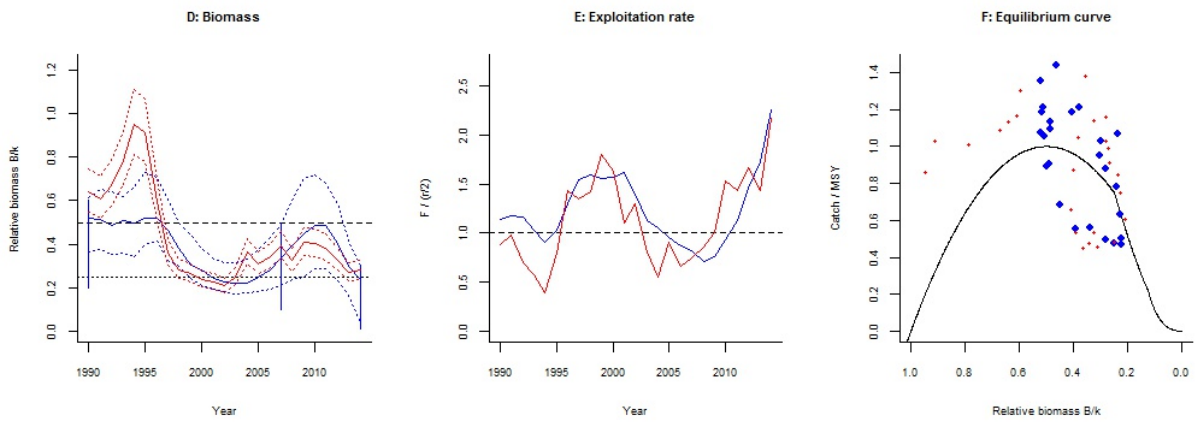
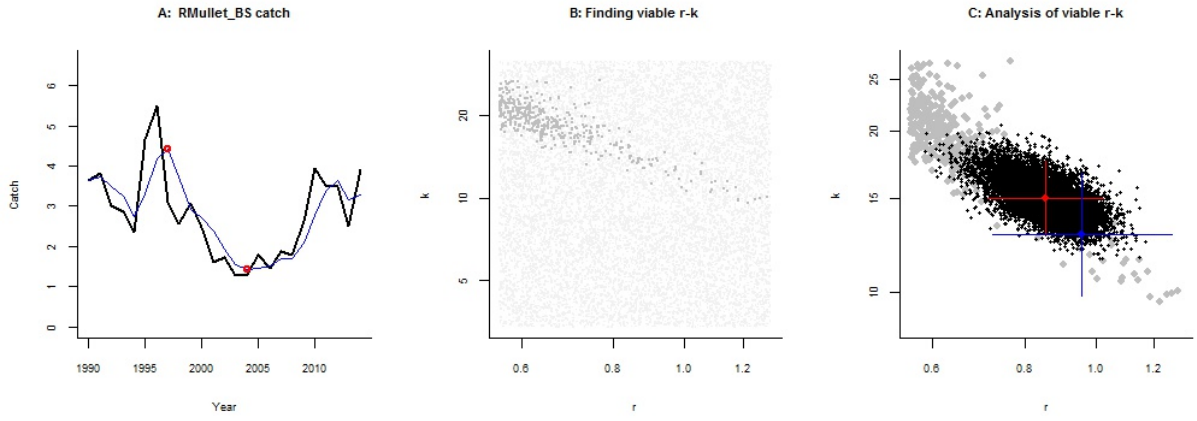
$F/F_{msy}$  = 2.19 , 2.5th perc = 1.89 , 97.5 perc = 2.58

Stock status and exploitation in 2014

Biomass = 4.17 ,  $B/B_{msy}$  = 0.556 , fishing mortality  $F$  = 0.935 ,  $F/F_{msy}$  = 2.19

Comment: SSB/Catch - RF Comment: OK

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Species: *Squalus acanthias* , stock: PDogfish\_BS

Picked dogfish in Black Sea

Source: [https://stecf.jrc.ec.europa.eu/documents/43805/1208033/2015-10\\_STECF+15-16+-+Black+Sea+assessments\\_JRC98095.pdf](https://stecf.jrc.ec.europa.eu/documents/43805/1208033/2015-10_STECF+15-16+-+Black+Sea+assessments_JRC98095.pdf)

Region: Mediterranean , Black Sea

Catch data used from years 1989 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.2 - 0.6 default

Prior intermediate rel. biomass= 0.01 - 0.2 in year 2001 expert

Prior final relative biomass = 0.01 - 0.1 expert

Prior range for  $r$  = 0.05 - 0.2 expert, , prior range for  $k$  = 30.8 - 493

Prior range of  $q$  = 0.197 - 0.788

Results of CMSY analysis with altogether 4619 viable trajectories for 3876 r-k pairs

$r$  = 0.141 , 95% CL = 0.101 - 0.195 ,  $k$  = 79.6 , 95% CL = 37.2 - 171

MSY = 2.8 , 95% CL = 1.2 - 6.56

Relative biomass last year = 0.0471  $k$ , 2.5th = 0.0116 , 97.5th = 0.0978

Exploitation  $F/(r/2)$  in last year = 0.288

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.0652 , 95% CL = 0.0378 - 0.112 ,  $k$  = 97.5 , 95% CL = 74.8 - 127

MSY = 1.59 , 95% CL = 0.886 - 2.85

Relative biomass in last year = 0.0125  $k$ , 2.5th perc = 0.011 , 97.5th perc = 0.0166

Exploitation  $F/(r/2)$  in last year = 1.88

$q$  = 0.493 , lcl = 0.391 , ucl = 0.621

Results for Management (based on CMSY analysis)

$F_{msy}$  = 0.0704 , 95% CL = 0.0507 - 0.0977 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0133 , 95% CL = 0.00956 - 0.0184 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 2.8 , 95% CL = 1.2 - 6.56

$B_{msy}$  = 39.8 , 95% CL = 18.6 - 85.3

Biomass in last year = 3.75 , 2.5th perc = 0.92 , 97.5 perc = 7.79

$B/B_{msy}$  in last year = 0.0942 , 2.5th perc = 0.0231 , 97.5 perc = 0.196

Fishing mortality in last year = 0.02 , 2.5th perc = 0.00963 , 97.5 perc = 0.0815

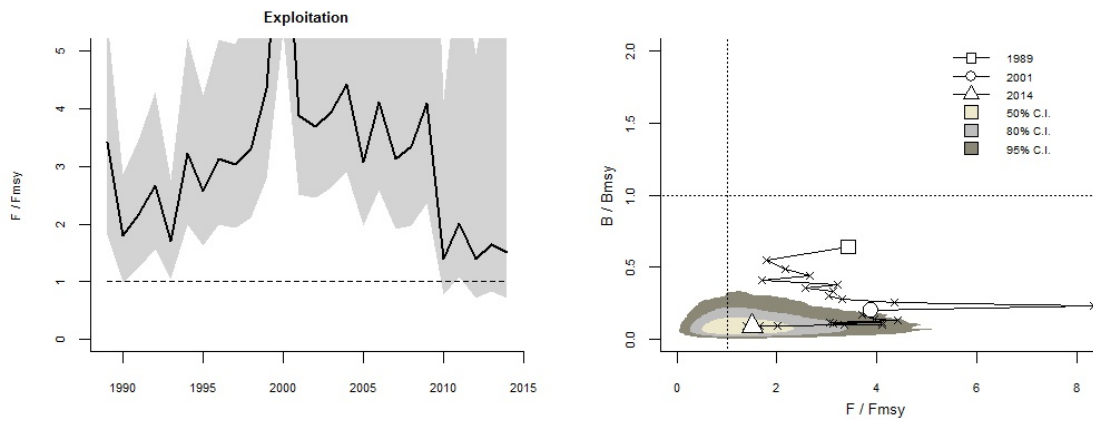
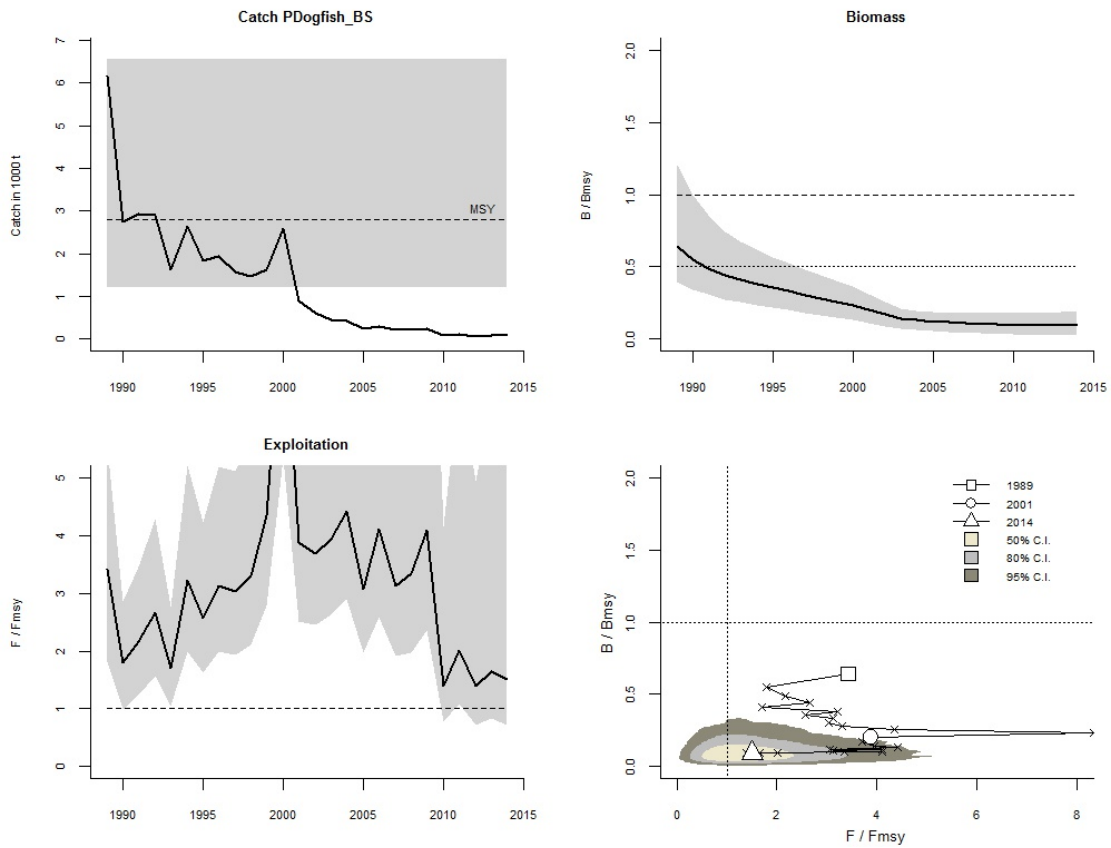
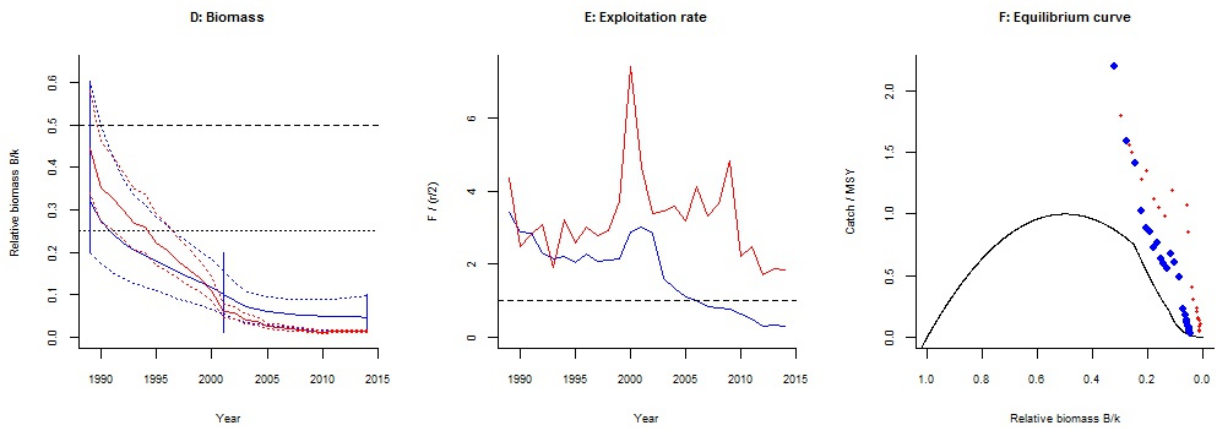
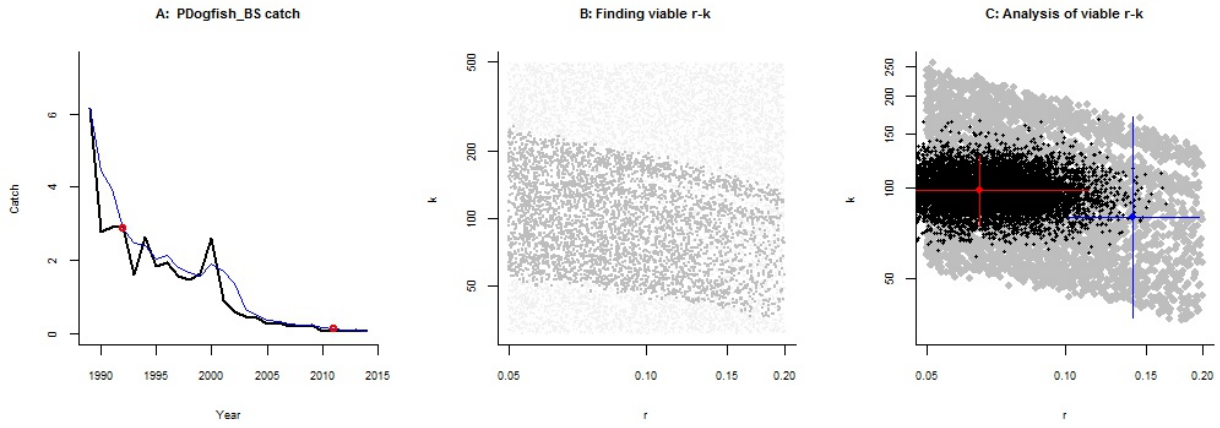
$F/F_{msy}$  = 1.51 , 2.5th perc = 0.725 , 97.5 perc = 6.14

Stock status and exploitation in 2014

Biomass = 3.75 ,  $B/B_{msy}$  = 0.0942 , fishing mortality  $F$  = 0.02 ,  $F/F_{msy}$  = 1.51

Comment: SSB/Landings. RF OK

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Species: *Scophthalmus maximus* , stock: Tur\_BS

Turbot in Black Sea

Source: [https://stecf.jrc.ec.europa.eu/documents/43805/1208033/2015-10\\_STECF+15-16+-+Black+Sea+assessments\\_JRC98095.pdf](https://stecf.jrc.ec.europa.eu/documents/43805/1208033/2015-10_STECF+15-16+-+Black+Sea+assessments_JRC98095.pdf)

Region: Mediterranean , Black Sea

Catch data used from years 1980 - 2014 , abundance = CPUE

Prior initial relative biomass = 0.5 - 0.9 expert

Prior intermediate rel. biomass= 0.01 - 0.4 in year 1986 expert

Prior final relative biomass = 0.01 - 0.3 expert

Prior range for  $r$  = 0.31 - 0.65 expert, , prior range for  $k$  = 6.79 - 57

Prior range of  $q$  = 0.614 - 1.78

Results of CMSY analysis with altogether 2657 viable trajectories for 1936 r-k pairs

$r$  = 0.459 , 95% CL = 0.357 - 0.59 ,  $k$  = 17 , 95% CL = 14 - 20.6

MSY = 1.95 , 95% CL = 1.71 - 2.23

Relative biomass last year = 0.203  $k$ , 2.5th = 0.0238 , 97.5th = 0.295

Exploitation  $F/(r/2)$  in last year = 1.85

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.411 , 95% CL = 0.334 - 0.506 ,  $k$  = 19.1 , 95% CL = 15.6 - 23.5

MSY = 1.97 , 95% CL = 1.66 - 2.34

Relative biomass in last year = 0.118  $k$ , 2.5th perc = 0.0912 , 97.5th perc = 0.147

Exploitation  $F/(r/2)$  in last year = 2.5

$q$  = 0.86 , lcl = 0.732 , ucl = 1.01

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.206 , 95% CL = 0.167 - 0.253 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.0969 , 95% CL = 0.0787 - 0.119 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 1.97 , 95% CL = 1.66 - 2.34

$B_{msy}$  = 9.57 , 95% CL = 7.8 - 11.7

Biomass in last year = 2.25 , 2.5th perc = 1.75 , 97.5 perc = 2.81

$B/B_{msy}$  in last year = 0.236 , 2.5th perc = 0.182 , 97.5 perc = 0.294

Fishing mortality in last year = 0.514 , 2.5th perc = 0.412 , 97.5 perc = 0.664

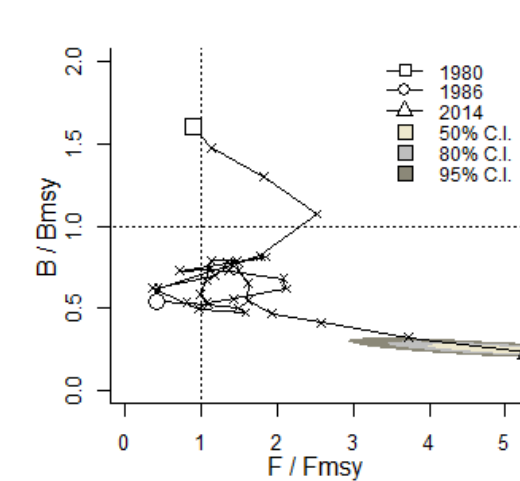
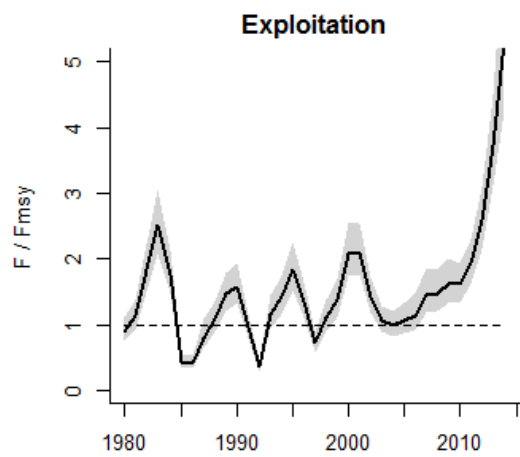
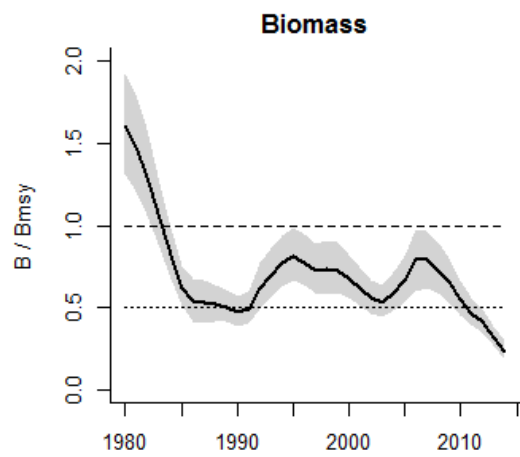
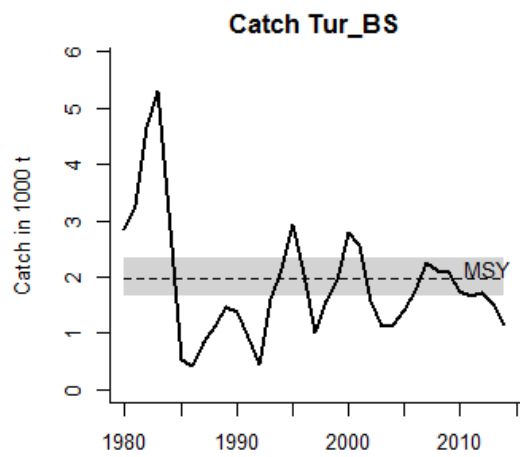
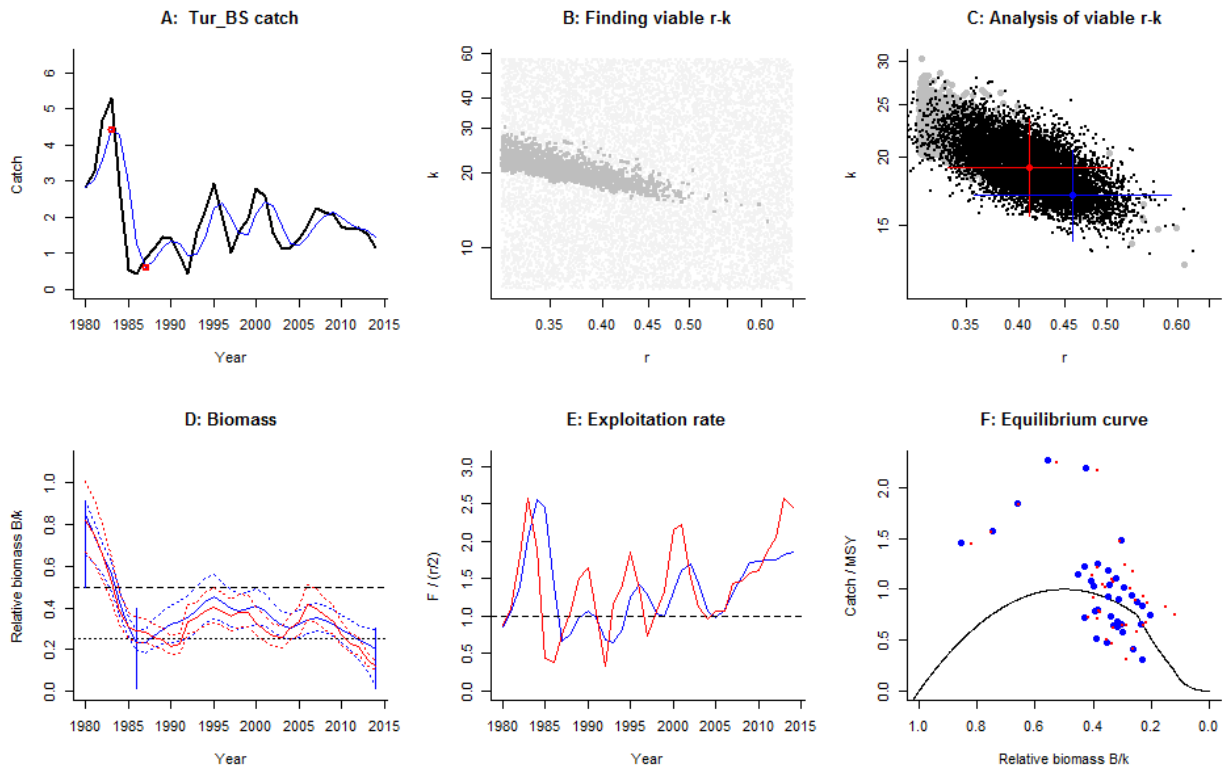
$F/F_{msy}$  = 5.31 , 2.5th perc = 4.25 , 97.5 perc = 6.86

Stock status and exploitation in 2014

Biomass = 2.25 ,  $B/B_{msy}$  = 0.236 , fishing mortality  $F$  = 0.514 ,  $F/F_{msy}$  = 5.31

Comment: Landings+IUU. RF OK

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Species: *Trachurus mediterraneus* , stock: MHMackerel\_BS  
Mediterranean horse mackerel in Black Sea  
Source: [https://stecf.jrc.ec.europa.eu/documents/43805/1208033/2015-10\\_STECF+15-16++Black+Sea+assessments\\_JRC98095.pdf](https://stecf.jrc.ec.europa.eu/documents/43805/1208033/2015-10_STECF+15-16++Black+Sea+assessments_JRC98095.pdf)  
Region: Mediterranean , Black 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 1988 expert  
Prior final relative biomass = 0.01 - 0.2 expert  
Prior range for  $r$  = 0.35 - 1.6 expert, , prior range for  $k$  = 72.5 - 1293  
Prior range of  $q$  = 0.613 - 2.59

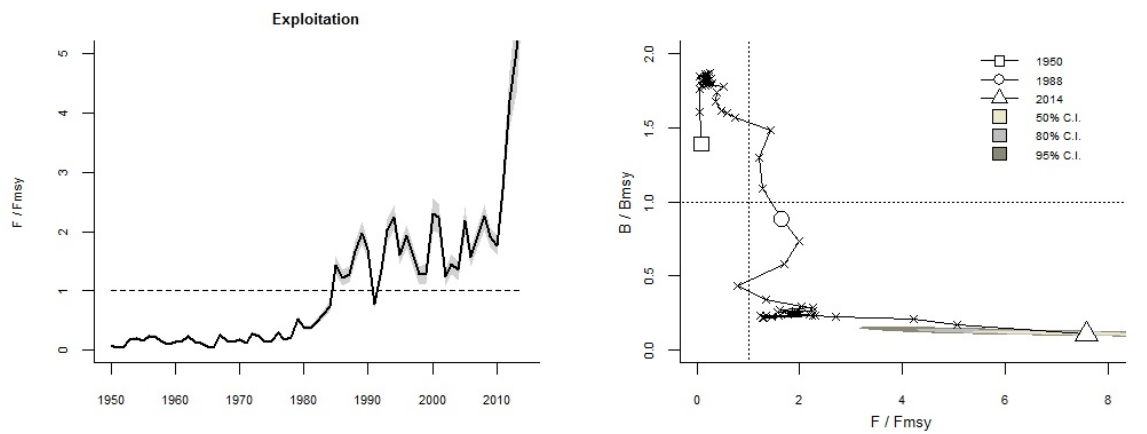
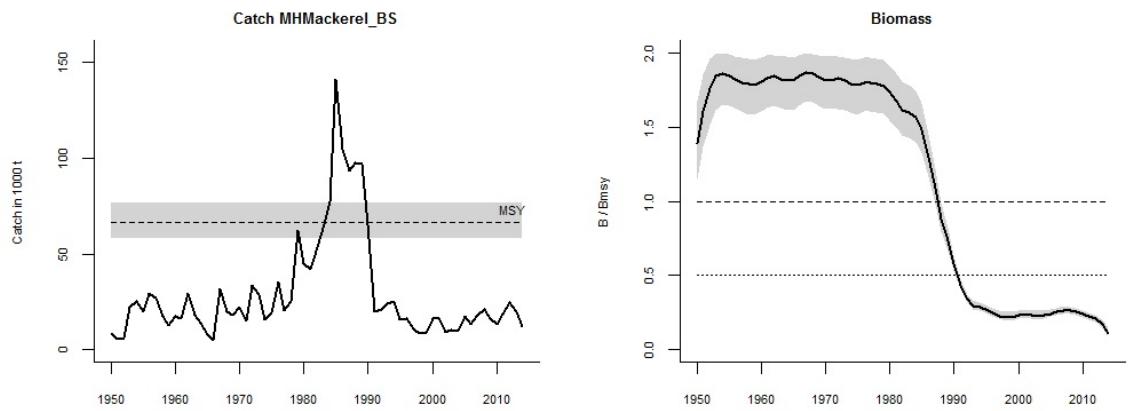
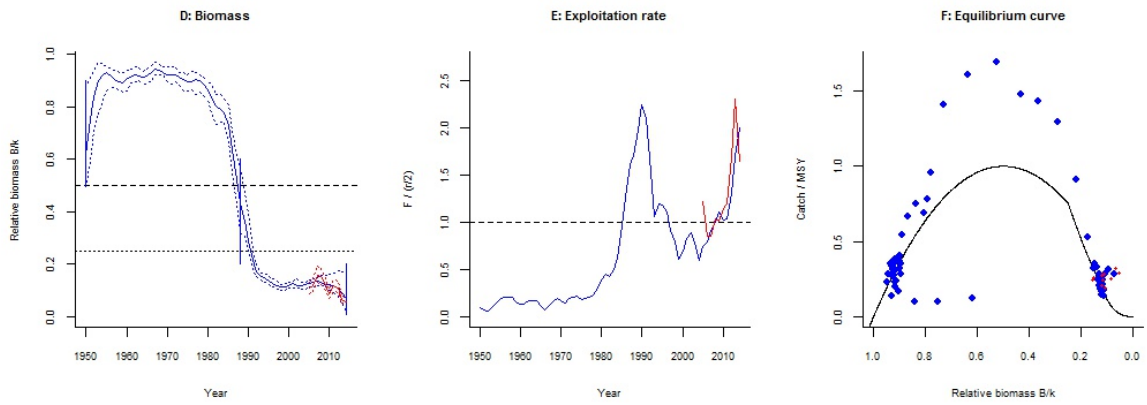
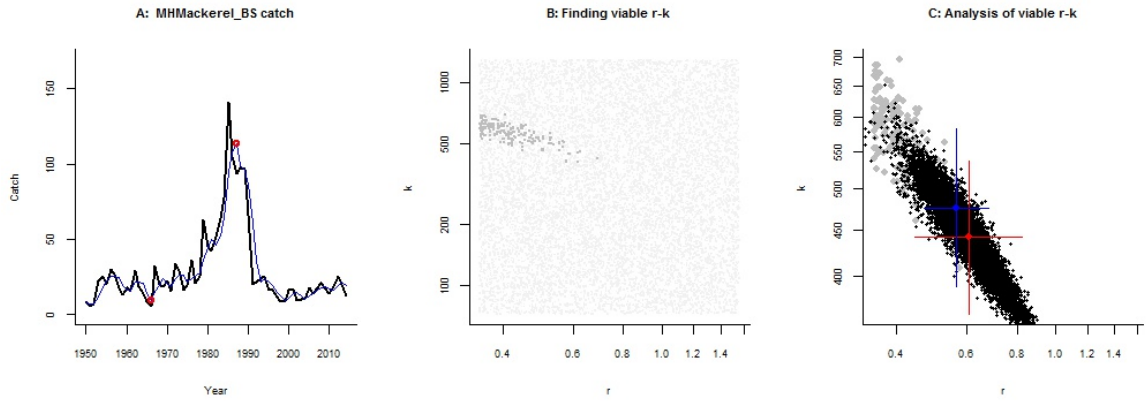
Results of CMSY analysis with altogether 157 viable trajectories for 156 r-k pairs  
 $r$  = 0.563 , 95% CL = 0.468 - 0.677 ,  $k$  = 476 , 95% CL = 388 - 583  
MSY = 66.9 , 95% CL = 59.5 - 75.4  
Relative biomass last year = 0.0716  $k$ , 2.5th = 0.022 , 97.5th = 0.163  
Exploitation  $F/(r/2)$  in last year = 2

Results from Bayesian Schaefer model using catch & CPUE  
 $r$  = 0.605 , 95% CL = 0.445 - 0.823 ,  $k$  = 441 , 95% CL = 362 - 537  
MSY = 66.8 , 95% CL = 57.9 - 77  
Relative biomass in last year = 0.0553  $k$ , 2.5th perc = 0.0445 , 97.5th perc = 0.0734  
Exploitation  $F/(r/2)$  in last year = 1.67  
 $q$  = 0.745 , lcl = 0.611 , ucl = 0.908

Results for Management (based on BSM analysis)  
 $F_{msy}$  = 0.303 , 95% CL = 0.223 - 0.411 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )  
 $F_{msy}$  = 0.0669 , 95% CL = 0.0492 - 0.091 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )  
MSY = 66.8 , 95% CL = 57.9 - 77  
 $B_{msy}$  = 221 , 95% CL = 181 - 269  
Biomass in last year = 24.4 , 2.5th perc = 19.6 , 97.5 perc = 32.4  
 $B/B_{msy}$  in last year = 0.111 , 2.5th perc = 0.089 , 97.5 perc = 0.147  
Fishing mortality in last year = 0.507 , 2.5th perc = 0.382 , 97.5 perc = 0.629  
 $F/F_{msy}$  = 7.57 , 2.5th perc = 5.7 , 97.5 perc = 9.4

Stock status and exploitation in 2014  
Biomass = 24.4 ,  $B/B_{msy}$  = 0.111 , fishing mortality  $F$  = 0.507 ,  $F/F_{msy}$  = 7.57  
Comment: SSB/Landings. RF OK

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Species: *Merlangius merlangus* , stock: Whiting\_BS

Whiting in Black Sea

Source: [https://stecf.jrc.ec.europa.eu/documents/43805/1208033/2015-10\\_STECF+15-16+-+Black+Sea+assessments\\_JRC98095.pdf](https://stecf.jrc.ec.europa.eu/documents/43805/1208033/2015-10_STECF+15-16+-+Black+Sea+assessments_JRC98095.pdf)

Region: Mediterranean , Black Sea

Catch data used from years 1994 - 2014 , 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  $r$  = 0.22 - 1 expert, , prior range for  $k$  = 14.5 - 266

Prior range of  $q$  = 0.383 - 1.64

Results of CMSY analysis with altogether 2329 viable trajectories for 1501 r-k pairs

$r$  = 0.586 , 95% CL = 0.379 - 0.906 ,  $k$  = 76.2 , 95% CL = 47.5 - 122

MSY = 11.2 , 95% CL = 8.07 - 15.4

Relative biomass last year = 0.296  $k$ , 2.5th = 0.0365 , 97.5th = 0.397

Exploitation  $F/(r/2)$  in last year = 1.18

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.566 , 95% CL = 0.414 - 0.774 ,  $k$  = 78 , 95% CL = 55.5 - 110

MSY = 11 , 95% CL = 8.92 - 13.6

Relative biomass in last year = 0.27  $k$ , 2.5th perc = 0.182 , 97.5th perc = 0.37

Exploitation  $F/(r/2)$  in last year = 1.49

$q$  = 0.627 , lcl = 0.476 , ucl = 0.826

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.283 , 95% CL = 0.207 - 0.387 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.283 , 95% CL = 0.207 - 0.387 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 11 , 95% CL = 8.92 - 13.6

$B_{msy}$  = 39 , 95% CL = 27.7 - 54.8

Biomass in last year = 21.1 , 2.5th perc = 14.2 , 97.5 perc = 28.8

$B/B_{msy}$  in last year = 0.541 , 2.5th perc = 0.363 , 97.5 perc = 0.739

Fishing mortality in last year = 0.42 , 2.5th perc = 0.307 , 97.5 perc = 0.625

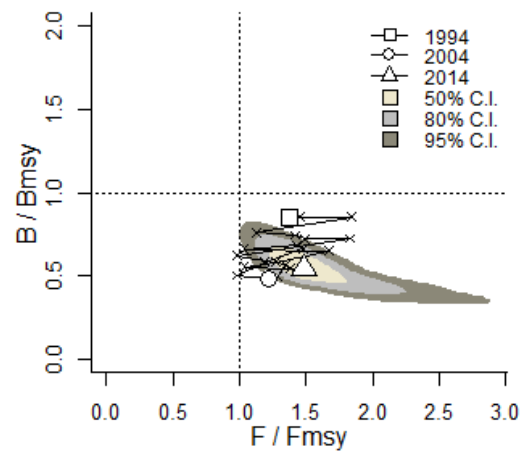
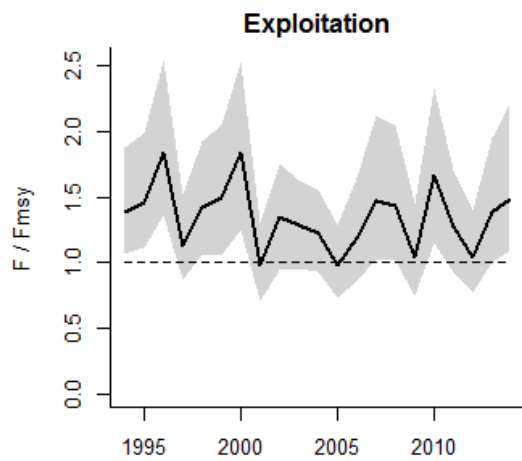
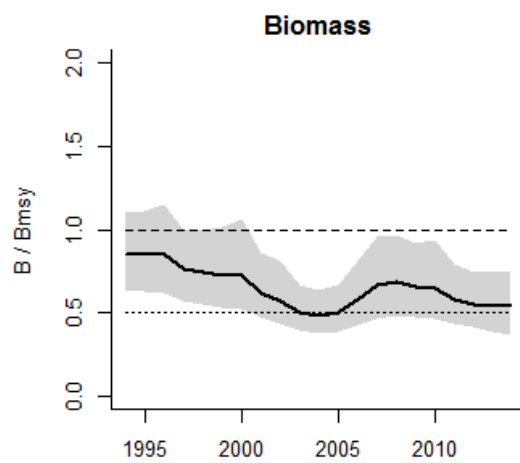
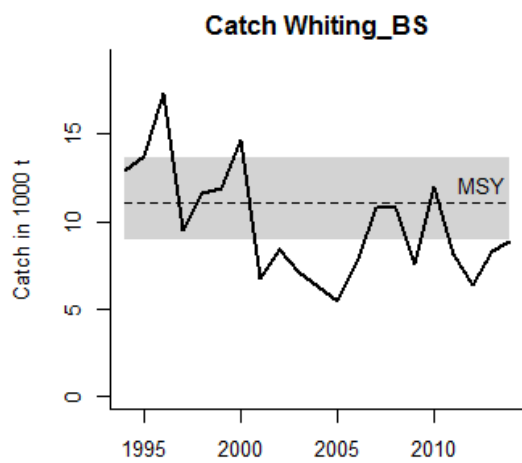
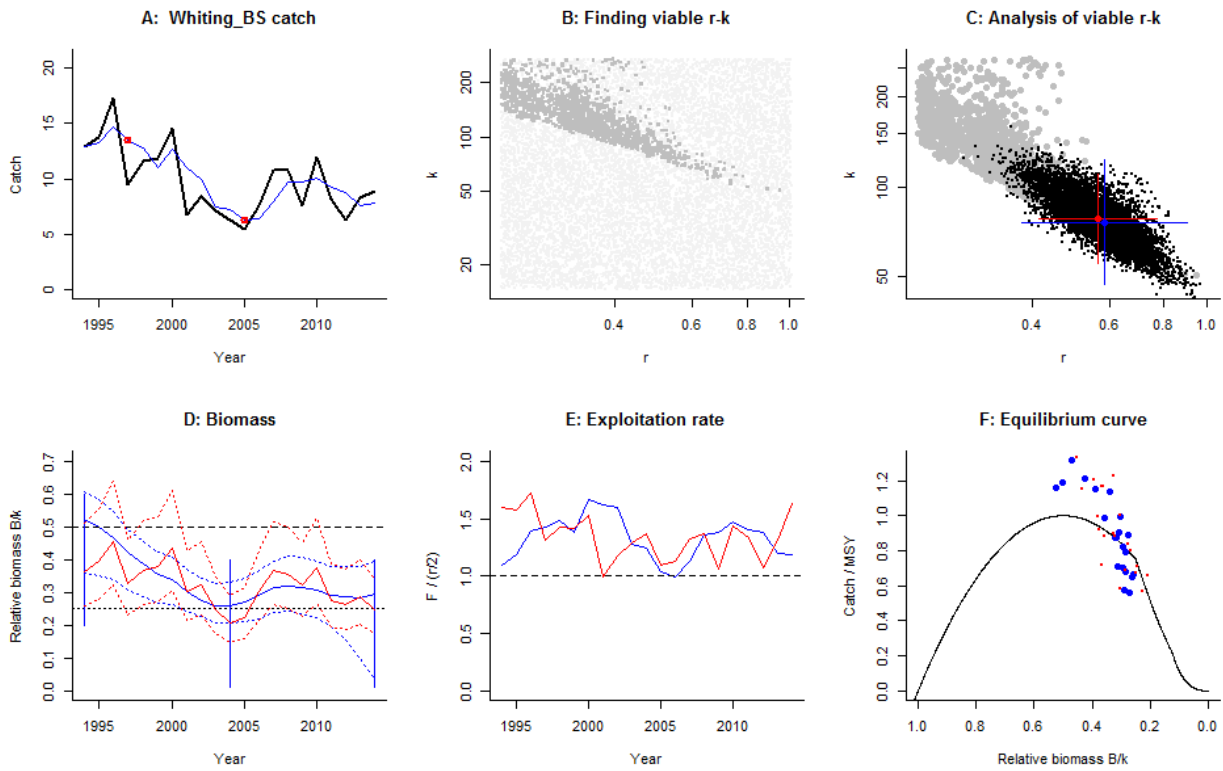
$F/F_{msy}$  = 1.49 , 2.5th perc = 1.09 , 97.5 perc = 2.21

Stock status and exploitation in 2014

Biomass = 21.1 ,  $B/B_{msy}$  = 0.541 , fishing mortality  $F$  = 0.42 ,  $F/F_{msy}$  = 1.49

Comment: SSB/Landings. RF OK

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Species: *Engraulis encrasicolus* , stock: BS\_anch

Black Sea anchovy

Source: [http://stecf.jrc.ec.europa.eu/documents/43805/409649/2012-11\\_STECF+12-15+-+Black+Sea+Assessments\\_JRC76532.pdf](http://stecf.jrc.ec.europa.eu/documents/43805/409649/2012-11_STECF+12-15+-+Black+Sea+Assessments_JRC76532.pdf)

Region: Mediterranean , Black Sea

Catch data used from years 1995 - 2014 , 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 = 0.01 - 0.4 expert

Prior range for  $r$  = 0.32 - 1.4 expert, , prior range for  $k$  = 286 - 4820

Prior range of  $q$  = 0.926 - 3.8

Results of CMSY analysis with altogether 1395 viable trajectories for 627 r-k pairs

$r$  = 0.937 , 95% CL = 0.669 - 1.31 ,  $k$  = 1125 , 95% CL = 763 - 1659

MSY = 264 , 95% CL = 238 - 291

Relative biomass last year = 0.279  $k$ , 2.5th = 0.0419 , 97.5th = 0.393

Exploitation  $F/(r/2)$  in last year = 1.48

Results from Bayesian Schaefer model using catch & CPUE

$r$  = 0.577 , 95% CL = 0.394 - 0.847 ,  $k$  = 1757 , 95% CL = 1271 - 2429

MSY = 254 , 95% CL = 217 - 297

Relative biomass in last year = 0.253  $k$ , 2.5th perc = 0.125 , 97.5th perc = 0.44

Exploitation  $F/(r/2)$  in last year = 1.23

$q$  = 1.86 , lcl = 1.39 , ucl = 2.49

Results for Management (based on BSM analysis)

$F_{msy}$  = 0.289 , 95% CL = 0.197 - 0.424 (if  $B > 1/2 B_{msy}$  then  $F_{msy} = 0.5 r$ )

$F_{msy}$  = 0.289 , 95% CL = 0.197 - 0.424 ( $r$  and  $F_{msy}$  are linearly reduced if  $B < 1/2 B_{msy}$ )

MSY = 254 , 95% CL = 217 - 297

$B_{msy}$  = 878 , 95% CL = 635 - 1214

Biomass in last year = 445 , 2.5th perc = 219 , 97.5 perc = 773

$B/B_{msy}$  in last year = 0.507 , 2.5th perc = 0.25 , 97.5 perc = 0.88

Fishing mortality in last year = 0.354 , 2.5th perc = 0.204 , 97.5 perc = 0.718

$F/F_{msy}$  = 1.23 , 2.5th perc = 0.706 , 97.5 perc = 2.49

Stock status and exploitation in 2014

Biomass = 445 ,  $B/B_{msy}$  = 0.507 , fishing mortality  $F$  = 0.354 ,  $F/F_{msy}$  = 1.23

Comment: SSB/Landings - RF Comment: OK

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