EQsim with retro object

Fmsys

|  |  |
| --- | --- |
| 2016 | 0.3733734 |
| 2015 | 0.3831832 |
| 2014 | 0.387988 |
| 2013 | 0.3867868 |
| 2012 |  |
| 2011 |  |

2016

> FITs <- eqsr\_fit(TUR, nsamp = nits, models = c( "Segreg"),

+ remove.years=c((dims(TUR)$maxyear - 2):dims(TUR)$maxyear))

>

> eqsr\_plot(FITs,n=nits)

>

> print(Blim <- FITs[["sr.det"]][,"b"])

[1] 4554.63

>

> print(Bpa <- 1.4 \* Blim)

[1] 6376.482

>

> ### Flim/Blim - Fpa/Bpa

> SIMlim <- eqsim\_run(FITs, bio.years = c((dims(TUR)$maxyear - 10), dims(TUR)$maxyear), bio.const = FALSE,

+ sel.years = c((dims(TUR)$maxyear - 10), dims(TUR)$maxyear), sel.const = FALSE,

+ Fcv=0, Fphi=0,

+ Btrigger = 0,Blim=Blim,Bpa=NA,

+ Fscan = seq(0,1.2,len=61),verbose=FALSE)

>

> print(Flim <- SIMlim$Refs2[1,3])

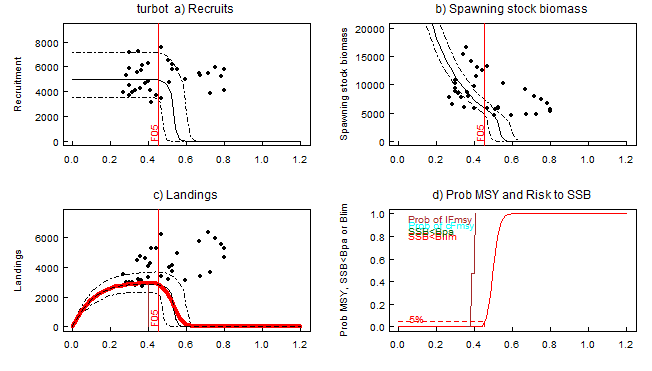
[1] 0.4976091

> print(Fpa <- Flim/1.4)

[1] 0.3554351

>

> eqsim\_plot(SIMlim,catch = "FALSE")



> Coby.fit(SIMlim,outfile = 'aa')

Reference point estimates:

F05 F10 F50 medianMSY meanMSY Medlower Meanlower Medupper

catF 0.452 0.462 0.498 NA 0.400 NA NA NA

lanF NA NA NA 0.449 0.400 0.246 0.248 0.474

catch 2810.872 2781.503 2582.703 NA 2860.856 NA NA NA

landings NA NA NA 2923.261 2860.856 2721.687 2762.528 2725.602

catB 5817.430 5541.833 4555.781 NA 7308.638 NA NA NA

lanB NA NA NA 6051.293 7308.638 14638.519 NA 5187.731

Meanupper

catF NA

lanF 0.459

catch NA

landings 2763.626

catB NA

lanB NA

>

> SIMlim\_pa[[years[iRetro]]] <- SIMlim

>

> print(Flim <- SIMlim$Refs2[1,3])

[1] 0.4976091

> print(Fpa <- Flim/1.4)

[1] 0.3554351

>

|  |
| --- |
| > ### Fmsy - proxy  > SIM\_fmsy <- eqsim\_run(FITs, bio.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), bio.const = FALSE,  + sel.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), sel.const = FALSE,  + Fcv=0.212, Fphi=0.423, # these are defauts, taken from WKMSYREF4, as used in Saithe assessments  + Btrigger = 0,Blim=Blim, Bpa=Bpa, Fscan = seq(0,1.0,len=51),verbose=FALSE)  >  > SIMfmsy[[years[iRetro]]] <- SIM\_fmsy  >  > eqsim\_plot(SIM\_fmsy,catch="FALSE")    > Coby.fit(SIM\_fmsy,outfile='tur sim1s')  Reference point estimates:  F05 F10 F50 medianMSY meanMSY Medlower Meanlower Medupper  catF 0.402 0.417 0.471 NA 0.360 NA NA NA  lanF NA NA NA 0.373 0.360 0.240 0.239 0.444  catch 2772.522 2744.468 2385.793 NA 2791.327 NA NA NA  landings NA NA NA 2796.299 2791.327 2652.357 2710.067 2655.097  catB 6893.891 6432.233 4532.174 NA 8239.334 NA NA NA  lanB NA NA NA 7795.817 8239.334 14017.775 NA 5572.845  Meanupper  catF NA  lanF 0.430  catch NA  landings 2712.495  catB NA  lanB NA  >  > #get median MSY from lanF  > print(FmsyS <- SIM\_fmsy$Refs2[2,4])  [1] 0.3733734  > #also get F05 from catF  > print(F05S <- SIM\_fmsy$Refs2[1,1])  [1] 0.4017995  >  > ### Btrigger  > SIM2s <- eqsim\_run(FITs, bio.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), bio.const = FALSE,  + sel.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), sel.const = FALSE,  + Fcv=0, Fphi=0, # these are defauts, taken from WKMSYREF4, as used in Saithe assessments  + Btrigger = 0,Blim=Blim,Bpa=Bpa,Fscan = seq(0.1,0.5,len=41),verbose=FALSE)  >  > print(Btrigs <- SIM2s$rbp[,4][SIM2s$rbp$variable=='Spawning stock biomass'& SIM2s$rbp$Ftarget==0.40])  [1] 6182.443  >  > ### Fmsy  > SIM3s <- eqsim\_run(FITs, bio.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), bio.const = FALSE,  + sel.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), sel.const = FALSE,  + Fcv=0.212, Fphi=0.423, # these are defauts, taken from WKMSYREF4, as used in Saithe assessments  + Btrigger = Btrigs ,Blim=Blim,Bpa=Bpa,Fscan = seq(0,1.2,len=61),verbose=FALSE)  >  > Coby.fit(SIM3s,outfile='turbot S with Btrigger and Fcv and Fphi')  Reference point estimates:  F05 F10 F50 medianMSY meanMSY Medlower Meanlower Medupper  catF 0.484 0.518 0.661 NA 0.380 NA NA NA  lanF NA NA NA 0.388 0.380 0.244 0.240 0.579  catch 2762.987 2730.751 2551.594 NA 2802.786 NA NA NA  landings NA NA NA 2803.585 2802.786 2664.545 2715.502 2663.405  catB 5804.033 5484.509 4554.519 NA 7665.072 NA NA NA  lanB NA NA NA 7446.340 7665.072 13803.879 NA 5041.807  Meanupper  catF NA  lanF 0.593  catch NA  landings 2715.290  catB NA  lanB NA  > print(Fmsys <- SIM3s$Refs2[2,4])  [1] 0.387988  > print(F05s <- SIM3s$Refs2[1,1])  [1] 0.4835863 |

2015

> FITs <- eqsr\_fit(TUR, nsamp = nits, models = c( "Segreg"),

+ remove.years=c((dims(TUR)$maxyear - 2):dims(TUR)$maxyear))

>

> eqsr\_plot(FITs,n=nits)

>

> print(Blim <- FITs[["sr.det"]][,"b"])

[1] 3775.536

>

> print(Bpa <- 1.4 \* Blim)

[1] 5285.751

>

> ### Flim/Blim - Fpa/Bpa

> SIMlim <- eqsim\_run(FITs, bio.years = c((dims(TUR)$maxyear - 10), dims(TUR)$maxyear), bio.const = FALSE,

+ sel.years = c((dims(TUR)$maxyear - 10), dims(TUR)$maxyear), sel.const = FALSE,

+ Fcv=0, Fphi=0,

+ Btrigger = 0,Blim=Blim,Bpa=NA,

+ Fscan = seq(0,1.2,len=61),verbose=FALSE)

>

> print(Flim <- SIMlim$Refs2[1,3])

[1] 0.5062685

> print(Fpa <- Flim/1.4)

[1] 0.3616204

>

> eqsim\_plot(SIMlim,catch = "FALSE")

> Coby.fit(SIMlim,outfile = 'aa')

Reference point estimates:

F05 F10 F50 medianMSY meanMSY Medlower Meanlower Medupper

catF 0.451 0.463 0.506 NA 0.400 NA NA NA

lanF NA NA NA 0.443 0.400 0.251 0.253 0.466

catch 2739.093 2695.294 1976.536 NA 2804.064 NA NA NA

landings NA NA NA 2849.817 2804.064 2665.074 2705.872 2669.385

catB 5623.396 5274.963 3334.061 NA 7135.507 NA NA NA

lanB NA NA NA 5960.279 7135.507 14282.519 NA 5144.084

Meanupper

catF NA

lanF 0.450

catch NA

landings 2712.734

catB NA

lanB NA

>

> SIMlim\_pa[[years[iRetro]]] <- SIMlim

>

> print(Flim <- SIMlim$Refs2[1,3])

[1] 0.5062685

> print(Fpa <- Flim/1.4)

[1] 0.3616204

>

> ### Fmsy - proxy

> SIM\_fmsy <- eqsim\_run(FITs, bio.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), bio.const = FALSE,

+ sel.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), sel.const = FALSE,

+ Fcv=0.212, Fphi=0.423, # these are defauts, taken from WKMSYREF4, as used in Saithe assessments

+ Btrigger = 0,Blim=Blim, Bpa=Bpa, Fscan = seq(0,1.0,len=51),verbose=FALSE)

>

> SIMfmsy[[years[iRetro]]] <- SIM\_fmsy

>

> eqsim\_plot(SIM\_fmsy,catch="FALSE")

> Coby.fit(SIM\_fmsy,outfile='tur sim1s')

Reference point estimates:

F05 F10 F50 medianMSY meanMSY Medlower Meanlower Medupper

catF 0.406 0.420 0.469 NA 0.360 NA NA NA

lanF NA NA NA 0.354 0.360 0.242 0.240 0.433

catch 2624.261 2577.314 2007.909 NA 2672.209 NA NA NA

landings NA NA NA 2677.905 2672.209 2539.201 2592.165 2540.261

catB 6353.221 5858.515 3691.962 NA 7890.615 NA NA NA

lanB NA NA NA 8106.763 7890.615 13620.011 NA 5411.212

Meanupper

catF NA

lanF 0.416

catch NA

landings 2593.042

catB NA

lanB NA

>

> #get median MSY from lanF

> print(FmsyS <- SIM\_fmsy$Refs2[2,4])

[1] 0.3543544

> #also get F05 from catF

> print(F05S <- SIM\_fmsy$Refs2[1,1])

[1] 0.4058114

>

> ### Btrigger

> SIM2s <- eqsim\_run(FITs, bio.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), bio.const = FALSE,

+ sel.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), sel.const = FALSE,

+ Fcv=0, Fphi=0, # these are defauts, taken from WKMSYREF4, as used in Saithe assessments

+ Btrigger = 0,Blim=Blim,Bpa=Bpa,Fscan = seq(0.1,0.5,len=41),verbose=FALSE)

Error in readChar(con, 5L, useBytes = TRUE) : cannot open the connection

In addition: Warning message:

In readChar(con, 5L, useBytes = TRUE) :

cannot open compressed file 'C:/Users/verke021/AppData/Local/Temp/Rtmpo5c4Wm/rs-graphics-f5ca57ad-05a8-4544-a276-f0f4b8b4dc54/.snapshot', probable reason 'No such file or directory'

Graphics error: Plot rendering error

>

> print(Btrigs <- SIM2s$rbp[,4][SIM2s$rbp$variable=='Spawning stock biomass'& SIM2s$rbp$Ftarget==0.40])

[1] 5873.553

>

> ### Fmsy

> SIM3s <- eqsim\_run(FITs, bio.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), bio.const = FALSE,

+ sel.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), sel.const = FALSE,

+ Fcv=0.212, Fphi=0.423, # these are defauts, taken from WKMSYREF4, as used in Saithe assessments

+ Btrigger = Btrigs ,Blim=Blim,Bpa=Bpa,Fscan = seq(0,1.2,len=61),verbose=FALSE)

>

> Coby.fit(SIM3s,outfile='turbot S with Btrigger and Fcv and Fphi')

Reference point estimates:

F05 F10 F50 medianMSY meanMSY Medlower Meanlower Medupper

catF 0.561 0.599 0.753 NA 0.380 NA NA NA

lanF NA NA NA 0.383 0.380 0.246 0.242 0.549

catch 2531.084 2474.887 2184.717 NA 2682.574 NA NA NA

landings NA NA NA 2682.999 2682.574 2549.961 2600.721 2548.473

catB 4833.675 4589.651 3775.828 NA 7309.974 NA NA NA

lanB NA NA NA 7222.498 7309.974 13378.150 NA 4914.850

Meanupper

catF NA

lanF 0.553

catch NA

landings 2599.486

catB NA

lanB NA

> print(Fmsys <- SIM3s$Refs2[2,4])

[1] 0.3831832

> print(F05s <- SIM3s$Refs2[1,1])

[1] 0.5611892

2014

> FITs <- eqsr\_fit(TUR, nsamp = nits, models = c( "Segreg"),

+ remove.years=c((dims(TUR)$maxyear - 2):dims(TUR)$maxyear))

>

> eqsr\_plot(FITs,n=nits)

>

> print(Blim <- FITs[["sr.det"]][,"b"])

[1] 4055.594

>

> print(Bpa <- 1.4 \* Blim)

[1] 5677.831

>

> ### Flim/Blim - Fpa/Bpa

> SIMlim <- eqsim\_run(FITs, bio.years = c((dims(TUR)$maxyear - 10), dims(TUR)$maxyear), bio.const = FALSE,

+ sel.years = c((dims(TUR)$maxyear - 10), dims(TUR)$maxyear), sel.const = FALSE,

+ Fcv=0, Fphi=0,

+ Btrigger = 0,Blim=Blim,Bpa=NA,

+ Fscan = seq(0,1.2,len=61),verbose=FALSE)

>

> print(Flim <- SIMlim$Refs2[1,3])

[1] 0.5002033

> print(Fpa <- Flim/1.4)

[1] 0.3572881

>

> eqsim\_plot(SIMlim,catch = "FALSE")

> Coby.fit(SIMlim,outfile = 'aa')

Reference point estimates:

F05 F10 F50 medianMSY meanMSY Medlower Meanlower Medupper

catF 0.447 0.460 0.500 NA 0.400 NA NA NA

lanF NA NA NA 0.444 0.400 0.259 0.260 0.467

catch 2695.316 2660.737 2386.010 NA 2746.972 NA NA NA

landings NA NA NA 2802.496 2746.972 2611.918 2647.582 2614.717

catB 5669.564 5303.159 4039.084 NA 7121.601 NA NA NA

lanB NA NA NA 5879.666 7121.601 13863.600 NA 5035.515

Meanupper

catF NA

lanF 0.452

catch NA

landings 2649.209

catB NA

lanB NA

>

> SIMlim\_pa[[years[iRetro]]] <- SIMlim

>

> print(Flim <- SIMlim$Refs2[1,3])

[1] 0.5002033

> print(Fpa <- Flim/1.4)

[1] 0.3572881

>

> ### Fmsy - proxy

> SIM\_fmsy <- eqsim\_run(FITs, bio.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), bio.const = FALSE,

+ sel.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), sel.const = FALSE,

+ Fcv=0.212, Fphi=0.423, # these are defauts, taken from WKMSYREF4, as used in Saithe assessments

+ Btrigger = 0,Blim=Blim, Bpa=Bpa, Fscan = seq(0,1.0,len=51),verbose=FALSE)

>

> SIMfmsy[[years[iRetro]]] <- SIM\_fmsy

>

> eqsim\_plot(SIM\_fmsy,catch="FALSE")

> Coby.fit(SIM\_fmsy,outfile='tur sim1s')

Reference point estimates:

F05 F10 F50 medianMSY meanMSY Medlower Meanlower Medupper

catF 0.398 0.409 0.460 NA 0.360 NA NA NA

lanF NA NA NA 0.402 0.360 0.249 0.248 0.431

catch 2522.347 2489.624 2114.147 NA 2551.527 NA NA NA

landings NA NA NA 2559.407 2551.527 2424.212 2471.944 2424.462

catB 6486.310 6087.706 4054.394 NA 7788.946 NA NA NA

lanB NA NA NA 6378.862 7788.946 13185.623 NA 5294.138

Meanupper

catF NA

lanF 0.413

catch NA

landings 2472.602

catB NA

lanB NA

>

> #get median MSY from lanF

> print(FmsyS <- SIM\_fmsy$Refs2[2,4])

[1] 0.4024024

> #also get F05 from catF

> print(F05S <- SIM\_fmsy$Refs2[1,1])

[1] 0.397541

>

> ### Btrigger

> SIM2s <- eqsim\_run(FITs, bio.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), bio.const = FALSE,

+ sel.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), sel.const = FALSE,

+ Fcv=0, Fphi=0, # these are defauts, taken from WKMSYREF4, as used in Saithe assessments

+ Btrigger = 0,Blim=Blim,Bpa=Bpa,Fscan = seq(0.1,0.5,len=41),verbose=FALSE)

>

> print(Btrigs <- SIM2s$rbp[,4][SIM2s$rbp$variable=='Spawning stock biomass'& SIM2s$rbp$Ftarget==0.40])

[1] 5762.224

>

> ### Fmsy

> SIM3s <- eqsim\_run(FITs, bio.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), bio.const = FALSE,

+ sel.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), sel.const = FALSE,

+ Fcv=0.212, Fphi=0.423, # these are defauts, taken from WKMSYREF4, as used in Saithe assessments

+ Btrigger = Btrigs ,Blim=Blim,Bpa=Bpa,Fscan = seq(0,1.2,len=61),verbose=FALSE)

>

> Coby.fit(SIM3s,outfile='turbot S with Btrigger and Fcv and Fphi')

Reference point estimates:

F05 F10 F50 medianMSY meanMSY Medlower Meanlower Medupper

catF 0.498 0.531 0.673 NA 0.380 NA NA NA

lanF NA NA NA 0.388 0.380 0.253 0.250 0.551

catch 2494.847 2457.557 2241.912 NA 2558.982 NA NA NA

landings NA NA NA 2559.742 2558.982 2431.318 2478.197 2432.134

catB 5200.484 4927.942 4055.691 NA 7180.941 NA NA NA

lanB NA NA NA 6962.512 7180.941 12918.272 NA 4772.782

Meanupper

catF NA

lanF 0.552

catch NA

landings 2476.968

catB NA

lanB NA

> print(Fmsys <- SIM3s$Refs2[2,4])

[1] 0.387988

> print(F05s <- SIM3s$Refs2[1,1])

[1] 0.4977557

2013

> FITs <- eqsr\_fit(TUR, nsamp = nits, models = c( "Segreg"),

+ remove.years=c((dims(TUR)$maxyear - 2):dims(TUR)$maxyear))

>

> eqsr\_plot(FITs,n=nits)

>

> print(Blim <- FITs[["sr.det"]][,"b"])

[1] 4122.854

>

> print(Bpa <- 1.4 \* Blim)

[1] 5771.996

>

> ### Flim/Blim - Fpa/Bpa

> SIMlim <- eqsim\_run(FITs, bio.years = c((dims(TUR)$maxyear - 10), dims(TUR)$maxyear), bio.const = FALSE,

+ sel.years = c((dims(TUR)$maxyear - 10), dims(TUR)$maxyear), sel.const = FALSE,

+ Fcv=0, Fphi=0,

+ Btrigger = 0,Blim=Blim,Bpa=NA,

+ Fscan = seq(0,1.2,len=61),verbose=FALSE)

>

> print(Flim <- SIMlim$Refs2[1,3])

[1] 0.4973129

> print(Fpa <- Flim/1.4)

[1] 0.3552235

>

> eqsim\_plot(SIMlim,catch = "FALSE")

> Coby.fit(SIMlim,outfile = 'aa')

Reference point estimates:

F05 F10 F50 medianMSY meanMSY Medlower Meanlower Medupper

catF 0.443 0.453 0.497 NA 0.400 NA NA NA

lanF NA NA NA 0.411 0.400 0.267 0.268 0.462

catch 2750.333 2713.762 2348.675 NA 2809.447 NA NA NA

landings NA NA NA 2851.105 2809.447 2669.616 2708.056 2687.900

catB 6026.427 5705.745 4116.524 NA 7488.275 NA NA NA

lanB NA NA NA 7175.454 7488.275 14139.113 NA 5392.427

Meanupper

catF NA

lanF 0.444

catch NA

landings 2708.245

catB NA

lanB NA

>

> SIMlim\_pa[[years[iRetro]]] <- SIMlim

>

> print(Flim <- SIMlim$Refs2[1,3])

[1] 0.4973129

> print(Fpa <- Flim/1.4)

[1] 0.3552235

>

> ### Fmsy - proxy

> SIM\_fmsy <- eqsim\_run(FITs, bio.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), bio.const = FALSE,

+ sel.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), sel.const = FALSE,

+ Fcv=0.212, Fphi=0.423, # these are defauts, taken from WKMSYREF4, as used in Saithe assessments

+ Btrigger = 0,Blim=Blim, Bpa=Bpa, Fscan = seq(0,1.0,len=51),verbose=FALSE)

>

> SIMfmsy[[years[iRetro]]] <- SIM\_fmsy

>

> eqsim\_plot(SIM\_fmsy,catch="FALSE")

> Coby.fit(SIM\_fmsy,outfile='tur sim1s')

Reference point estimates:

F05 F10 F50 medianMSY meanMSY Medlower Meanlower Medupper

catF 0.396 0.407 0.456 NA 0.360 NA NA NA

lanF NA NA NA 0.372 0.360 0.257 0.255 0.424

catch 2524.862 2488.025 2048.321 NA 2558.740 NA NA NA

landings NA NA NA 2564.859 2558.740 2431.052 2480.509 2434.098

catB 6768.582 6333.705 4099.419 NA 8132.454 NA NA NA

lanB NA NA NA 7671.469 8132.454 13335.357 NA 5663.062

Meanupper

catF NA

lanF 0.407

catch NA

landings 2482.847

catB NA

lanB NA

>

> #get median MSY from lanF

> print(FmsyS <- SIM\_fmsy$Refs2[2,4])

[1] 0.3723724

> #also get F05 from catF

> print(F05S <- SIM\_fmsy$Refs2[1,1])

[1] 0.3960903

>

> ### Btrigger

> SIM2s <- eqsim\_run(FITs, bio.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), bio.const = FALSE,

+ sel.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), sel.const = FALSE,

+ Fcv=0, Fphi=0, # these are defauts, taken from WKMSYREF4, as used in Saithe assessments

+ Btrigger = 0,Blim=Blim,Bpa=Bpa,Fscan = seq(0.1,0.5,len=41),verbose=FALSE)

>

> print(Btrigs <- SIM2s$rbp[,4][SIM2s$rbp$variable=='Spawning stock biomass'& SIM2s$rbp$Ftarget==0.40])

[1] 5933.838

>

> ### Fmsy

> SIM3s <- eqsim\_run(FITs, bio.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), bio.const = FALSE,

+ sel.years = c((dims(TUR)$maxyear - 5), dims(TUR)$maxyear), sel.const = FALSE,

+ Fcv=0.212, Fphi=0.423, # these are defauts, taken from WKMSYREF4, as used in Saithe assessments

+ Btrigger = Btrigs ,Blim=Blim,Bpa=Bpa,Fscan = seq(0,1.2,len=61),verbose=FALSE)

>

> Coby.fit(SIM3s,outfile='turbot S with Btrigger and Fcv and Fphi')

Reference point estimates:

F05 F10 F50 medianMSY meanMSY Medlower Meanlower Medupper

catF 0.501 0.534 0.675 NA 0.380 NA NA NA

lanF NA NA NA 0.387 0.380 0.263 0.259 0.530

catch 2478.916 2432.334 2182.896 NA 2567.107 NA NA NA

landings NA NA NA 2567.157 2567.107 2441.224 2486.170 2438.988

catB 5322.738 5036.839 4122.806 NA 7501.123 NA NA NA

lanB NA NA NA 7299.005 7501.123 12988.257 NA 5065.301

Meanupper

catF NA

lanF 0.528

catch NA

landings 2486.812

catB NA

lanB NA

> print(Fmsys <- SIM3s$Refs2[2,4])

[1] 0.3867868

> print(F05s <- SIM3s$Refs2[1,1])

[1] 0.500884

2012