

ICES data quality issues corrected prior to the analysis

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The stock assessment graphs (SAG) dataset found at <http://standardgraphs.ices.dk/stockList.aspx> was used to extract the ICES data needed for the CFP indicators analysis. Prior to the analysis, an extensive data quality check was carried out on the data relevant to the analysis. During this data quality check the following fields were checked and corrected:

- Stock size, fishing pressure and reference points of stocks cat. 1-3 (data moved from custom columns when needed).
- Stock size description, stock size units, fishing pressure description, fishing pressure units of stocks cat 1-2.
- Stock size description of stocks cat 3.

There are still issues to be corrected in the ICES SAG dataset which were not addressed here due to time limitations and because they were not very relevant to our analysis. For example, we noticed inconsistencies and errors in stock units, fishing pressure description and fishing pressure units of many cat 3 stocks.

Overall changes

There are various stocks where F_{age} is being transformed in a Date in the Excel file!!!

Within Fishing Pressure Units: “per year” changed to “Year-1”

Within Fishing Pressure Description: “Relative F” and “Fishing Pressure: Relative” changed to “Frel”; “Fishing Pressure: F” changed to “F”; “Fishing pressure: F” changed to “F”; “Fishing Pressure” changed to F; “Harvest Rate” changed to “HR”; “Harvest rate” changed to “HR”

Within Stock Size Description: “Abundance Index” changed to “Abundance index”; “Biomass Index” changed to “Biomass index”; “ssb” change to SSB; “TSB/Bmsy” changed to “B/Bmsy”

Within Stock Size Units: “Tonnes” changed to “tonnes”

Category 1-2 stocks

ane.27.8

##using relative F with harves rate is misleading so we changed the description

```
Data[Data$FishStock=="ane.27.8",]$FishingPressureDescription <- "HR" ##
```

bli.27.5b67

== NO SUMMARY SHEET IN THE STOCK LIST (<http://standardgraphs.ices.dk/stockList.aspx>)

FAge – values are shown as a date in the excel file, format of the .csv file should be checked.

#bss.27.4bc7ad-h

```
head(Data[Data$FishStock=="bss.27.4bc7ad-h",]) #--commercial discards in custom column2
```

#cap.27.1-2

```
Data[Data$FishStock=="cap.27.1-2",]$FishingPressureDescription <- "NA"
```

```
Data[Data$FishStock=="cap.27.1-2",]$FishingPressureUnits <- "NA"
```

```
Data[Data$FishStock=="cap.27.1-2",]$TotalBiomassUnits <- "tonnes"
```

#cod.2127.1f14

```
Data[Data$FishStock=="cod.2127.1f14",]$TotalBiomassUnits <- "tonnes"
```

#cod.27.1-2

```
Data[Data$FishStock=="cod.27.1-2",]$UnitOfRecruitment <- "thousands"
```

```
Data[Data$FishStock=="cod.27.1-2",]$TotalBiomassUnits <- "tonnes"
```

cod.27.5b1

This stock is connected to the wrong .pdf for the advice sheet

<http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.27.47d20.pdf>

#cod.27.7e-k

```
Data[Data$FishStock=="cod.27.7e-k",]$TotalBiomassUnits <- "tonnes"
```

#cod.27.24-32

On the website this stock is still Data Category 3 while it should be updated to 1

#dgs.27.nea

```
head(Data[Data$FishStock=="dgs.27.nea",])
```

```
Data[Data$FishStock=="dgs.27.nea",]$TotalBiomassUnits <- "tonnes"
```

```

Data[Data$FishStock=="dgs.27.nea",]$FishingPressureUnits <- "ratio"

# -- summary sheet in the latest advice link (http://www.ices.dk/community/advisory-process/Pages/Latest-advice.aspx) (not in the stock list)

#ghl.27.1-2

head(Data[Data$FishStock=="ghl.27.1-2",])

Data[Data$FishStock=="ghl.27.1-2",]$FishingPressureDescription <- "HR"


#had.27.5a

Data[Data$FishStock=="had.27.5a",]$FishingPressureDescription <- "HR"

Data[Data$FishStock=="had.27.5a",]$StockSizeDescription <- "SSB"

Data[Data$FishStock=="had.27.5a",]$UnitOfRecruitment <- "millions"

Data[Data$FishStock=="had.27.5a",]$RecruitmentDescription <- "Recruitment"

Data[Data$FishStock=="had.27.5a",]$TotalBiomassUnits <- "1000 tonnes"

Data[Data$FishStock=="had.27.5a",]$Report <-
"http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/had.27.5a.pdf"


#had.27.5b

Data[Data$FishStock=="had.27.5b",]$Report <-
"http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/had.27.5b.pdf"

Data[Data$FishStock=="had.27.5b",]$FishingPressureUnits <- "Year-1"

Data[Data$FishStock=="had.27.5b",]$TotalBiomassUnits <- "tonnes"


#had.27.6b

Data[Data$FishStock=="had.27.6b",]$Report <-
"http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/had.27.6b.pdf"

Data[Data$FishStock=="had.27.6b",]$TotalBiomassUnits <- "tonnes"


#had.27.7a

Data[Data$FishStock=="had.27.7a",]$RecruitmentDescription <- "Recruitment"


#had.27.7b-k

Data[Data$FishStock=="had.27.7b-k",]$TotalBiomassUnits <- "tonnes"

```

#her.27.1-24a514a

Data[Data\$FishStock=="her.27.1-24a514a"],\$TotalBiomassUnits <- "tonnes"

#her.27.28

Data[Data\$FishStock=="her.27.28"],\$TotalBiomassUnits <- "tonnes"

#her.27.3a47d

Data[Data\$FishStock=="her.27.3a47d"],\$RecruitmentDescription <- "Recruitment"

Data[Data\$FishStock=="her.27.3a47d"],\$TotalBiomassUnits <- "tonnes"

#"cod.21.1"

Data[Data\$FishStock == "cod.21.1"],\$TotalBiomassUnits <- "tonnes"

Data[Data\$FishStock == "cod.21.1"],\$Report <-

"http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.21.1.pdf"

#"bss.27.8ab"

Data[Data\$FishStock == "bss.27.8ab"],\$Report <-

"http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/bss.27.8ab.pdf"

Data[Data\$FishStock == "bss.27.8ab"],\$TotalBiomassUnits <- "tonnes"

#her.27.5a

Data[Data\$FishStock == "her.27.5a"],\$TotalBiomassUnits <- "tonnes"

#her.27.6a7bc

Data Category on the website is still 1.2 while it should be updated to 3

Data[Data\$FishStock == "her.27.6a7bc"],\$FishingPressureDescription <- "Frel"

Data[Data\$FishStock == "her.27.6a7bc"],\$FishingPressureUnits <- "Relative to mean"

Data[Data\$FishStock == "her.27.6a7bc"],\$StockSizeDescription <- "Relative SSB"

Data[Data\$FishStock == "her.27.6a7bc"],\$StockSizeUnits <- "Relative to mean"

Data[Data\$FishStock == "her.27.6a7bc"],\$UnitOfRecruitment <- "Relative to mean"

#her.27.irls

Data[Data\$FishStock == "her.27.irls",]\$TotalBiomassUnits <- "tonnes"

Data[Data\$FishStock == "her.27.irls",]\$UnitOfRecruitment <- "thousands"

Columns Blim and Bpa were shifted

#her.27.nirs

Data[Data\$FishStock == "her.27.nirs",]\$RecruitmentDescription <- "Recruitment"

Data[Data\$FishStock == "her.27.nirs",]\$TotalBiomassUnits <- "tonnes"

#hke.27.3a46-8abd

Data[Data\$FishStock == "hke.27.3a46-8abd",]\$TotalBiomassUnits <- "tonnes"

#hke.27.8c9a

Data[Data\$FishStock == "hke.27.8c9a",]\$TotalBiomassUnits <- "tonnes"

#hom.27.9a

Data[Data\$FishStock == "hom.27.9a",]\$FishingPressureUnits <- "Year-1"

#hom.27.2a4a5b6a7a-ce-k8

Set MSYBtrigger = Bpa

#ldb.27.8c9a

Data[Data\$FishStock == "ldb.27.8c9a",]\$TotalBiomassUnits <- "tonnes"

#lin.27.5a

Data[Data\$FishStock == "lin.27.5a",]\$FishingPressureDescription <- "HR"

#mac.27.nea

Data[Data\$FishStock == "mac.27.nea",]\$TotalBiomassUnits <- "tonnes"

#meg.27.7b-k8abd

```
Data[Data$FishStock == "meg.27.7b-k8abd"],]$TotalBiomassUnits <- "tonnes"
```

```
#meg.27.8c9a
```

```
Data[Data$FishStock == "meg.27.8c9a"],]$TotalBiomassUnits <- "tonnes"
```

```
#mon.27.78abd
```

```
Data[Data$FishStock == "mon.27.78abd"],]$TotalBiomassUnits <- "tonnes"
```

```
#mon.27.8c9a
```

```
Data[Data$FishStock == "mon.27.8c9a"],]$TotalBiomassUnits <- "tonnes"
```

```
#All Nephrops with UW TV index corrected to Abundance Index
```

```
Data$StockSizeDescription <- as.factor(Data$StockSizeDescription)
```

```
levels(Data$StockSizeDescription)[levels(Data$StockSizeDescription)=="UW TV index"] <- "Abundance"
```

```
#nep.fu.11
```

```
Data[Data$FishStock == "nep.fu.11"],]$FishingPressureDescription <- "HR"
```

```
Data[Data$FishStock == "nep.fu.11"],]$FishingPressureUnits <- "Percent"
```

```
#nep.fu.12
```

```
Data[Data$FishStock == "nep.fu.12"],]$FishingPressureDescription <- "HR"
```

```
Data[Data$FishStock == "nep.fu.12"],]$FishingPressureUnits <- "Percent"
```

```
#nep.fu.13
```

```
Data[Data$FishStock == "nep.fu.13"],]$FishingPressureDescription <- "HR"
```

```
Data[Data$FishStock == "nep.fu.13"],]$FishingPressureUnits <- "Percent"
```

```
#nep.fu.14
```

```
Data[Data$FishStock == "nep.fu.14"],]$FishingPressureDescription <- "HR"
```

```
Data[Data$FishStock == "nep.fu.14"],]$FishingPressureUnits <- "Percent"
```

```
Data[Data$FishStock == "nep.fu.14"],]$StockSizeUnits <- "millions"
```

#nep.fu.15

Data[Data\$FishStock == "nep.fu.15",]\$FishingPressureDescription <- "HR"

Data[Data\$FishStock == "nep.fu.15",]\$FishingPressureUnits <- "Percent"

#nep.fu.16

Data[Data\$FishStock == "nep.fu.16",]\$FishingPressureDescription <- "HR"

Data[Data\$FishStock == "nep.fu.16",]\$FishingPressureUnits <- "Percent"

#nep.fu.17

Data[Data\$FishStock == "nep.fu.17",]\$FishingPressureDescription <- "HR"

Data[Data\$FishStock == "nep.fu.17",]\$FishingPressureUnits <- "Percent"

#nep.fu.19

Data[Data\$FishStock == "nep.fu.19",]\$FishingPressureDescription <- "HR"

Data[Data\$FishStock == "nep.fu.19",]\$FishingPressureUnits <- "Percent"

#nep.fu.2021

Data[Data\$FishStock == "nep.fu.2021",]\$FishingPressureDescription <- "HR"

Data[Data\$FishStock == "nep.fu.2021",]\$FishingPressureUnits <- "Percent"

#nep.fu.22

Data[Data\$FishStock == "nep.fu.22",]\$FishingPressureDescription <- "HR"

Data[Data\$FishStock == "nep.fu.22",]\$FishingPressureUnits <- "Percent"

#nep.fu.2324

Data[Data\$FishStock == "nep.fu.2324",]\$FishingPressureDescription <- "HR"

Data[Data\$FishStock == "nep.fu.2324",]\$FishingPressureUnits <- "Percent"

Data[Data\$FishStock == "nep.fu.2324",]\$Report <-

<http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/nep.fu.2324.pdf>

#nep.fu.33

Stock assessment year should be updated to 2019 in the SID dataset

#nep.fu.3-4

Data[Data\$FishStock == "nep.fu.3-4",]\$StockSizeDescription <- "Abundance"

Data[Data\$FishStock == "nep.fu.3-4",]\$StockSizeUnits <- "millions"

Data[Data\$FishStock == "nep.fu.3-4",]\$FishingPressureDescription <- "HR"

Data[Data\$FishStock == "nep.fu.3-4",]\$FishingPressureUnits <- "Percent"

#nep.fu.6

Data[Data\$FishStock == "nep.fu.6",]\$StockSizeDescription <- "Abundance"

Data[Data\$FishStock == "nep.fu.6",]\$FishingPressureDescription <- "HR"

Data[Data\$FishStock == "nep.fu.6",]\$FishingPressureUnits <- "Percent"

-- there is an issue with the graphs of stock abundance in the advice sheet as the scale is not consistent

#nep.fu.7

Data[Data\$FishStock == "nep.fu.7",]\$StockSizeUnits <- "billions"

Data[Data\$FishStock == "nep.fu.7",]\$FishingPressureDescription <- "HR"

Data[Data\$FishStock == "nep.fu.7",]\$FishingPressureUnits <- "Percent"

-- abundance in billions in the advice sheet and in millions in SAG (check consistency)

#nep.fu.8

Data[Data\$FishStock == "nep.fu.8",]\$FishingPressureDescription <- "HR"

Data[Data\$FishStock == "nep.fu.8",]\$FishingPressureUnits <- "Percent"

-- there is an issue with the graphs of stock abundance in the advice sheet as the scale is not consistent

#nep.fu.9

Data[Data\$FishStock == "nep.fu.9",]\$FishingPressureDescription <- "HR"

Data[Data\$FishStock == "nep.fu.9",]\$FishingPressureUnits <- "Percent"

#nop.27.3a4

Data[Data\$FishStock == "nop.27.3a4",]\$TotalBiomassUnits <- "tonnes"

#pil.27.8abd

```
Data[Data$FishStock == "pil.27.8abd",]$TotalBiomassUnits <- "tonnes"
```

#pil.27.8c9a

```
Data[Data$FishStock == "pil.27.8abd",]$StockSizeDescription <- "Biomass"
```

```
Data[Data$FishStock == "pil.27.8abd",]$Report <-  
"http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/pil.27.8c9a.pdf"
```

#ple.27.21-23

```
Data[Data$FishStock == "ple.27.21-23",]$StockSizeUnits <- "tonnes"
```

```
Data[Data$FishStock == "ple.27.21-23",]$UnitOfRecruitment <- "thousands"
```

```
Data[Data$FishStock == "ple.27.21-23",]$TotalBiomassUnits <- "tonnes"
```

Ref points were not consistent with advice sheet

#ple.27.420

```
Data[Data$FishStock == "ple.27.420",]$TotalBiomassUnits <- "tonnes"
```

#ple.27.7a

```
Data[Data$FishStock == "ple.27.7a",]$FishingPressureUnits <- "Year-1"
```

```
Data[Data$FishStock == "ple.27.7a",]$TotalBiomassUnits <- "tonnes"
```

#pok.27.1-2

```
Data[Data$FishStock == "pok.27.1-2",]$TotalBiomassUnits <- "tonnes"
```

#pok.27.3a46

```
Data[Data$FishStock == "pok.27.3a46",]$TotalBiomassUnits <- "tonnes"
```

#pok.27.5a

as all reference points where based on HR, Fpressure = F, was replaced to Fpressure = HR, units changed to "ratio" and reference points moved from custom column to the Flim, Fpa and FMSY columns

#pok.27.5b

Data[Data\$FishStock == "pok.27.5b",]\$StockSizeUnits <- "tonnes"

Data[Data\$FishStock == "pok.27.5b",]\$TotalBiomassUnits <- "tonnes"

Data[Data\$FishStock == "pok.27.5b",]\$UnitOfRecruitment <- "thousands"

Data[Data\$FishStock == "pok.27.5b",]\$Report <-
"http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/pok.27.5b.pdf"

#pra.27.1-2

Data[Data\$FishStock == "pra.27.1-2",]\$FishingPressureUnits <- "Relative to Fmsy"

Data[Data\$FishStock == "pra.27.1-2",]\$StockSizeUnits <- "Relative to Bmsy"

#reb.2127.dp

Data[Data\$FishStock == "reb.2127.dp",]\$FishingPressureDescription <- "Frel"

Data[Data\$FishStock == "reb.2127.dp",]\$FishingPressureUnits <- "Relative to mean"

Data[Data\$FishStock == "reb.2127.dp",]\$StockSizeDescription <- "Relative SSB"

Data[Data\$FishStock == "reb.2127.dp",]\$StockSizeUnits <- "Relative to mean"

Data[Data\$FishStock == "reb.2127.dp",]\$TotalBiomassUnits <- "Relative to mean"

Data[Data\$FishStock == "reb.2127.dp",]\$UnitOfRecruitment <- "Relative to mean"

Data[Data\$FishStock == "reb.2127.dp",]\$RecruitmentDescription <- "Relative Recruitment"

#reg.27.1-2

Data[Data\$FishStock == "reg.27.1-2",]\$TotalBiomassUnits <- "tonnes"

-- advice sheet 2018

#reg.27.561214

Data[Data\$FishStock == "reg.27.561214",]\$TotalBiomassUnits <- "tonnes"

#san.sa.1r

Data[Data\$FishStock == "san.sa.1r",]\$Report <-
"http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/san.sa.1r.pdf"

#san.sa.2r

```
Data[Data$FishStock == "san.sa.2r",]$Report <-  
"http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/san.sa.2r.pdf"
```

#sol.27.20-24

```
Data[Data$FishStock == "sol.27.20-24",]$UnitOfRecruitment <- "thousands"
```

#sol.27.7a

```
Data[Data$FishStock == "sol.27.7a",]$UnitOfRecruitment <- "thousands"
```

#sol.27.7e

```
Data[Data$FishStock == "sol.27.7e",]$TotalBiomassUnits <- "tonnes"
```

#sol.27.7fg

```
Data[Data$FishStock == "sol.27.7fg",]$TotalBiomassUnits <- "tonnes"
```

#sol.27.8ab

```
Data[Data$FishStock == "sol.27.8ab",]$RecruitmentDescription <- "Recruitment"
```

#spr.27.22-32

```
Data[Data$FishStock == "spr.27.22-32",]$TotalBiomassUnits <- "tonnes"
```

#tur.27.4

```
Data[Data$FishStock == "tur.27.4",]$TotalBiomassUnits <- "tonnes"
```

#usk.27.5a14

```
Data[Data$FishStock == "usk.27.5a14",]$FishingPressureDescription <- "HR"
```

```
Data[Data$FishStock == "usk.27.5a14",]$FMSY <- 0.17 #HRMSY value from custom column
```

#whb.27.1-91214

```
Data[Data$FishStock == "whb.27.1-91214",]TotalBiomassUnits <- "tonnes"
```

```
#whg.27.6a
```

```
# - assessment from 2018
```

```
#whg.27.7a
```

```
Data[Data$FishStock == "whg.27.7a",]$TotalBiomassUnits <- "tonnes"
```

```
#whg.27.7b-ce-k
```

```
Data[Data$FishStock == "whg.27.7b-ce-k",]$RecruitmentDescription <- "Recruitment"
```

```
#wit.27.3a47d
```

```
Data[Data$FishStock == "wit.27.3a47d",]$UnitOfRecruitment <- "thousands"
```