Formato Archivo Data.ss

April, 10, 2023

Contents

0.1 Archivos utilizado para enfoque de modelación SS3

1. Identificamos el directorio donde se encuentra el modelo base simple

```
dirname.base <- here("modelos_SS3","simple")
```

3. Creamos un nuevo directorio para la nueva versión del modelo modificado

```
dirname.simple_mod <- here("boqueron_SS3")
dir.create(path=dirname.simple_mod, showWarnings = TRUE, recursive = TRUE)
```

5. Copiamos los archivos para el modelo que vamos a modificar

```
copy_SS_inputs(dir.old = dirname.base,
               dir.new = dirname.simple_mod,
               copy_exe = TRUE,
               verbose = FALSE)
## [1] FALSE
```

1 Descripción del Formado de entrada de datos para cada enfoque de modelación

1.1 Archivo data

1.1.1 Información general del modelo Formato `Gadget`

Buscar esta información en archivos entregados!!!

1.1.2 Información general del modelo Formato `SS3`

En la parte superior se especifica información general del modelo: los años del modelo, número de temporadas, número de sexos, edad máxima, número de áreas, número de flotas

Consulte la Guía de usuario de SS3: Sección 7.5 "Model Dimensions".

Revisamos los nombres de los componentes de la lista del archivo .dat

```
dat <- r4ss::SS_readdat(here(dirname.base,"data.ss")) #base
dat1<-dat # para modificar
#names(dat1) # muestra los objetos de la lista
```

```
#Especificaciones iniciales
dat1$styr           <-1971  #_StartYr
dat1$endyr          <-2001  #_EndYr
dat1$nseas          <-1     #_Nseas
dat1$months_per_seas<-12    #_months/season
dat1$Nsubseasons    <-2     #_Nsubseasons (even number, minimum is 2)
dat1$spawn_month    <-1     #_spawn_month (puesta alrededor de junio)
dat1$Ngenders       <-2     #_Ngenders: 1, 2, -1  (use -1 for 1 sex setup with SSB
                            # multiplied by female_frac parameter)
dat1$Nsexes         <-2
dat1$Nages          <-40    #_Nages=accumulator age, first age is always age 0
dat1$N_areas        <-1     #_Nareas
dat1$Nfleets        <-3     #_Nfleets (including surveys)
```

1.1.3 Capturas en formato `Gadget`

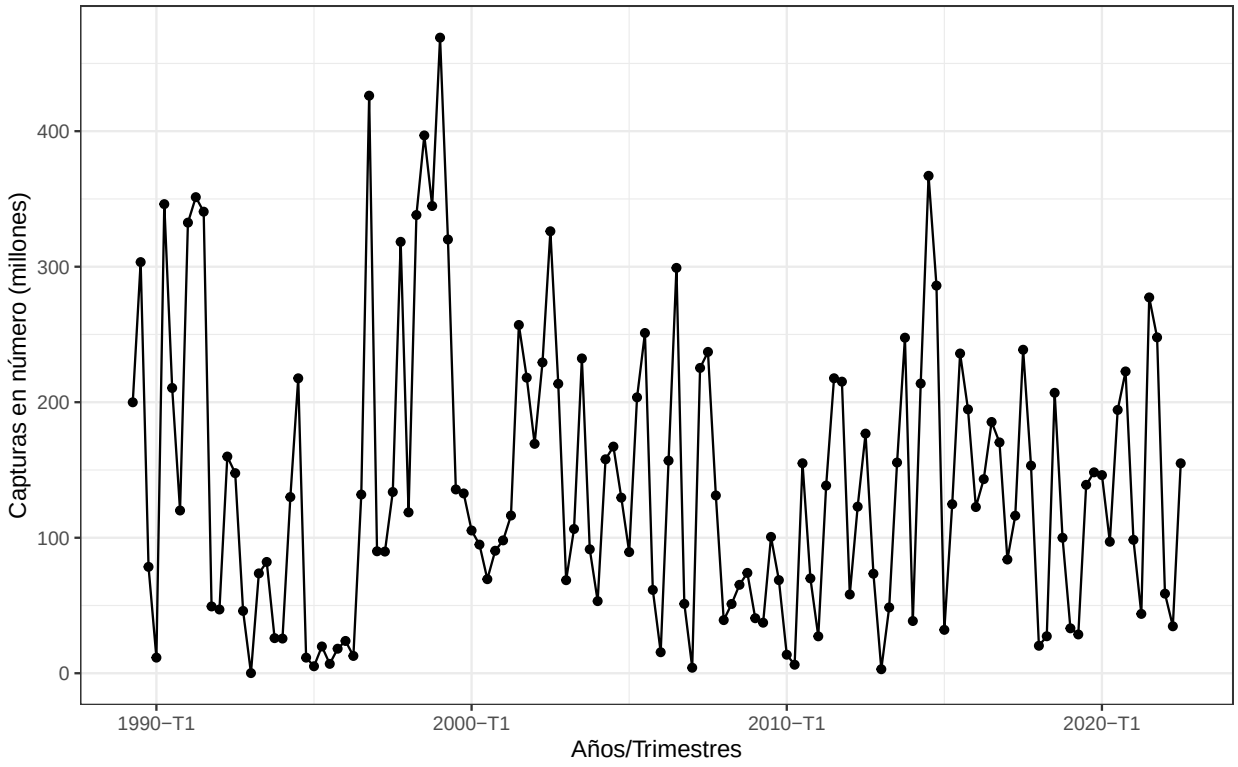
Capturas anuales del stock (toneladas)

```
# Se lee archivo de entrada Gadget
capturas<-read.table(file=here('Data_Gadget',"fleet.seine.data"),
                         header=F,sep="",na='NA',fill=T,skip = 3) %>%
             magrittr::set_colnames(c('year','step','area','vessel','number'))
capturas
##      year step area vessel    number
## 1    1989    1    1  seine 199957658
## 2    1989    2    1  seine 303404539
## 3    1989    3    1  seine  78515361
## 4    1989    4    1  seine  11546955
## 5    1990    1    1  seine 346182244
## 6    1990    2    1  seine 210525329
## 7    1990    3    1  seine 120108618
## 8    1990    4    1  seine 332530366
## 9    1991    1    1  seine 351328902
## 10   1991    2    1  seine 340602150
## 11   1991    3    1  seine  49312629
## 12   1991    4    1  seine  47046961
## 13   1992    1    1  seine 159922576
## 14   1992    2    1  seine 147661453
## 15   1992    3    1  seine  45994065
## 16   1992    4    1  seine    127120
## 17   1993    1    1  seine  73682881
## 18   1993    2    1  seine  82135796
## 19   1993    3    1  seine  25916888
## 20   1993    4    1  seine  25596844
## 21   1994    1    1  seine 130034554
## 22   1994    2    1  seine 217656255
## 23   1994    3    1  seine  11525852
## 24   1994    4    1  seine   5163484
## 25   1995    1    1  seine  19768686
## 26   1995    2    1  seine   6933215
## 27   1995    3    1  seine  18107269
## 28   1995    4    1  seine  23842803
## 29   1996    1    1  seine  12784780
## 30   1996    2    1  seine 131867261
## 31   1996    3    1  seine 426215877
## 32   1996    4    1  seine  90010878
## 33   1997    1    1  seine  89790005
## 34   1997    2    1  seine 133756630
## 35   1997    3    1  seine 318361300
## 36   1997    4    1  seine 118745840
## 37   1998    1    1  seine 338158909
## 38   1998    2    1  seine 396886478
## 39   1998    3    1  seine 344793206
## 40   1998    4    1  seine 469039786
## 41   1999    1    1  seine 320090480
## 42   1999    2    1  seine 135647781
## 43   1999    3    1  seine 132708122
## 44   1999    4    1  seine 105354172
```

```
## 45  2000    1    1  seine  94934247
## 46  2000    2    1  seine  69427997
## 47  2000    3    1  seine  90398846
## 48  2000    4    1  seine  98046118
## 49  2001    1    1  seine 116388957
## 50  2001    2    1  seine 257020480
## 51  2001    3    1  seine 218117734
## 52  2001    4    1  seine 169306973
## 53  2002    1    1  seine 229360149
## 54  2002    2    1  seine 326163766
## 55  2002    3    1  seine 213611139
## 56  2002    4    1  seine  68691547
## 57  2003    1    1  seine 106463024
## 58  2003    2    1  seine 232333314
## 59  2003    3    1  seine  91476186
## 60  2003    4    1  seine  53229801
## 61  2004    1    1  seine 157879561
## 62  2004    2    1  seine 167247350
## 63  2004    3    1  seine 129593348
## 64  2004    4    1  seine  89424185
## 65  2005    1    1  seine 203597685
## 66  2005    2    1  seine 251078169
## 67  2005    3    1  seine  61497185
## 68  2005    4    1  seine  15524401
## 69  2006    1    1  seine 156899482
## 70  2006    2    1  seine 299136087
## 71  2006    3    1  seine  51229041
## 72  2006    4    1  seine   4078413
## 73  2007    1    1  seine 225304208
## 74  2007    2    1  seine 237116980
## 75  2007    3    1  seine 131194676
## 76  2007    4    1  seine  39218249
## 77  2008    1    1  seine  51134931
## 78  2008    2    1  seine  65269767
## 79  2008    3    1  seine  74055919
## 80  2008    4    1  seine  40614587
## 81  2009    1    1  seine  37316482
## 82  2009    2    1  seine 100609343
## 83  2009    3    1  seine  68739753
## 84  2009    4    1  seine  13678035
## 85  2010    1    1  seine   6302699
## 86  2010    2    1  seine 154965206
## 87  2010    3    1  seine  70007563
## 88  2010    4    1  seine  27249389
## 89  2011    1    1  seine 138476630
## 90  2011    2    1  seine 217685468
## 91  2011    3    1  seine 215194998
## 92  2011    4    1  seine  58131127
## 93  2012    1    1  seine 122941225
## 94  2012    2    1  seine 176832216
## 95  2012    3    1  seine  73445864
## 96  2012    4    1  seine   2969225
## 97  2013    1    1  seine  48578745
```

```
## 98  2013    2    1  seine 155495582
## 99  2013    3    1  seine 247628885
## 100 2013    4    1  seine  38570864
## 101 2014    1    1  seine 213793570
## 102 2014    2    1  seine 367082645
## 103 2014    3    1  seine 286065085
## 104 2014    4    1  seine  32046803
## 105 2015    1    1  seine 124742305
## 106 2015    2    1  seine 235960505
## 107 2015    3    1  seine 194743244
## 108 2015    4    1  seine 122664188
## 109 2016    1    1  seine 143233486
## 110 2016    2    1  seine 185412989
## 111 2016    3    1  seine 170348562
## 112 2016    4    1  seine  83926740
## 113 2017    1    1  seine 116260007
## 114 2017    2    1  seine 238729392
## 115 2017    3    1  seine 153222922
## 116 2017    4    1  seine  20285986
## 117 2018    1    1  seine  27304293
## 118 2018    2    1  seine 206949158
## 119 2018    3    1  seine  99971323
## 120 2018    4    1  seine  33158572
## 121 2019    1    1  seine  28630214
## 122 2019    2    1  seine 139035879
## 123 2019    3    1  seine 148275978
## 124 2019    4    1  seine 146229025
## 125 2020    1    1  seine  97038024
## 126 2020    2    1  seine 194314049
## 127 2020    3    1  seine 222722477
## 128 2020    4    1  seine  98451683
## 129 2021    1    1  seine  43803454
## 130 2021    2    1  seine 277339244
## 131 2021    3    1  seine 247847055
## 132 2021    4    1  seine  58737332
## 133 2022    1    1  seine  34657697
## 134 2022    2    1  seine 154925664
```

```
capturaplot<-capturas %>% mutate(ytr=as.yearqtr(year + step/4))

ggplot(capturaplot,aes(x=ytr,y=number/1000000))+
  geom_line()+
  geom_point()+
   labs(x="Años/Trimestres", y="Capturas en número (millones)") +
   theme_bw() +
scale_x_yearqtr(format = "%Y-T%q")
```



1.1.4 Capturas en formato SS3

Primero ingresamos las especificaciones de los Datos de captura de la flota

Consulte la Guía de usuario de SS3: Sección 7.9 “Catch”.

1.1.4.1 Especificaciones de datos de captura

```
#_____________________________________________________________________________
#_fleet_type: 1=catch fleet; 2=bycatch only fleet; 3=survey; 4=ignore
#_sample_timing: -1 for fishing fleet to use season-long catch-at-age for
#observations, or 1 to use observation month;  (always 1 for surveys)
#_fleet_area:  area the fleet/survey operates in
#_units of catch:  1=bio; 2=num (ignored for surveys; their units read later)
#_catch_mult: 0=no; 1=yes
#_rows are fleets
#_fleet_type fishery_timing area catch_units need_catch_mult fleetname
#_____________________________________________________________________________
# Arreglo de datos
fleetnames1       <-c("FLOTA", "PELAGO", "ECOCADIZ")
type1             <-c(1,3,3)
surveytiming1     <-c(-1,1,1)
units_of_catch1   <-c(2,1,1)
areas1            <-c(1,1,1)
need_catch_mult1  <-c(0,0,0)
#_____________________________________________________________________________
# crear data.frame
fleetinfo1<-data.frame(type            = type1,
                       surveytiming    = surveytiming1,
```

```
                      area            = areas1,
                      units           = units_of_catch1,
                      need_catch_mult = need_catch_mult1,
                      fleetname       = fleetnames1)
#-------------------------------------------------------------------------------------
dat1$fleetinfo<-fleetinfo1
dat1$fleetinfo
##   type surveytiming area units need_catch_mult fleetname
## 1    1           -1    1     2               0     FLOTA
## 2    3            1    1     1               0    PELAGO
## 3    3            1    1     1               0  ECOCADIZ
#-------------------------------------------------------------------------------------
```

1.1.4.2 Datos de captura

```
#-------------------------------------------------------------------------------------
#_Catch data: yr, seas, fleet, catch, catch_se
#_catch_se:  standard error of log(catch)
#_NOTE:  catch data is ignored for survey fleets
#-------------------------------------------------------------------------------------
# Arreglo de Datos
year           <- capturas$year
nyear          <- length(year)

catch_year     <- c(-999,year)
catch_seas     <- c(0,capturas$step)
catch_fleet    <- rep(1,nyear+1)
catch_catch    <- c(0,capturas$number)
catch_catch_se <- rep(0.01,nyear+1) # se asume cv = 0.01 Revisar!!!!
#-------------------------------------------------------------------------------------
# crear data.frame
catch1<-data.frame(year     = catch_year,
                   seas     = catch_seas,
                   fleet    = catch_fleet,
                   catch    = catch_catch,
                   catch_se = catch_catch_se)
#-------------------------------------------------------------------------------------
dat1$catch<-catch1
dat1$catch
##     year seas fleet     catch catch_se
## 1   -999    0     1         0     0.01
## 2   1989    1     1 199957658     0.01
## 3   1989    2     1 303404539     0.01
## 4   1989    3     1  78515361     0.01
## 5   1989    4     1  11546955     0.01
## 6   1990    1     1 346182244     0.01
## 7   1990    2     1 210525329     0.01
## 8   1990    3     1 120108618     0.01
## 9   1990    4     1 332530366     0.01
## 10  1991    1     1 351328902     0.01
## 11  1991    2     1 340602150     0.01
## 12  1991    3     1  49312629     0.01
## 13  1991    4     1  47046961     0.01
## 14  1992    1     1 159922576     0.01
```

```
## 15  1992    2     1 147661453     0.01
## 16  1992    3     1  45994065     0.01
## 17  1992    4     1    127120     0.01
## 18  1993    1     1  73682881     0.01
## 19  1993    2     1  82135796     0.01
## 20  1993    3     1  25916888     0.01
## 21  1993    4     1  25596844     0.01
## 22  1994    1     1 130034554     0.01
## 23  1994    2     1 217656255     0.01
## 24  1994    3     1  11525852     0.01
## 25  1994    4     1   5163484     0.01
## 26  1995    1     1  19768686     0.01
## 27  1995    2     1   6933215     0.01
## 28  1995    3     1  18107269     0.01
## 29  1995    4     1  23842803     0.01
## 30  1996    1     1  12784780     0.01
## 31  1996    2     1 131867261     0.01
## 32  1996    3     1 426215877     0.01
## 33  1996    4     1  90010878     0.01
## 34  1997    1     1  89790005     0.01
## 35  1997    2     1 133756630     0.01
## 36  1997    3     1 318361300     0.01
## 37  1997    4     1 118745840     0.01
## 38  1998    1     1 338158909     0.01
## 39  1998    2     1 396886478     0.01
## 40  1998    3     1 344793206     0.01
## 41  1998    4     1 469039786     0.01
## 42  1999    1     1 320090480     0.01
## 43  1999    2     1 135647781     0.01
## 44  1999    3     1 132708122     0.01
## 45  1999    4     1 105354172     0.01
## 46  2000    1     1  94934247     0.01
## 47  2000    2     1  69427997     0.01
## 48  2000    3     1  90398846     0.01
## 49  2000    4     1  98046118     0.01
## 50  2001    1     1 116388957     0.01
## 51  2001    2     1 257020480     0.01
## 52  2001    3     1 218117734     0.01
## 53  2001    4     1 169306973     0.01
## 54  2002    1     1 229360149     0.01
## 55  2002    2     1 326163766     0.01
## 56  2002    3     1 213611139     0.01
## 57  2002    4     1  68691547     0.01
## 58  2003    1     1 106463024     0.01
## 59  2003    2     1 232333314     0.01
## 60  2003    3     1  91476186     0.01
## 61  2003    4     1  53229801     0.01
## 62  2004    1     1 157879561     0.01
## 63  2004    2     1 167247350     0.01
## 64  2004    3     1 129593348     0.01
## 65  2004    4     1  89424185     0.01
## 66  2005    1     1 203597685     0.01
## 67  2005    2     1 251078169     0.01
```

```
## 68  2005    3     1  61497185     0.01
## 69  2005    4     1  15524401     0.01
## 70  2006    1     1 156899482     0.01
## 71  2006    2     1 299136087     0.01
## 72  2006    3     1  51229041     0.01
## 73  2006    4     1   4078413     0.01
## 74  2007    1     1 225304208     0.01
## 75  2007    2     1 237116980     0.01
## 76  2007    3     1 131194676     0.01
## 77  2007    4     1  39218249     0.01
## 78  2008    1     1  51134931     0.01
## 79  2008    2     1  65269767     0.01
## 80  2008    3     1  74055919     0.01
## 81  2008    4     1  40614587     0.01
## 82  2009    1     1  37316482     0.01
## 83  2009    2     1 100609343     0.01
## 84  2009    3     1  68739753     0.01
## 85  2009    4     1  13678035     0.01
## 86  2010    1     1   6302699     0.01
## 87  2010    2     1 154965206     0.01
## 88  2010    3     1  70007563     0.01
## 89  2010    4     1  27249389     0.01
## 90  2011    1     1 138476630     0.01
## 91  2011    2     1 217685468     0.01
## 92  2011    3     1 215194998     0.01
## 93  2011    4     1  58131127     0.01
## 94  2012    1     1 122941225     0.01
## 95  2012    2     1 176832216     0.01
## 96  2012    3     1  73445864     0.01
## 97  2012    4     1   2969225     0.01
## 98  2013    1     1  48578745     0.01
## 99  2013    2     1 155495582     0.01
## 100 2013    3     1 247628885     0.01
## 101 2013    4     1  38570864     0.01
## 102 2014    1     1 213793570     0.01
## 103 2014    2     1 367082645     0.01
## 104 2014    3     1 286065085     0.01
## 105 2014    4     1  32046803     0.01
## 106 2015    1     1 124742305     0.01
## 107 2015    2     1 235960505     0.01
## 108 2015    3     1 194743244     0.01
## 109 2015    4     1 122664188     0.01
## 110 2016    1     1 143233486     0.01
## 111 2016    2     1 185412989     0.01
## 112 2016    3     1 170348562     0.01
## 113 2016    4     1  83926740     0.01
## 114 2017    1     1 116260007     0.01
## 115 2017    2     1 238729392     0.01
## 116 2017    3     1 153222922     0.01
## 117 2017    4     1  20285986     0.01
## 118 2018    1     1  27304293     0.01
## 119 2018    2     1 206949158     0.01
## 120 2018    3     1  99971323     0.01
```

```
## 121 2018    4     1  33158572     0.01
## 122 2019    1     1  28630214     0.01
## 123 2019    2     1 139035879     0.01
## 124 2019    3     1 148275978     0.01
## 125 2019    4     1 146229025     0.01
## 126 2020    1     1  97038024     0.01
## 127 2020    2     1 194314049     0.01
## 128 2020    3     1 222722477     0.01
## 129 2020    4     1  98451683     0.01
## 130 2021    1     1  43803454     0.01
## 131 2021    2     1 277339244     0.01
## 132 2021    3     1 247847055     0.01
## 133 2021    4     1  58737332     0.01
## 134 2022    1     1  34657697     0.01
## 135 2022    2     1 154925664     0.01
#-------------------------------------------------------------------------------
```

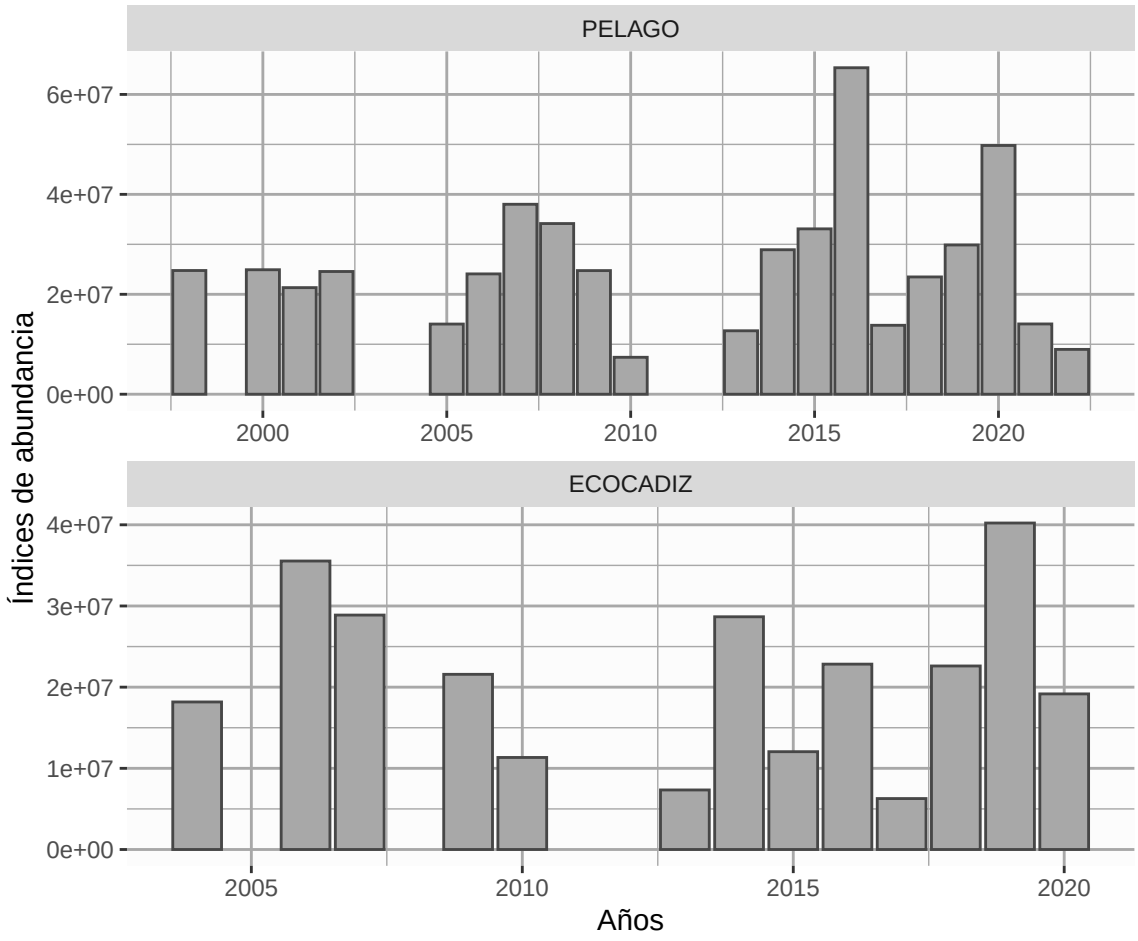
- La primera línea del fragmento de código anterior muestra los encabezados de columna para los datos de captura.
- Tenga en cuenta que toda la captura proviene de la pesquería. La línea `-999 1 1 0 0.01` especifica la captura de equilibrio para los años anteriores al inicio del modelo; en este caso, no hay captura de equilibrio porque la columna de captura es 0.

1.1.5 Indices de abundancia formato Gadget

```
#-------------------------------------------------------------------------------------------
pelago<-read.table(file=here('Data_Gadget',"surveyindices.pelagonumber.survey.lengths"),
                        header=F,sep="",na='NA',fill=T,skip = 3) %>%
                    magrittr::set_colnames(c('year','step','area','length','number'))
pelago
##    year step area length   number
## 1  1998    4  IXa    all 24763000
## 2  2000    4  IXa    all 24913000
## 3  2001    4  IXa    all 21335000
## 4  2002    4  IXa    all 24565000
## 5  2005    1  IXa    all 14041000
## 6  2006    1  IXa    all 24082000
## 7  2007    1  IXa    all 38020000
## 8  2008    1  IXa    all 34162000
## 9  2009    1  IXa    all 24745000
## 10 2010    1  IXa    all  7395000
## 11 2013    1  IXa    all 12700000
## 12 2014    1  IXa    all 28917000
## 13 2015    1  IXa    all 33100000
## 14 2016    1  IXa    all 65345000
## 15 2017    1  IXa    all 13797000
## 16 2018    1  IXa    all 23473000
## 17 2019    1  IXa    all 29876000
## 18 2020    1  IXa    all 49787000
## 19 2021    1  IXa    all 14065000
## 20 2022    1  IXa    all  8972473
#-------------------------------------------------------------------------------------------
ecocadiz<-read.table(file=here('Data_Gadget',"surveyindices.ecocadiz.survey.lengths"),
                        header=F,sep="",na='NA',fill=T,skip = 3)%>%
                    magrittr::set_colnames(c('year','step','area','length','number'))
ecocadiz
##    year step area length   number
## 1  2004    1  IXa    all 18177143
## 2  2006    1  IXa    all 35539397
## 3  2007    2  IXa    all 28882127
## 4  2009    2  IXa    all 21580497
## 5  2010    2  IXa    all 11338565
## 6  2013    2  IXa    all  7336184
## 7  2014    2  IXa    all 28669340
## 8  2015    2  IXa    all 12051443
## 9  2016    2  IXa    all 22836029
## 10 2017    2  IXa    all  6275136
## 11 2018    2  IXa    all 22608374
## 12 2019    2  IXa    all 40220555
## 13 2020    2  IXa    all 19168579
#-------------------------------------------------------------------------------------------
```

```
pelago1  <-data.frame(yrs=pelago$year,PELAGO=pelago$number)
ecocadiz1<-data.frame(yrs=ecocadiz$year,ECOCADIZ=ecocadiz$number)
indexplot<-merge(pelago1,ecocadiz1,by="yrs",all=TRUE) %>% melt(id.vars="yrs")

ggplot()  +
```

```
    geom_bar(data=indexplot, aes(x=yrs, y =value),
             stat="identity", fill='gray66', color = 'gray28') +
    facet_wrap(~variable,scale="free",dir = 'v', as.table = TRUE) +
    labs(x="Años", y="Índices de abundancia") +
    theme(panel.background = element_rect(fill ="gray99")) +
    theme(panel.grid=element_line(color="gray66"))
```



1.1.6 Indices de abundancia formato SS3

Luego viene la especificación de los índices de abundancia. Primero está la configuración para todas las flotas.

Consulte la Guía de usuario de SS3: Sección 7.10 "Indices".

1.1.6.1 Especificaciones de los índices de abundancia

```
#_____________________________________________________________________________
#_CPUE_and_surveyabundance_observations
#_Units:  0=numbers; 1=biomass; 2=F; >=30 for special types
#_Errtype:  -1=normal; 0=lognormal; >0=T
#_SD_Report: 0=no sdreport; 1=enable sdreport
#_Fleet Units Errtype SD_Report
#_____________________________________________________________________________
# Arreglo de datos
CPUEinfo_Fleet     <- c(1,2,3)
```

```
CPUEinfo_Units     <- c(1,1,1) # unidades la dejamos en 1=biomass Revisar!!!
CPUEinfo_Errtype   <- c(0,0,0) # en general se trabaja lognormal
CPUEinfo_SD_Report <- c(0,0,0) # esto se puede cambiar después si se necesita
                               # SD_Report, por ahora no es necesario...
CPUEinfo_names<-fleetnames1
#-------------------------------------------------------------------------------
# crear data.frame
CPUEinfo1<-data.frame(Fleet     = CPUEinfo_Fleet,
                      Units     = CPUEinfo_Units,
                      Errtype   = CPUEinfo_Errtype,
                      SD_Report = CPUEinfo_SD_Report)

row.names(CPUEinfo1)<-CPUEinfo_names
#-------------------------------------------------------------------------------
dat1$CPUEinfo<-CPUEinfo1
dat1$CPUEinfo
##          Fleet Units Errtype SD_Report
## FLOTA        1     1       0         0
## PELAGO       2     1       0         0
## ECOCADIZ     3     1       0         0
#-------------------------------------------------------------------------------
```

- Los encabezados de las columnas de esta sección están directamente encima de los números. Tenga en cuenta que aquí se definen todas las flotas (es decir, cada flota necesita una línea), incluida la pesquería, y se enumeran en el mismo orden que cuando se especificaron los tipos de flota.
- Lo más importante en esta sección es que se especifican las unidades y el tipo de error que se utilizará al leer los índices de abundancia.
- En este caso, la pesquería y las campañas tienen unidades de biomasa. Revisar que pasa si lo cambiamos a número. Se asume un error logarítmico normal para las 3 flotas.
- Inmediatamente después de su encabezado, se incluyen los datos de índices de abundancia:

1.1.6.2 Datos de índices de abundancia

```
#-------------------------------------------------------------------------------
# Arreglo de datos

CPUE_year<-c(pelago$year,ecocadiz$year)
#CPUE_seas = fecha e las campañas, se asume 1 (enero),
#corregir por el mes correspondiente
CPUE_seas<-rep(1,length(CPUE_year))
# Los números de "CPUE_index" son los mismos números de "Fleet"
# que se especifican en "CPUEinfo"
CPUE_index<-c(rep(2,length(pelago$year)),
              rep(3,length(ecocadiz$year)))
CPUE_obs<-c(pelago$number,
            ecocadiz$number)
CPUE_se_log<-c(rep(0.3,length(pelago$year)),
               rep(0.3,length(ecocadiz$year)))
#-------------------------------------------------------------------------------
# crear data.frame
CPUE1<-data.frame(year   = CPUE_year,
                  seas   = CPUE_seas,
                  index  = CPUE_index,
```

```
                  obs    = CPUE_obs,
                  se_log = CPUE_se_log)
#-------------------------------------------------------------------------------
dat1$CPUE<-CPUE1
dat1$CPUE
##    year seas index      obs se_log
## 1  1998    1     2 24763000    0.3
## 2  2000    1     2 24913000    0.3
## 3  2001    1     2 21335000    0.3
## 4  2002    1     2 24565000    0.3
## 5  2005    1     2 14041000    0.3
## 6  2006    1     2 24082000    0.3
## 7  2007    1     2 38020000    0.3
## 8  2008    1     2 34162000    0.3
## 9  2009    1     2 24745000    0.3
## 10 2010    1     2  7395000    0.3
## 11 2013    1     2 12700000    0.3
## 12 2014    1     2 28917000    0.3
## 13 2015    1     2 33100000    0.3
## 14 2016    1     2 65345000    0.3
## 15 2017    1     2 13797000    0.3
## 16 2018    1     2 23473000    0.3
## 17 2019    1     2 29876000    0.3
## 18 2020    1     2 49787000    0.3
## 19 2021    1     2 14065000    0.3
## 20 2022    1     2  8972473    0.3
## 21 2004    1     3 18177143    0.3
## 22 2006    1     3 35539397    0.3
## 23 2007    1     3 28882127    0.3
## 24 2009    1     3 21580497    0.3
## 25 2010    1     3 11338565    0.3
## 26 2013    1     3  7336184    0.3
## 27 2014    1     3 28669340    0.3
## 28 2015    1     3 12051443    0.3
## 29 2016    1     3 22836029    0.3
## 30 2017    1     3  6275136    0.3
## 31 2018    1     3 22608374    0.3
## 32 2019    1     3 40220555    0.3
## 33 2020    1     3 19168579    0.3
#-------------------------------------------------------------------------------
```

1.1.7 Descartes y tallas medias Formato `Gadget`

En este modelo no se ingresan datos de estructuras de tallas.

1.1.8 Descartes y tallas medias Formato `SS3`

A continuación, se podrían especificar los datos de descartes y tallas media.

Consulte la Guía de usuario de SS3: Sección 7.11 “Discard”.

1.1.8.1 Descarte

```
dat1$N_discard_fleets<-0 #_N_fleets_with_discard
#_____________________________________________________________________________
#_discard_units (1=same_as_catchunits(bio/num);
#                2=fraction;
#                3=numbers)
#_discard_errtype:  >0 for DF of T-dist(read CV below);
#                    0 for normal with CV;
#                   -1 for normal with se;
#                   -2 for lognormal;
#                   -3 for trunc normal with CV
# note: only enter units and errtype for fleets with discard
# note: discard data is the total for an entire season, so input of month
#       here must be to a month in that season
#_Fleet units errtype
#_____________________________________________________________________________
# -9999 0 0 0.0 0.0 # terminator for discard data
```

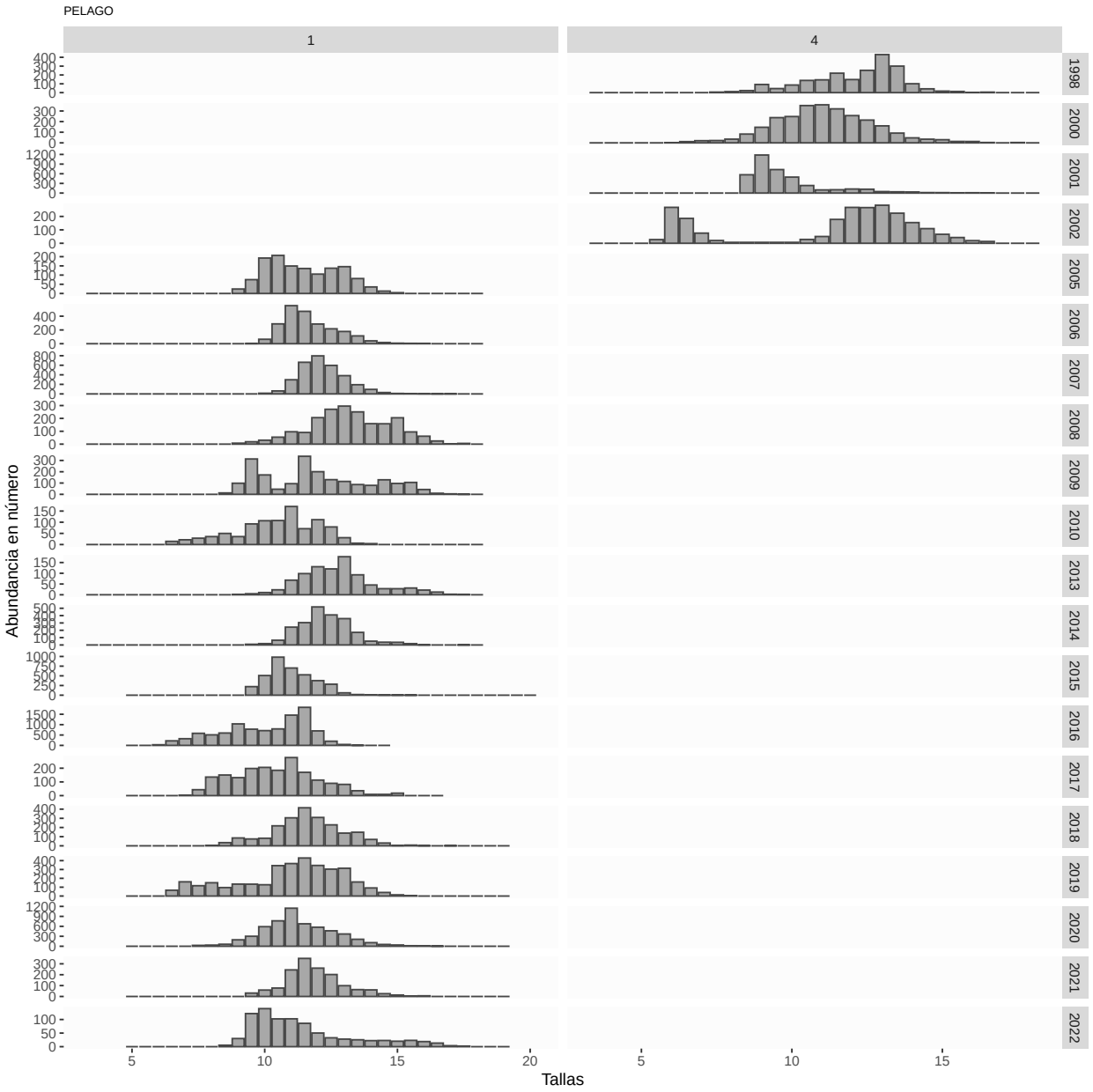
1.1.8.2 Tallas medias

```
dat1$use_meanbodywt<-0 #_use meanbodysize_data (0/1)
#_____________________________________________________________________________
#_COND_0 #_DF_for_meanbodysize_T-distribution_like
# note:  type=1 for mean length; type=2 for mean body weight
#_yr month fleet part type obs stderr
#_____________________________________________________________________________
#  -9999 0 0 0 0 0 0 # terminator for mean body size data
```

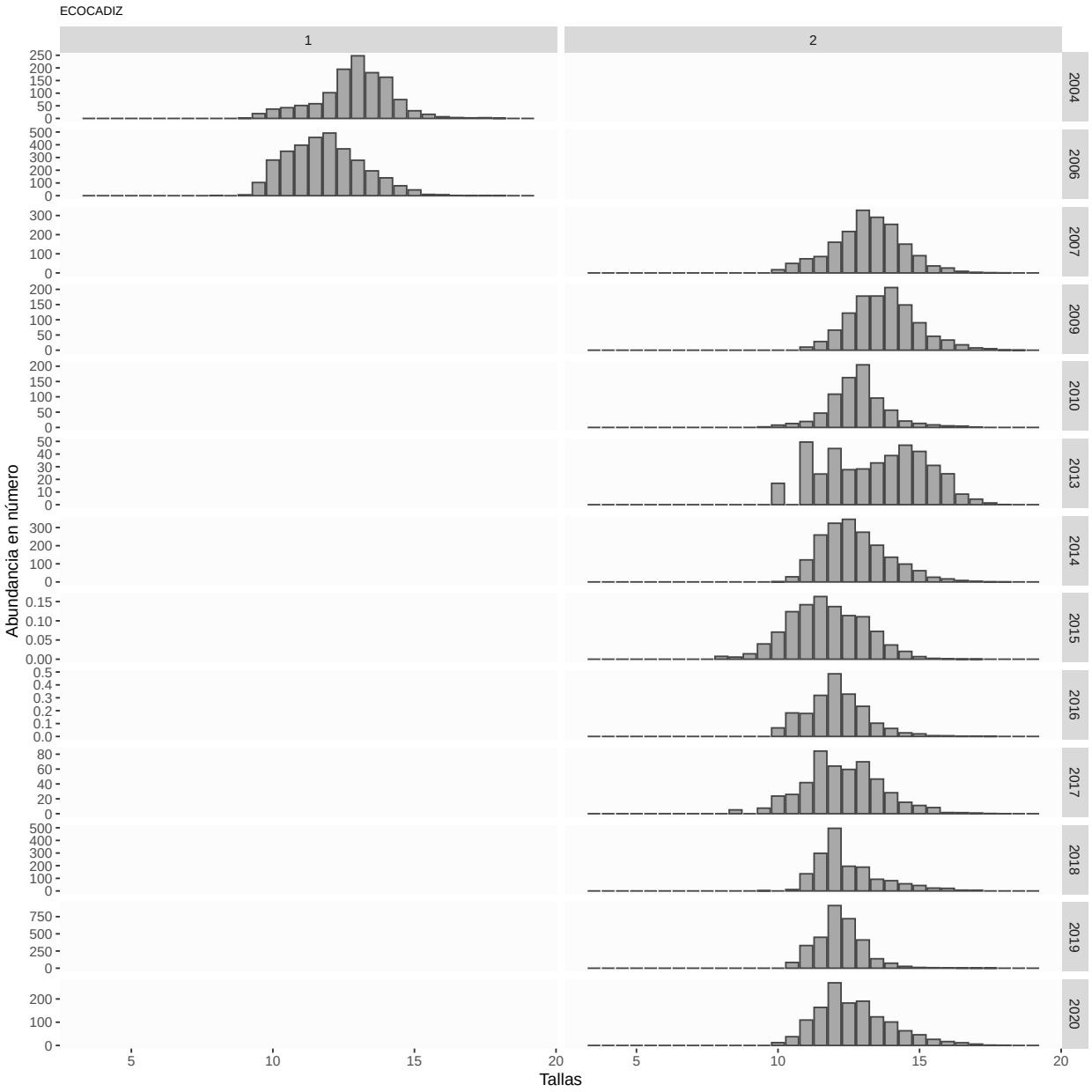
1.1.9 Composición de tallas Formato Gadget

```
#-------------------------------------------------------------------------------
tallaspelago<-read.table(file=here('Data_Gadget',"catchdistribution.ldist.pelago.noage.sumofsquares"),
                         header=F,sep="",na='NA',fill=T,skip = 3) %>%
                magrittr::set_colnames(c('year','step','area','age','length','number')) %>%
                       separate(length,into=c("text","length"),sep=3,convert =TRUE)

#tallaspelago
#-------------------------------------------------------------------------------
tallasecocadiz<-read.table(file=here('Data_Gadget',"catchdistribution.ldist.ecocadiz.noage.sumofsquares
                         header=F,sep="",na='NA',fill=T,skip = 3) %>%
                magrittr::set_colnames(c('year','step','area','age','length','number')) %>%
                       separate(length,into=c("text","length"),sep=3,convert =TRUE)

#tallasecocadiz
#-------------------------------------------------------------------------------
tallasflota<-read.table(file=here('Data_Gadget',"catchdistribution.ldist.seine.sumofsquares"),
                         header=F,sep="",na='NA',fill=T,skip = 3) %>%
                magrittr::set_colnames(c('year','step','area','age','length','number')) %>%
                       separate(length,into=c("text","length"),sep=3,convert =TRUE)

#tallasflota
#-------------------------------------------------------------------------------
```

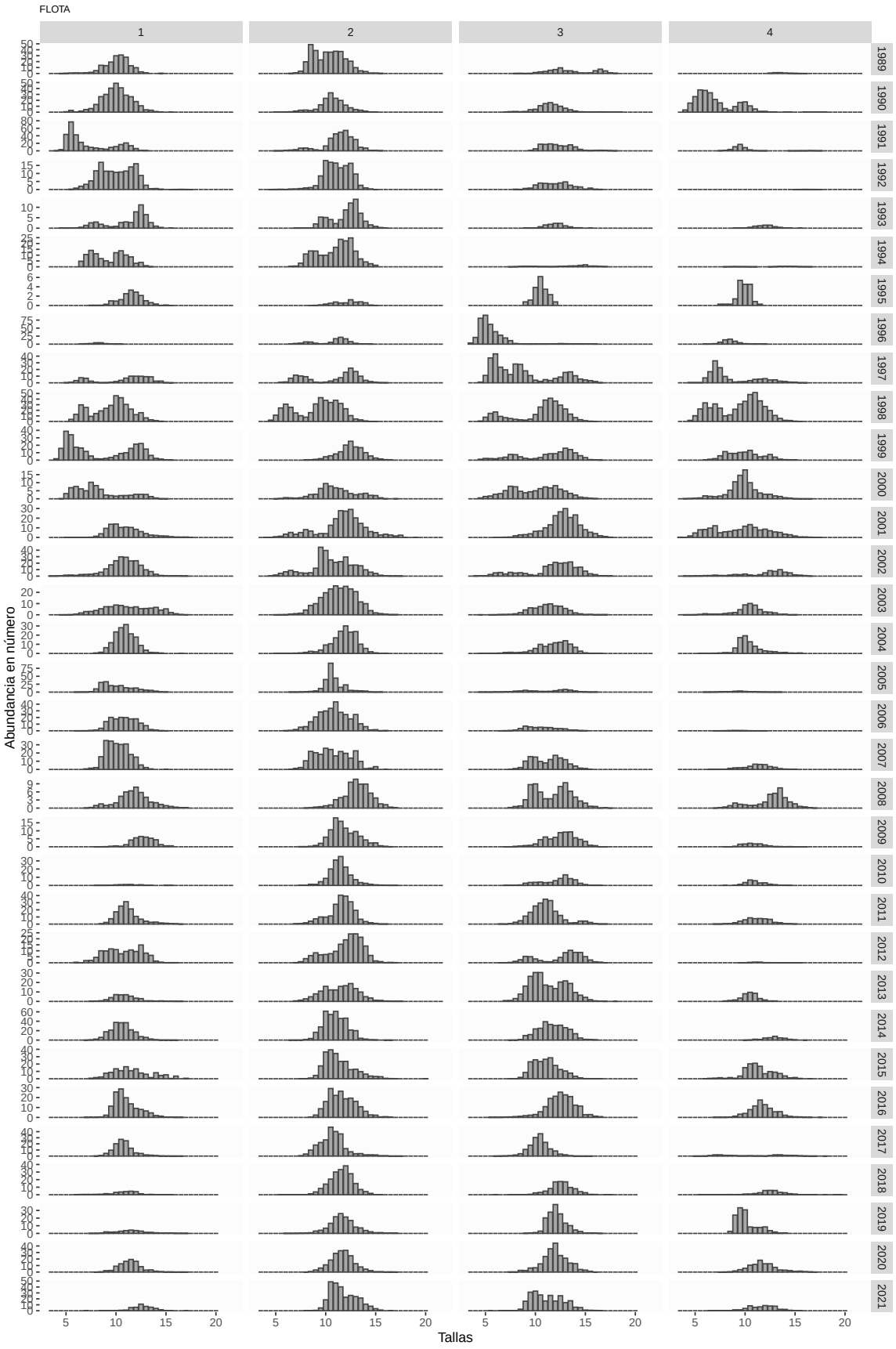
```
ggplot(tallaspelago) +
    geom_bar(aes(x = length, y = number/1000000), stat="identity", fill='gray66', color = 'gray28') +
    facet_grid(year~step,  as.table = TRUE,scales = "free") +
    labs(x = 'Tallas', y = 'Abundancia en número') +
    theme(panel.background = element_rect(fill ="gray99")) +
    theme(panel.grid=element_line(color=NA)) +
     ggtitle('PELAGO')+
    theme(plot.title = element_text(size = 8))
```




```
ggplot(tallasecocadiz) +
    geom_bar(aes(x = length, y = number/1000000), stat="identity", fill='gray66', color = 'gray28') +
   facet_grid(year~step,  as.table = TRUE,scales = "free") +
    labs(x = 'Tallas', y = 'Abundancia en número') +
    theme(panel.background = element_rect(fill ="gray99")) +
    theme(panel.grid=element_line(color=NA)) +
     ggtitle('ECOCADIZ')+
    theme(plot.title = element_text(size = 8))
```




```
ggplot(tallasflota) +
    geom_bar(aes(x = length, y = number/1000000), stat="identity", fill='gray66', color = 'gray28') +
    facet_grid(year~step,  as.table = TRUE,scales = "free") +
    labs(x = 'Tallas', y = 'Abundancia en número') +
    theme(panel.background = element_rect(fill ="gray99")) +
    theme(panel.grid=element_line(color=NA)) +
     ggtitle('FLOTA')+
    theme(plot.title = element_text(size = 8))
```


FLOTA
1
2
3
4
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Abundancia en número
Tallas
5
10
15
20

1.1.10 Composición de tallas Formato SS3

La siguiente sección configura los intervalos de talla (`length bin`) de la población.

Esto debe especificarse ya sea que se utilicen o no datos de composiciones de tallas (aunque podría generar los intervalos de longitud de la población a partir de los intervalos de datos de composiciones de tallas).

Consulte la Guía de usuario de SS3: Sección 7.14 "Length Composition Data Structure".

1.1.10.1 Bins tallas

```
# set up population length bin structure (note - irrelevant if not using size
#data and using empirical wtatage
dat1$lbin_method  <-2     # length bin method:
                          # 1=use databins;
                          # 2=generate from binwidth,min,max below;
                          # 3=read vector
dat1$binwidth     <-0.5   # binwidth for population size comp
dat1$minimum_size <-3.5   # minimum size in the population
                          # (lower edge of first bin and size at age 0.00)
dat1$maximum_size <-21.5  # maximum size in the population (lower edge of last bin)
dat1$use_lencomp  <-1     # use length composition data (0/1)
```

Después de los intervalos de tallas de la población está la especificación para la composición de tallas (asumiendo 1 línea por flota):

1.1.10.2 Especificación composición de tallas

```
#-------------------------------------------------------------------------------
#_mintailcomp:  upper and lower distribution for females and males separately are
#               accumulated until exceeding this level.
#_addtocomp:    after accumulation of tails; this value added to all bins
#_combM+F:      males and females treated as combined gender below this bin number
#_compressbins: accumulate upper tail by this number of bins; acts simultaneous with
#               mintailcomp; set=0 for no forced accumulation
#_Comp_Error:   0=multinomial,
#               1=dirichlet using Theta*n,
#               2=dirichlet using beta,
#               3=MV_Tweedie
#_ParmSelect:  consecutive index for dirichlet or MV_Tweedie
#_minsamplesize: minimum sample size; set to 1 to match 3.24, minimum value is 0.001
#
#_mintailcomp addtocomp combM+F CompressBins CompError ParmSelect minsamplesize
#-------------------------------------------------------------------------------
# Arreglo de datos
nfleets<-dat1$Nfleets
len_info_mintailcomp   <-rep(-1,nfleets)
len_info_addtocomp     <-rep(0.001,nfleets)
len_info_combine_M_F   <-rep(0,nfleets)
len_info_CompressBins  <-rep(0,nfleets)
len_info_CompError     <-rep(0,nfleets)
len_info_ParmSelect    <-rep(0,nfleets)
len_info_minsamplesize <-rep(1,nfleets)
#-------------------------------------------------------------------------------
# crear data.frame
len_info1<-data.frame(mintailcomp     = len_info_mintailcomp,
```

```
                        addtocomp     = len_info_addtocomp,
                        combine_M_F   = len_info_combine_M_F,
                        CompressBins  = len_info_CompressBins,
                        CompError     = len_info_CompError,
                        ParmSelect    = len_info_ParmSelect,
                        minsamplesize = len_info_minsamplesize)

row.names(len_info1)<-fleetnames1
#-------------------------------------------------------------------------------
dat1$len_info<-len_info1 #data.frame
dat1$len_info
##           mintailcomp addtocomp combine_M_F CompressBins CompError ParmSelect
## FLOTA              -1     0.001           0            0         0          0
## PELAGO             -1     0.001           0            0         0          0
## ECOCADIZ           -1     0.001           0            0         0          0
##           minsamplesize
## FLOTA                 1
## PELAGO                1
## ECOCADIZ              1
#-------------------------------------------------------------------------------
```

1.1.10.3 Especificación del vector de tallas

```
dat1$N_lbins<-37
dat1$lbin_vector<-seq(3.5,21.5,0.5)
```

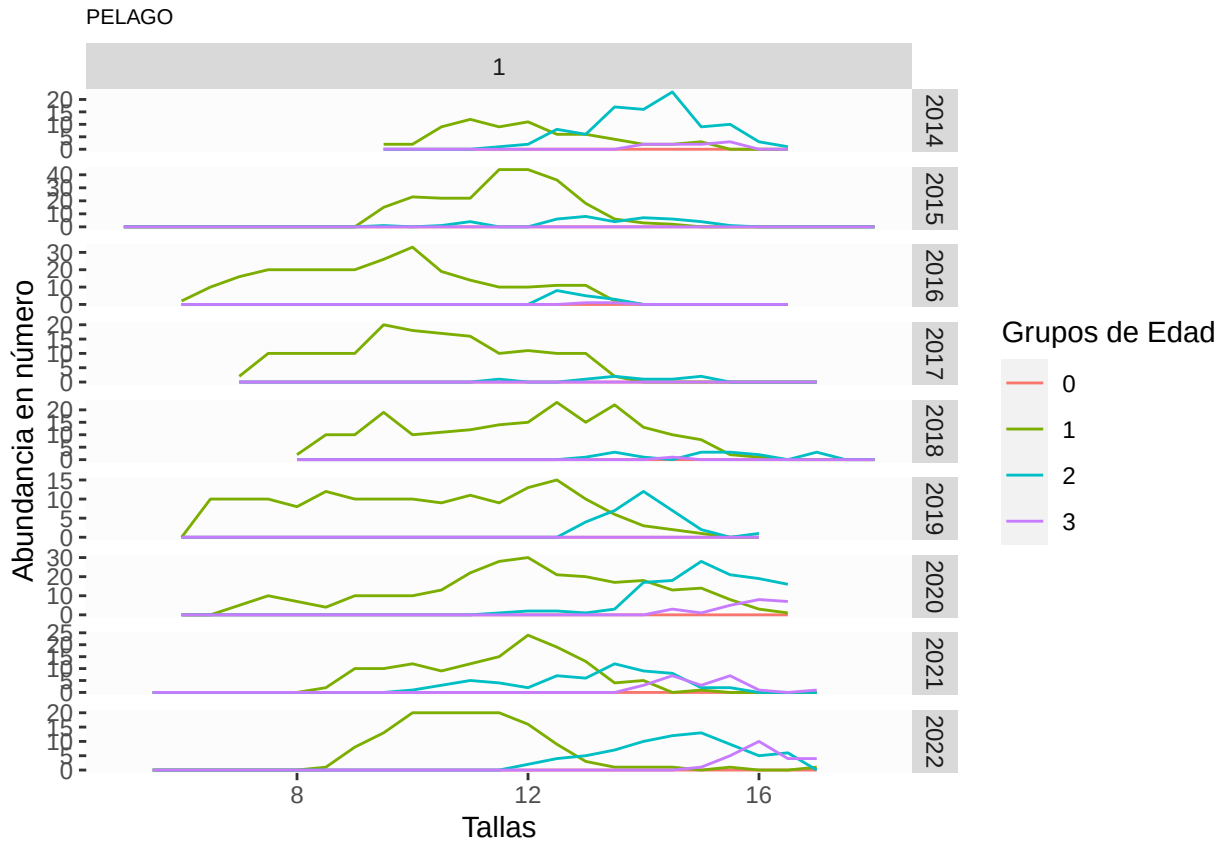
1.1.10.4 Datos de composición de tallas

```
#-------------------------------------------------------------------------------
# sex codes:  0=combined;
#             1=use female only;
#             2=use male only;
#             3=use both as joint sexxlength distribution
# partition codes:  (0=combined;
#                    1=discard;
#                    2=retained
#-------------------------------------------------------------------------------
# Arreglo de datos
#-------------------------------------------------------------------------------
tallasplot<-merge(tallasflota,
            merge(tallaspelago,tallasecocadiz,
                  by=c('year','step','area','age','length',"text"),all=TRUE),
                  by=c('year','step','area','age','length',"text"),all=TRUE) %>%
               select(-area, -age,-text)%>%
               magrittr::set_colnames(c('year','step','length','FLOTA','PELAGO','ECOCADIZ')) %>%
               mutate(Gender=0,
                      Part=0,
                      Nsamp=100) %>%
               melt(id.vars=c('year','step','length','Gender','Part','Nsamp')) %>%
               spread(length,value)

tallasSS3<-tallasplot[order(tallasplot$variable),]
tallasSS3[is.na(tallasSS3)] <- 0
#-------------------------------------------------------------------------------
```

```r
nyear<-length(tallasSS3$year)/3

new_lencomp <- data.frame(Yr     = tallasSS3$year,
                          Seas   = tallasSS3$step,
                          FltSvy = c(rep(1,nyear),rep(2,nyear),rep(3,nyear)),
                          Gender = tallasSS3$Gender,
                          Part   = tallasSS3$Part,
                          Nsamp  = tallasSS3$Nsamp)

dat_rows_names <- paste("L",seq(3.5,21.5,0.5) ,sep="")

dat_rows <- tallasSS3[,7:43]
names(dat_rows)<-dat_rows_names
#-------------------------------------------------------------------------------
# crear data.frame
new_lencomp1<-cbind(new_lencomp, dat_rows)
#-------------------------------------------------------------------------------
dat1$lencomp<-new_lencomp1
#dat1$lencomp
#-------------------------------------------------------------------------------
```

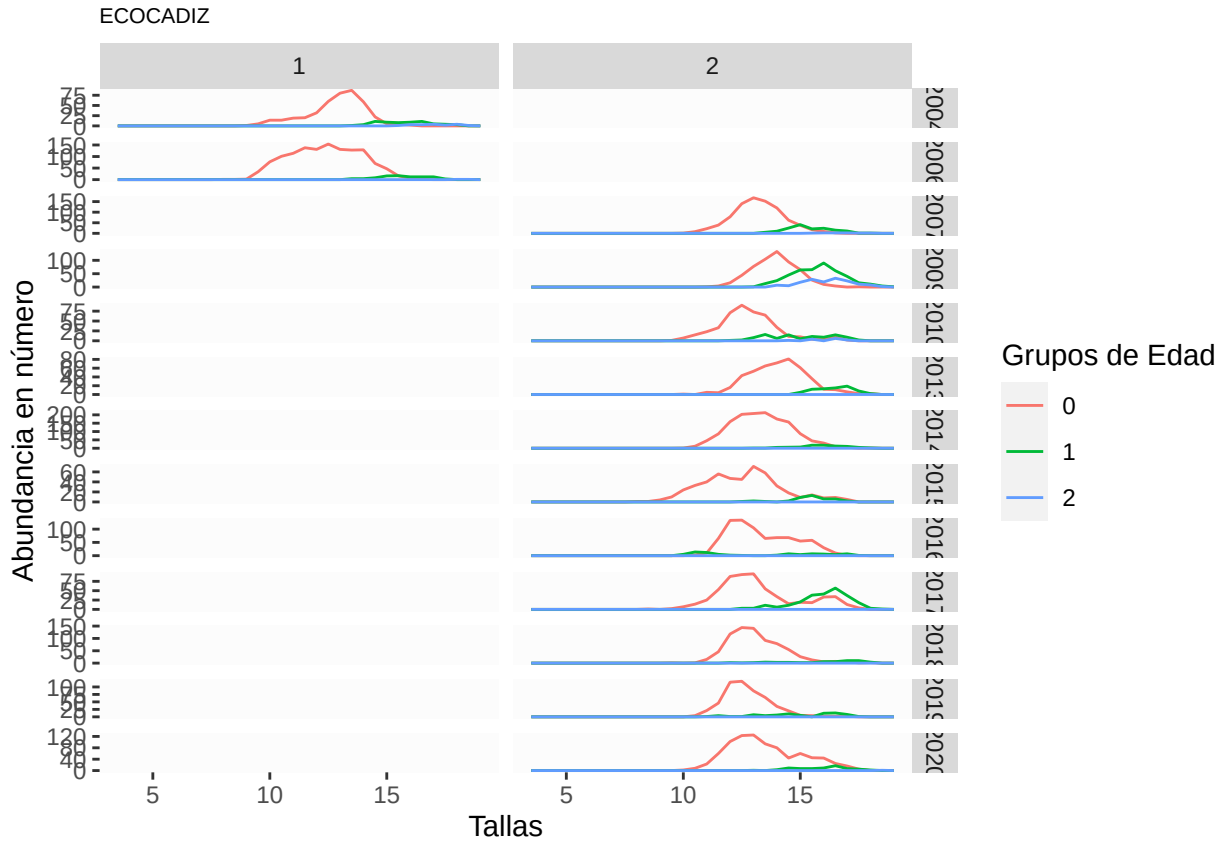
```
pelago.aldist<-read.table(file=here("Data_Gadget","catchdistribution.aldist.pelago.sumofsquares"),
                          header=F,sep="",na='NA',fill=T,skip = 3)
names(pelago.aldist)<-c('year','step','area','age','length','number')


pelago.aldist$fleet   <- 2
pelago.aldist$sex     <- 0
pelago.aldist$part    <- 0
pelago.aldist$ageerr  <- 2
pelago.aldist$Lbin_lo <- pelago.aldist$length
pelago.aldist$Lbin_hi <- pelago.aldist$length
pelago.aldist$Nsamp   <- 10

pelago.aldist_xxx<- pelago.aldist %>%
                    separate(length,into=c("text","length"),sep=3,convert=TRUE)


# Se transforma a formato SS3
pelago.aldistSS3<- pelago.aldist %>%
                    separate(length,into=c("text","length"),sep=3,convert=TRUE)%>%
                    separate(Lbin_lo,into=c("text","Lbin_lo"),sep=3,convert=TRUE)%>%
                    separate(Lbin_hi,into=c("text","Lbin_hi"),sep=3,convert=TRUE)%>%
                    arrange("Lbin_lo","Lbin_hi",'year','step','part','ageerr','Nsamp')%>%
                    spread(age,number)%>%
                    select(-area,-length,-text)
pelago.aldistSS3[is.na(pelago.aldistSS3)] <- 0
```

```
ggplot(pelago.aldist_xxx, aes(x=length, y=number,group=age,colour=as.character(age))) +
    geom_line()+
    facet_grid(year~step,  as.table = TRUE,scales = "free") +
    labs(x = 'Tallas', y = 'Abundancia en número') +
    scale_colour_discrete(name  ="Grupos de Edad",
                          labels=seq(0,4))+
    theme(panel.background = element_rect(fill ="gray99")) +
    theme(panel.grid=element_line(color=NA)) +
     ggtitle('PELAGO')+
    theme(plot.title = element_text(size = 8))
```




```
ecocadiz.aldist<-read.table(file=here("Data_Gadget","catchdistribution.aldist.ecocadiz.sumofsquares"),
                        header=F,sep="",na='NA',fill=T,skip = 3)
names(ecocadiz.aldist)<-c('year','step','area','age','length','number')

ecocadiz.aldist$fleet   <- 3
ecocadiz.aldist$sex     <- 0
ecocadiz.aldist$part    <- 0
ecocadiz.aldist$ageerr  <- 2
ecocadiz.aldist$Lbin_lo <- ecocadiz.aldist$length
ecocadiz.aldist$Lbin_hi <- ecocadiz.aldist$length
ecocadiz.aldist$Nsamp   <- 10

ecocadiz.aldist_xxx<- ecocadiz.aldist %>%
                  separate(length,into=c("text","length"),sep=3,convert=TRUE)

# Se transforma a formato SS3
ecocadiz.aldistSS3  <-ecocadiz.aldist %>%
                      separate(length,into=c("text","length"),sep=3,convert=TRUE)%>%
                      separate(Lbin_lo,into=c("text","Lbin_lo"),sep=3,convert=TRUE)%>%
                      separate(Lbin_hi,into=c("text","Lbin_hi"),sep=3,convert=TRUE)%>%
                      arrange("Lbin_lo","Lbin_hi",'year','step','part','ageerr','Nsamp')%>%
                      spread(age,number)%>%
                      select(-area,-length,-text)
ecocadiz.aldistSS3[is.na(ecocadiz.aldistSS3)] <- 0
```

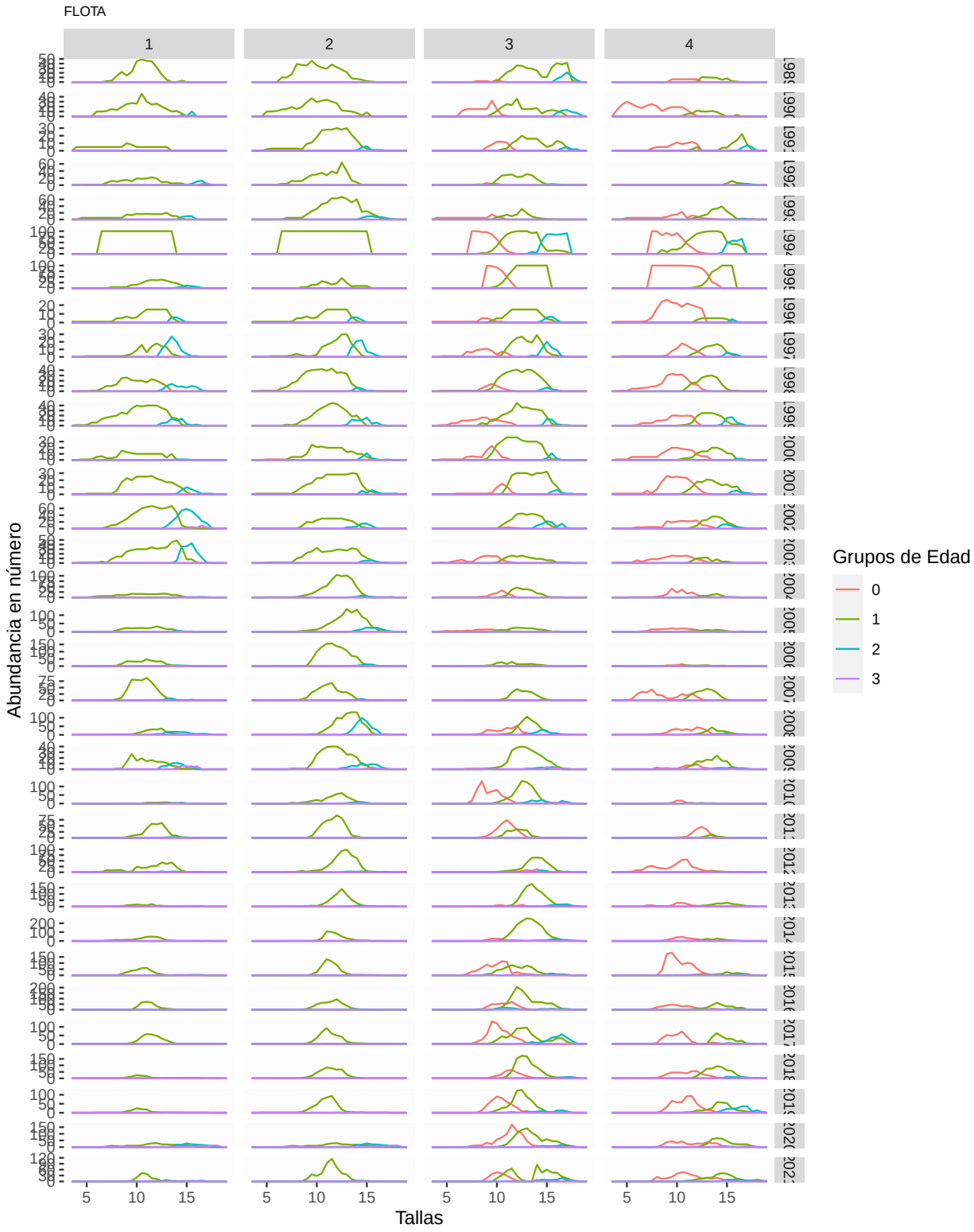
```
ggplot(ecocadiz.aldist_xxx, aes(x=length, y=number,group=age,colour=as.character(age))) +
    geom_line()+
    facet_grid(year~step,  as.table = TRUE,scales = "free") +
    labs(x = 'Tallas', y = 'Abundancia en número') +
    scale_colour_discrete(name  ="Grupos de Edad",
                          labels=seq(0,4))+
    theme(panel.background = element_rect(fill ="gray99")) +
    theme(panel.grid=element_line(color=NA)) +
     ggtitle('ECOCADIZ')+
    theme(plot.title = element_text(size = 8))
```




```
fleet.ldist.alkseine<-read.table(file=here("Data_Gadget","catchdistribution.ldist.alkseine.sumofsquares
                        header=F,sep="",na='NA',fill=T,skip = 3)
names(fleet.ldist.alkseine)<-c('year','step','area','age','length','number')

fleet.ldist.alkseine$fleet   <- 3
fleet.ldist.alkseine$sex     <- 0
fleet.ldist.alkseine$part    <- 0
fleet.ldist.alkseine$ageerr  <- 2
fleet.ldist.alkseine$Lbin_lo <- fleet.ldist.alkseine$length
fleet.ldist.alkseine$Lbin_hi <- fleet.ldist.alkseine$length
fleet.ldist.alkseine$Nsamp   <- 10

fleet.ldist.alkseine_xxx <- fleet.ldist.alkseine %>%
                            separate(length,into=c("text","length"),sep=3,convert=TRUE)
```

```
# Se transforma a formato SS3
fleet.ldist.alkseineSS3    <- fleet.ldist.alkseine %>%
                              separate(length,into=c("text","length"),sep=3,convert=TRUE)%>%
                              separate(Lbin_lo,into=c("text","Lbin_lo"),sep=3,convert=TRUE)%>%
                              separate(Lbin_hi,into=c("text","Lbin_hi"),sep=3,convert=TRUE)%>%
                              arrange("Lbin_lo","Lbin_hi",'year','step','part','ageerr','Nsamp')%>%
                              spread(age,number)%>%
                              select(-area,-length,-text)
fleet.ldist.alkseineSS3[is.na(fleet.ldist.alkseineSS3)] <- 0
```

```
ggplot(fleet.ldist.alkseine_xxx, aes(x=length, y=number,group=age,colour=as.character(age))) +
    geom_line()+
    facet_grid(year~step,  as.table = TRUE,scales = "free") +
    labs(x = 'Tallas', y = 'Abundancia en número') +
    scale_colour_discrete(name  ="Grupos de Edad",
                          labels=seq(0,4))+
    theme(panel.background = element_rect(fill ="gray99")) +
    theme(panel.grid=element_line(color=NA)) +
     ggtitle('FLOTA')+
    theme(plot.title = element_text(size = 8))
```


FLOTA
1
2
3
4
Abundancia en número
Tallas
5
10
15
Grupos de Edad
0
1
2
3