Difference between:

# Get the length-frequency data (length in millimeters)

lfmm <- read.lfmmdata.f(raw\_data\_dir,"LengthMM2000-2021.txt")

# Get the grouped length-frequency output

lfgrpd <- read.lengthfreq.f(raw\_data\_dir,"LengthFreq2000-2021.txt")

What is month.substitution.mat?

A picture containing computer, computer, electronics

Description automatically generated

get.catch.estimates.f = function(cae.in,caestrtflg.in,totunlds.in,lfgrpd.in,lfgrpd.stratflg.in,lfmm.in,my.year,minsamps.in,well.estimates,myarea.submat,growshrink.incrs.mat.touse,PS,Species) {

why minsamps.in is set to 2?

"WARNING: Reached step (4) in get.sub.f looking for substitute; please tell CL"

Is gear and month substitute matrices species specific?

substitute.f = function(strat.defns,unloads.bystrat.miss,lfgrpd.all.frm,lfgrpd.stratflg,lfmm.all.frm,gear.sub,area.sub,month.sub,min.subsize,growth.increments.array)

{

# this function computes catch species and size composition for strata with unloads (ie, cae+idm) but no sample data

# edited version of stratum.estimates.f (see that function for documentation details of equations)

#

# lfgrpd.stratflg is output of create.strat.flg.f applied to lfgrpd.all.frm

#

# strat.defns and unloads.bystrat.miss are the parts output by get.strat.unloads.f

# but subsetted for missing data strata using output of stratum.estimates.f

# lfgprd.all.frm is output from read.lengthfreq.f; subsetted for specific year

# min.subsize is the minimum number of samples per stratum required to make an estimate

#

# this function uses the following functions: get.sub.f, well.miss.f

#

# edited December 2021 to fix bug in code that searches for a substitution (bug was that number of rows of lfgrpd.all.frm for a cell was used as number of samples,

# which is not correct because records in that data frame are unique tripno x wellsampleno x species (and possibly x sampno if sorted sample)

#

# start of code added Jan 25 2022

# column 1 of fo.fishery.submat is the fishery seeking a sub, and columns 2-5 are the possible subs

fo.fishery.submat<-matrix(c("FO.A1","FO.A3","FO.A2","FO.A4","FO.A5","FO.A2","FO.A4","FO.A5","FO.A1","FO.A3","FO.A3","FO.A1","FO.A4","FO.A5","FO.A2","FO.A4","FO.A5","FO.A2","FO.A3","FO.A1","FO.A5","FO.A4","FO.A2","FO.A3","FO.A1"),ncol=5,byrow=T)

# end of code added Jan 25 2022

#

# get number of strata

nstrats<-length(unloads.bystrat.miss)

#

# initialize output storage for stratum weight by species (What.i) and number of fish by 1cm bin by species (Nhat.ik)

# and substitution details

What.i<-matrix(0,nrow=nstrats,ncol=3)

Nhat.ik<-array(0,dim=c(nstrats,201,3))

sub.details<-matrix(NA,ncol=9,nrow=nstrats)

#

# get sample ids for the data frame lfgrpd.all.frm (id is trip number:well sample number)

lfgrpd.all.sampid<-paste(lfgrpd.all.frm$tripno,lfgrpd.all.frm$wellsampno,pasate=":")

#

# loop over strata, computing What.i, Nhat.ik

for(nstr in 1:nstrats){

#

# find a substitute stratum

substr.info<-get.sub.f(strat.defns$area[nstr],strat.defns$month[nstr],strat.defns$gear[nstr],strat.defns$fishery[nstr],lfgrpd.stratflg,gear.sub,area.sub,month.sub,min.subsize,lfgrpd.all.sampid)

sub.details[nstr,]<-unlist(c(strat.defns$area[nstr],strat.defns$month[nstr],strat.defns$gear[nstr],strat.defns$fishery[nstr],substr.info),use.names=F)

#

# subset LF grouped data for the substitute stratum

if(is.na(substr.info$fishery.areagear)){

# substitute stratum is a specific area, month, gear

lfgrpd.sub.frm<-lfgrpd.all.frm[lfgrpd.stratflg$area==substr.info$area & lfgrpd.stratflg$month==substr.info$month & lfgrpd.stratflg$gear==substr.info$gear,]

} else {

# substitute stratum is the fishery area-gear

lfgrpd.sub.frm<-lfgrpd.all.frm[lfgrpd.stratflg$fishery.areagear==substr.info$fishery.areagear,]

#

# start of code below added Jan 25 2022

if(nrow(lfgrpd.sub.frm)==0){

# no data for this fishery for the year so we are desperate to find a substitution option

fo.type<-substr(substr.info$fishery.areagear,1,2)

if(fo.type=="FO"){

fish.found<-F

ifish.sub<-2

while(!fish.found & ifish.sub<=5){

lfgrpd.sub.frm<-lfgrpd.all.frm[lfgrpd.stratflg$fishery.areagear==fo.fishery.submat[fo.fishery.submat[,1]==substr.info$fishery.areagear,ifish.sub],]

if(nrow(lfgrpd.sub.frm)>=1){

# this only means there is at least one well sample; need to fix in future when modify all code to use samples from original (if there) plus samples in substitute stratum

fish.found<-T

} else {

ifish.sub<-ifish.sub+1

}

} # end of while loop

#

# if ifish.sub is 6 no data found

if(ifish.sub==6){

print("\*\*\*\*\*\*\*\*\* No data found FO fishery-level substitution")

}

#

} # end of if for FO

#

if(fo.type=="UN"){

# NOTE that UN substitution as coded here is garbage; using whole EPO

lfgrpd.sub.frm<-lfgrpd.all.frm[substr(lfgrpd.stratflg$fishery.areagear,1,2)==fo.type,]

}

#

if(fo.type=="DP"){

# NOTE that DP substitution as coded here is garbage; using whole EPO

lfgrpd.sub.frm<-lfgrpd.all.frm[substr(lfgrpd.stratflg$fishery.areagear,1,2)==fo.type,]

}

# end of code added Jan 25 2022

}

#

}

#

# get well-level estimates for samples in this substitute stratum

# first determine the shift direction if there is a month change original versus substitute

delta.col<-NULL

if(substr.info$grwshrk.flg){

if((strat.defns$month[nstr]-substr.info$month)==1){

# grow fish lengths by 1 month

delta.col<-2

} else {

if((strat.defns$month[nstr]-substr.info$month)==(-1)){

# shrink fish lengths by 1 month

delta.col<-3

}

}

}

well.estimates<-well.miss.f(lfgrpd.sub.frm,lfmm.all.frm,substr.info,delta.col,growth.increments.array)

#

# now get stratum-level estimates for this stratum

#(note that code is not totally efficient; could be simplified somewhat, but not done at this point to keep readability)

#

# get well stratum and find if there is an unloads stratum that matches

W<-unloads.bystrat.miss[nstr]

#

# compute What.i

sum.Wj<-sum(well.estimates$ancillary.info$wellmt.3spp)

What.i[nstr,]<-W\*(apply(well.estimates$What.ij,2,sum)/sum.Wj)

#

# compute Nhat.ik

for(ispp in 1:3){

sum.Nj<-sum(well.estimates$Nhat.j)

sum.Nij<-sum(well.estimates$Nhat.ij[,ispp])

if(sum.Nij>0){

if(!is.vector(well.estimates$Nhat.ijk[,,ispp])){

# there is more than one well sample with this species

Nhat.ik[nstr,,ispp]<-(W/(sum.Wj/sum.Nj))\*(sum.Nij/sum.Nj)\*(apply(well.estimates$Nhat.ijk[,,ispp],2,sum)/sum.Nij)

} else {

# there is only one well sample with this species

Nhat.ik[nstr,,ispp]<-(W/(sum.Wj/sum.Nj))\*(sum.Nij/sum.Nj)\*(well.estimates$Nhat.ijk[,,ispp]/sum.Nij)

}

}

}

}

#

sub.details<-data.frame(sub.details)

names(sub.details)<-c("old.area","old.month","old.gear","fishery.areagear","get.sub.area","get.sub.month","get.sub.gear","grwshrk.flg","fshareagear.flg")

#

return(list(strats=strat.defns,What.i=What.i,Nhat.ik=Nhat.ik,sub.details=sub.details))

}