**Estimation for purse-seine, 2000 - present (BET, YFT, SKJ)**

There are several steps to create **P-S species composition estimates** for a given year: 1) get total fleet catch of tropical tunas (i.e., total unloadings for YFT+SKJ+BET); 2) prorate the fleet total to catch estimation strata (areas, months, gears; done using CAE+IDM data); 3) get and process raw port-sampling data; 4) estimate species catch and size comps for the catch estimation strata; and, 5) compute stock assessment input quantities from catch estimation strata estimates.

R functions are used for all but the raw data extractions from the various IATTC data bases. All R functions are in the workspace on Cleridy's computer: /Users/clennert/Documents/R/CL programs\_stock assessment/spp comp programs\_from 2000/spp comp\_R functions.RData (a copy is also available at: U:\StockAssessment\Catch\_Estimation\_Programs\Species\_Comp\_Sampling\spp comp\_R functions.RData). Functions are based on equations in: Tomlinson, P.K. 2004. SAR4, pages 311-333 ( <http://www.iattc.org/PDFFiles2/StockAssessmentReports/SAR4_sampling_ENG.pdf> ), and pers comm with Pat Tomlinson and Alejandro Perez during 2010-2013.

----------------------------------------------------------------------------------------------------------

To get the raw data from the IATTC data bases, run the following three VB progams that are located in: Y:\Observer\Programs\Miscellaneous. This is done by double-clicking on the main program Miscellaneous.exe (written and maintained by Nick Vogel) and then running the following programs associated with Miscellaneous.exe:

- For total unloadings run the program: "Get prorated Unload (June 11, 2014)" in "Cleridy data files"

- For CAE+IDM data run the program: "CAE data" under "Data dump files"

- For port-sampling (length-frequency) data run the program: "Length frequency II (May 16, 2008)" located under "Cleridy data files"

NOTE: All three of these VB data extraction programs can be run for blocks of years at one time.

---------------------------------------------------------------------------------------------------------

Below are the list of R commands to implement steps (1)-(5) (above) from within an R session, once the Miscellaneous VB extraction programs have been run and the output copied/moved to an appropriate directory.

**NOTE**: In order to run some of the R commands and functions below on a machine other than Cleridy's, you will need to modify the paths.

# Attach the workspace with the R functions

> attach("/Users/clennert/Documents/R/poststratification/CL programs\_stock assessment/spp comp programs\_from 2000/spp comp\_R functions.RData",pos=2)

**NOTE: WHAT IMMEDIATELY FOLLOWS IS A GENERIC EXAMPLE. IF YOU WANT TO RUN PATS ESTIMATES OR RUN ESTIMATES WITH CAROLINA'S NEW STRATA, PLEASE SEE EXAMPLES NEAR BOTTOM OF THIS FILE.**

#\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

# First, some inportant set-up specific to treatment of catch strata without sample data

# **NOTE**: you may not need to run this section if the following already exist in the workspace

# that you attached (unless you want to change the growth matrix or the strata):

# grow.increments.betyftskj, area.substitution.mat,

# gear.substitution.mat, month.substitution.mat

#

# Specify grow/shrink array for the function substitute.f

# (NOTE: this only needs to be run once or whenever growth information changes)

#

# This is a look-up table that tells how much (in cm) to grow/shrink a fish in a 1-month time step.

# The expected array has three columns:

# (1) the 1cm interval midpoint (e.g., 20.5) corresponding to the starting length;

# (2) the number of cm to add to grow the fish by 1 month (a positive number; e.g., 2.0);

# (3) the number of cm to substract to shrink the fish by 1 month (a negative number; e.g., -2.0).

#

# The order of the third dimension in the arrray is: bet (1), yft (2), skj (3).

# The example below initializes the array to all 0s; then fills the first matrix of the array for bet,

# the second for yft, and leaves skj (which is the matrix grow.increments.betyftskj[,,3]) as all 0s.

#

# Note: the number of rows in the array should span the range of lengths expected. In the array below,

# which has 201 rows, it is implicitly assumed that there will be no fish smaller than 1.0cm

# and no fish larger than 201.9999 cm; the 1-cm intervals are assumed to be of the form:

# 1.0-1.99999, 2.0-2.99999, etc. (so the lower endpoint of these intervals will be 1.0, 2.0, etc)

#

# The grow/shrink matrices used below are from Carolina and Alex

# (originally Excel files, converted to CSV files and then to .RData files, with a few adjustments)

# and loaded by:

# > load("C:\\Users\\clennert\\Documents\\R\\poststratification\\CL programs\_stock assessment\\spp comp programs\_from 2000\\yft\_growshrink\_based on Carolina 091914\_1-201cm.RData")

# > load("C:\\Users\\clennert\\Documents\\R\\poststratification\\CL programs\_stock assessment\\spp comp programs\_from 2000\\bet\_growshrink\_based on Alex 010210\_1-201cm.RData")

# > load("C:\\Users\\clennert\\Documents\\R\\poststratification\\CL programs\_stock assessment\\spp comp programs\_from 2000\\skj\_growshrink\_based on Carolina 121114\_1-201cm.RData")

#

> grow.increments.betyftskj<-array(0,dim=c(201,3,3))

> grow.increments.betyftskj[,,1]<-as.matrix(bet.grwshrnk)

> grow.increments.betyftskj[,,2]<-as.matrix(yft.grwshrnk)

> grow.increments.betyftskj[,,3]<-as.matrix(skj.grwshrnk)

# Specify area/gear/month substitution matrices for the function substitute.f

# To create these substitution matrices, edit Excel templates in PS\_area\_gear\_month\_substitution matrices\_templates.xlsx; save individually as DOS CSV files without headers; load into R using read.csv with header=F.

# (NOTE: This only needs to be run once or whenever substitution options change)

#

> area.substitution.mat<-as.matrix(read.csv("/Users/clennert/Documents/R/poststratification/CL programs\_stock assessment/spp comp programs\_from 2000/area\_substitution\_matrix.csv",header=F))

> gear.substitution.mat<-as.matrix(read.csv("/Users/clennert/Documents/R/poststratification/CL programs\_stock assessment/spp comp programs\_from 2000/gear\_substitution\_matrix.csv",header=F))

> month.substitution.mat<-as.matrix(read.csv("/Users/clennert/Documents/R/poststratification/CL programs\_stock assessment/spp comp programs\_from 2000/month\_substitution\_matrix.csv",header=F))

# \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

# Now get and minimally process data output by Miscellaneous.exe VB programs

#

# (i) This can be done in two ways: all at once (example is for a 2000-2013 raw data extraction):

> get.VB.output.f("Unloading2000-2013.txt","CAE2000-2013.txt","LengthMM2000-2013.txt","LengthFreq2000-2013.txt",2000,2013)

# (ii) Or, by running each function separately:

#

# Get the total unloads for the P-S fleet

> total.unlds.20002013<-read.unloads.f("Unloading2000-2013.txt",2000,2013)

# Get the CAE+IDM data

> cae.20002013<-read.cae.f("CAE2000-2013.txt",2000,2013)

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

> lfmm.20002013<-read.lfmmdata.f("LengthMM2000-2013.txt")

# Get the grouped length-frequency output

> lfgrpd.20002013<-read.lengthfreq.f("LengthFreq2000-2013.txt")

# \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

# Create variables that identify the catch estimation strata for the CAE+IDM data and for the grouped length-frequnecy data

# Create a catch stratum id variable for the CAE+IDM data

> cae.stratflg.20002013<-create.strat.flg.f(cae.20002013$latc5,cae.20002013$lonc5,is.lwrght=F,cae.20002013$month,cae.20002013$setype,cae.20002013$class)

[1] "\*\*\* Please edit first to make sure stratum definitions are correct \*\*\*"

# Create a catch stratum id variable for the groupd length-frequency data

> lfgrpd.stratflg.20002013<-create.strat.flg.f(lfgrpd.20002013$lat.5deg,lfgrpd.20002013$lon.5deg,is.lwrght=T,floor(lfgrpd.20002013$moda/100),lfgrpd.20002013$setype,lfgrpd.20002013$class)

[1] "\*\*\* Please edit first to make sure stratum definitions are correct \*\*\*"

#\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**NOTE**: the functions above that read and process the raw input data, and create stratum id variables, can all be run on blocks of years at one time. However, ALL the functions below operate on INDIVIDUAL years only.

#\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

# Estimate catch by species and size for catch strata, for a given year

#

# (i) This can be done in two ways: all at once (example is for 2010, with minimum stratum sample size requirement of 5 well samples):

> get.catch.estimates.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2010,5)

[1] "\*\*\* Please edit first to make sure stratum definitions are correct \*\*\*"

[1] "\*\*\* create.fishery.flg.f: Please edit first to make sure stratum definitions are correct \*\*\*"

# (ii) Or, by running each function separately (example is for 2010):

#

# Get total unloads for each catch stratum

> totunlds.bystrat.2010<-get.strat.unloads.f(cae.20002013[cae.20002013$year==2010,],cae.stratflg.20002013[cae.20002013$year==2010,],total.unlds.20002013[as.numeric(dimnames(total.unlds.20002013)[[1]])==2010])

# Get well-level estimates

> well.estimates.2010<-well.estimates.f(lfgrpd.20002013[lfgrpd.20002013$year.firstset==2010,],lfmm.20002013)

# Create a catch stratum id variable for the well-level estimate output

> well.stratflg.2010<-create.strat.flg.f(well.estimates.2010$ancillary.info$lat.5deg,well.estimates.2010$ancillary.info$lon.5deg,is.lwrght=T,well.estimates.2010$ancillary.info$month,well.estimates.2010$ancillary.info$setype,well.estimates.2010$ancillary.info$class)

[1] "\*\*\* Please edit first to make sure stratum definitions are correct \*\*\*"

# Get stratum-level estimates for catch strata that have sufficient sample data;

# sufficient sample data is defined in terms of the minimum number of well samples per stratum.

# (in the example below, the minimum number of well samples required is 5)

> stratum.estimates.2010.withsamps<-stratum.estimates.f(totunlds.bystrat.2010,well.estimates.2010,well.stratflg.2010,5)

# Get stratum-level estimates for catch strata that DO NOT have sufficient sample data

# NOTE: minimum number of samples per stratum should match that used by stratum.estimates.f

#

# Before running substitute.f, you need to determine the fishery-areas for the unloadings data

# (because this is information is used in the missing data algorithm)

# This code is lame and should be improved.... ;-(

> tmpcl<-create.fishery.flg.f(totunlds.bystrat.2010$str.defns)

> tmp.unlds.stratdefns.miss.2010<-data.frame(totunlds.bystrat.2010$str.defns,tmpcl)[,c(1:3,5)][is.na(stratum.estimates.2010.withsamps$unloads.vs.wells),]

> tmp.unlds.stratdefns.miss.2010$fishery.areagear<-as.character(tmp.unlds.stratdefns.miss.2010$fishery.areagear)

> rm(tmpcl)

> stratum.estimates.2010.NOsamps<-substitute.f(tmp.unlds.stratdefns.miss.2010,totunlds.bystrat.2010$totunlds.bystr[is.na(stratum.estimates.2010.withsamps$unloads.vs.wells)],lfgrpd.20002013[lfgrpd.20002013$year.firstset==2010,],lfgrpd.stratflg.20002013[lfgrpd.20002013$year.firstset==2010,],lfmm.20002013,gear.substitution.mat,area.substitution.mat,month.substitution.mat,5,grow.increments.betyftskj)

#\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

# And, last but not least, get stock assessment estimates, for a given year (example is for 2010):

> fishery.estimates.2010<-fishery.estimates.f(stratum.estimates.2010.withsamps,stratum.estimates.2010.NOsamps,2010)

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**Some notes regarding possible modifications:**

**Changing strata and/or substitution rules**

To change catch strata (e.g., areas) and/or stock assessment gear-area definitions, you need to modify the following functions: create.strat.flg.f, create.fishery.flg.f

In addition, if you change stratum definitions and/or you want to change the substitution rules for handling strata without sample data, you will need to edit the matrices area.substitution.mat, gear.substitution.mat, month.substitution.mat, and edit the function get.sub.f . The function get.sub.f is called by the function substitute.f

**Changing growth information**

To change length adjustments (growing/shrinking) when substitute samples are taken from other months, edit the array grow.increments.betyftskj and the function grow.shrink.f

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**Example of running CL version of Pat, 2000-2013 (run Dec 1, 2014)**

**(comments returned by functions are not shown below)**

FIRST MAKE SURE YOU HAVE EDITED CREATE.STRAT.FLG.G AND CREATE.FISHERY.FLG.F TO USE THE CORRECT STRATA!

> attach("/Users/clennert/Documents/R/poststratification/CL programs\_stock assessment/spp comp programs\_from 2000/spp comp\_R functions.RData",pos=2)

> get.VB.output.f("Unloading2000-2013.txt","CAE2000-2013.txt","LengthMM2000-2013.txt","LengthFreq2000-2013.txt",2000,2013)

> cae.stratflg.20002013<-create.strat.flg.f(cae.20002013$latc5,cae.20002013$lonc5,is.lwrght=F,cae.20002013$month,cae.20002013$setype,cae.20002013$class)

> lfgrpd.stratflg.20002013<-create.strat.flg.f(lfgrpd.20002013$lat.5deg,lfgrpd.20002013$lon.5deg,is.lwrght=T,floor(lfgrpd.20002013$moda/100),lfgrpd.20002013$setype,lfgrpd.20002013$class)

> get.catch.estimates.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2000,2)

> fishery.estimates.2000<-fishery.estimates.f(stratum.estimates.2000.withsamps,stratum.estimates.2000.NOsamps,2000)

> get.catch.estimates.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2001,2)

> fishery.estimates.2001<-fishery.estimates.f(stratum.estimates.2001.withsamps,stratum.estimates.2001.NOsamps,2001)

> get.catch.estimates.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2002,2)

> fishery.estimates.2002<-fishery.estimates.f(stratum.estimates.2002.withsamps,stratum.estimates.2002.NOsamps,2002)

> get.catch.estimates.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2003,2)

> fishery.estimates.2003<-fishery.estimates.f(stratum.estimates.2003.withsamps,stratum.estimates.2003.NOsamps,2003)

> get.catch.estimates.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2004,2)

> fishery.estimates.2004<-fishery.estimates.f(stratum.estimates.2004.withsamps,stratum.estimates.2004.NOsamps,2004)

> get.catch.estimates.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2005,2)

> fishery.estimates.2005<-fishery.estimates.f(stratum.estimates.2005.withsamps,stratum.estimates.2005.NOsamps,2005)

> get.catch.estimates.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2006,2)

> fishery.estimates.2006<-fishery.estimates.f(stratum.estimates.2006.withsamps,stratum.estimates.2006.NOsamps,2006)

> get.catch.estimates.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2007,2)

> fishery.estimates.2007<-fishery.estimates.f(stratum.estimates.2007.withsamps,stratum.estimates.2007.NOsamps,2007)

> get.catch.estimates.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2008,2)

> fishery.estimates.2008<-fishery.estimates.f(stratum.estimates.2008.withsamps,stratum.estimates.2008.NOsamps,2008)

> get.catch.estimates.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2009,2)

> fishery.estimates.2009<-fishery.estimates.f(stratum.estimates.2009.withsamps,stratum.estimates.2009.NOsamps,2009)

> get.catch.estimates.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2010,2)

> fishery.estimates.2010<-fishery.estimates.f(stratum.estimates.2010.withsamps,stratum.estimates.2010.NOsamps,2010)

> get.catch.estimates.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2011,2)

> fishery.estimates.2011<-fishery.estimates.f(stratum.estimates.2011.withsamps,stratum.estimates.2011.NOsamps,2011)

> get.catch.estimates.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2012,2)

> fishery.estimates.2012<-fishery.estimates.f(stratum.estimates.2012.withsamps,stratum.estimates.2012.NOsamps,2012)

> get.catch.estimates.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2013,2)

> fishery.estimates.2013<-fishery.estimates.f(stratum.estimates.2013.withsamps,stratum.estimates.2013.NOsamps,2013)

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FEBRUARY 11, 2015: THIS SECTION IS OLD; SEE NOTES IN current-estimates sub-directory

**Example of running Carolina's areas for YFT, 2000-2013 (December 3-4, 2014)**

**(comments returned by functions are not shown below)**

The following table gives the combinations of catch strata, fishery strata and area substitution matrices to use when running the R functions:

YFT

Dolpin sets : YFT DOL catch strata; DOL and UNA fishery strata; YFT DOL and UNA area matrix

Unassoc sets: YFT UNA catch strata; DOL and UNA fishery strata; YFT DOL and UNA area matrix

Flt obj sets : FLT catch strata; YFT FLT fishery strata; YFT FLT area matrix

BET

Dolpin sets : YFT DOL catch strata; DOL and UNA fishery strata; YFT DOL and UNA area matrix

Unassoc sets: YFT UNA catch strata; DOL and UNA fishery strata; YFT DOL and UNA area matrix

Flt obj sets : FLT catch strata; BET FLT fishery strata; BET FLT area matrix

\*\*\*\*\*\*\*\*\*\*\*\*\*

**WARNING:** YOU HAVE TO EDIT CREATE.STRAT.FLG.G AND CREATE.FISHERY.FLG.F SEVERAL TIMES DURING THIS PROCESS TO USE THE CORRECT STRATA AND AREA SUBSTITUTION MATRIX FOR EACH SET TYPE AND SPECIES!!!!

> attach("/Users/clennert/Documents/R/poststratification/CL programs\_stock assessment/spp comp programs\_from 2000/spp comp\_R functions.RData",pos=2)

> get.VB.output.f("Unloading2000-2013.txt","CAE2000-2013.txt","LengthMM2000-2013.txt","LengthFreq2000-2013.txt",2000,2013)

> well.estimates.2000<-well.estimates.f(lfgrpd.20002013[lfgrpd.20002013$year.firstset==2000,],lfmm.20002013)

> well.estimates.2001<-well.estimates.f(lfgrpd.20002013[lfgrpd.20002013$year.firstset==2001,],lfmm.20002013)

> well.estimates.2002<-well.estimates.f(lfgrpd.20002013[lfgrpd.20002013$year.firstset==2002,],lfmm.20002013)

> well.estimates.2003<-well.estimates.f(lfgrpd.20002013[lfgrpd.20002013$year.firstset==2003,],lfmm.20002013)

> well.estimates.2004<-well.estimates.f(lfgrpd.20002013[lfgrpd.20002013$year.firstset==2004,],lfmm.20002013)

> well.estimates.2005<-well.estimates.f(lfgrpd.20002013[lfgrpd.20002013$year.firstset==2005,],lfmm.20002013)

> well.estimates.2006<-well.estimates.f(lfgrpd.20002013[lfgrpd.20002013$year.firstset==2006,],lfmm.20002013)

> well.estimates.2007<-well.estimates.f(lfgrpd.20002013[lfgrpd.20002013$year.firstset==2007,],lfmm.20002013)

> well.estimates.2008<-well.estimates.f(lfgrpd.20002013[lfgrpd.20002013$year.firstset==2008,],lfmm.20002013)

> well.estimates.2009<-well.estimates.f(lfgrpd.20002013[lfgrpd.20002013$year.firstset==2009,],lfmm.20002013)

> well.estimates.2010<-well.estimates.f(lfgrpd.20002013[lfgrpd.20002013$year.firstset==2010,],lfmm.20002013)

> well.estimates.2011<-well.estimates.f(lfgrpd.20002013[lfgrpd.20002013$year.firstset==2011,],lfmm.20002013)

> well.estimates.2012<-well.estimates.f(lfgrpd.20002013[lfgrpd.20002013$year.firstset==2012,],lfmm.20002013)

> well.estimates.2013<-well.estimates.f(lfgrpd.20002013[lfgrpd.20002013$year.firstset==2013,],lfmm.20002013)

# YFT in dolphin sets

> detach(pos=2) # done in estimation workspace

> fix(create.strat.flg.f) # **done in function workspace**

> fix(create.fishery.flg.f) # **done in function workspace (be sure to save workspace)**

> attach("/Users/clennert/Documents/R/poststratification/CL programs\_stock assessment/spp comp programs\_from 2000/spp comp\_R functions.RData",pos=2) # done in estimation workspace

> cae.stratflg.20002013<-create.strat.flg.f(cae.20002013$latc5,cae.20002013$lonc5,is.lwrght=F,cae.20002013$month,cae.20002013$setype,cae.20002013$class)

> lfgrpd.stratflg.20002013<-create.strat.flg.f(lfgrpd.20002013$lat.5deg,lfgrpd.20002013$lon.5deg,is.lwrght=T,floor(lfgrpd.20002013$moda/100),lfgrpd.20002013$setype,lfgrpd.20002013$class)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2000,5,well.estimates.2000,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2000<-fishery.estimates.f(stratum.estimates.2000.withsamps,stratum.estimates.2000.NOsamps,2000)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2001,5,well.estimates.2001,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2001<-fishery.estimates.f(stratum.estimates.2001.withsamps,stratum.estimates.2001.NOsamps,2001)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2002,5,well.estimates.2002,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2002<-fishery.estimates.f(stratum.estimates.2002.withsamps,stratum.estimates.2002.NOsamps,2002)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2003,5,well.estimates.2003,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2003<-fishery.estimates.f(stratum.estimates.2003.withsamps,stratum.estimates.2003.NOsamps,2003)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2004,5,well.estimates.2004,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2004<-fishery.estimates.f(stratum.estimates.2004.withsamps,stratum.estimates.2004.NOsamps,2004)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2005,5,well.estimates.2005,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2005<-fishery.estimates.f(stratum.estimates.2005.withsamps,stratum.estimates.2005.NOsamps,2005)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2006,5,well.estimates.2006,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2006<-fishery.estimates.f(stratum.estimates.2006.withsamps,stratum.estimates.2006.NOsamps,2006)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2007,5,well.estimates.2007,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2007<-fishery.estimates.f(stratum.estimates.2007.withsamps,stratum.estimates.2007.NOsamps,2007)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2008,5,well.estimates.2008,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2008<-fishery.estimates.f(stratum.estimates.2008.withsamps,stratum.estimates.2008.NOsamps,2008)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2009,5,well.estimates.2009,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2009<-fishery.estimates.f(stratum.estimates.2009.withsamps,stratum.estimates.2009.NOsamps,2009)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2010,5,well.estimates.2010,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2010<-fishery.estimates.f(stratum.estimates.2010.withsamps,stratum.estimates.2010.NOsamps,2010)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2011,5,well.estimates.2011,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2011<-fishery.estimates.f(stratum.estimates.2011.withsamps,stratum.estimates.2011.NOsamps,2011)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2012,5,well.estimates.2012,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2012<-fishery.estimates.f(stratum.estimates.2012.withsamps,stratum.estimates.2012.NOsamps,2012)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2013,5,well.estimates.2013,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2013<-fishery.estimates.f(stratum.estimates.2013.withsamps,stratum.estimates.2013.NOsamps,2013)

# YFT in unassociated sets

> detach(pos=2) # done in estimation workspace

> fix(create.strat.flg.f) # **done in function workspace (be sure to save function workspace)**

> attach("/Users/clennert/Documents/R/poststratification/CL programs\_stock assessment/spp comp programs\_from 2000/spp comp\_R functions.RData",pos=2) # done in estimation workspace

> cae.stratflg.20002013<-create.strat.flg.f(cae.20002013$latc5,cae.20002013$lonc5,is.lwrght=F,cae.20002013$month,cae.20002013$setype,cae.20002013$class)

> lfgrpd.stratflg.20002013<-create.strat.flg.f(lfgrpd.20002013$lat.5deg,lfgrpd.20002013$lon.5deg,is.lwrght=T,floor(lfgrpd.20002013$moda/100),lfgrpd.20002013$setype,lfgrpd.20002013$class)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2000,5,well.estimates.2000,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2000<-fishery.estimates.f(stratum.estimates.2000.withsamps,stratum.estimates.2000.NOsamps,2000)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2001,5,well.estimates.2001,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2001<-fishery.estimates.f(stratum.estimates.2001.withsamps,stratum.estimates.2001.NOsamps,2001)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2002,5,well.estimates.2002,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2002<-fishery.estimates.f(stratum.estimates.2002.withsamps,stratum.estimates.2002.NOsamps,2002)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2003,5,well.estimates.2003,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2003<-fishery.estimates.f(stratum.estimates.2003.withsamps,stratum.estimates.2003.NOsamps,2003)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2004,5,well.estimates.2004,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2004<-fishery.estimates.f(stratum.estimates.2004.withsamps,stratum.estimates.2004.NOsamps,2004)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2005,5,well.estimates.2005,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2005<-fishery.estimates.f(stratum.estimates.2005.withsamps,stratum.estimates.2005.NOsamps,2005)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2006,5,well.estimates.2006,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2006<-fishery.estimates.f(stratum.estimates.2006.withsamps,stratum.estimates.2006.NOsamps,2006)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2007,5,well.estimates.2007,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2007<-fishery.estimates.f(stratum.estimates.2007.withsamps,stratum.estimates.2007.NOsamps,2007)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2008,5,well.estimates.2008,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2008<-fishery.estimates.f(stratum.estimates.2008.withsamps,stratum.estimates.2008.NOsamps,2008)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2009,5,well.estimates.2009,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2009<-fishery.estimates.f(stratum.estimates.2009.withsamps,stratum.estimates.2009.NOsamps,2009)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2010,5,well.estimates.2010,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2010<-fishery.estimates.f(stratum.estimates.2010.withsamps,stratum.estimates.2010.NOsamps,2010)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2011,5,well.estimates.2011,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2011<-fishery.estimates.f(stratum.estimates.2011.withsamps,stratum.estimates.2011.NOsamps,2011)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2012,5,well.estimates.2012,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2012<-fishery.estimates.f(stratum.estimates.2012.withsamps,stratum.estimates.2012.NOsamps,2012)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2013,5,well.estimates.2013,area.substitution.mat.YFT.DOLandUNA)

> fishery.estimates.2013<-fishery.estimates.f(stratum.estimates.2013.withsamps,stratum.estimates.2013.NOsamps,2013)

# YFT in floating-object sets

> detach(pos=2) # done in estimation workspace

> fix(create.strat.flg.f) # **done in function workspace**

> fix(create.fishery.flg.f) # **done in function workspace (be sure to save function workspace)**

> attach("/Users/clennert/Documents/R/poststratification/CL programs\_stock assessment/spp comp programs\_from 2000/spp comp\_R functions.RData",pos=2) # done in estimation workspace

> cae.stratflg.20002013<-create.strat.flg.f(cae.20002013$latc5,cae.20002013$lonc5,is.lwrght=F,cae.20002013$month,cae.20002013$setype,cae.20002013$class)

> lfgrpd.stratflg.20002013<-create.strat.flg.f(lfgrpd.20002013$lat.5deg,lfgrpd.20002013$lon.5deg,is.lwrght=T,floor(lfgrpd.20002013$moda/100),lfgrpd.20002013$setype,lfgrpd.20002013$class)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2000,5,well.estimates.2000,area.substitution.mat.YFT.FLT)

> fishery.estimates.2000<-fishery.estimates.f(stratum.estimates.2000.withsamps,stratum.estimates.2000.NOsamps,2000)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2001,5,well.estimates.2001,area.substitution.mat.YFT.FLT)

> fishery.estimates.2001<-fishery.estimates.f(stratum.estimates.2001.withsamps,stratum.estimates.2001.NOsamps,2001)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2002,5,well.estimates.2002,area.substitution.mat.YFT.FLT)

> fishery.estimates.2002<-fishery.estimates.f(stratum.estimates.2002.withsamps,stratum.estimates.2002.NOsamps,2002)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2003,5,well.estimates.2003,area.substitution.mat.YFT.FLT)

> fishery.estimates.2003<-fishery.estimates.f(stratum.estimates.2003.withsamps,stratum.estimates.2003.NOsamps,2003)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2004,5,well.estimates.2004,area.substitution.mat.YFT.FLT)

> fishery.estimates.2004<-fishery.estimates.f(stratum.estimates.2004.withsamps,stratum.estimates.2004.NOsamps,2004)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2005,5,well.estimates.2005,area.substitution.mat.YFT.FLT)

> fishery.estimates.2005<-fishery.estimates.f(stratum.estimates.2005.withsamps,stratum.estimates.2005.NOsamps,2005)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2006,5,well.estimates.2006,area.substitution.mat.YFT.FLT)

> fishery.estimates.2006<-fishery.estimates.f(stratum.estimates.2006.withsamps,stratum.estimates.2006.NOsamps,2006)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2007,5,well.estimates.2007,area.substitution.mat.YFT.FLT)

> fishery.estimates.2007<-fishery.estimates.f(stratum.estimates.2007.withsamps,stratum.estimates.2007.NOsamps,2007)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2008,5,well.estimates.2008,area.substitution.mat.YFT.FLT)

> fishery.estimates.2008<-fishery.estimates.f(stratum.estimates.2008.withsamps,stratum.estimates.2008.NOsamps,2008)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2009,5,well.estimates.2009,area.substitution.mat.YFT.FLT)

> fishery.estimates.2009<-fishery.estimates.f(stratum.estimates.2009.withsamps,stratum.estimates.2009.NOsamps,2009)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2010,5,well.estimates.2010,area.substitution.mat.YFT.FLT)

> fishery.estimates.2010<-fishery.estimates.f(stratum.estimates.2010.withsamps,stratum.estimates.2010.NOsamps,2010)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2011,5,well.estimates.2011,area.substitution.mat.YFT.FLT)

> fishery.estimates.2011<-fishery.estimates.f(stratum.estimates.2011.withsamps,stratum.estimates.2011.NOsamps,2011)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2012,5,well.estimates.2012,area.substitution.mat.YFT.FLT)

> fishery.estimates.2012<-fishery.estimates.f(stratum.estimates.2012.withsamps,stratum.estimates.2012.NOsamps,2012)

> get.catch.estimates.V2.f(cae.20002013,cae.stratflg.20002013,total.unlds.20002013,lfgrpd.20002013,lfgrpd.stratflg.20002013,lfmm.20002013,2013,5,well.estimates.2013,area.substitution.mat.YFT.FLT)

> fishery.estimates.2013<-fishery.estimates.f(stratum.estimates.2013.withsamps,stratum.estimates.2013.NOsamps,2013)