

Package ‘GLFC’

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Title Great Lakes Fishery Commission Functions

Version 0.0.0.9001

Description Functions developed for the Great Lakes Fishery Commission's sea lamprey control program.

Depends R (>= 3.1.3)

Imports plyr

License GPL

LazyData TRUE

URL <https://github.com/JVAdams/GLFC>

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estAIndex	<i>Estimate Index of Sea Lamprey Adults</i>
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Description

Estimate the Adult Index of sea lampreys in a single Great Lake.

Usage

```
estAIndex(indexStreams, streamPECurr, streamPEPrev = NULL, minNMR = 2,  
          show = FALSE)
```

Arguments

indexStreams	A numeric vector of IDs identifying streams to be included in the index, e.g., 1.064 = lake code + (stream code)/1000.
streamPECurr	A data frame of stream mark-recapture estimates from the current year, with variables: year, lake, lscore, trapcatch, Emr, CVmr.
streamPEPrev	A data frame of stream mark-recapture and Adult Index estimates from previous years, with variables: year, lake, lscore, trapcatch, Emr, CVmr, indexContrib, default NULL.
minNMR	A numeric scalar, the minimum number of mark-recapture estimates needed in a year to generate an index, default 2.
show	A logical scalar indicating if a brief summary of the results should be printed, default FALSE.

Details

The annual Adult Index is simply the sum of stream PEs for each year. The jackknifed range is produced by recalculating the index, leaving out one stream at a time, then scaling up the result to the same scale as the Adult Index based on all streams.

Value

A list with two components: streamPE, a data frame of stream mark-recapture and Adult Index estimates from previous and current years combined, with the same variables as streamPEPrev; and lakeIndex, a numeric matrix with five columns, lake, year, index (the Adult Index), jlo, and jhi (the lower and upper jackknifed range).

Examples

```
now <- data.frame(year=2000, lake=1,
  lscore=c(1.1, 1.2, 1.3), trapcatch=c(5, 10, 15),
  Emr=c(10, 20, 30), CVmr=c(50, 50, 30))
before <- data.frame(year=rep(1998:1999, c(3, 3)), lake=1,
  lscore=rep(c(1.1, 1.2, 1.3), 2), trapcatch=c(5, 10, 15, 3, 8, 12),
  Emr=c(15, 20, 35, 12, 22, 30), CVmr=c(50, 50, 30, 50, 40, 30),
  indexContrib=c(15, 20, 35, 12, 22, 30))
estAIndex(c(1.1, 1.2, 1.3), now, before)
```

index2pe

Factors to Scale Up the Adult Index to a Lakewide Population

Description

Lake-specific conversion factors to scale up indices of adult sea lamprey abundance in the Great Lakes to lake-wide population estimates.

Format

A named vector of length 5 (for the 5 Great Lakes) with factors rounded to the nearest hundredth.

Author(s)

GLFC Trapping Task Force.

Source

Great Lakes Fishery Commission (**GLFC**) Sea Lamprey Control Board Meeting 14-02, 15-17 Oct 2014, Briefing Item 5 - Attachment 2, Transitioning to the New Adult Index in 2015.

jackIndex	<i>Index of Sea Lamprey Adults with Jackknifed Range</i>
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Description

Estimated Adult Index of sea lamprey with the observed range in the index when one stream at a time is excluded from the estimation.

Usage

```
jackIndex(m)
```

Arguments

m	A numeric matrix of stream run size estimates with observation years as rows and individual streams as columns.
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Details

The annual Adult Index is simply the sum of the columns in **m** for each row. The jackknifed range is produced by recalculating the index, leaving out one stream at a time, then scaling up the result to the same scale as the Adult Index based on all streams.

Value

A numeric matrix with three columns, the Adult Index, and the lower and upper jackknifed range.

Examples

```
streampe <- matrix(1:12, nrow=3, dimnames=list(1996:1998, letters[1:4]))
jackIndex(streampe)
```

1sIndex

Great Lakes Streams used in the Index of Adult Sea Lampreys

Description

IDs identifying streams to used to generate the Adult Index.

Format

A list of 5 numeric vectors of stream IDs for the 5 Great Lakes, e.g., 1.064 = (lake code) + (stream code)/1000.

Author(s)

GLFC Trapping Task Force.

Source

Great Lakes Fishery Commission (GLFC) Sea Lamprey Control Board Meeting 14-02, 15-17 Oct 2014, Briefing Item 5 - Attachment 2, Transitioning to the New Adult Index in 2015.

1sKeep

Great Lakes Streams with Commitment to Adult Sea Lamprey Trapping

Description

IDs identifying streams which will continue to have ongoing trapping even if not part of the Adult Index.

Format

A list of 5 numeric vectors of stream IDs for the 5 Great Lakes, e.g., 1.064 = (lake code) + (stream code)/1000.

Author(s)

GLFC Trapping Task Force.

Source

Great Lakes Fishery Commission (GLFC) Sea Lamprey Control Board Meeting 14-02, 15-17 Oct 2014, Briefing Item 5 - Attachment 2, Transitioning to the New Adult Index in 2015.

predAntilog	<i>Unbiased Prediction of Log Transformed Response on Original Scale</i>
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Description

Provide unbiased estimates on the original scale from an analysis of variance model with a log transformed response.

Usage

```
predAntilog(aovfit, xdata, logbase = exp(1), k = 0)
```

Arguments

aovfit	An object of class c("aov", "lm").
xdata	A data frame with predictor variables corresponding to those in model for which predictions should be made.
logbase	A numeric scalar, the base of the log transformation used in the transformed response of model, default exp(1).
k	A numeric scalar, the constant added to the response prior to transformation, default 0.

Value

A numeric vector of predicted values on the original scale of the response.

Examples

```
fit <- aov(log(yield) ~ block + N * P + K, npk)
predAntilog(fit, npk)
```

trappedStreams	<i>General Information on Great Lakes Streams Trapped for Adult Sea Lampreys</i>
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Description

Location information on trapped streams (past and present).

Format

A data frame with 8 elements: lake (lake code), lscore (lake + strcode/1000), country, strcode (stream code), estr (stream ID for Empiric Stream Treatment Ranking), strname (stream name), lat (latitude), long (longitude).

Author(s)

GLFC Trapping Task Force.

Source

Great Lakes Fishery Commission ([GLFC](#)) spawner model data base, last updated 12 May 2015.

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