# R Handout - Age-Length Key

**Dr. Derek Ogle**
Northland College

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## Preliminaries

```
> library(FSA)      # for Subset(), view(), Summarize(), lencat(), ageKey(), fact2num()
> library(plotrix)  # for histStack()
```

```
> setwd("C:/aaaWork/Web/fishR/courses/Vermont2014/CourseMaterial/") # Derek's Computer
> d <- read.csv("Data/SpotVA2.csv",header=TRUE)
> str(d)
'data.frame': 403 obs. of  2 variables:
 $ tl : num  10.6 7.1 12.3 9.7 11.2 8.9 12.6 7.6 10 7 ...
 $ age: int  1 1 3 2 3 1 3 1 1 1 ...
> view(d)
      tl age
68  11.4  NA
72   8.9  NA
300  8.9  NA
324  9.5  NA
350  7.4  NA
384 10.4  NA
```

```
> sp.len <- Subset(d,is.na(age))
> str(sp.len)
'data.frame': 331 obs. of  2 variables:
 $ tl : num  9.6 9.4 9.1 9.4 9.6 9 8.2 9.8 10.7 9.1 ...
 $ age: int  NA NA NA NA NA NA NA NA NA NA ...
> sp.age <- Subset(d,!is.na(age))
> str(sp.age)
'data.frame': 72 obs. of  2 variables:
 $ tl : num  10.6 7.1 12.3 9.7 11.2 8.9 12.6 7.6 10 7 ...
 $ age: int  1 1 3 2 3 1 3 1 1 1 ...
```

## Constructing and Applying the Age-Length Key

```
> Summarize(~tl,data=sp.age,digits=1)
      n     mean       sd      min       Q1   median       Q3      max percZero
   72.0     10.3      2.1      6.3      8.7     10.3     12.0     13.9      0.0
> sp.age.mod <- lencat(~tl,data=sp.age,startcat=6,w=1)
> view(sp.age.mod)
     tl age LCat
3  12.3   3   12
16  8.2   1    8
36 11.1   3   11
```

```
45 12.0   1   12
47  8.7   1    8
48  8.5   1    8
```

```
> ( AL.raw <- xtabs(~LCat+age,data=sp.age.mod) )
```

```
    age
LCat  0  1  2  3  4
  6   2  0  0  0  0
  7   0 10  0  0  0
  8   1  9  0  0  0
  9   0  8  2  0  0
  10  0  9  1  0  0
  11  0  1  3  6  0
  12  0  1  4  4  1
  13  0  0  0  8  2
```

```
> ( AL.key <- prop.table(AL.raw,margin=1) )
```

```
    age
LCat   0   1   2   3   4
  6  1.0 0.0 0.0 0.0 0.0
  7  0.0 1.0 0.0 0.0 0.0
  8  0.1 0.9 0.0 0.0 0.0
  9  0.0 0.8 0.2 0.0 0.0
  10 0.0 0.9 0.1 0.0 0.0
  11 0.0 0.1 0.3 0.6 0.0
  12 0.0 0.1 0.4 0.4 0.1
  13 0.0 0.0 0.0 0.8 0.2
```

```
> sp.len.mod <- ageKey(AL.key,age~tl,data=sp.len)
```

```
Warning:  The maximum observed length in the length sample (13.8)
is greater than the largest length category in the age-length key (13).
Thus, the last length category will be treated as all-inclusive.
```

```
> view(sp.len.mod)
```

```
      tl age
12   9.6   1
19   9.7   1
78   8.0   1
118  8.4   1
194  7.5   1
326 10.3   1
```

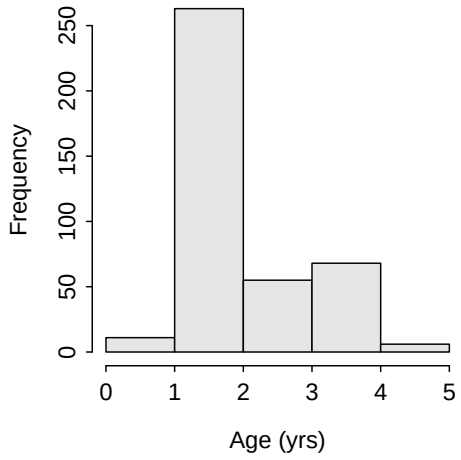
```
> sp.comb <- rbind(sp.age,sp.len.mod)
> str(sp.comb)
```

```
'data.frame': 403 obs. of  2 variables:
 $ tl : num  10.6 7.1 12.3 9.7 11.2 8.9 12.6 7.6 10 7 ...
 $ age: num  1 1 3 2 3 1 3 1 1 1 ...
```

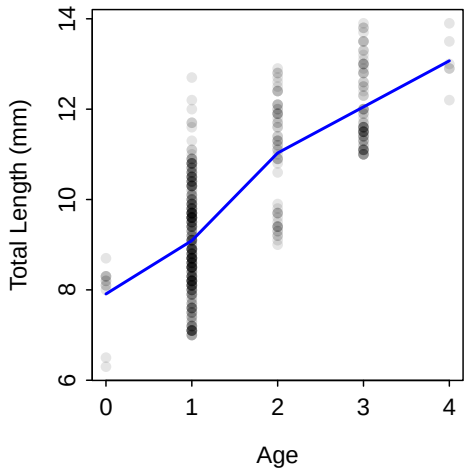
## Summarizing Final Results

```
> agefreq <- xtabs(~age,data=sp.comb)
> round(prop.table(agefreq)*100,1)

age
   0    1    2    3    4
 2.7 65.3 13.6 16.9  1.5
```

```
> ( sp.sum <- Summarize(tl~age,data=sp.comb,digits=2) )

Warning:  To continue, variable(s) on RHS of formula were converted to a factor.
  age   n  mean   sd  min    Q1 median   Q3  max percZero
1   0  11  7.91 0.77  6.3  8.05    8.2  8.3  8.7        0
2   1 263  9.09 1.16  7.0  8.20    9.0  9.9 12.7        0
3   2  55 11.03 1.20  9.0  9.70   11.3 12.0 12.9        0
4   3  68 12.05 0.87 11.0 11.40   11.7 12.8 13.9        0
5   4   6 13.07 0.58 12.2 12.90   13.0 13.4 13.9        0
> hist(~age,data=sp.comb,breaks=0:5,xlab="Age (yrs)")
```




```
> plot(tl~age,data=sp.comb,ylab="Total Length (mm)",xlab="Age",pch=16,col=rgb(0,0,0,1/10))
> lines(mean~fact2num(age),data=sp.sum,col="blue",lwd=2)
```



```
> histStack(tl~age,data=sp.comb,xlab="Total Length",ylim=c(0,100),
            col="gray.colors",legend="topright")
Warning:  z was converted to a factor
```