Homework 2 MVA

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Import Dataset

```
library(readr)
```

```
## Warning: package 'readr' was built under R version 4.2.2
```

```
Bumpus_sparrows <- read_csv("C:/Users/aveda/Downloads/Bumpus_sparrows.csv")
```

```
## Rows: 49 Columns: 6
## ── Column specification ────────────────────────────────────────────────────────
## Delimiter: ","
## chr (1): Survivorship
## dbl (5): Total_length, Alar_extent, L_beak_head, L_humerous, L_keel_sternum
##
## ℹ Use `spec()` to retrieve the full column specification for this data.
## ℹ Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
Bumpus_sparrows
```

```
## # A tibble: 49 × 6
##    Survivorship Total_length Alar_extent L_beak_head L_humerous L_keel_sternum
##    <chr>               <dbl>       <dbl>       <dbl>      <dbl>          <dbl>
##  1 S                     156         245        31.6       18.5           20.5
##  2 S                     154         240        30.4       17.9           19.6
##  3 S                     153         240        31         18.4           20.6
##  4 S                     153         236        30.9       17.7           20.2
##  5 S                     155         243        31.5       18.6           20.3
##  6 S                     163         247        32         19             20.9
##  7 S                     157         238        30.9       18.4           20.2
##  8 S                     155         239        32.8       18.6           21.2
##  9 S                     164         248        32.7       19.1           21.1
## 10 S                     158         238        31         18.8           22
## # … with 39 more rows
```

```
sparr = Bumpus_sparrows
sparr
```

```
## # A tibble: 49 × 6
##    Survivorship Total_length Alar_extent L_beak_head L_humerous L_keel_sternum
##    <chr>               <dbl>       <dbl>       <dbl>      <dbl>          <dbl>
##  1 S                     156         245        31.6       18.5           20.5
##  2 S                     154         240        30.4       17.9           19.6
##  3 S                     153         240        31         18.4           20.6
##  4 S                     153         236        30.9       17.7           20.2
##  5 S                     155         243        31.5       18.6           20.3
##  6 S                     163         247        32         19             20.9
##  7 S                     157         238        30.9       18.4           20.2
##  8 S                     155         239        32.8       18.6           21.2
##  9 S                     164         248        32.7       19.1           21.1
## 10 S                     158         238        31         18.8           22
## # … with 39 more rows
```

Load packages

```
library(lattice)
library(ggplot2)
```

```
## Warning: package 'ggplot2' was built under R version 4.2.2
```

```
library(ggridges)
```

```
## Warning: package 'ggridges' was built under R version 4.2.2
```

```
library(ggvis)
```

```
## Warning: package 'ggvis' was built under R version 4.2.2
```

```
##
## Attaching package: 'ggvis'
```

```
## The following object is masked from 'package:ggplot2':
##
##     resolution
```

```
library(ggthemes)
```

```
## Warning: package 'ggthemes' was built under R version 4.2.2
```

```
library(cowplot)
```

```
## Warning: package 'cowplot' was built under R version 4.2.2
```

```
##
## Attaching package: 'cowplot'
```

```
## The following object is masked from 'package:ggthemes':
##
##     theme_map
```

```
library(gapminder)
```

```
## Warning: package 'gapminder' was built under R version 4.2.2
```

```
library(gganimate)
```

```
## Warning: package 'gganimate' was built under R version 4.2.2
```

```
## No renderer backend detected. gganimate will default to writing frames to separate files
## Consider installing:
## - the `gifski` package for gif output
## - the `av` package for video output
## and restarting the R session
```

```
##
## Attaching package: 'gganimate'
```

```
## The following object is masked from 'package:ggvis':
##
##     view_static
```

```
library(dplyr)
```

```
## Warning: package 'dplyr' was built under R version 4.2.2
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
library(tidyverse)
```

```
## Warning: package 'tidyverse' was built under R version 4.2.2
```

```
## ── Attaching packages
## ──────────────────────────────────────
## tidyverse 1.3.2 ──
```

```
## ✓ tibble  3.1.8     ✓ stringr 1.4.1
## ✓ tidyr   1.2.1     ✓ forcats 0.5.2
## ✓ purrr   0.3.4
```

```
## Warning: package 'tidyr' was built under R version 4.2.2
```

```
## Warning: package 'forcats' was built under R version 4.2.2
```

```
## ── Conflicts ──────────────────────────────────────── tidyverse_conflicts() ──
## ✖ dplyr::filter()     masks stats::filter()
## ✖ dplyr::lag()        masks stats::lag()
## ✖ ggvis::resolution() masks ggplot2::resolution()
```

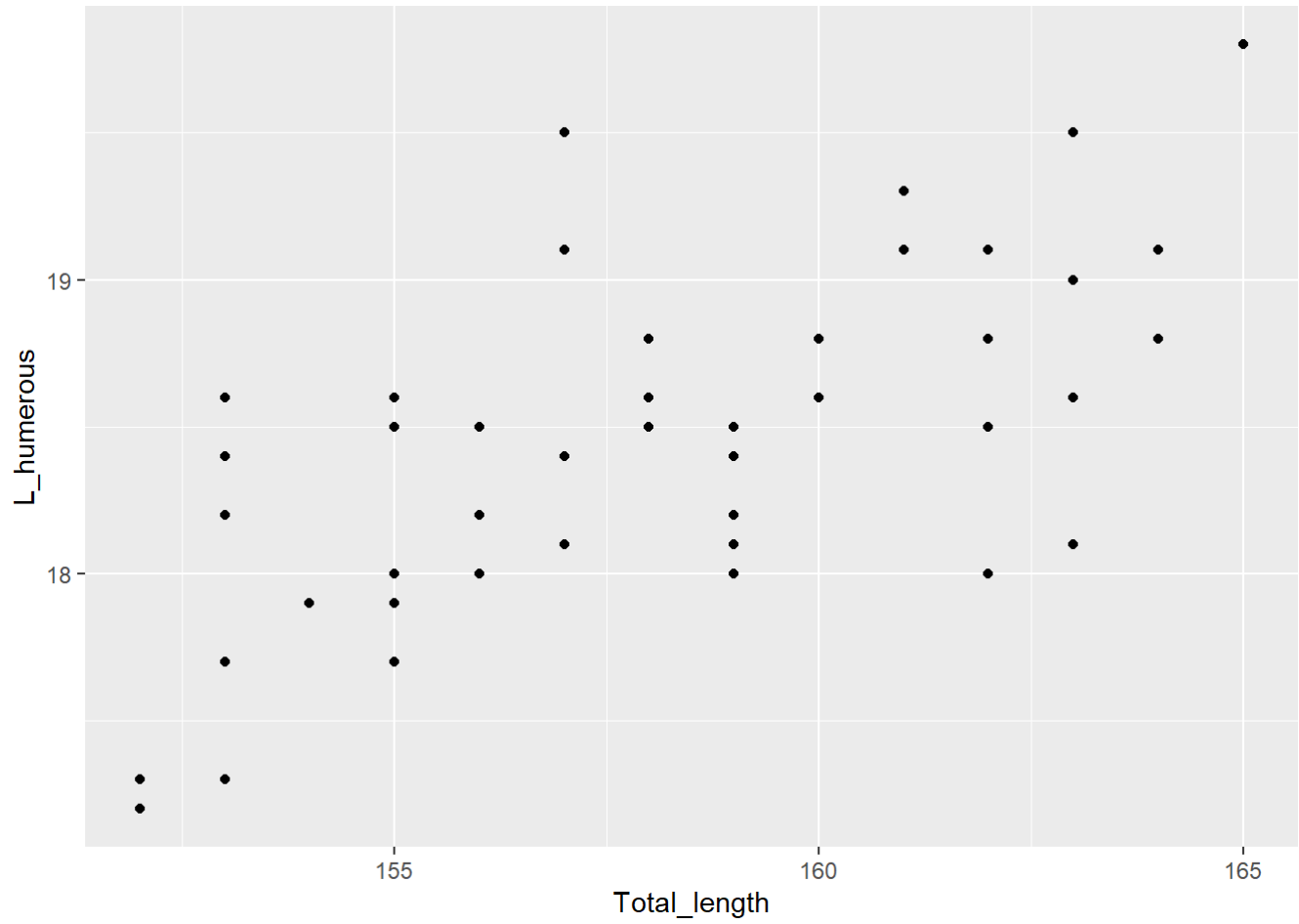
```
library(grid)
library(gridExtra)
```

```
##
## Attaching package: 'gridExtra'
##
## The following object is masked from 'package:dplyr':
##
##     combine
```

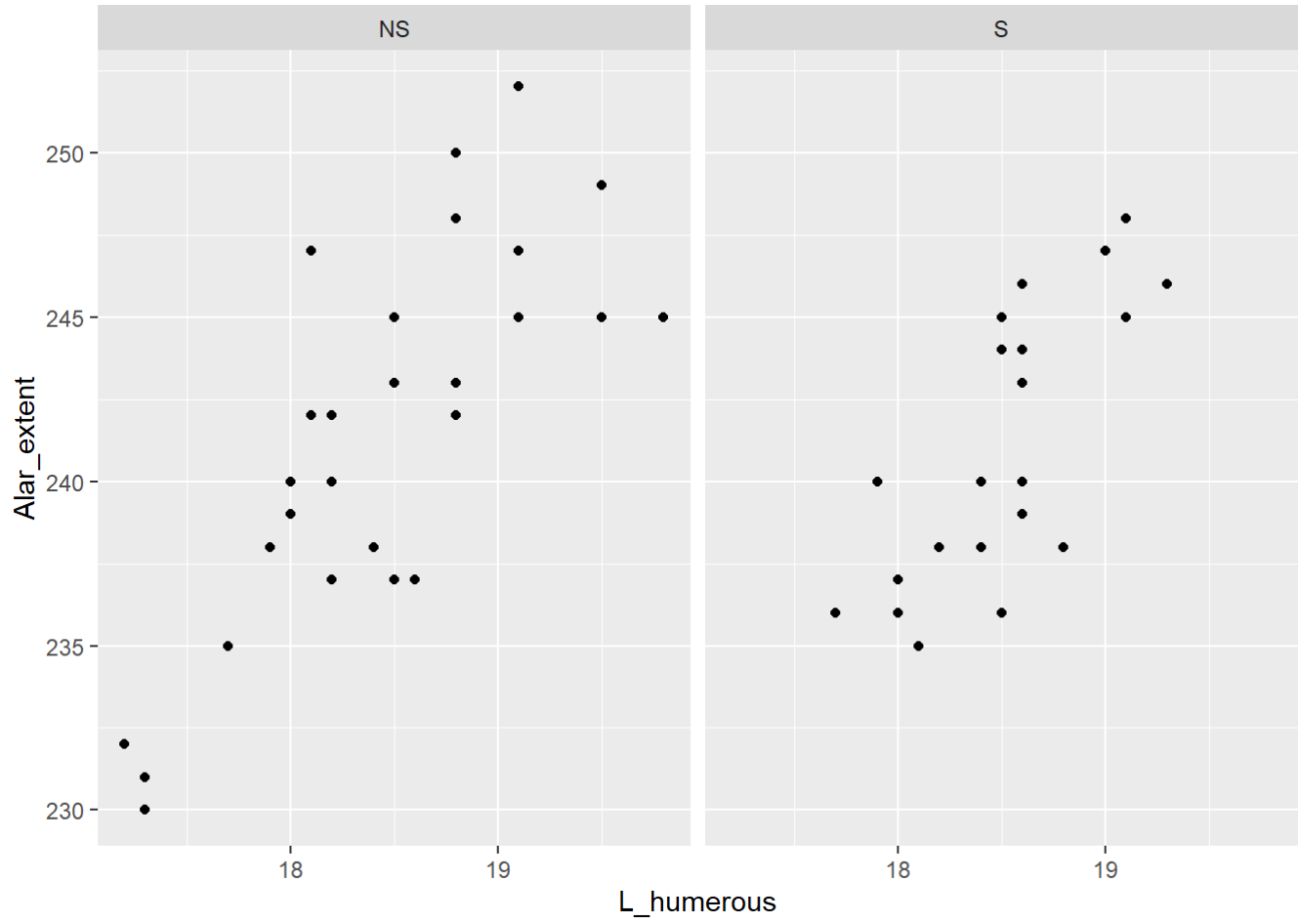
```
library(RColorBrewer)
```

ggplot

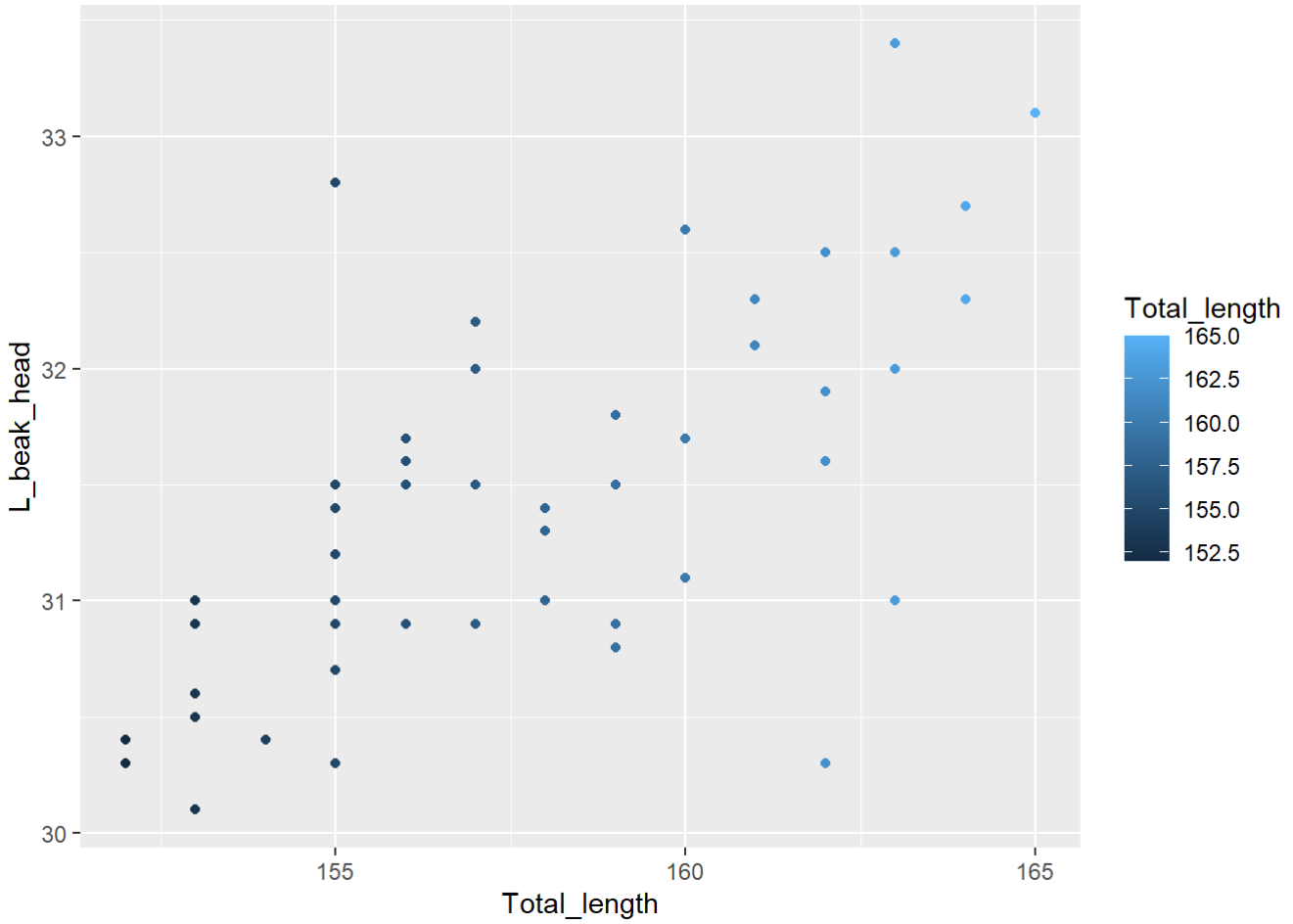
```
ggplot(sparr, aes(x=Total_length,y=L_humerous)) + geom_point()
```



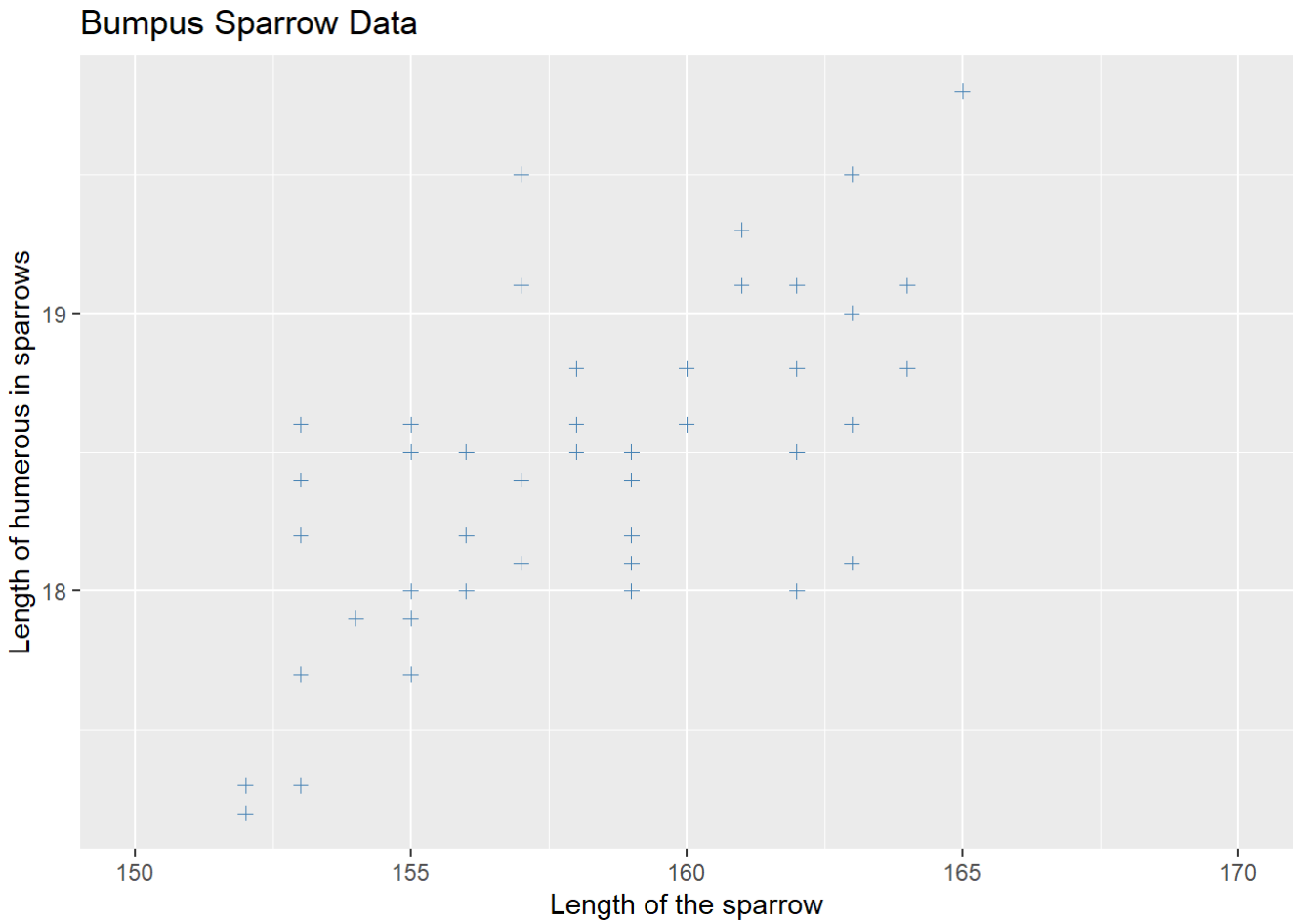

```
ggplot(sparr, aes(x=L_humerous,y=Alar_extent)) + facet_wrap(~Survivorship) + geom_point()
```



```
ggplot(sparr, aes(x=Total_length, y=L_beak_head)) +geom_point(aes(color=Total_length))
```

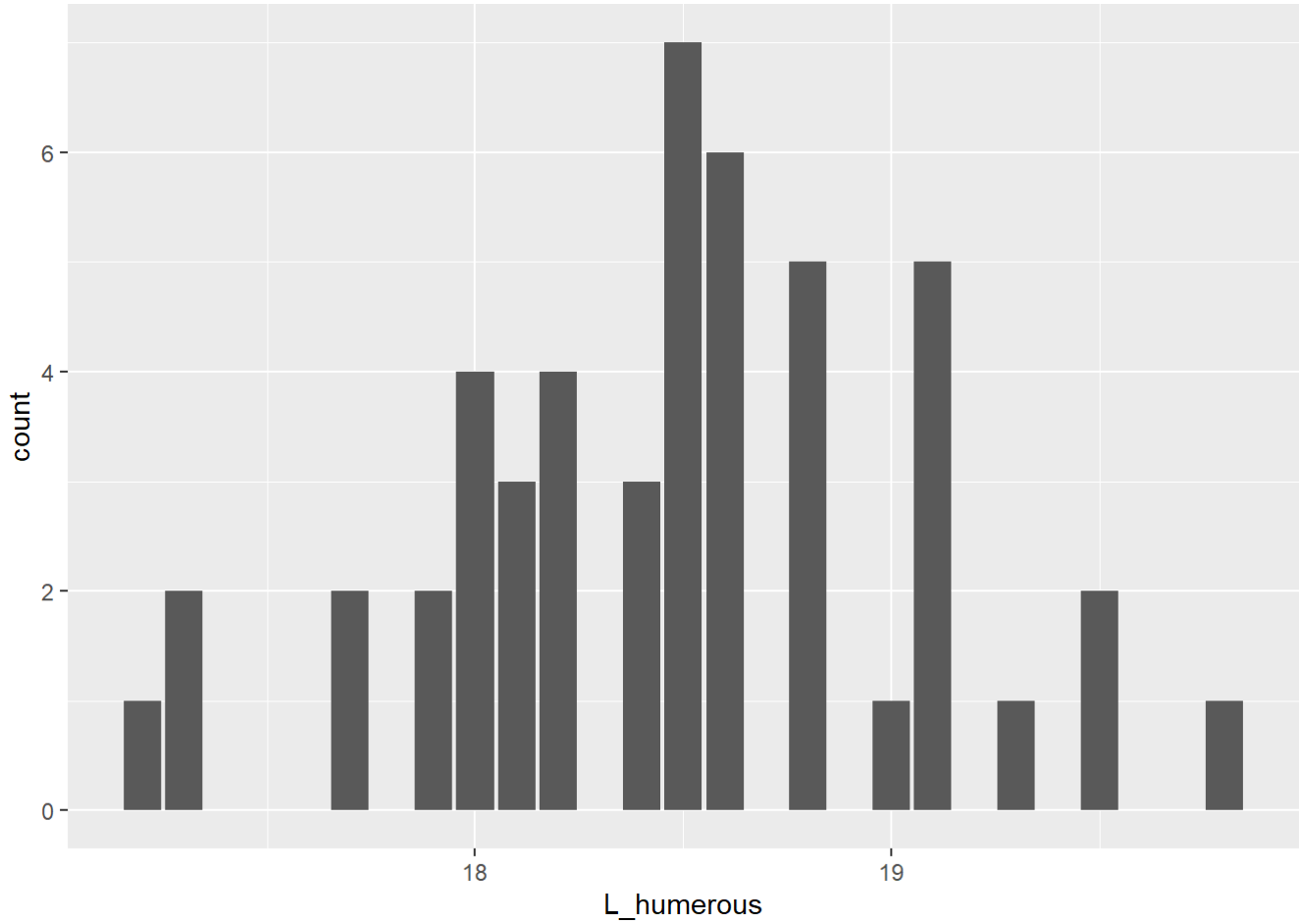



```
ggplot(sparr, aes(x=Total_length,y=L_humerous)) + xlim(150,170) + geom_point(colour="steelblue", pch=3) +
  labs(x="Length of the sparrow", y="Length of humerous in sparrows", title="Bumpus Sparrow Data")
```

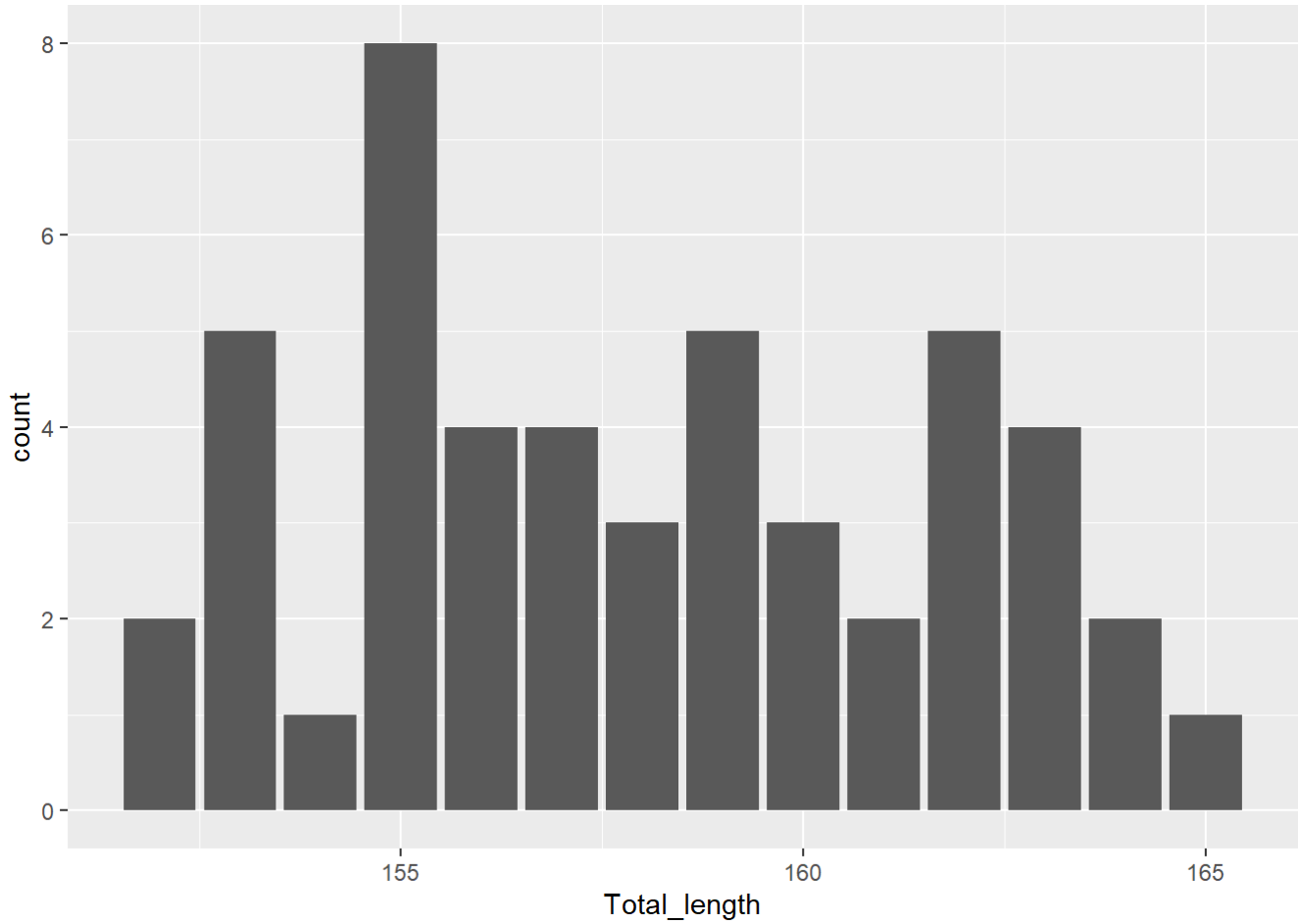


Bar chart

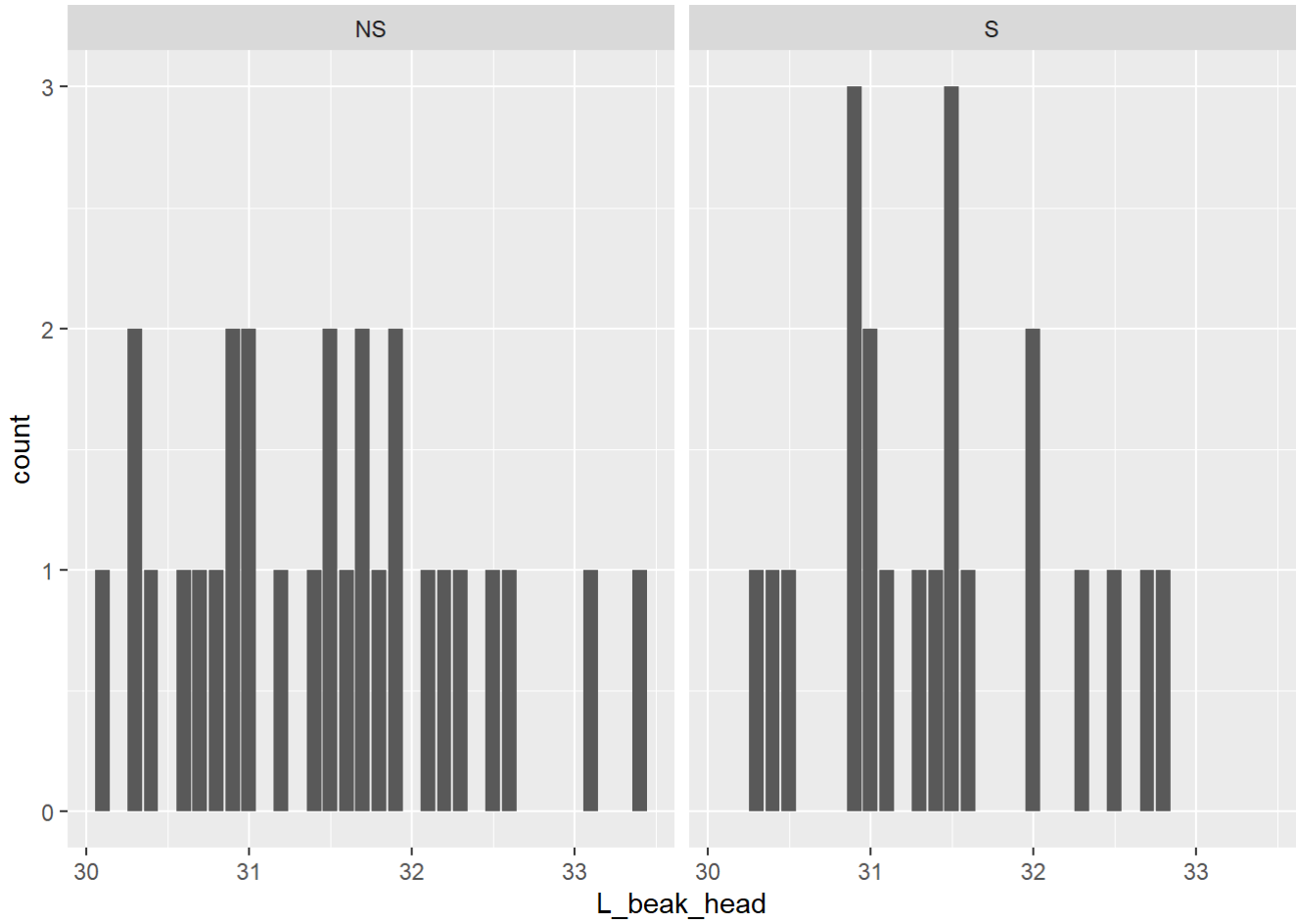
```
ggplot(sparr, aes(L_humerous)) + geom_bar(position="stack")
```



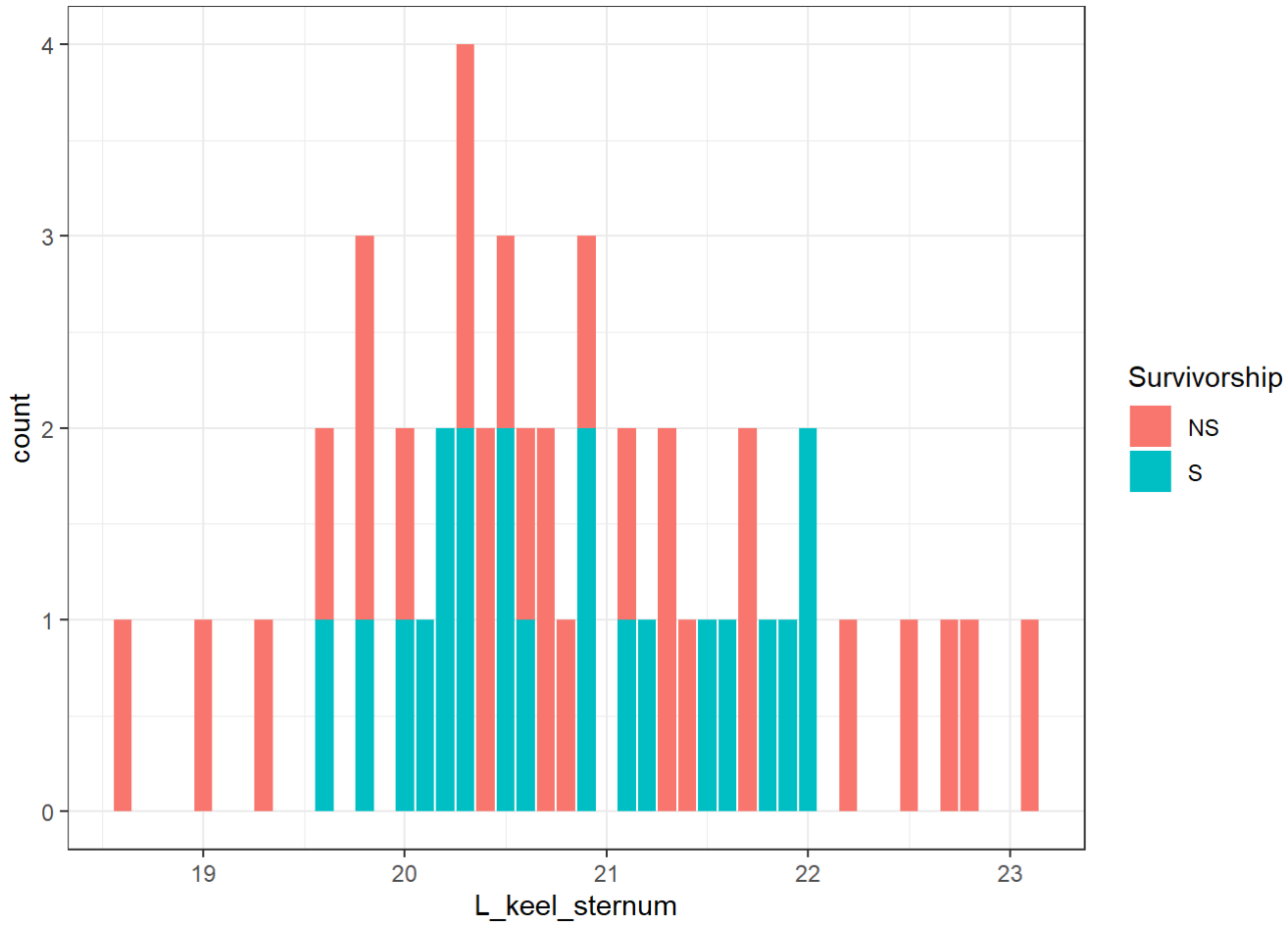

```
ggplot(sparr, aes(Total_length) )+ geom_bar(position="stack")
```



```
ggplot(sparr, aes(L_beak_head)) + facet_grid(.~Survivorship) + geom_bar(position="dodge")
```

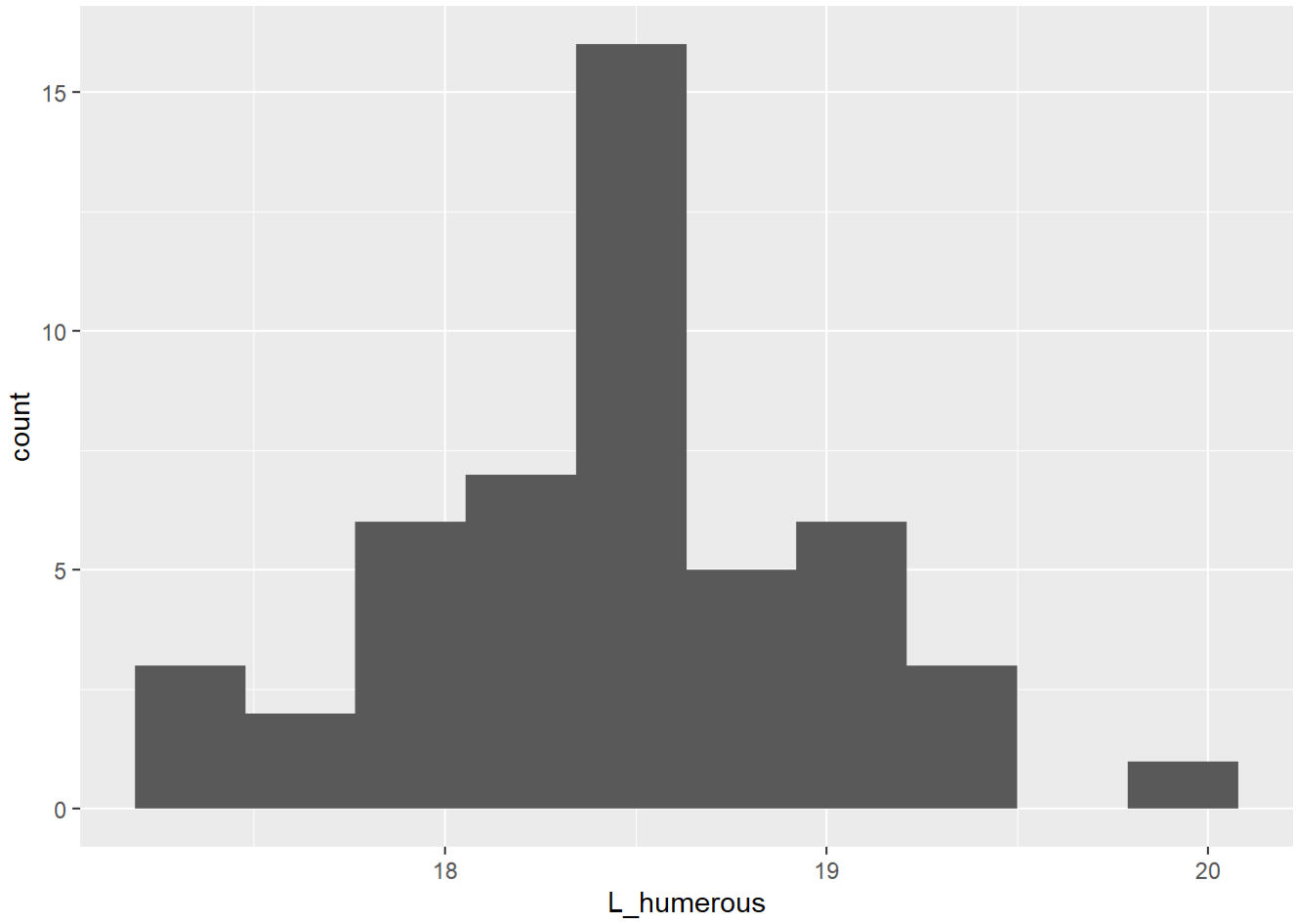



```
ggplot(sparr, aes(x=L_keel_sternum, fill=Survivorship)) + geom_bar()+theme_bw()
```



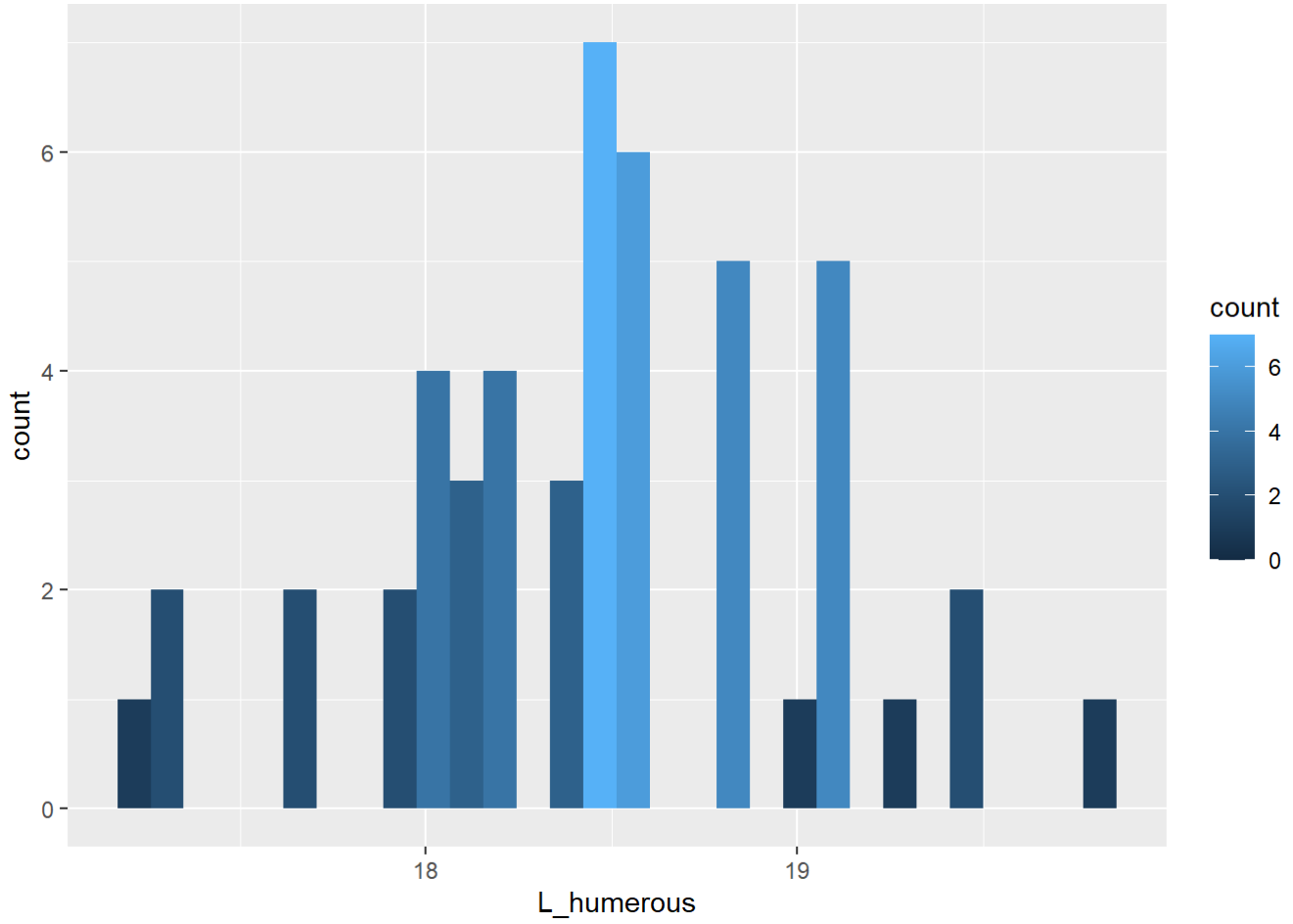
Histogram

```
ggplot(sparr, aes(L_humerous))+geom_histogram(bins=10)
```




```
ggplot(sparr, aes(L_humerous))+geom_histogram(aes(fill = after_stat(count)))
```

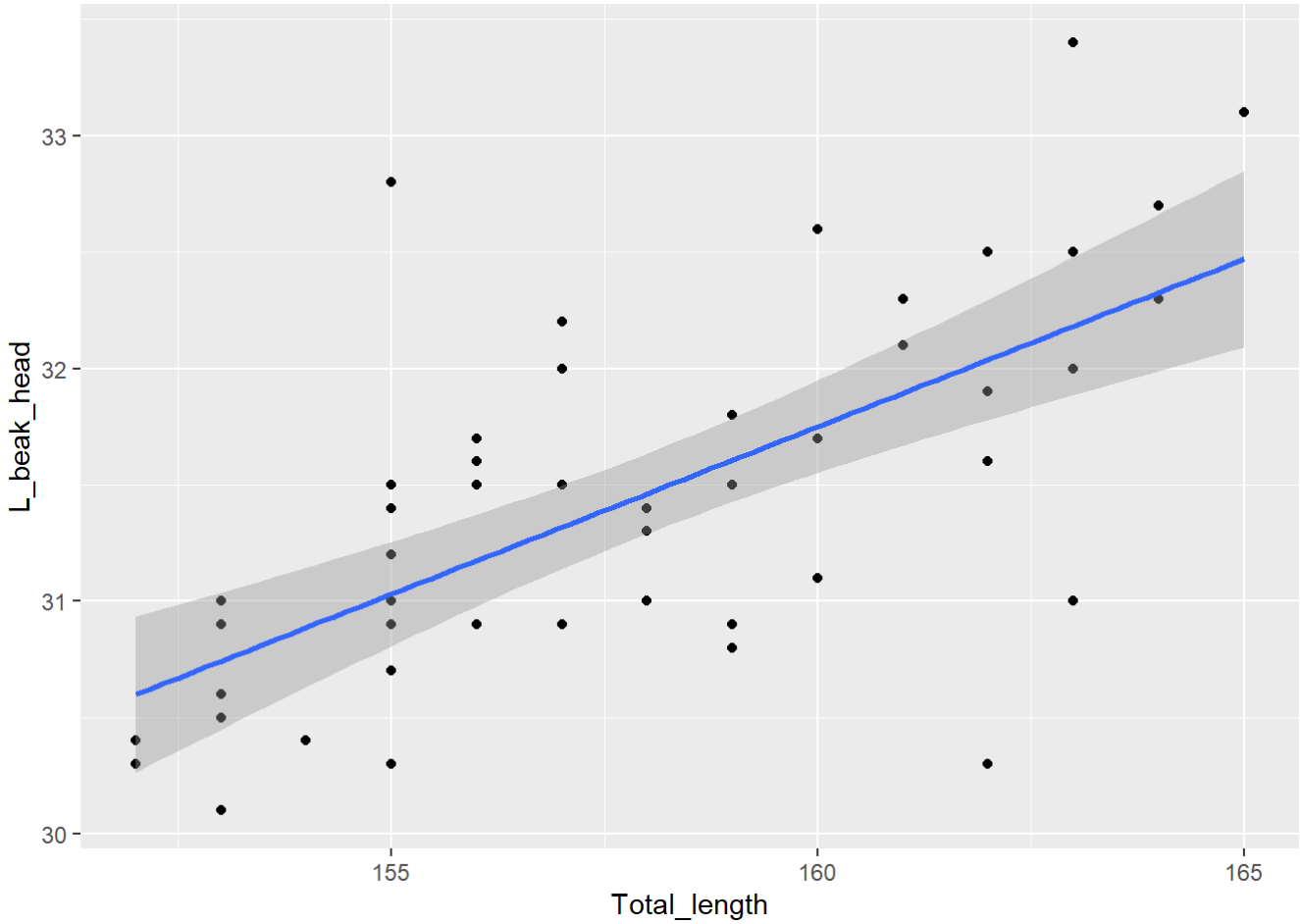
```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```



Regression

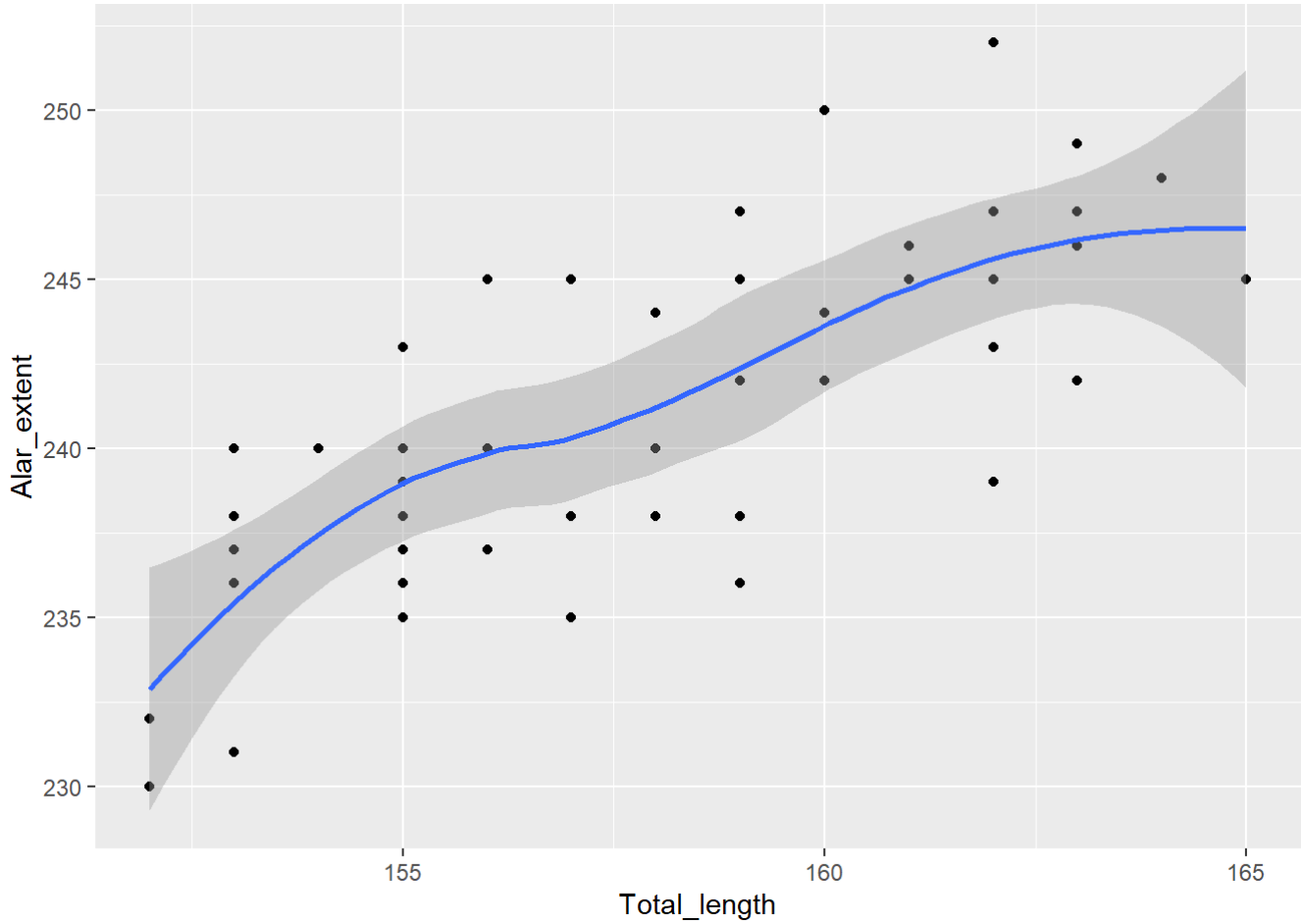
```
ggplot(sparr, aes(x=Total_length, y=L_beak_head)) + geom_point() + geom_smooth(method=lm)
```

```
## `geom_smooth()` using formula = 'y ~ x'
```



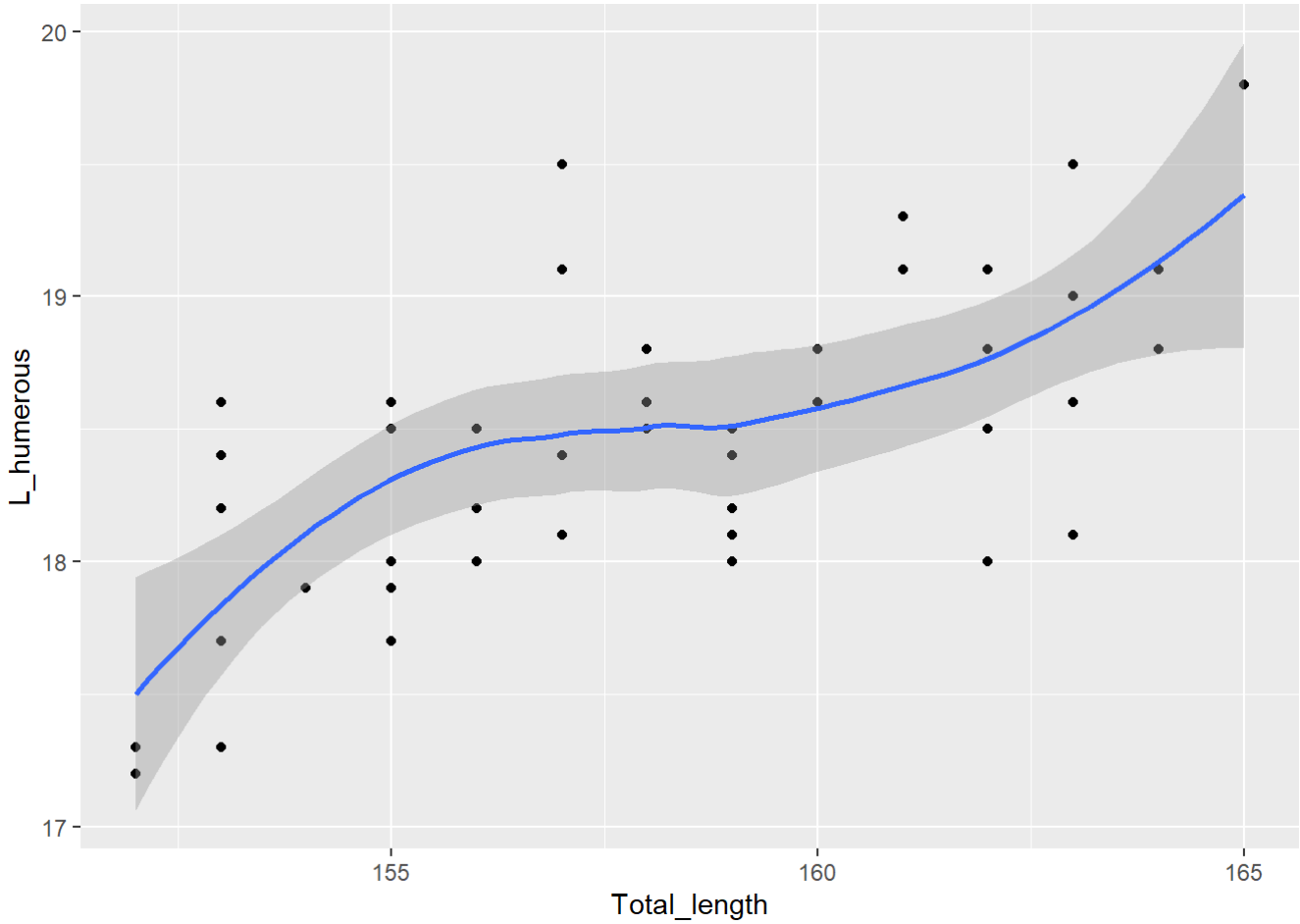

```
ggplot(sparr, aes(x=Total_length, y=Alar_extent)) + geom_point() + stat_smooth()
```

```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```



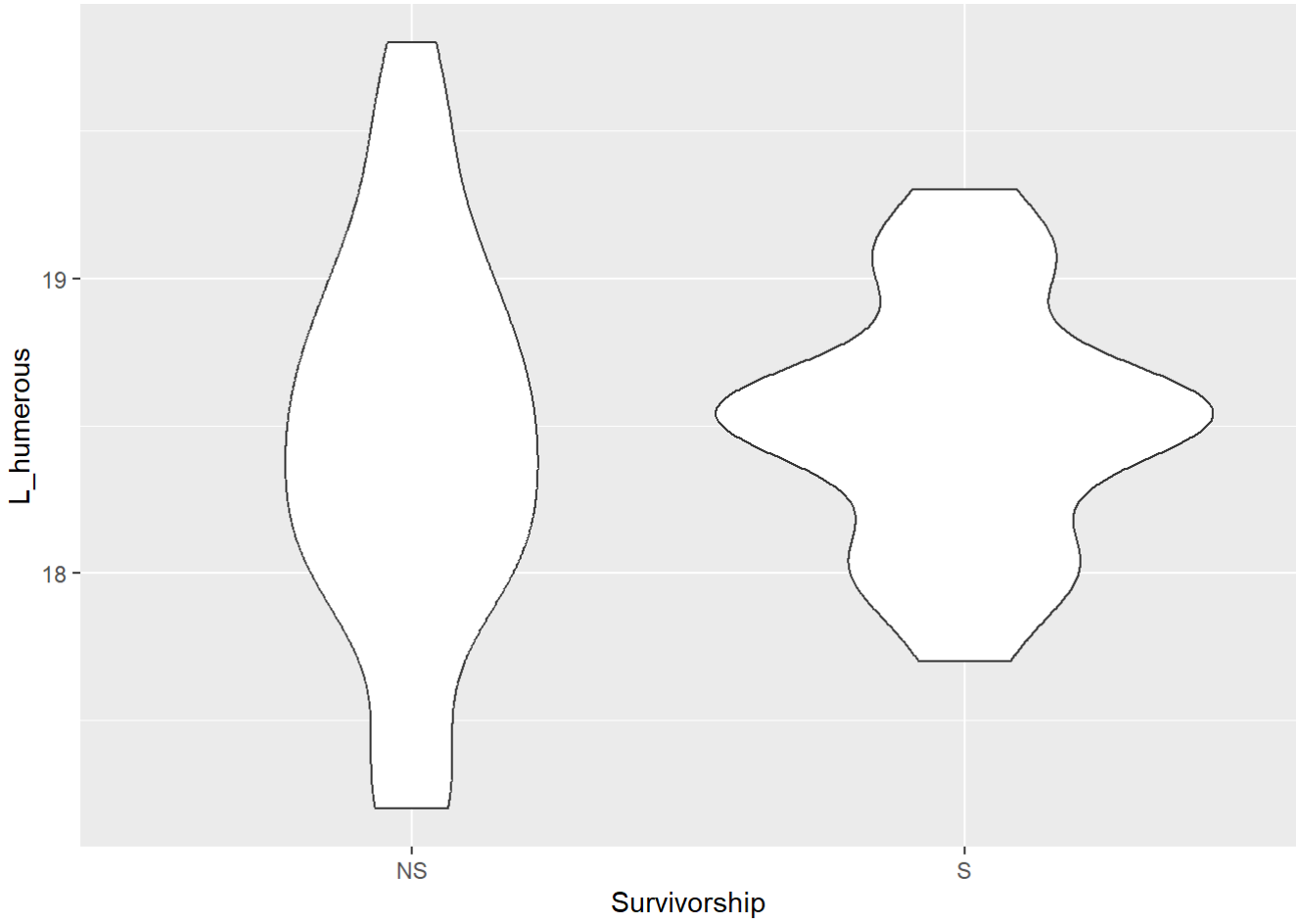

```
ggplot(sparr, aes(x=Total_length, y=L_humerous)) + geom_point() + stat_smooth()
```

```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```

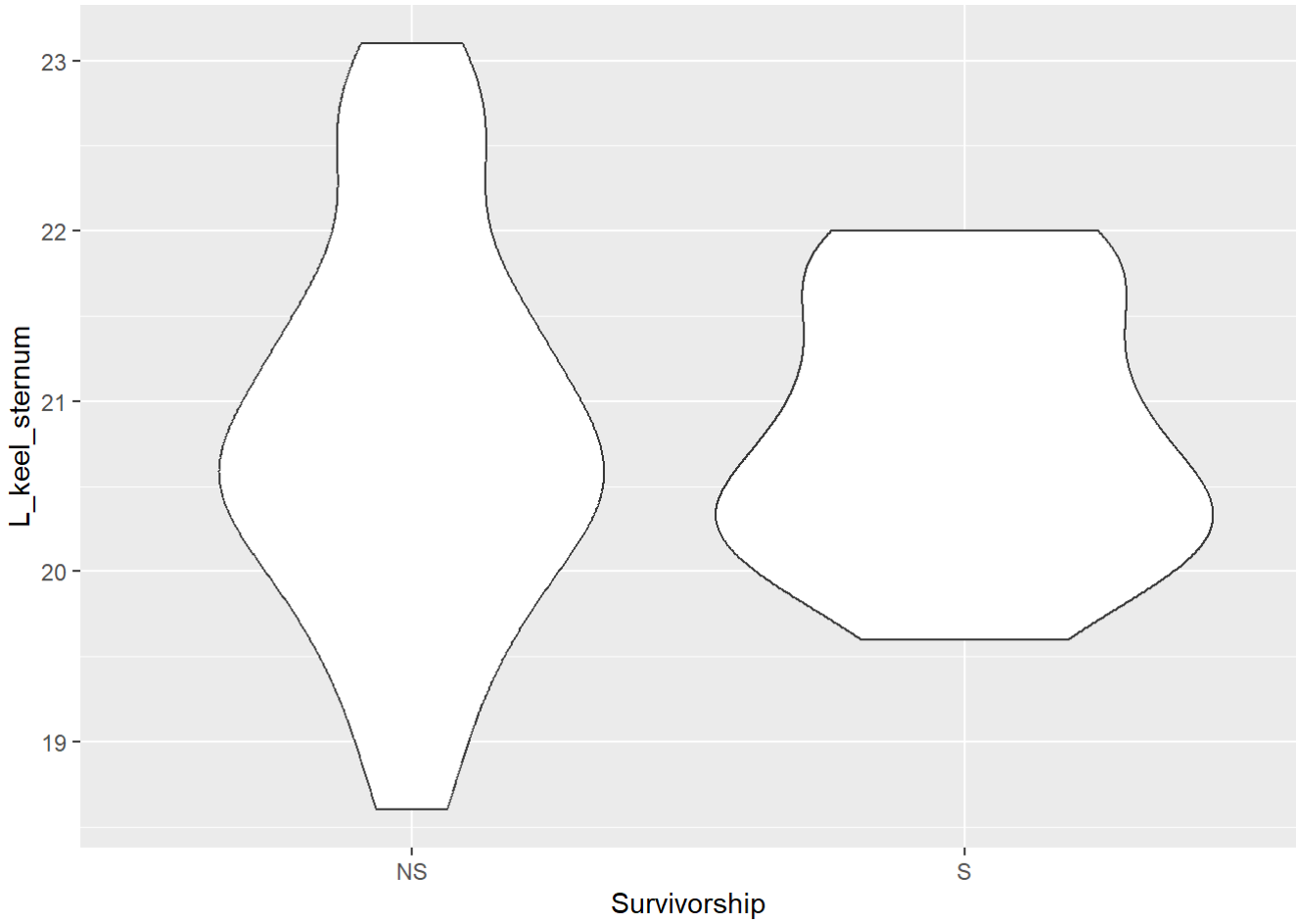


Violin Plot

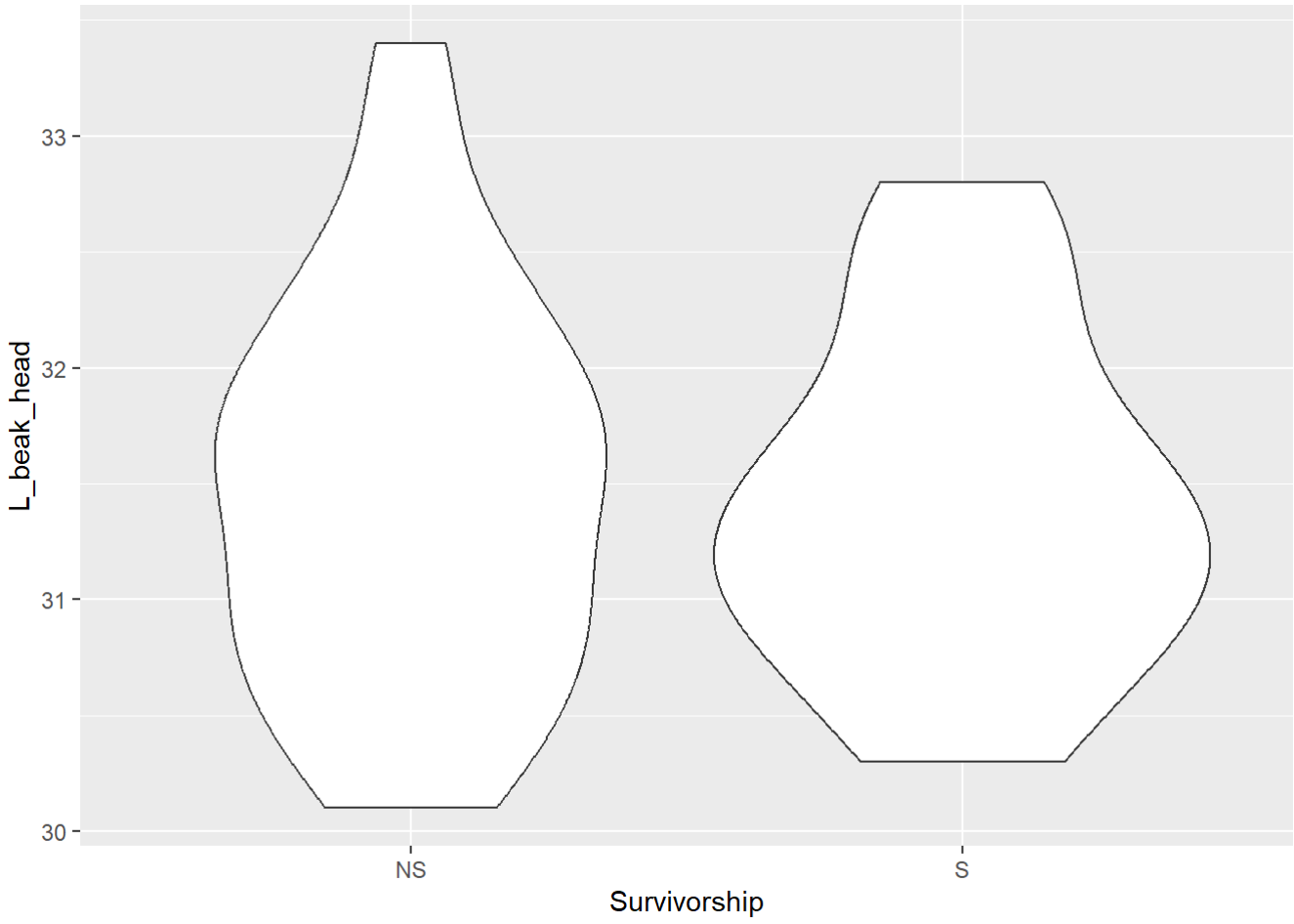
```
ggplot(sparr, aes(x=Survivorship, y=L_humerous)) + geom_violin()
```




```
ggplot(sparr, aes(x=Survivorship, y=L_keel_sternum)) + geom_violin()
```

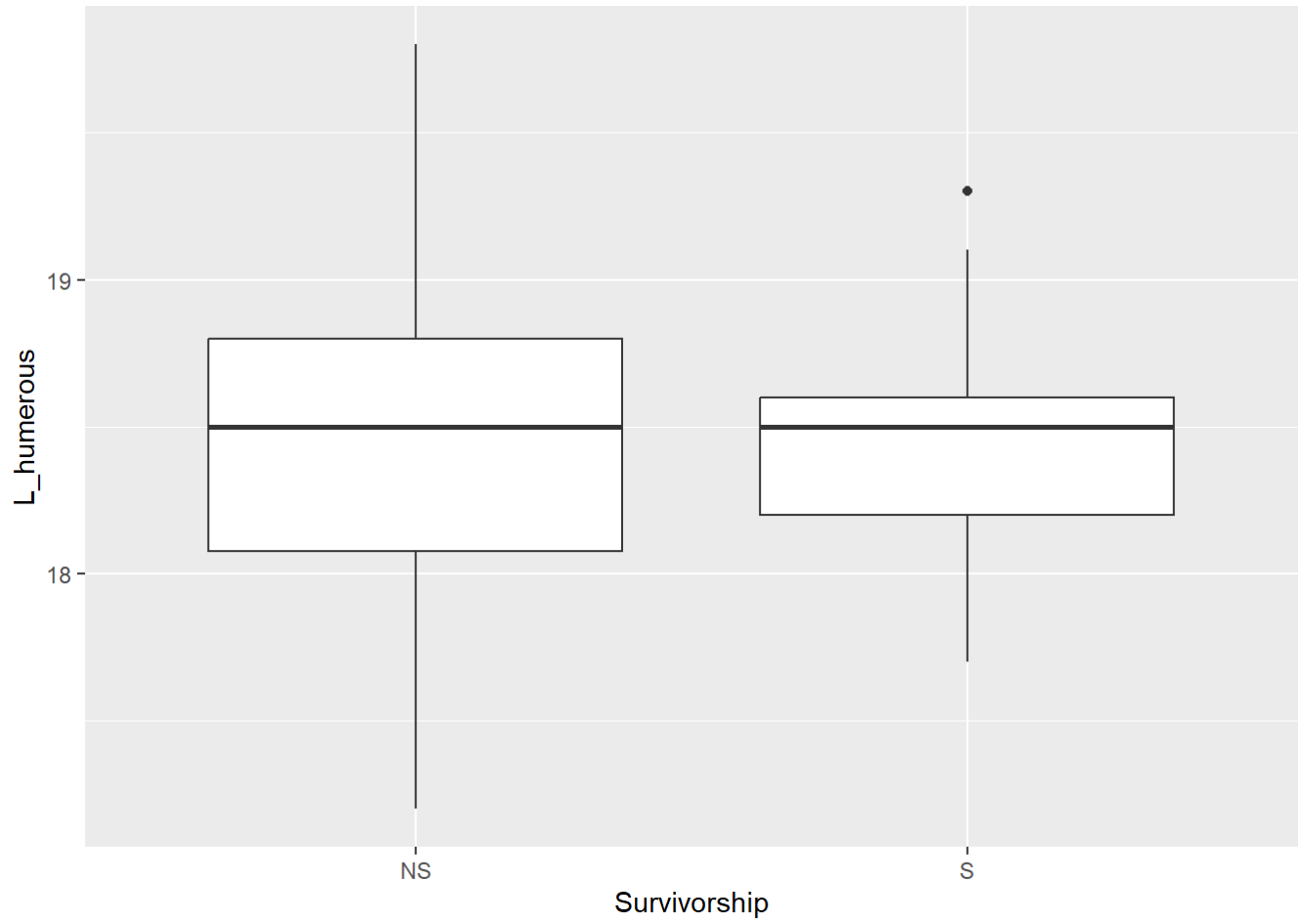


```
ggplot(sparr, aes(x=Survivorship, y=L_beak_head)) + geom_violin()
```

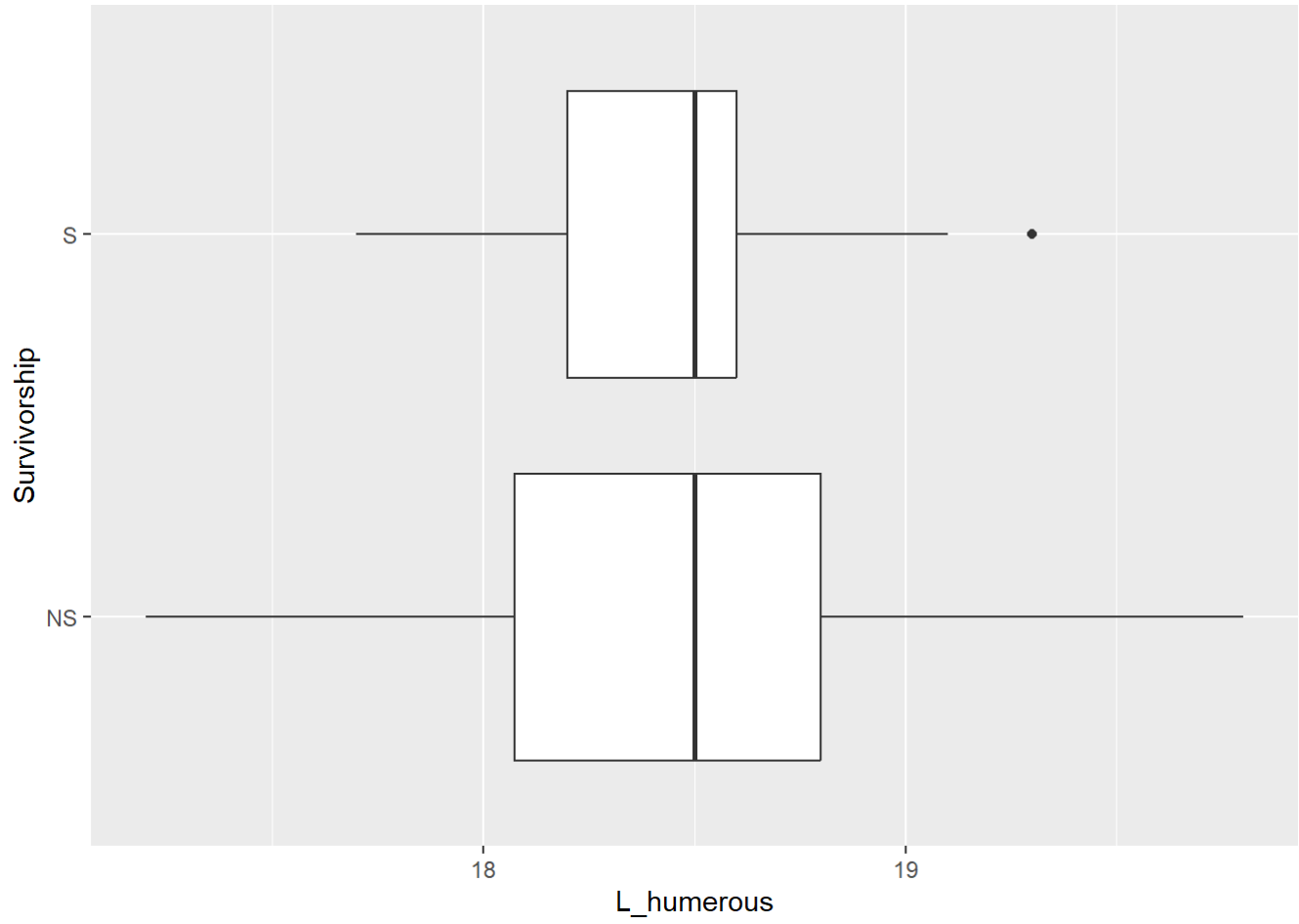


Box Plot

```
ggplot(sparr, aes(x=Survivorship, y=L_humerous)) + geom_boxplot()
```

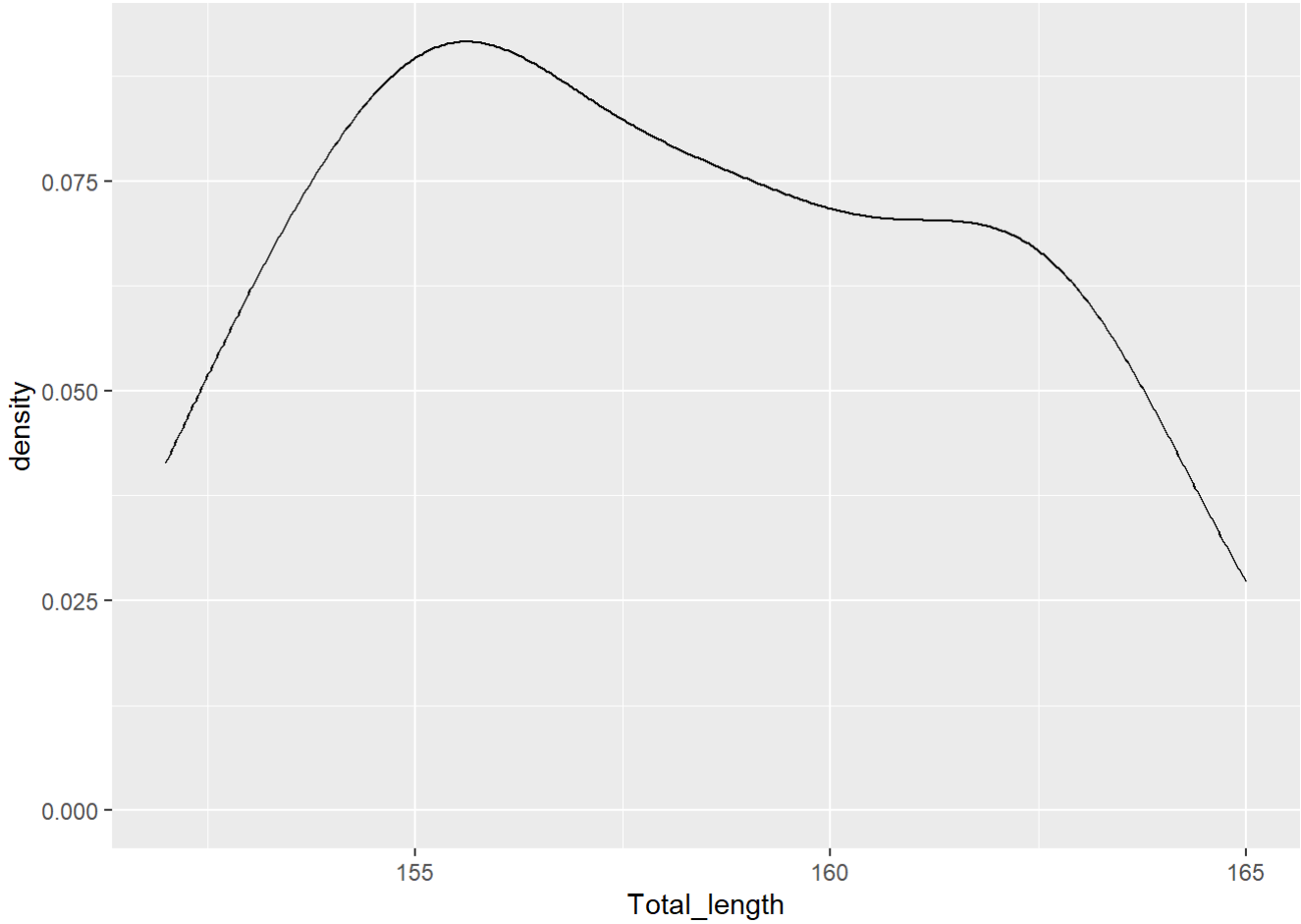



```
ggplot(sparr, aes(x=Survivorship, y=L_humerous)) + geom_boxplot() + coord_flip()
```

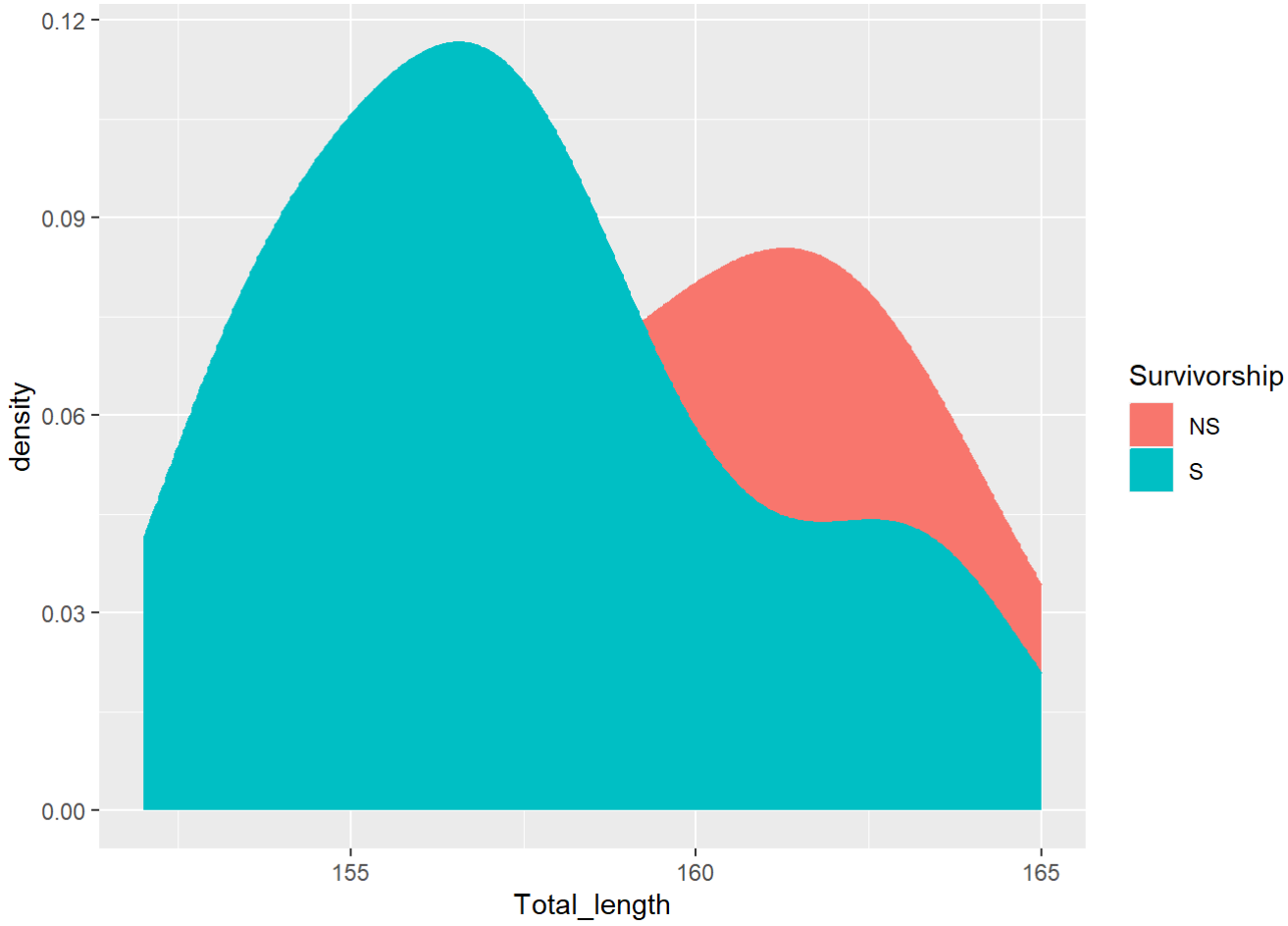


Density Plot and ggridges

```
ggplot(sparr, aes(x=Total_length)) + geom_density()
```

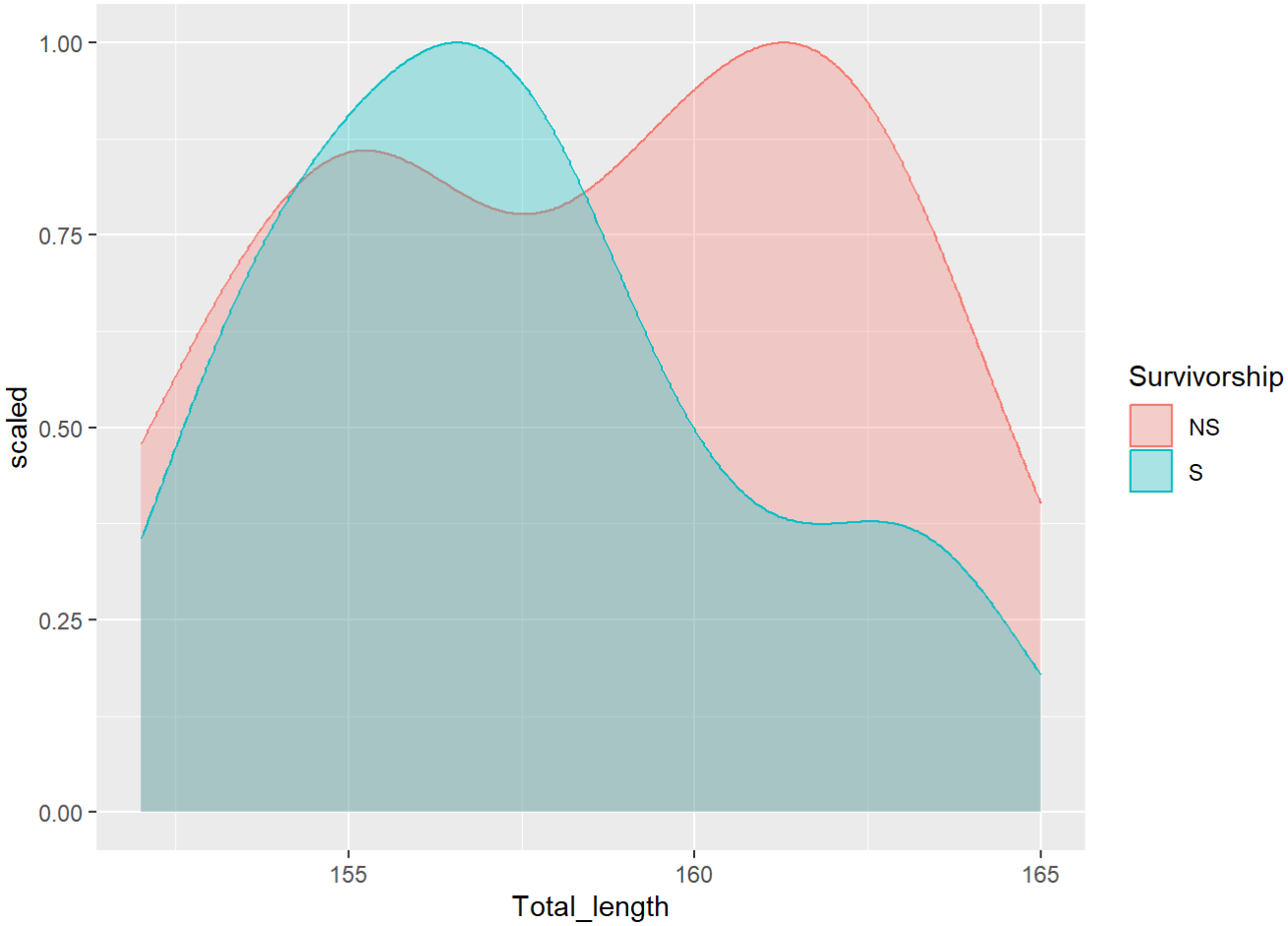



```
ggplot(sparr, aes(x=Total_length, fill=Survivorship, color=Survivorship)) + geom_density()
```



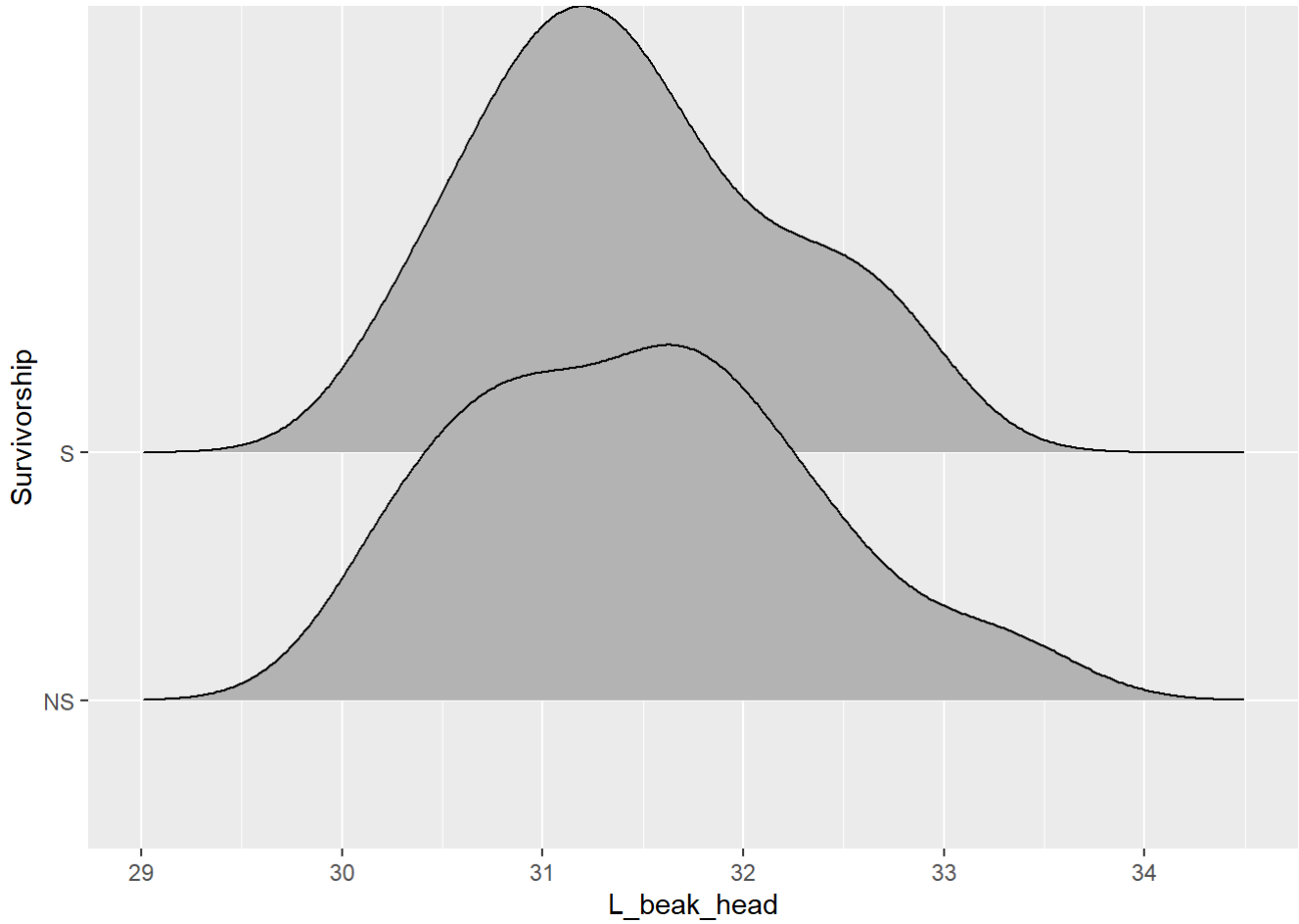

```
ggplot(sparr, aes(x=Total_length, fill=Survivorship, color=Survivorship)) + geom_density(alph
a=0.3, aes(y=..scaled..))
```

```
## Warning: The dot-dot notation (`..scaled..`) was deprecated in ggplot2 3.4.0.
## ℹ Please use `after_stat(scaled)` instead.
```

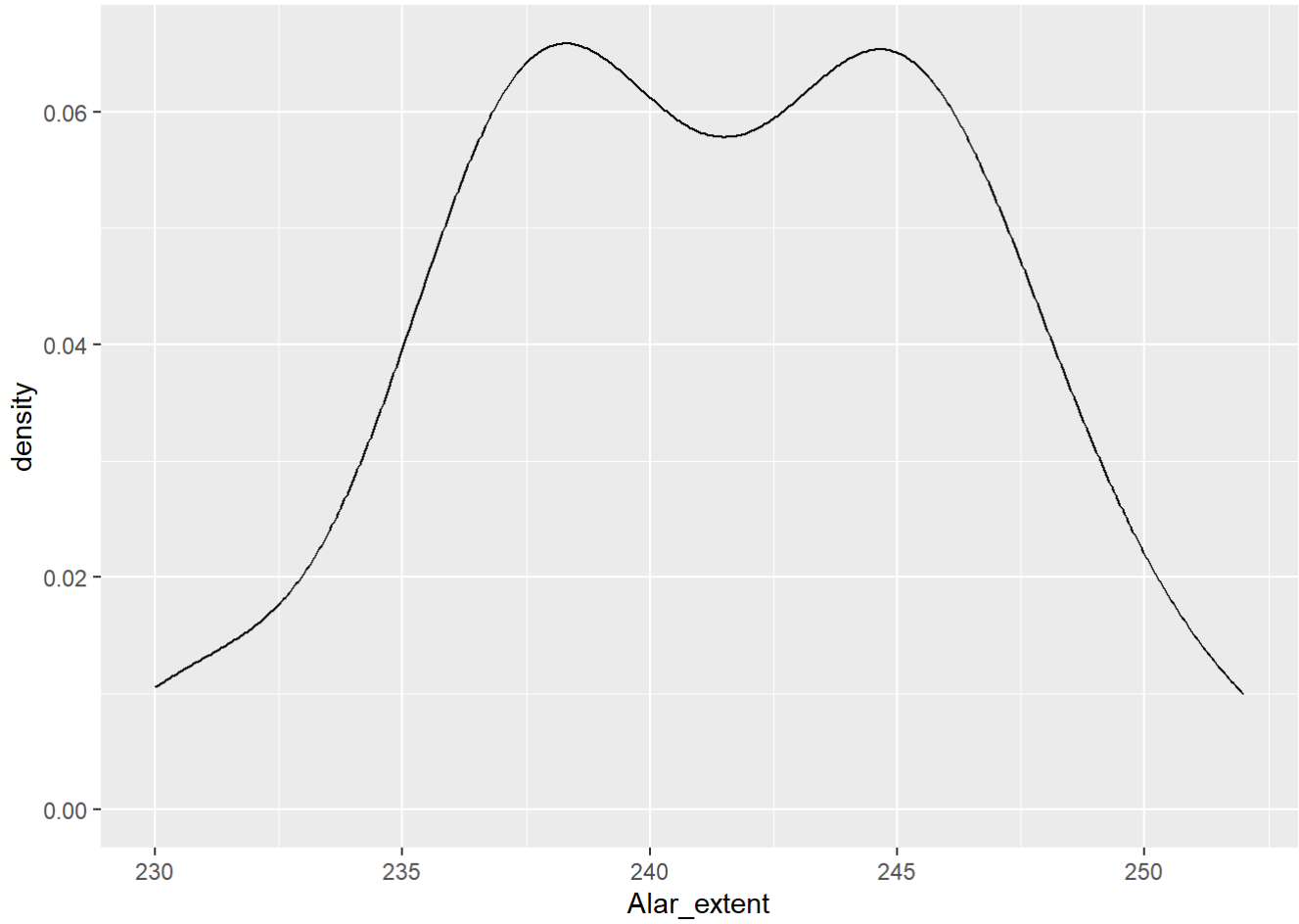



```
ggplot(sparr, aes(x=L_beak_head, y=Survivorship)) + geom_density_ridges()
```

```
## Picking joint bandwidth of 0.364
```

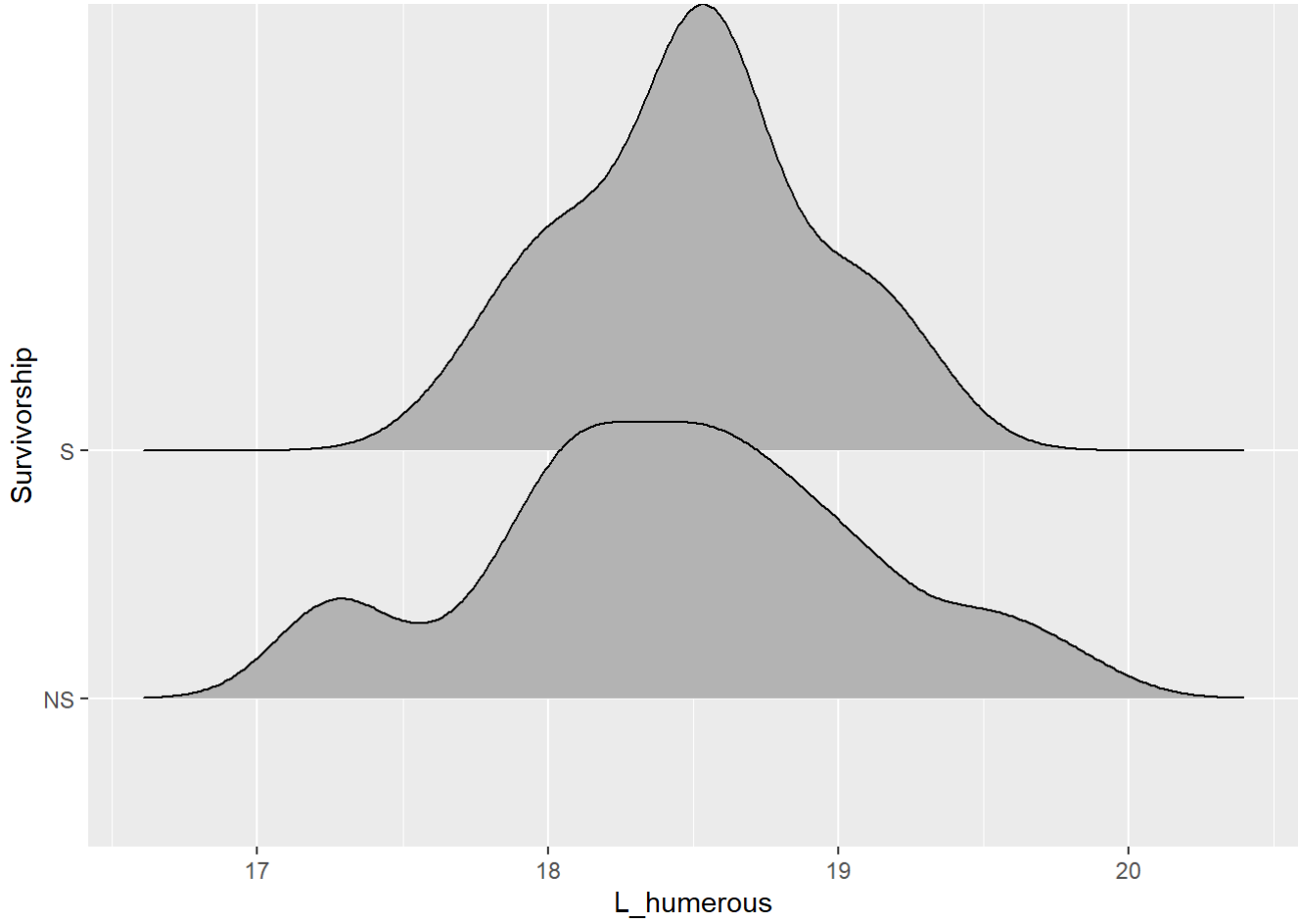



```
ggplot(sparr, aes(x=Alar_extent)) + geom_density()
```



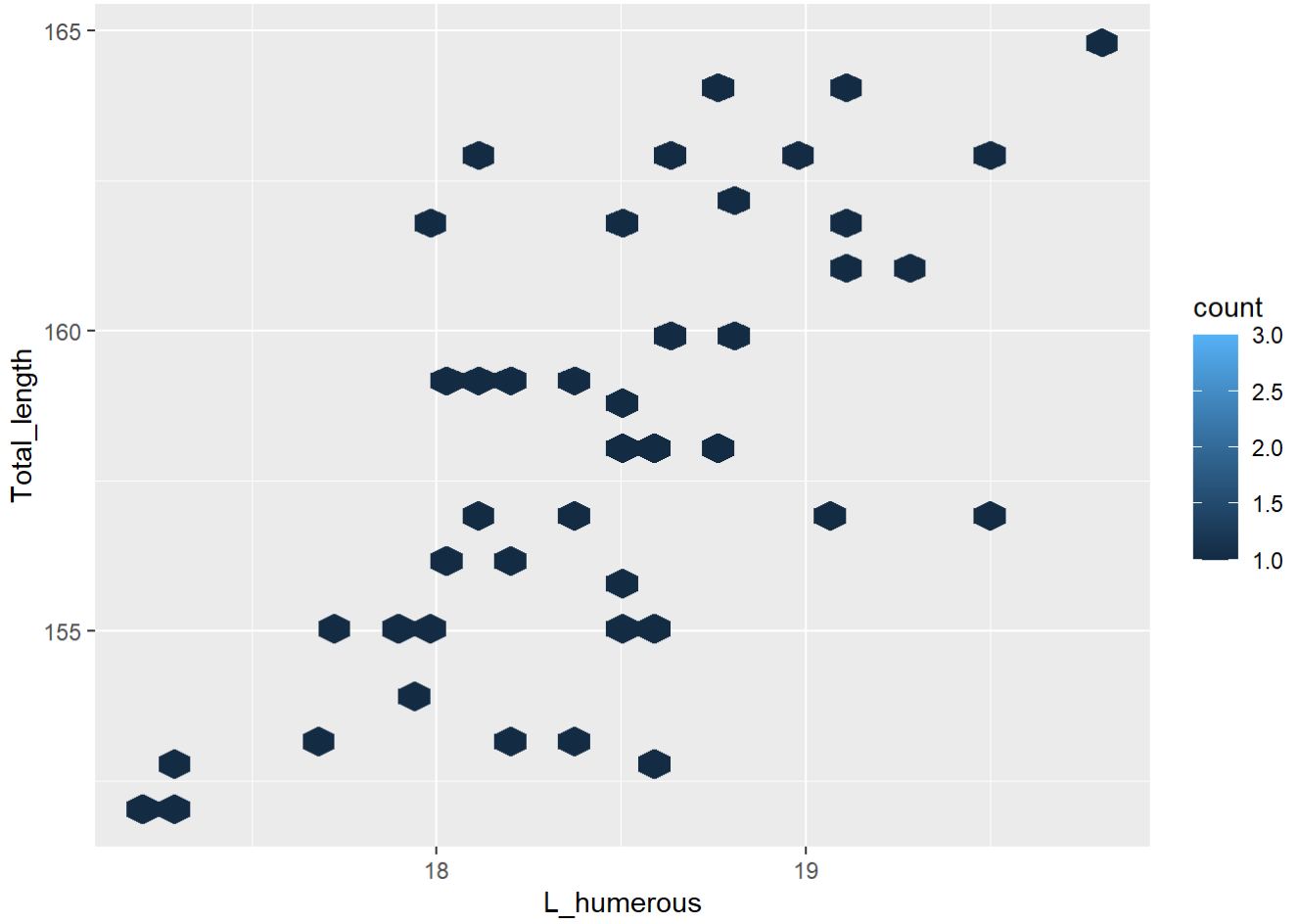
```
ggplot(sparr, aes(x=L_humerous, y=Survivorship)) + geom_density_ridges()
```

```
## Picking joint bandwidth of 0.198
```



Hexbin

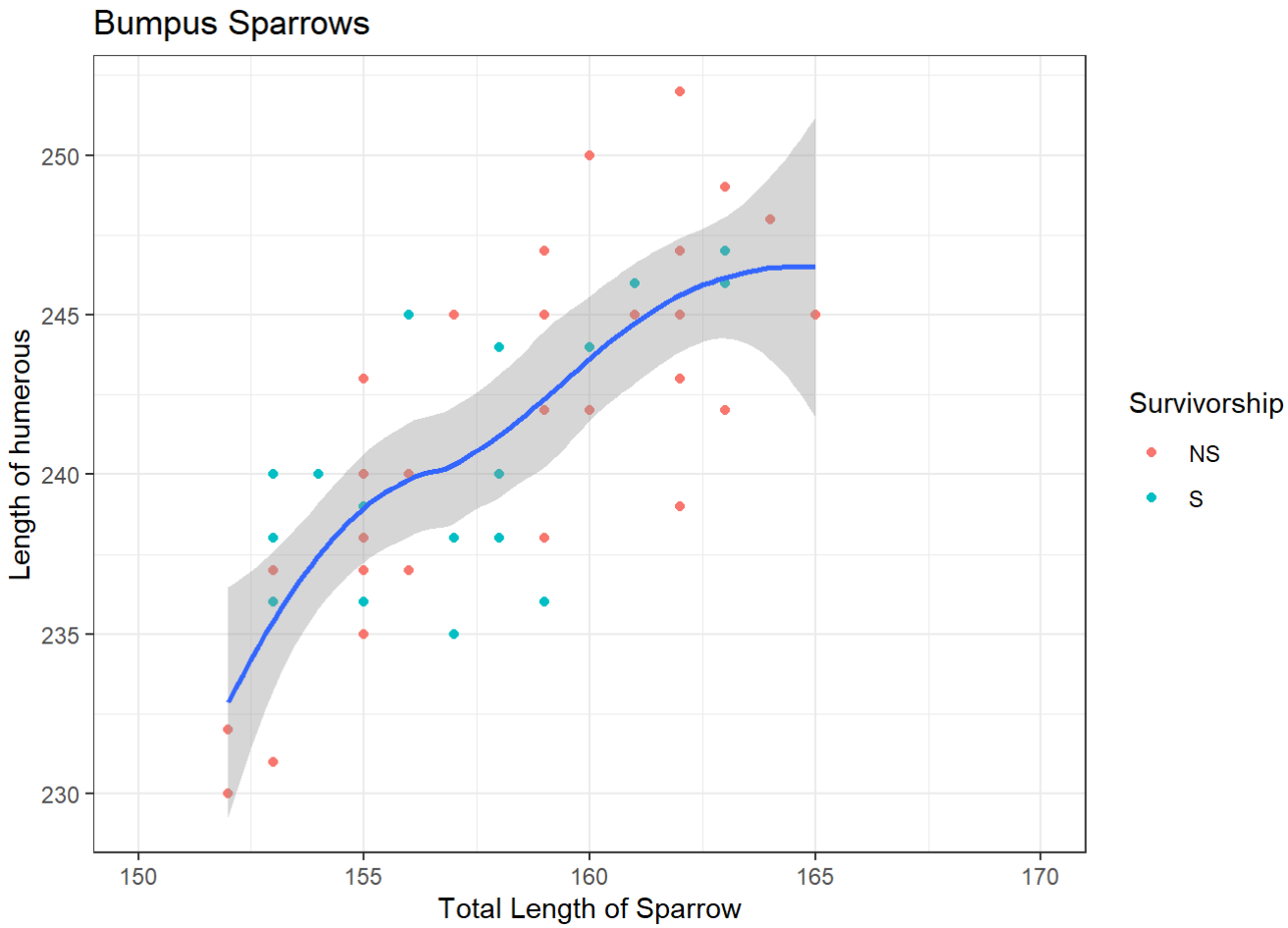
```
ggplot(sparr, aes(x=L_humerous, y=Total_length)) + geom_hex()
```



Ggthemes

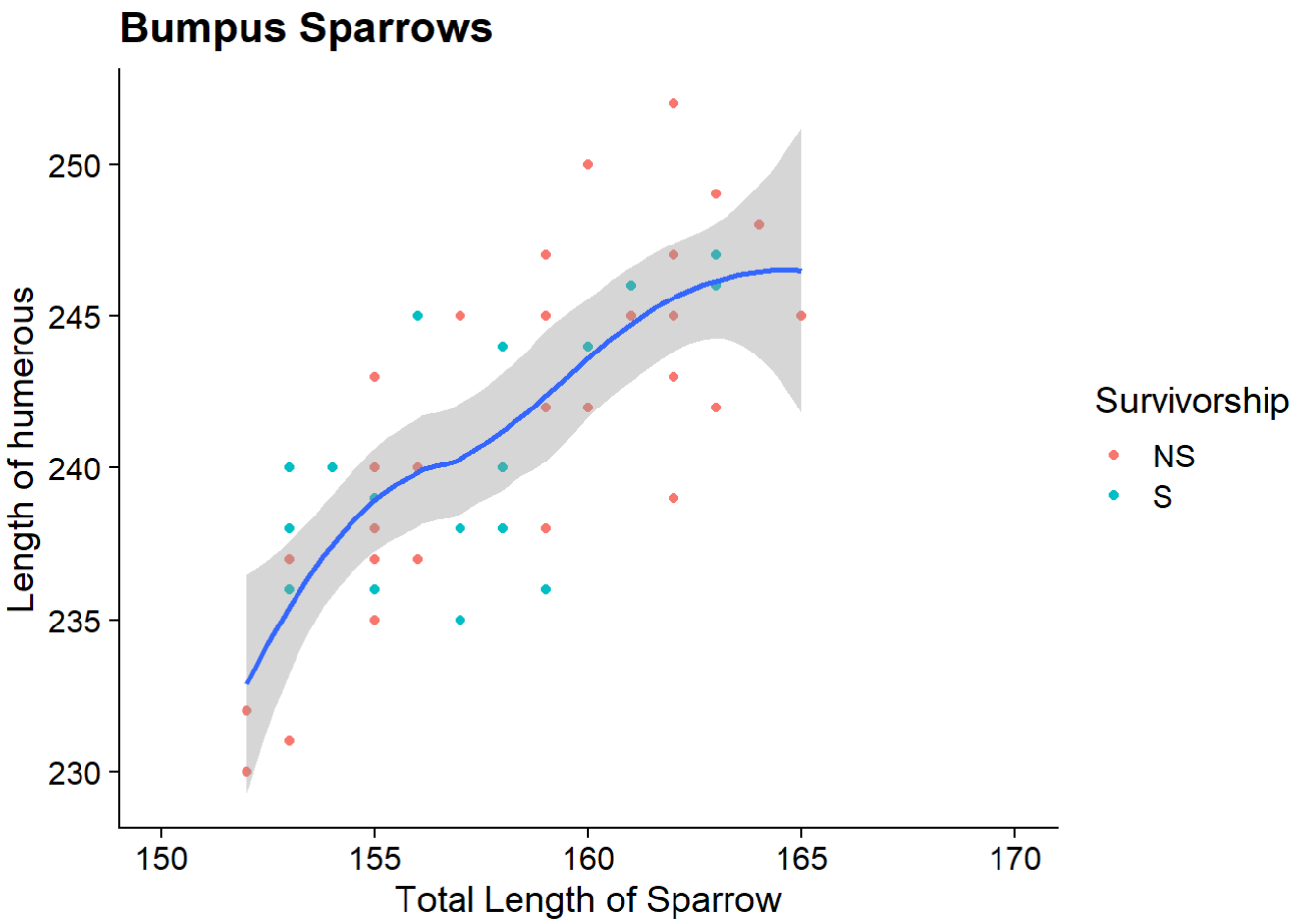
```
# with ggthemes (see also ggsci, ggthemr)
lastplot <- ggplot(sparr, aes(x=Total_length,y=Alar_extent)) + xlim(150,170) + geom_point(aes
(color=Survivorship)) + stat_smooth() +
  labs(x="Total Length of Sparrow", y="Length of humerous", title="Bumpus Sparrows")

lastplot + theme_bw()
```

```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```



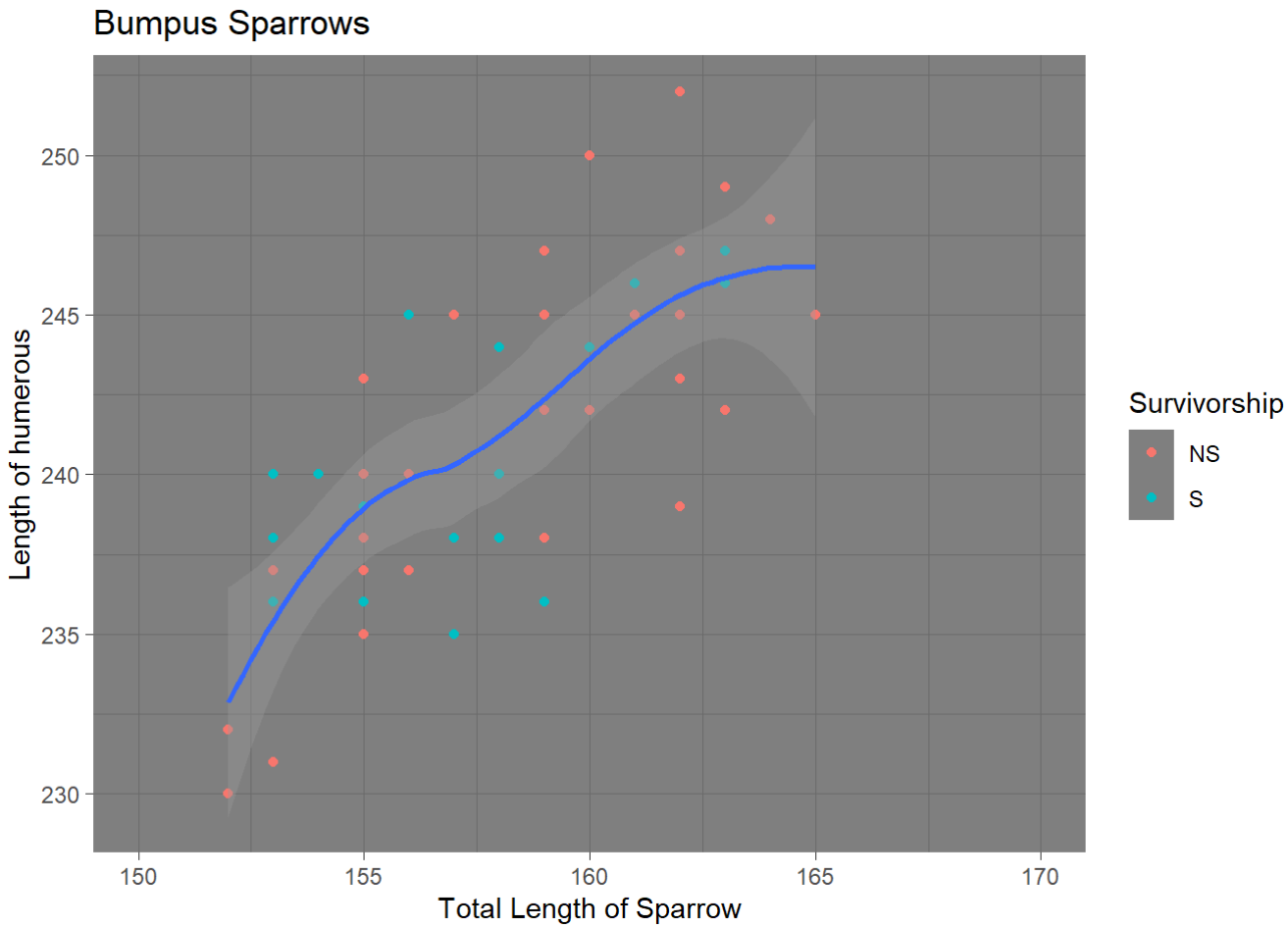

```
lastplot + theme_cowplot()
```

```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```



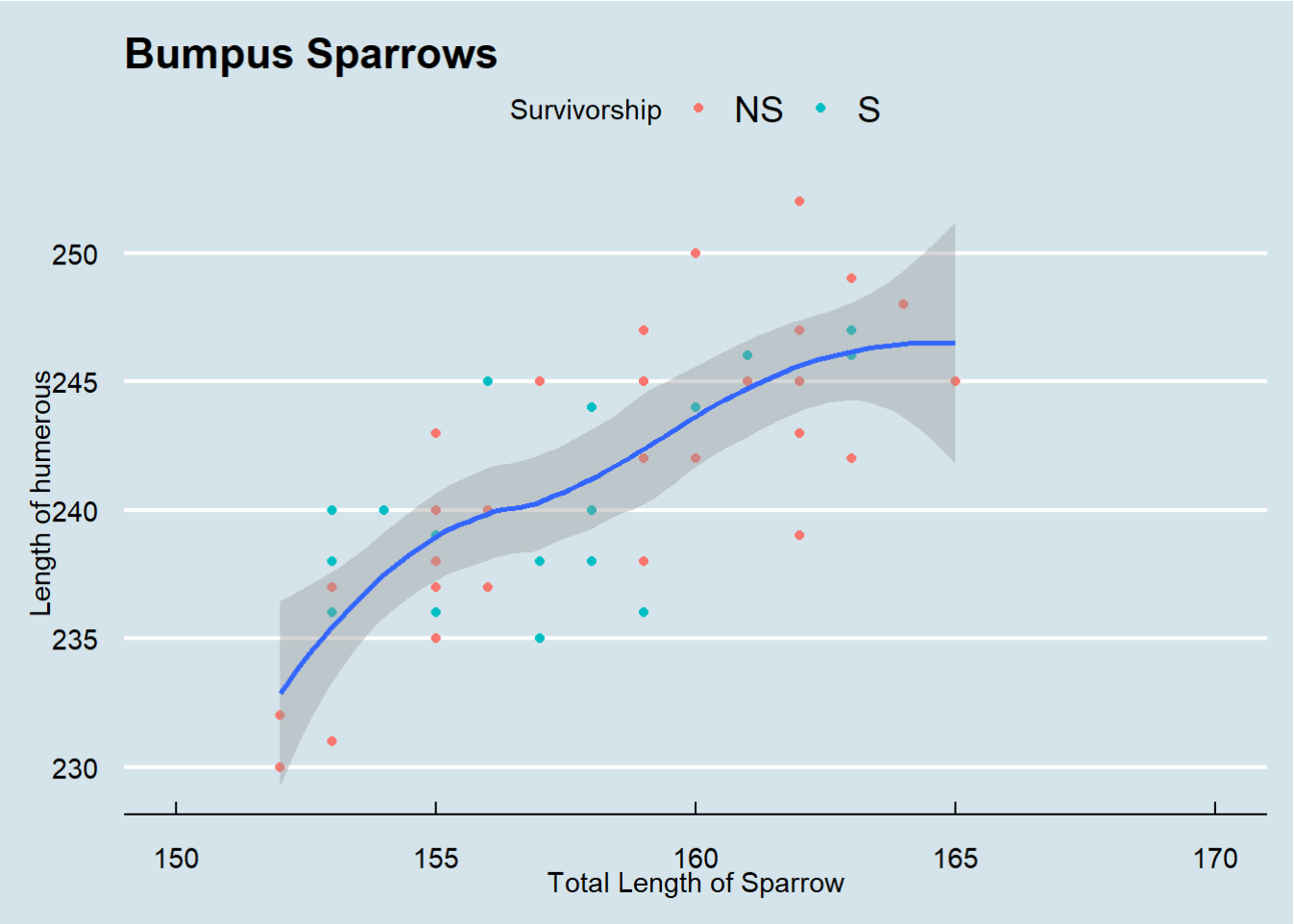

```
lastplot + theme_dark()
```

```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```



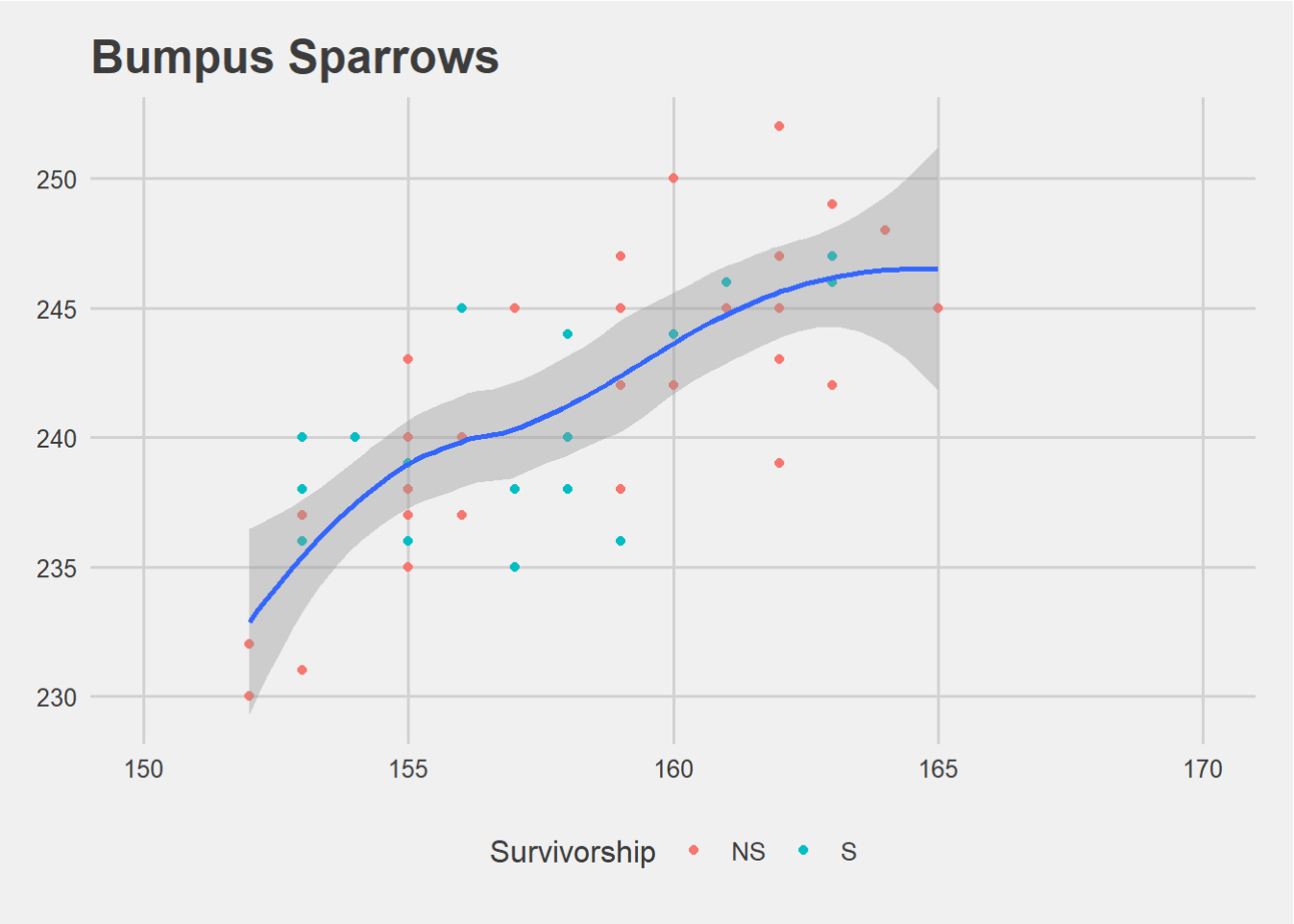

```
lastplot + theme_economist()
```

```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```



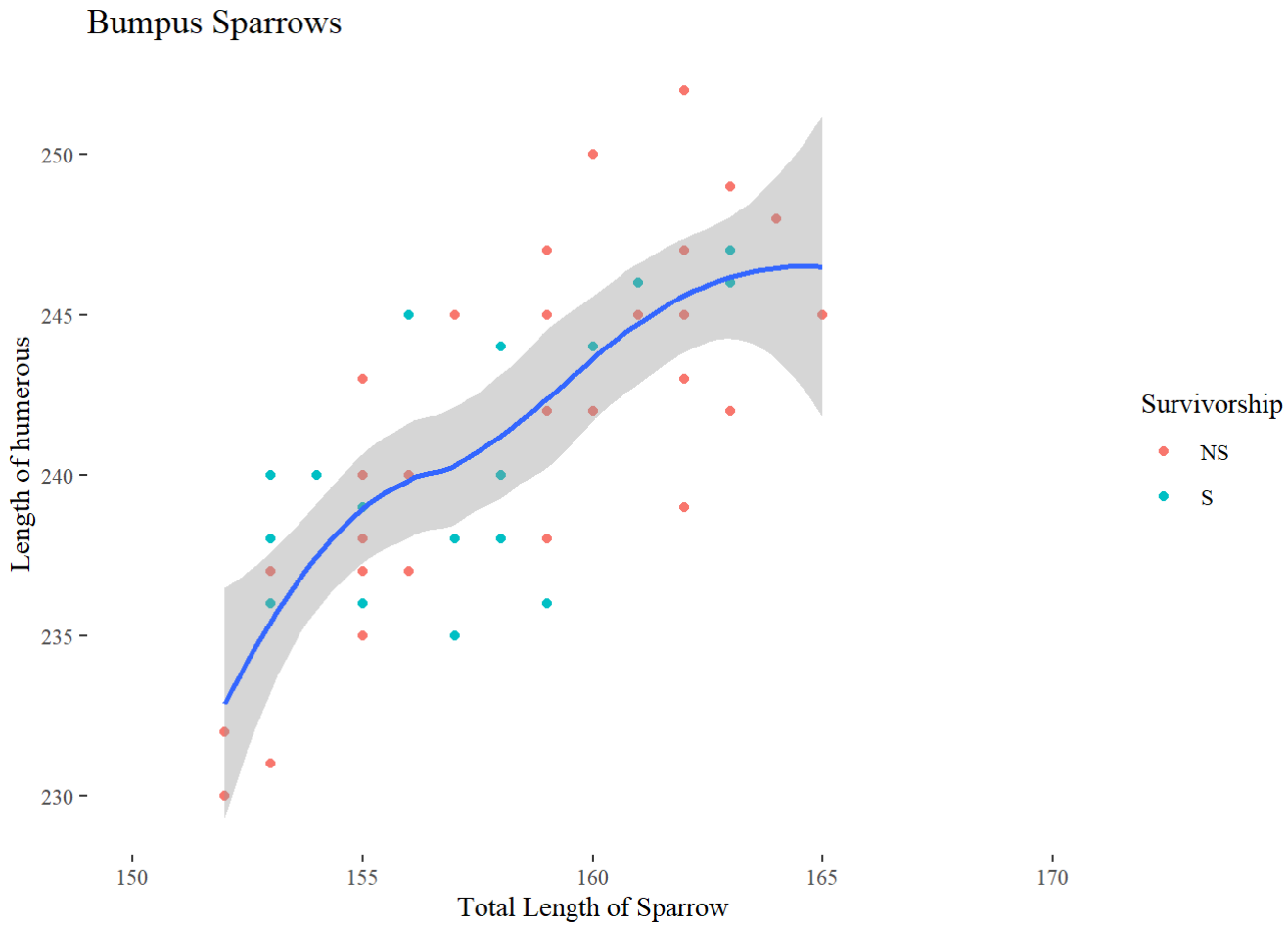

```
lastplot + theme_fivethirtyeight()
```

```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```



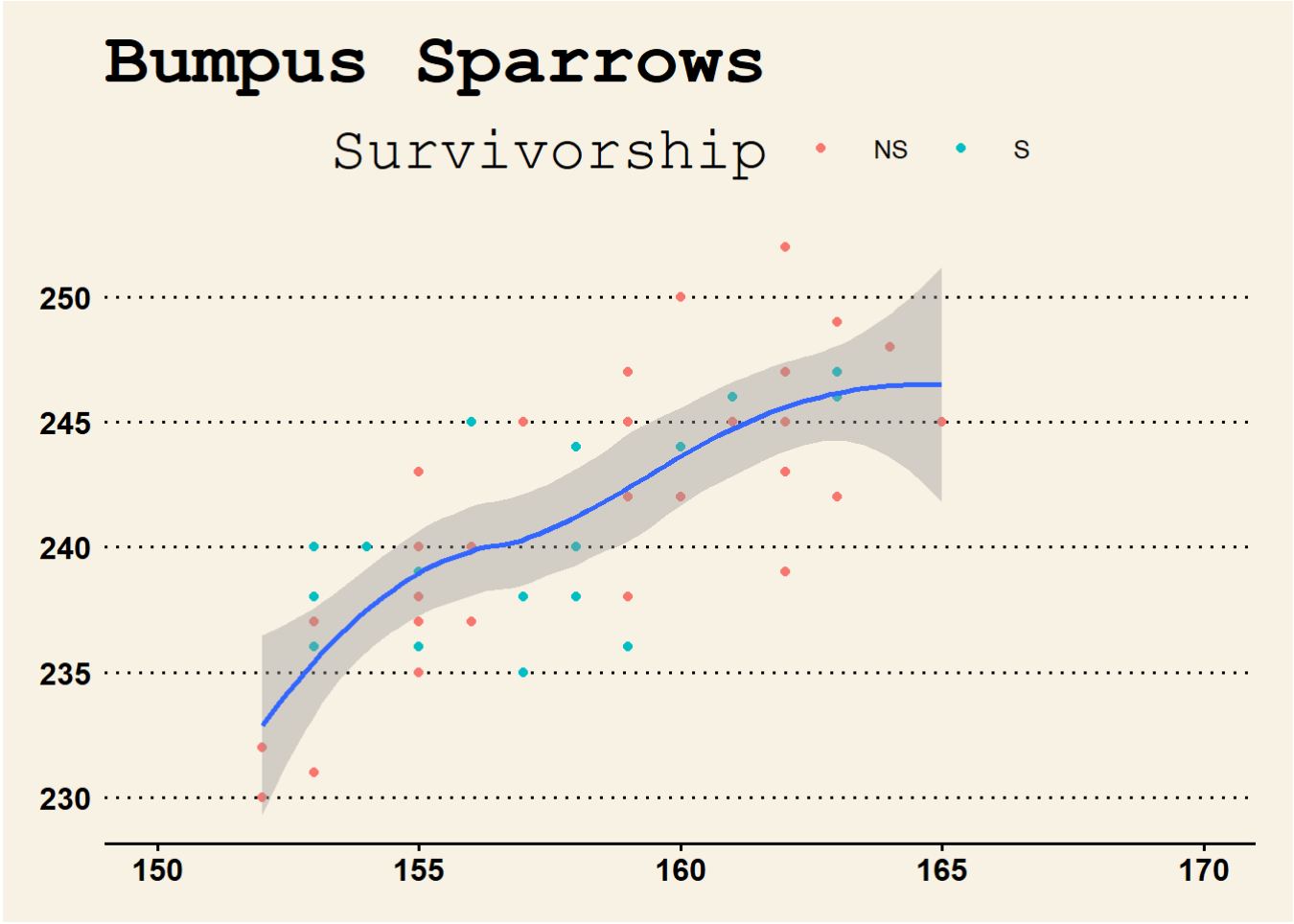

```
lastplot + theme_tufte()
```

```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```




```
lastplot + theme_wsj()
```

```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```



Based on plotting all the above, we can analyze that the birds with lengths in the extremes did not survive.Though, the birds which survived, all of them had the lengths in the average range.However, we cannot say a range in which the birds will die or survive cause we need to analyze more..