

Common Loon Data Tidying

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Loading the Packages and Data

```
library(tidyverse)
```

```
## -- Attaching core tidyverse packages ----- tidyverse 2.0.0 --
## v dplyr      1.1.2      v readr      2.1.4
## v forcats    1.0.0      v stringr   1.5.0
## v ggplot2    3.4.2      v tibble    3.2.1
## v lubridate  1.9.2      v tidyr     1.3.0
## v purrr      1.0.1
## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()     masks stats::lag()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

```
library(lubridate)
```

Loading Data - 2023

```
#2023
all_bird_untidy_2023 <- read_csv("loons_2023.csv")

## Rows: 577 Columns: 33
## -- Column specification -----
## Delimiter: ","
## chr  (19): date, tide, cal, location, species, latitude, longitude, meters_o...
## dbl  (12): year, month, day, tide_percentage, number, temperature, wind_spe...
## lgl   (1): shelter_gradient
## time  (1): time
##
## 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.
```

```
loons_2023 <- read_csv("loons_2023.csv")
```

```
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```

```
## Delimiter: ","
## chr (19): date, tide, cal, location, species, latitude, longitude, meters_o...
## dbl (12): year, month, day, tide_percentage, number, temperature, wind_spee...
## lgl (1): shelter_gradient
## time (1): time
##
## 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.
```

```
#2024
loons_2024 <- read_csv("loons_2024.csv")
```

```
## Rows: 775 Columns: 31
## -- Column specification -----
## Delimiter: ","
## chr (19): date, tide, location, species, latitude, behavior, sex, behavior_...
## dbl (11): number, longitude, meters_offshore, temperature, wind_speed, baro...
## time (1): time
##
## 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.
```

Tidying the Data

Exposure

```
#assigning exposure level to locations
loons_2023 <- loons_2023 %>%
  mutate(shelter_gradient = case_when(location == "BAR HARBOR PIER" ~ "exposed",
                                     location == "SEAL HARBOR BEACH" ~ "moderate",
                                     location == "BRACY HARBOR" ~ "moderate",
                                     location == "NORTHEAST HARBOR" ~ "moderately_sheltered",
                                     location == "SOMES SOUND" ~ "sheltered",
                                     location == "SOUTHWEST HARBOR" ~ "moderately_sheltered",
                                     location == "SEAWALL" ~ "exposed",
                                     location == "SEAL COVE" ~ "moderately_exposed",
                                     location == "SAND BEACH" ~ "moderately_exposed"))

#releveling the exposure levels from most exposed to least exposed
shelter_factor <- fct_relevel(loons_2023$shelter_gradient, c(
  "exposed",
  "moderately_exposed",
  "moderate",
  "moderately_sheltered",
  "sheltered"))

#saving a dataset to include only loons and the shelter factor
loons_2023 <- loons_2023 %>%
  mutate(shelter_factor = shelter_factor) %>%
  filter(species == "COMMON LOON")
```

```
#counting how many different exposure observations we have
loons_2023 %>%
  count(shelter_factor)
```

```
## # A tibble: 5 x 2
##   shelter_factor      n
##   <fct>          <int>
## 1 exposed         48
## 2 moderately_exposed 33
## 3 moderate        29
## 4 moderately_sheltered 17
## 5 sheltered        4
```

Changing chr variables to num

There are a number of variables within this dataset that are character variables that should be numeric variables (i.e. meters_offshore, longitude, latitude)

```
#Change character numbers to numeric
loons_2023 <- loons_2023 %>%
  mutate(meters_offshore = as.numeric(meters_offshore)) %>%
  mutate(latitude = as.numeric(latitude)) %>%
  mutate(longitude = as.numeric(longitude)) %>%
  mutate(barometer = as.numeric(barometer)) %>%
  mutate(date = as_date(date, format = "%m/%d/%Y")) %>%
  mutate(time = hms::as_hms(time)) %>%
  select(-year, -day, -month)
```

```
## Warning: There was 1 warning in 'mutate()'.
## i In argument: 'barometer = as.numeric(barometer)'.
## Caused by warning:
## ! NAs introduced by coercion
```

```
glimpse(loons_2023)
```

```
## Rows: 131
## Columns: 31
## $ date      <date> 2023-01-04, 2023-01-04, 2023-01-04, 2023-01-04, 20~
## $ time      <time> 14:20:00, 14:20:00, 14:20:00, 14:20:00, 14:50:00, ~
## $ tide_percentage <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 50, 50, 50, 60, 60, 60, 60, ~
## $ tide      <chr> "LOW", "LOW", "LOW", "LOW", "LOW", "LOW", "LOW", "LOW", "L~
## $ cal       <chr> "LOW EBB", "LOW EBB", "LOW EBB", "LOW EBB", "LOW", ~
## $ location  <chr> "BAR HARBOR PIER", "BAR HARBOR PIER", "BAR HARBOR P~
## $ species   <chr> "COMMON LOON", "COMMON LOON", "COMMON LOON", "COMMO~
## $ number    <dbl> 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, ~
## $ latitude  <dbl> 44.39161, 44.39124, 44.39107, 44.39105, 44.29530, 4~
## $ longitude <dbl> -68.20366, -68.20303, -68.20228, -68.20255, -68.239~
## $ meters_offshore <dbl> 50, 37, 18, 16, 15, 450, 440, 300, 100, 30, 30, 153~
## $ behavior  <chr> "PEERING", "DIVING", "DRIFTING", "DRIFTING", "DIVIN~
## $ behavior_notes <chr> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, ~
## $ sky_condition <chr> "CLOUDY, WINDY", "CLOUDY, WINDY", "CLOUDY, WINDY", ~
```

```
## $ weather_notes      <chr> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, ~
## $ precipitation      <chr> "NONE", "NONE", "NONE", "NONE", "NONE", "NONE", "NO~
## $ temperature        <dbl> 42.5, 42.5, 42.5, 42.5, 42.7, 42.0, 42.0, 42.0, 32.~
## $ wind_speed          <dbl> 2.0, 2.0, 2.0, 2.0, 2.4, 2.0, 2.0, 2.0, 5.0, 5.0, 5~
## $ wind_direction      <chr> "NNE", "NNE", "NNE", "NNE", "NNE", "NNE", "NNE", "N~
## $ barometer           <dbl> 29.98, 29.98, 29.98, 29.98, 29.98, 29.98, 29.98, 29~
## $ humidity            <dbl> 88, 88, 88, 88, 88, 88, 88, 88, 97, 97, 97, 97, 97, ~
## $ cloud_coverage      <dbl> 100, 100, 100, 100, 75, 60, 60, 60, 100, 100, 100, ~
## $ wave_class           <dbl> 1.0, 1.0, 1.0, 1.0, 2.0, 2.0, 2.0, 2.0, 3.0, 3.0, 3~
## $ human_activity       <chr> "CONSTRUCTION", "CONSTRUCTION", "CONSTRUCTION", "CO~
## $ water_activity       <chr> "NONE", "NONE", "NONE", "NONE", "NONE", "NONE", "NO~
## $ shelter_gradient     <chr> "exposed", "exposed", "exposed", "exposed", "modera~
## $ notes                <chr> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, ~
## $ moon_phase           <chr> "WAXING GIBBOUS", "WAXING GIBBOUS", "WAXING GIBBOUS~
## $ overall_abundance   <dbl> 8, 8, 8, 8, 8, 8, 8, 8, 7, 7, 7, 7, 7, 7, 4, 4, ~
## $ specific_abundance  <dbl> 4, 4, 4, 4, 1, 3, 3, 3, 3, 3, 3, 3, 3, 3, 1, 1, 2, ~
## $ shelter_factor       <fct> exposed, exposed, exposed, exposed, moderate, moder~
```

Location

```
#determining how many locations we have
unique(loons_2023$location)
```

```
## [1] "BAR HARBOR PIER"      "SEAL HARBOR BEACH" "BRACY HARBOR"
## [4] "NORTHEAST HARBOR"    "SOMES SOUND"       "SOUTHWEST HARBOR"
## [7] "SEAWALL"             "SEAL COVE"         "SAND BEACH"
```

Behavior

```
unique(loons_2023$behavior)
```

```
## [1] "PEERING"      "DIVING"      "DRIFTING"      "MAINTENANCE" "ASHORE"
```

```
#Count occurrence of behaviors
loons_2023_behavior <- loons_2023 %>%
  filter(species == "COMMON LOON") %>%
  group_by(date, behavior, species, tide, tide_percentage) %>%
  count(behavior)

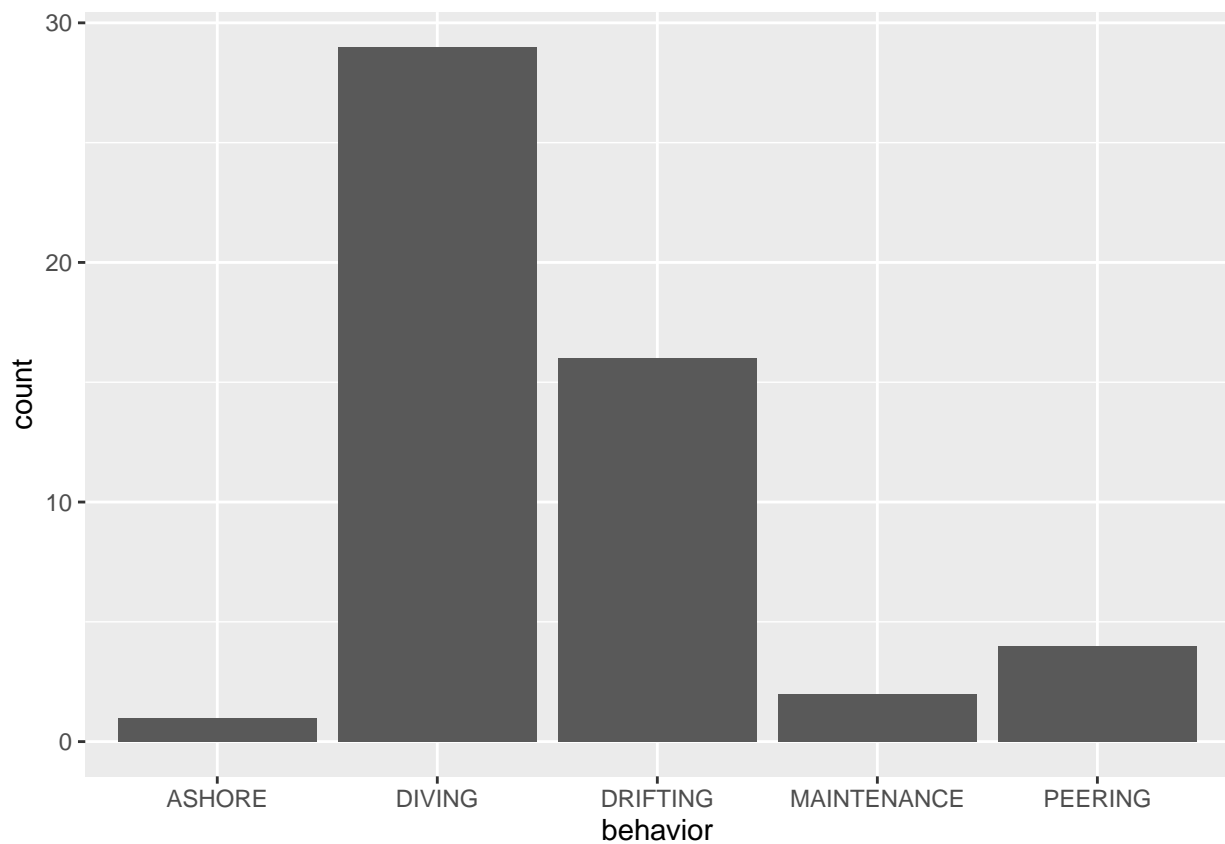
loons_2023_behavior
```

```
## # A tibble: 52 x 6
## # Groups:   date, behavior, species, tide, tide_percentage [52]
##   date      behavior  species      tide tide_percentage     n
##   <date>    <chr>      <chr>      <chr>         <dbl> <int>
## 1 2023-01-04 DIVING    COMMON LOON LOW              0     4
## 2 2023-01-04 DRIFTING  COMMON LOON LOW              0     2
## 3 2023-01-04 MAINTENANCE COMMON LOON LOW              0     1
```

```
## 4 2023-01-04 PEERING      COMMON LOON LOW      0      1
## 5 2023-01-06 DIVING       COMMON LOON MID      50     3
## 6 2023-01-06 DIVING       COMMON LOON MID      60     4
## 7 2023-01-08 DIVING       COMMON LOON HIGH     90     3
## 8 2023-01-08 DRIFTING     COMMON LOON HIGH     90     1
## 9 2023-01-12 DIVING       COMMON LOON LOW      0      3
## 10 2023-01-12 DIVING      COMMON LOON LOW     10     2
## # i 42 more rows
```

#Count the occurrences of behavior of loons

```
ggplot(data = loons_2023_behavior, mapping = aes(x = behavior)) +
  geom_bar()
```



#Count how many low, high, and mid tide observations we have

```
ggplot(data = loons_2023_behavior, mapping = aes(x = tide)) +
  geom_bar()
```

