Stat7350: Assignment Three

Due: April 9, 2019

Group project: Data analysis and presesntation

Bee conservation has four main objectives: 1) to conserve the individual species of native bees, 2) to conserve the ecological services (pollination of native plants) provided by native bees, 3) to bring more native bee species into agricultural service, and 4) to maintain the health and viability of honey bees for agricultural purposes. Three of these objectives relate directly to native habitats, and in order to begin to address them it is necessary to identify which bee species are present within a particular geography, and to gain a basic understanding of the span of their ecological tolerances and abundance. Native habitats and communities offer the best starting point for this effort because they are reservoirs of biodiversity compared to disturbed areas, urban parks, habitat reconstructions, etc. The dataset presented here was initiated in 2012 and enabled by staff and volunteers and the US Fish and Wildlife Service, as a first step towards identifying and documenting the bee species present on selected refuges in the Midwest, and also provides limited data on their ecological amplitude and abundance. Collecting effort in 2013 varied from refuge to refuge, as did the number of sampling sites and the intent or design of the survey at each refuge. Some refuges were interested in comparing remnants to reconstructions, others compared different native habitat types, others were simply interested in an overall survey of the refuge. The value of the data to each refuge is largely proportional to the effort expended, but even limited collecting effort provided some valuable data.

```
bees <- read_csv(url("https://www.microstatslab.ca/uploads/2/3/5/6/23564534/usfws_bee_survey_2013.csv"),
                 col_type = cols())
```

```
## Warning: Missing column names filled in: 'X14' [14], 'X15' [15],
## 'X16' [16], 'X17' [17], 'X18' [18], 'X19' [19], 'X20' [20]
```

```
bees
```

```
## # A tibble: 6,071 x 20
##    Genus Species Gender State County Refuge Division `Sample Site`
##    <chr> <chr>   <chr>  <chr> <chr>  <chr>  <chr>    <chr>
##  1 Agap~ Agapos~ Female Miss~ Lafay~ Big M~ N/A      N/A
##  2 Agap~ Agapos~ Female Miss~ Lafay~ Big M~ N/A      BB
##  3 Agap~ Agapos~ Female Miss~ Lafay~ Big M~ N/A      BB
##  4 Agap~ Agapos~ Female Miss~ Ray    Big M~ N/A      BB
##  5 Agap~ Agapos~ Male   Miss~ Lafay~ Big M~ N/A      BB
##  6 Agap~ Agapos~ Female Miss~ Ray    Big M~ N/A      JAB
##  7 Agap~ Agapos~ Female Miss~ Ray    Big M~ N/A      JAB
##  8 Agap~ Agapos~ Female Miss~ Ray    Big M~ N/A      JAB
##  9 Agap~ Agapos~ Female Miss~ Ray    Big M~ N/A      JAB
## 10 Agap~ Agapos~ Male   Miss~ Ray    Big M~ N/A      JAB
## # ... with 6,061 more rows, and 12 more variables: Coordinates <chr>,
## #   Habitat <chr>, `Date Sampled` <chr>, Collector <chr>, Notes <chr>,
## #   X14 <lgl>, X15 <lgl>, X16 <lgl>, X17 <lgl>, X18 <lgl>, X19 <lgl>,
## #   X20 <lgl>
```

Your goal is to prepare a ~ 20-30 minute presentation on this dataset for our final class on April 9th

[I'll leave it up to you to decide exactly how long it needs to be to cover the required topics]

A complete presentation will (at minimum) have the following components:
* An introduction to the topic - tell your audience why we should care
* An overview of the dataset
* A story that encompasses multiple aspects of the dataset that guides your audience though what you have learned from the data (and in this course!) using effective visualization techniques paired with statistical analyses where appropriate * Future directions that highlight additional data you would collect (and how you would collect it) if you could design a future study related to this one
* A link to a github repo that contains the dataset and supporting analyses should be provided. The work should be reproducible.

Division of labour

It's up to you to decide how you want to tackle this project. A single grade will be given.

Audience

I will invite members of our department to attend this presentation. The communication of science is an extremely important skill for scientists to have. Like all skills, it requires practice in a 'real world' setting. If you like, we can schedule it for the second part of class and you can do a run-through in the first half. Or you can do it in the first part to get it over with. Please let me know your preference next class.

Evaluation

Let's decide together what you want to be evaluated on.