

Case Study 3: Eagle wing flaps

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Recap of the situation

The client is studying bald eagles at a local reserve. There is interest in how the patterns of their flight is related to weather patterns.

The data was obtained in the last six months in the following manner: For one hour each week they recorded the temperature and the number of wing flaps for the first thirty seconds that they saw each bird. They want to know if there is an association between the number of flaps and the temperature.

In the recorded data, the birds generally flapped between 10 and 40 times. However there is concerned because about 25% of the observed birds did not flap at all during the thirty seconds that they were observed.

Questions

- Do you know any previous studies on this topic?
- Why these variables were selected?
- Why was this measurement method was used?
- Were the observations made at the same location/time?
- Who is the audience of the study?
- Is this part of a larger study?
- How are the results going to be used?
- Do you know (or care) if you counted the same bird twice?

Concerns

- A quarter of the data might be “missing” due to poor recording strategy.
- Poor designed experiment. Time/Location taken into account?
- We do not know many observers the experiment had.
- Incorrect data. 40 flaps seems high for an eagle, also 10 flaps are easier to count compared to 40.
- Why are other factors ignored, like the age/size of a bird or wind velocity.

Analysis

There seems to be concern about treating the values where no flaps were observed as “missing”. For this reason we would like to avoid just ignoring these points.

- Spearman's rank correlation coefficient and a permutation test.
- Treat data as categorical.
- Censored data model and EM algorithm.