Hawks: A Data Analysis on 3 Different Hawk Species

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https://github.com/BVUjac8/Hawks.git

Which Domain?

A GitHub repository of R datasets in the form of CSV files.

Lund, N. (2015, September 18). *A Beginner's Guide to IDing Cooper's and Sharp-Shinned Hawks*. A Beginner's Guide to IDing Cooper's and Sharp-Shinned Hawks | Audubon. Audubon.

Cooper's hawk. (n.d.). Cooper's hawk - Wikipedia

Identification of Small Accipiters Sharp-shinned Hawk vs. Cooper's Hawk. (n.d.). Retrieved from Coopers Hawk vs. Sharp-Shinned Hawk Identification (birdwatching-bliss.com)

Measurements on Three Hawk Species. (n.d.). Retrieved from R: Measurements on Three Hawk Species (vincentarelbundock.github.io)

Red-tailed hawk. (n.d.). Retrieved from Red-tailed hawk - Wikipedia

Rosemary. (2014, September 3). *Know Your Hawks*. Know Your Hawks | Your Great Outdoors (massaudubon.org). Massa Audubon.

Sharp-shinned Hawk. (n.d.). Retrieved from Sharp-shinned Hawk Identification, All About Birds, Cornell Lab of Ornithology

Sharp-shinned hawk. (n.d.). Retrieved from Sharp-shinned hawk - Wikipedia

Similar Species for Red-shouldered Hawk. (n.d.). Retrieved from Similar Species to Red-shouldered Hawk, All About Birds, Cornell Lab of Ornithology

Stiteler, S. (2016). *Six Quick Questions to Help You Identify Red-Tailed Hawks*. Six Quick Questions to Help You Identify Red-Tailed Hawks | Audubon. Audubon.

With each reference, it displays distinguishing features of the three species of hawks from the hawks data set as well as contrasting identifications between each species of hawks versus other species of hawks.

Which Data?

R: Measurements on Three Hawk Species (vincentarelbundock.github.io)

Data from a random sample of hawks from three different species located in Iowa.

A data frame with 908 observations and 19 variables.

Month	8=September to 12=December
Day	Date in the month
Year	Year: 1992-2003
CaptureTime	Time of capture (HH:MM)

ReleaseTime	Time of release (HH:MM)
BandNumber	ID band code
Species	CH=Cooper's, RT=Red-tailed, SS=Sharp-Shinned
Age	A=Adult or I=Immature
Sex	F=Female or M=Male
Wing	Length (in mm) of primary wing feather from tip to wrist it attaches to
Weight	Body weight (in gm)
Culmen	Length (in mm) of the upper bill from the tip to where it bumps into the fleshy part of the bird
Hallux	Length (in mm) of the killing talon
Tail	Measurement (in mm) related to the length of the tail (invented at the MacBride Raptor Center)
StandardTail	Standard measurement of tail length (in mm)
Tarsus	Length of the basic foot bone (in mm)
WingPitFat	Amount of fat in the wing pit
KeelFat	Amount of fat on the breastbone (measured by feel
Crop	Amount of material in the crop, coded from 1=full to 0=empty

Research Questions? Benefits? Why analyze these data?

- Which species of hawks grew to maturity (adulthood)?
- Which species of hawks migrated south in the month of November?
- Which species of hawks has a lengthier hallux (killing talon)?
- Does the time of capture have anything to do with the maturity of species of hawks?

After just observing the hawks data set, understanding which species of hawks reached maturity compared to others is beneficial for hunting/gaming season as well as which species of hawks tend to not migrate south for the winter which could potentially put them in danger of animal predators or human hunters. With the knowledge of which species of hawks has a lengthier hallux, you could comprehend the species of hawks that is in the process of natural selection or adapting to their changing environment by the length of their killing talon. Lastly, does the maturity of a species of hawks has any correlation to the time of capture or are adolescent hawks prey to animals predators or human hunters.

What Method?

There is two methods to possibly perform upon the hawks data set: clustering and regression. The clustering models will be built for the first three research questions to provide: which species of hawks was more prevalent in maturity, which species of hawks was less prevalent in November due to migration, and which species of hawks has a lengthier hallux for hunting means. The regression model that will be built will probably be a multiple, linear regression model of time of capture versus the age and species of hawks to determine if maturity effects capture rate.

Potential Issues?

The only data manipulation that needs to transpire upon this data set is removal of unnecessary columns, filling in missing data, and fixing the NA’s/nulls. However, the data wrangling that requires to fill in

missing inputs as well as fixing the nulls to the average of the columns instead of a 0 input is what could cause this data analysis on the hawks data set to fall off schedule.

Concluding Remarks

Hawks are native to the Western Hemisphere particularly North America and reaches to bits of Canada as well as areas in northern South America. “Backyard” hawks are three different species called Red-tailed, Cooper’s, and Sharp-Shinned hawks. In the course of 12 years, the Cornell College in Mount Vernon, Iowa collected data on these three species of hawks. A data analysis will be performed to determine which species of hawks matured the most, which species of hawks took part in migration, which species of hawks has a lengthier hallux (or killing talon), and does the maturity of a species of hawks pertain to their time of capture.