WILDLIFE STRIKES ANALYSIS

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PROJECT/GOALS DESCRIPTION

- This project involves analyzing the FAA Wildlife Strikes dataset spanning from 2000 to 2015 in the United States. The goal is to gain insights into the patterns, trends, and factors associated with wildlife strikes, ultimately contributing to aviation safety.

PROCESS

Data Exploration and Understanding

Connected to the FAA Wildlife Strikes dataset.

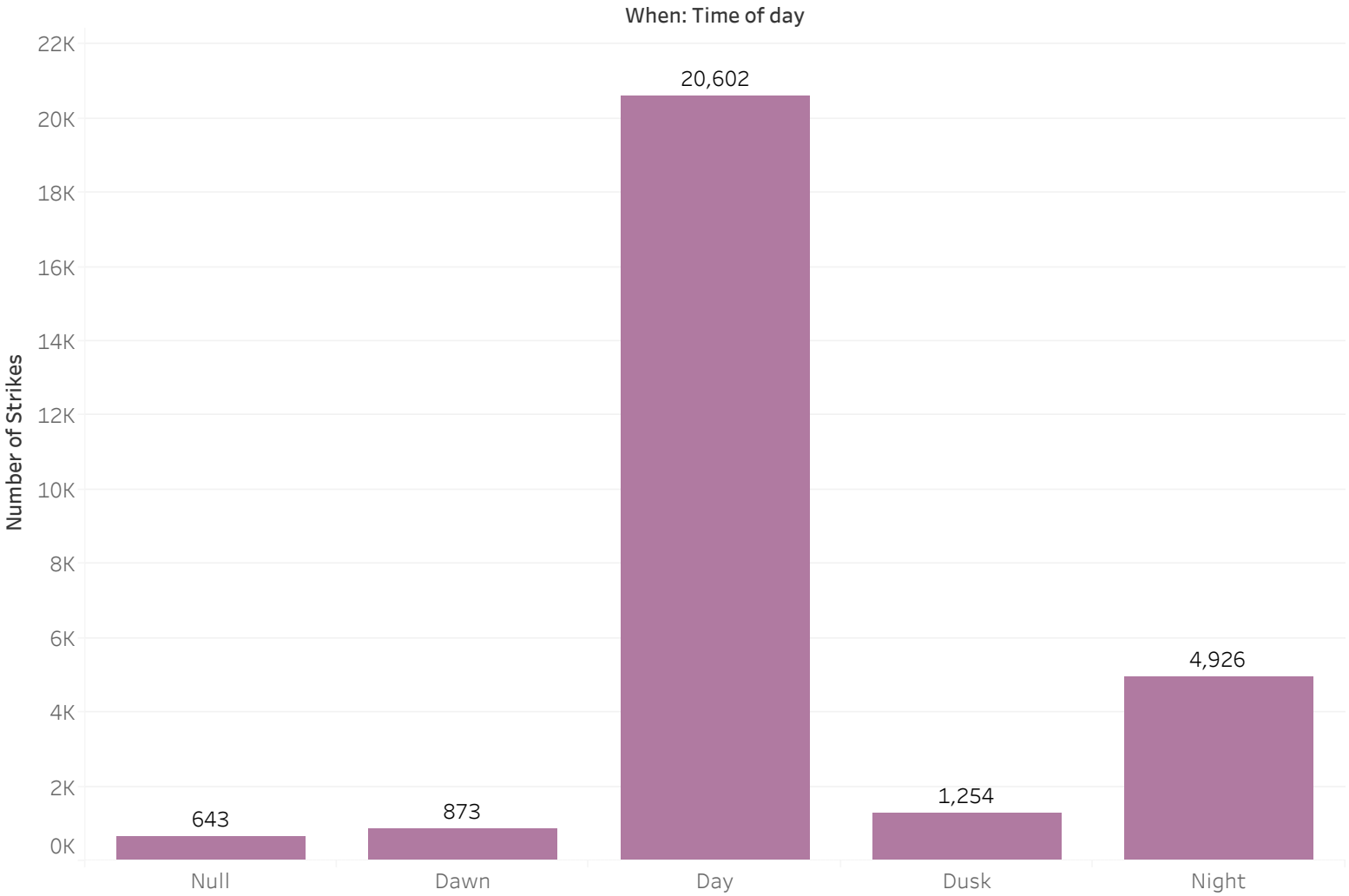
Explored different data types, detected patterns, and identified key categorical and numerical features.

Formulated data questions to guide the analysis.

Built various visualizations to explore and understand different aspects of the dataset.

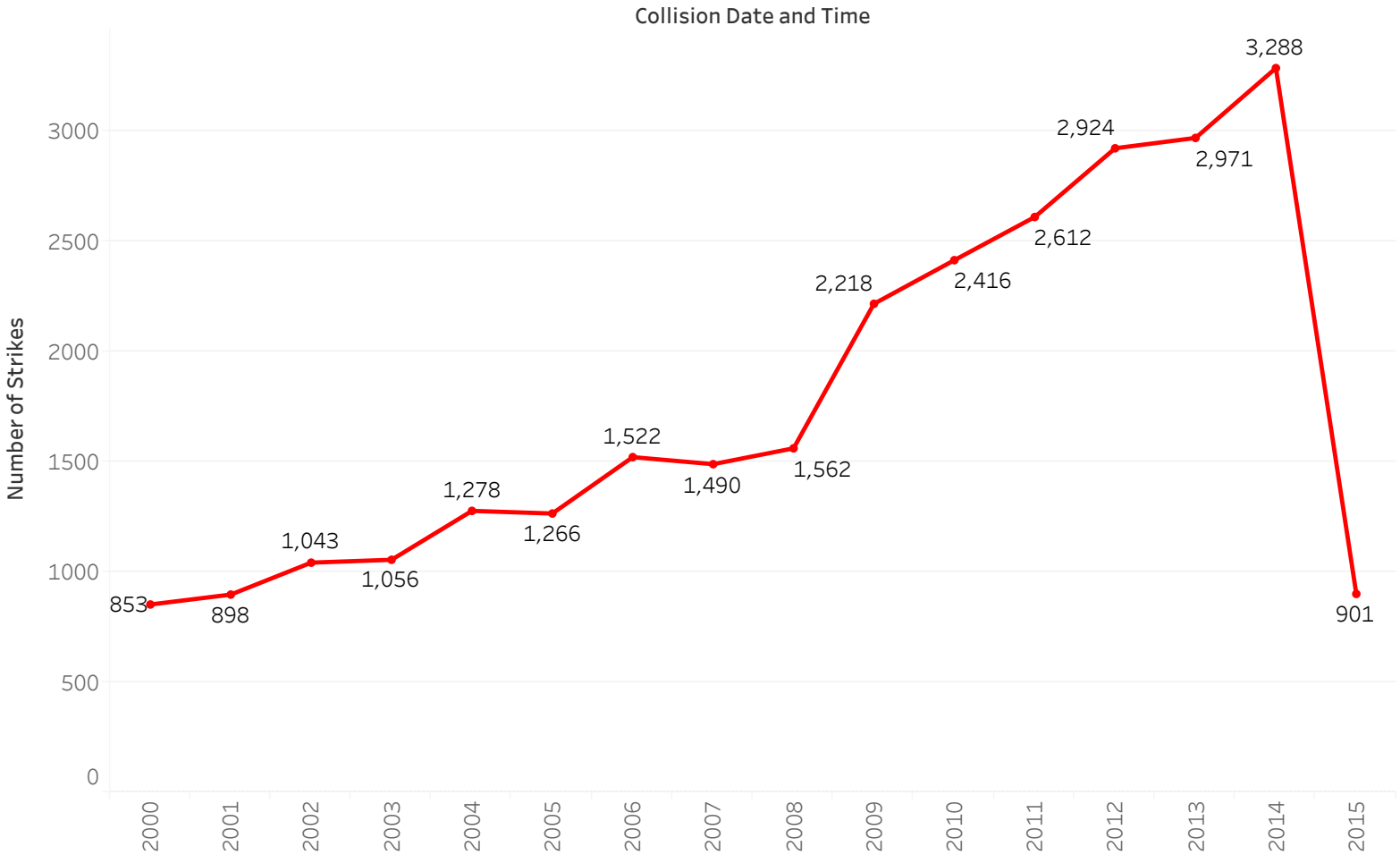
Used maps, line charts, and clustering techniques to uncover insights. Addressed data questions related to wildlife strikes, their effects, and geographical patterns.

Distribution of strikes by the hour of the day



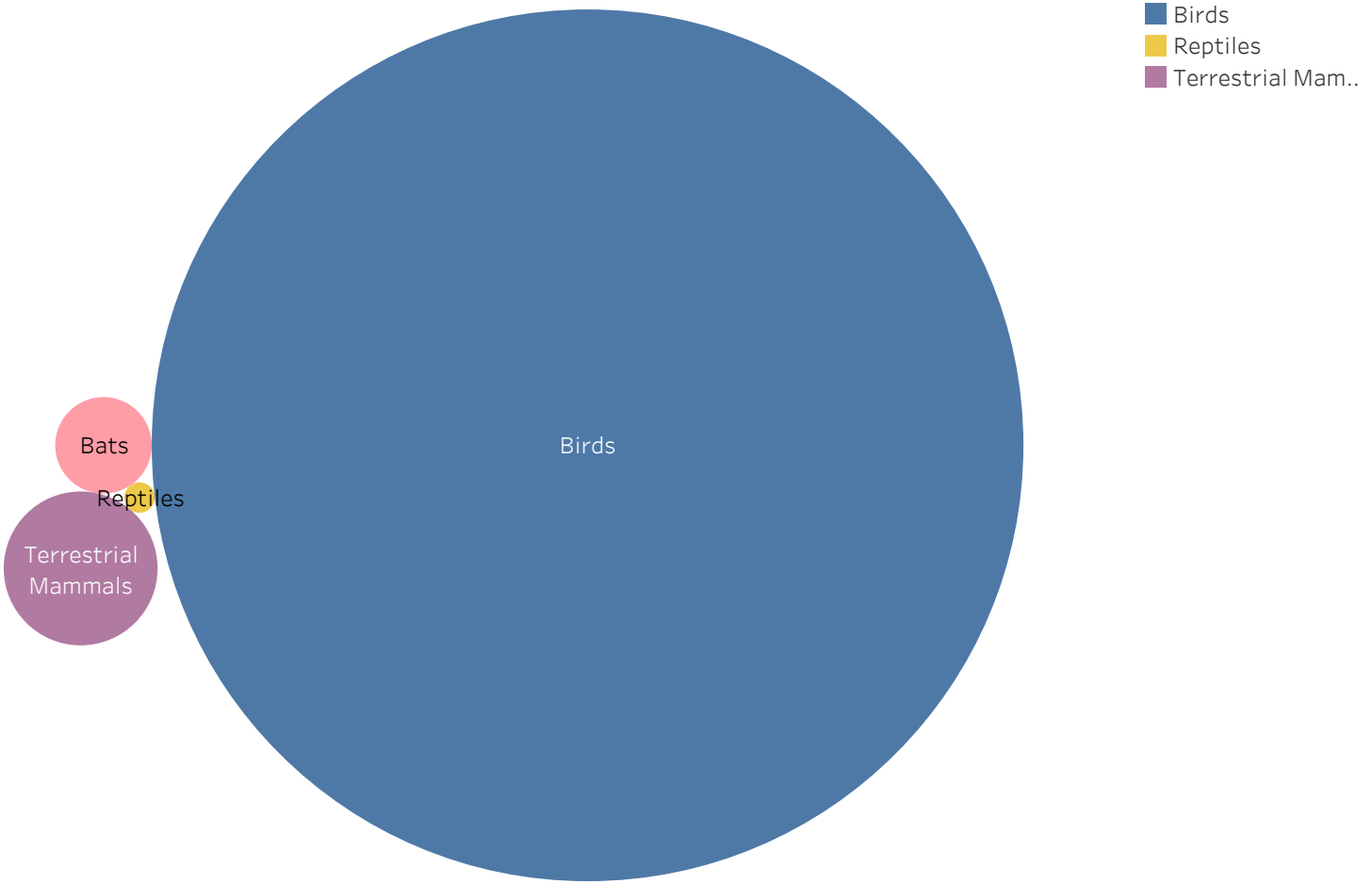
This bar chart shows the time period that has the highest number of strikes to the wildlife which is during the day with a total of 20602 strikes.

Distribution of wildlife strikes over the years



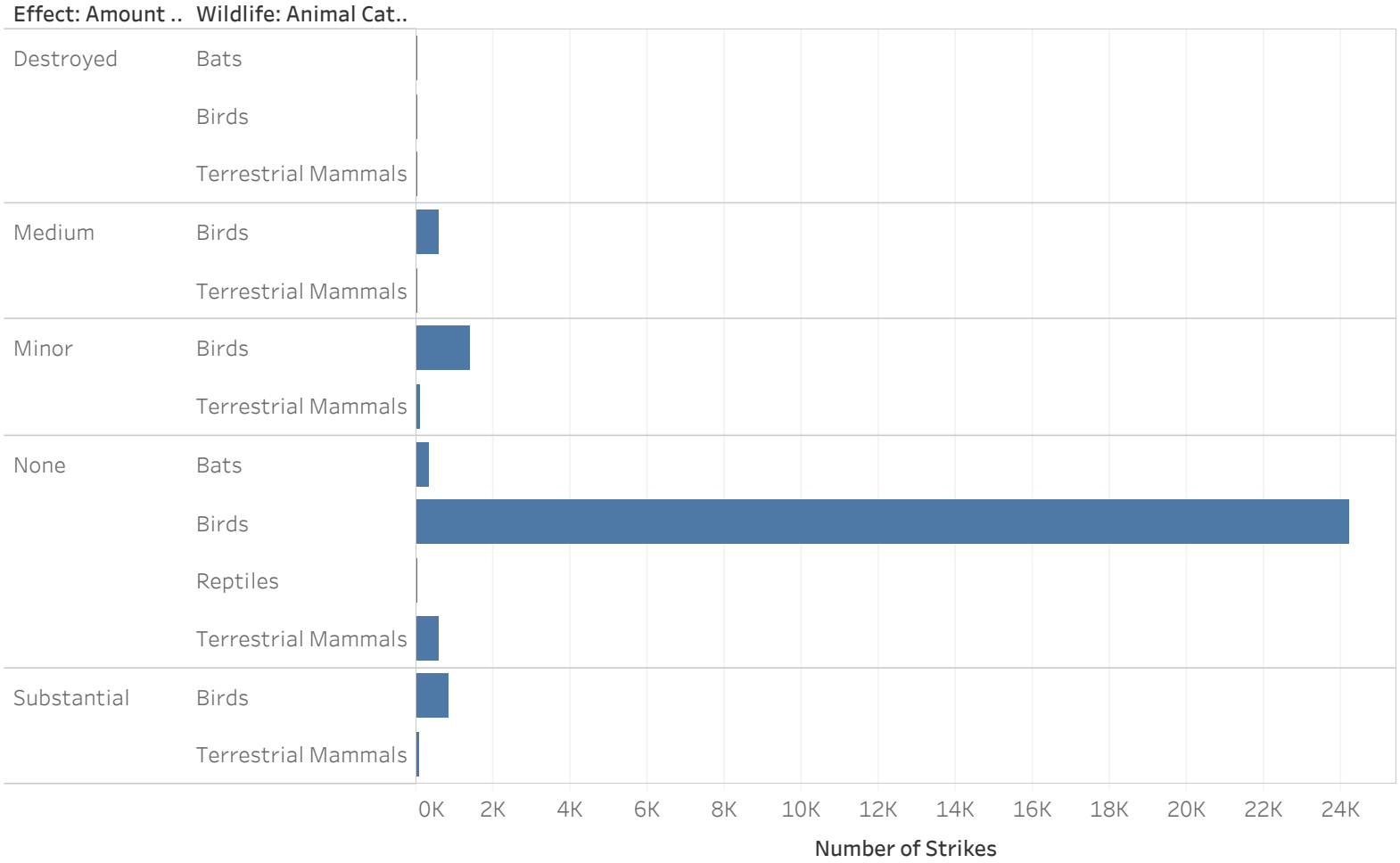
This is a time series line chart showing the number of wildlife strikes from year 2000-2015. We can see 2014 has the highest number of strikes of 3288 and 2000 had the lowest number of strikes with 853.

Distribution of wildlife species involved in strikes



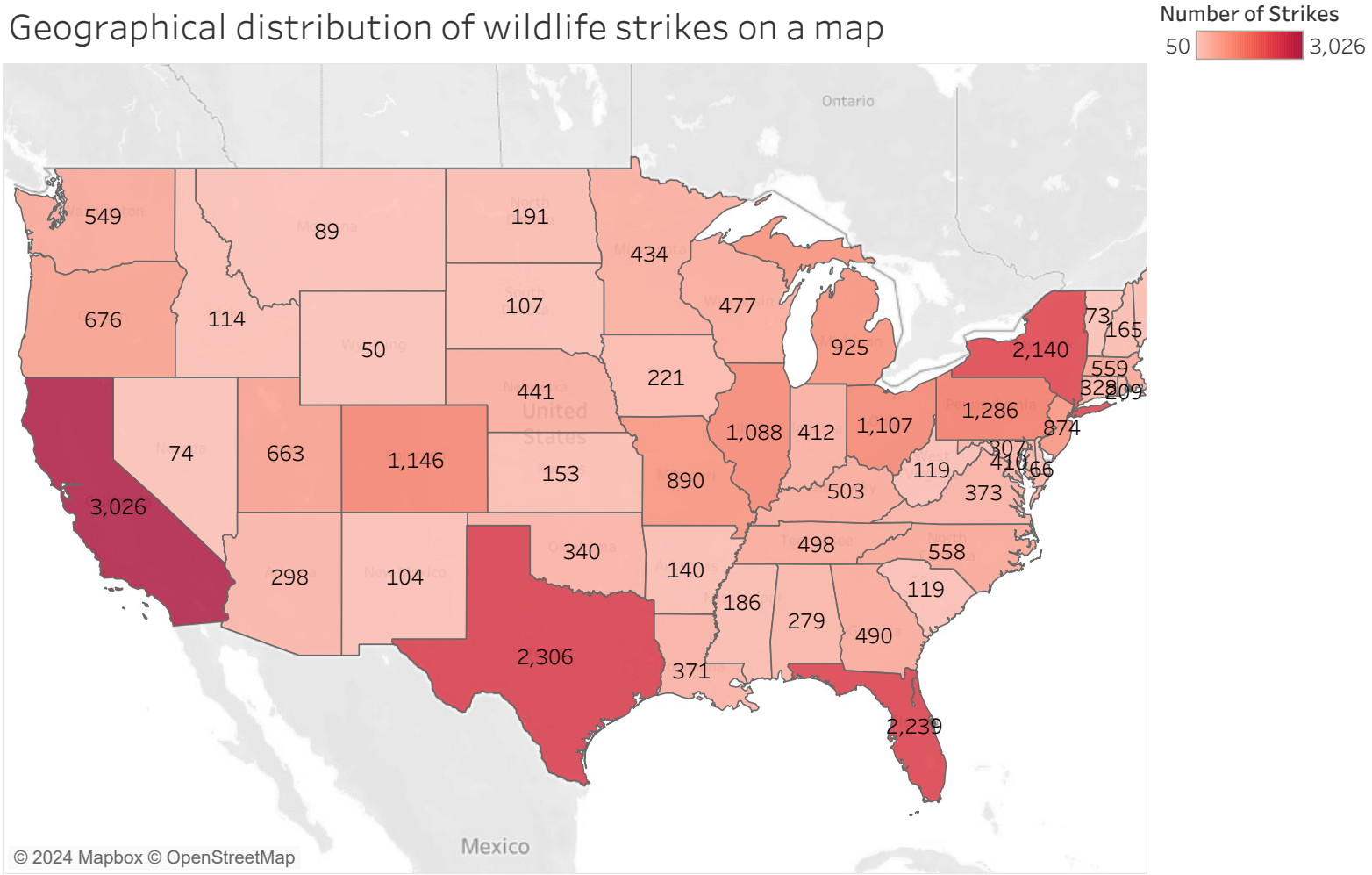
This visualization shows the different wildlife species involved in the strikes and their frequencies. We observe that the wildlife strikes affected the birds the most with a total of 27089 strikes recorded and the reptiles were the least affected.

Distribution showing the amount of damages caused by the strikes



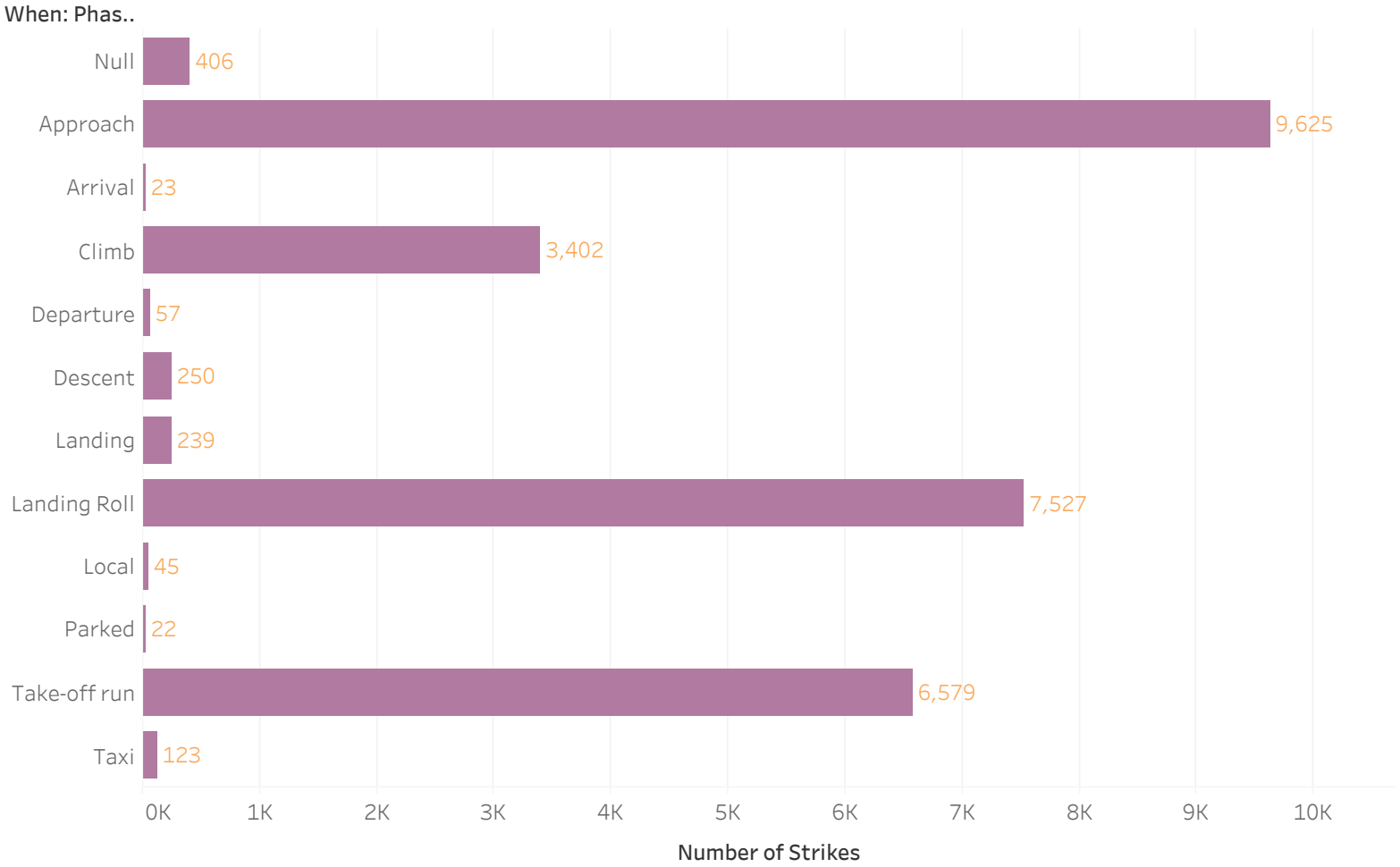
This visualization shows the number of strikes and the damages they caused to each category of animals. We realize that majority of the strikes caused no damage to the wildlifes but 955 strikes caused substantial amount of damage to them.

Geographical distribution of wildlife strikes on a map



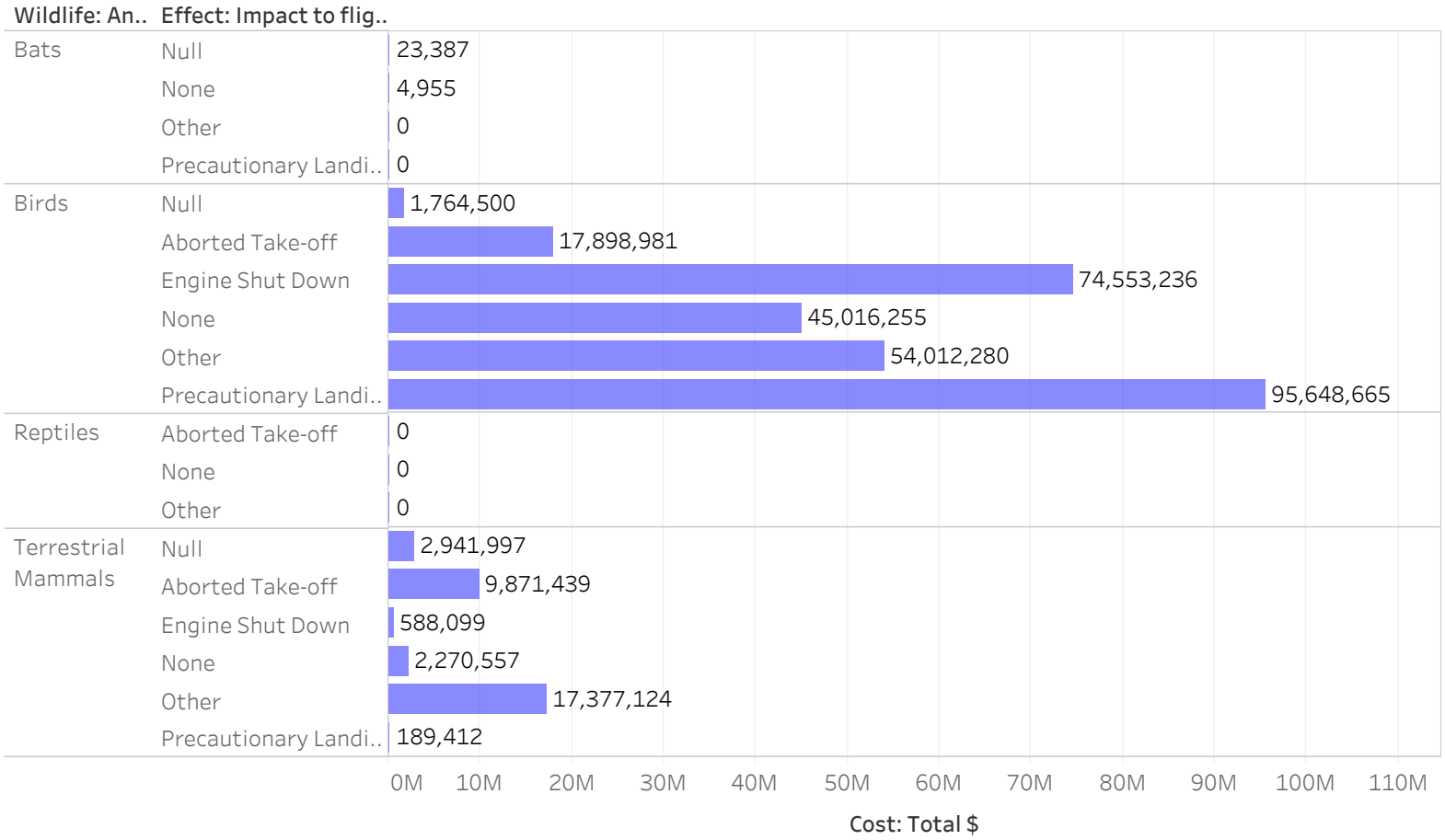
This map shows the number of strikes in various cities in the United States. It is observed that California is the state with the highest number of strikes with a total of 3026 and the lowest was in Delaware with a total of 66 recorded strikes.

Phase of flights with number of strikes



This bar chart shows each phase during flights and the number of strikes that occurs during those phases. It is recorded that the Approach, Landing Roll and Take-off run phases had the highest impacts to the wildlife.

Distribution of the wildlife species impacted by the strikes and their effects to the aircraft

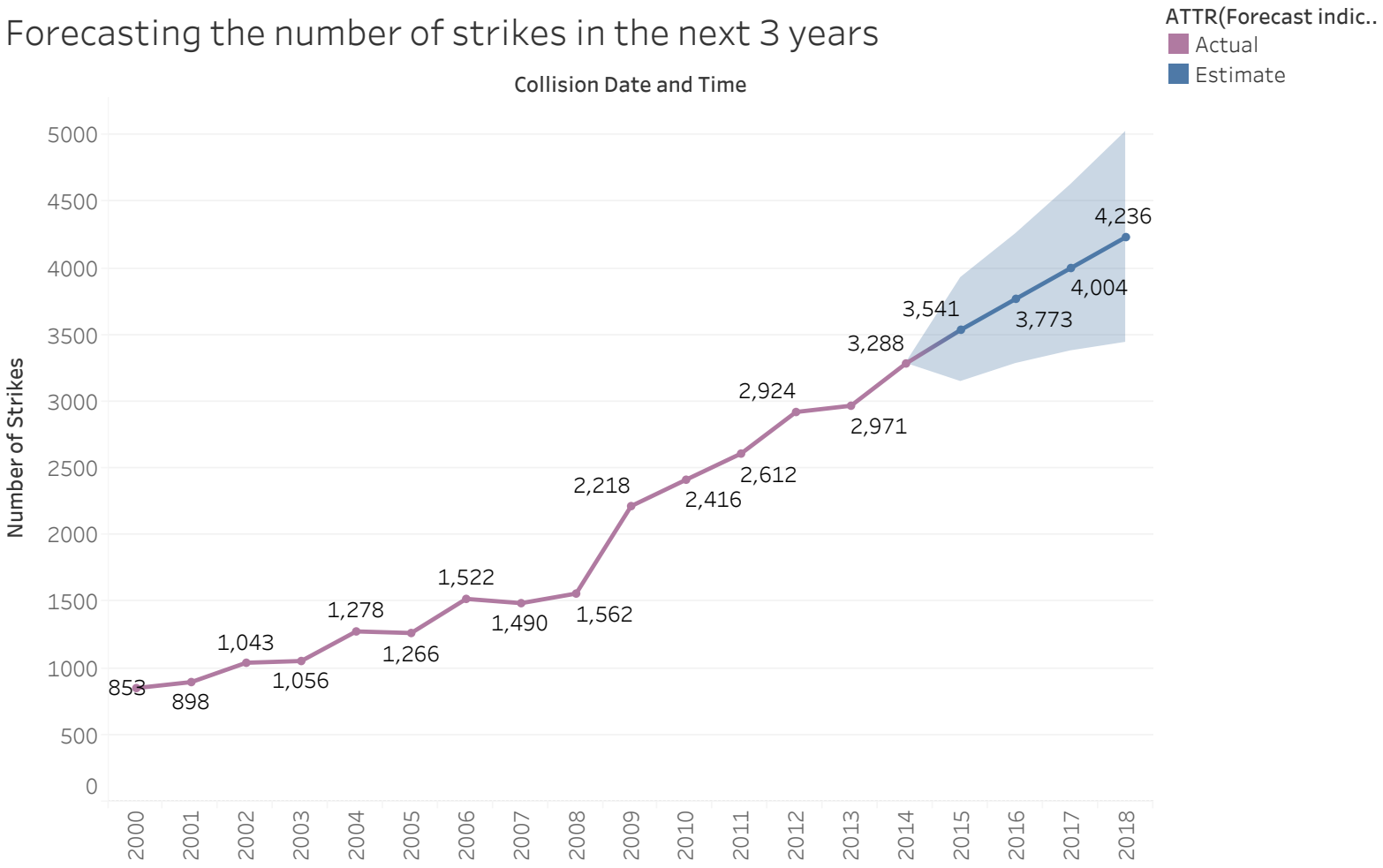


This visualization shows that the strikes of the birds costs the airlines the most amount of money which was about $95 million due the precautionary landing the airlines had to do.

Distribution of the strikes of each wildlife category

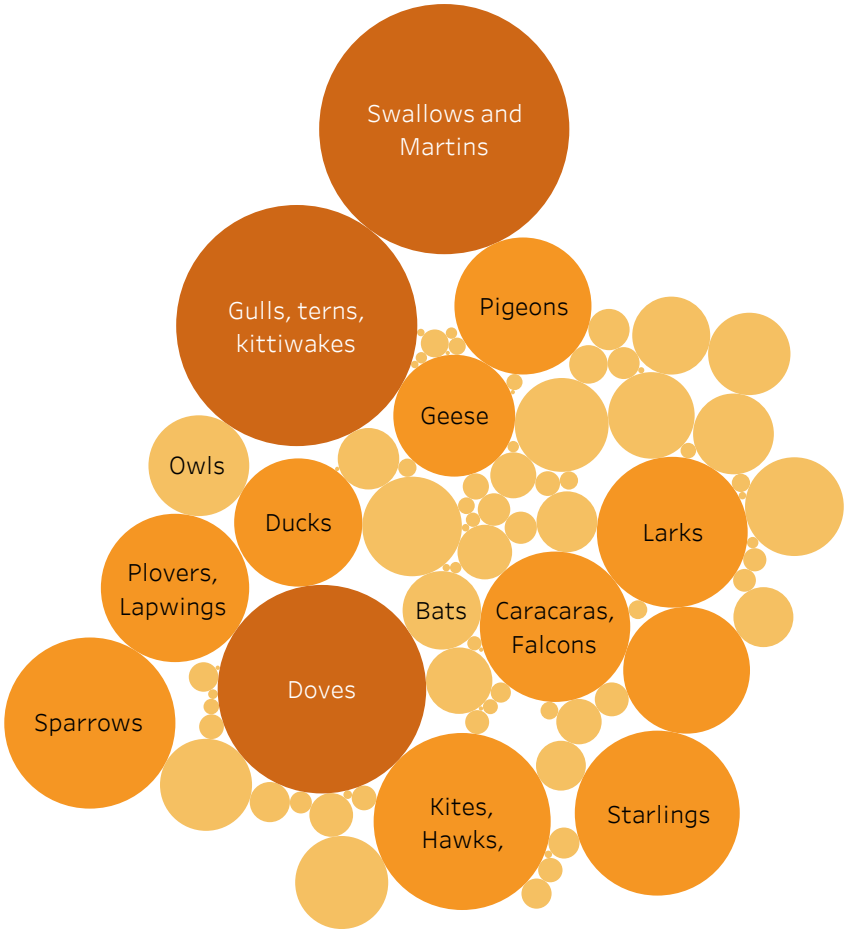
Wildlife: Animal Cat..	Cost: Aircraft time out of s..	Cost: Total $	Feet above ground	Number of Strikes
Bats	18	28,342	230,242	332
Birds	179,354	288,893,917	8,195,349	27,089
Reptiles	3	0	0	33
Terrestrial Mammals	68,901	33,238,628	2,216	844

This visualization shows that the strikes to the species also caused the aircrafts to be out of service for some hours and was also very expensive for the aircrafts. The strikes to birds happened mostly 8 million feet above ground. The reptiles species had the least amount of strikes and didn’t cost the aircrafts any money.



This visualization shows the number of strikes along the years from 2000-2015 and forecasts the number of strikes from 2016-2018. As shown, the number of strikes increases in the coming years and will continue to increase based on the previous records of the strikes.

Distribution of the number of strikes and various species affected



This visualization shows the number of species per group that was affected by the strikes. They have been clustered into different colors based on the number of strikes. The higher the strike, the darker the color.

CONCLUSION

1. Overall Trends in Wildlife Strikes: Businesses and airlines can use the observed trend to implement proactive measures during peak wildlife strike seasons. Increased vigilance and preventive strategies can be employed to reduce the impact of strikes during high-risk periods.
2. Seasonal Variations: Airlines can adjust their operations and safety protocols during peak seasons, such as summer months, when there is a higher frequency of strikes. This could include enhanced monitoring, adjustments to flight schedules, or increased training for pilots and ground crews.
3. Geographical Impact: Airlines can allocate resources more effectively by focusing on regions with higher strike risks. Airports in California, identified as having the highest number of strikes, can implement specific measures to mitigate these risks, such as habitat management programs or enhanced wildlife detection systems.
4. Time of Day and Severity: The correlation between the time of day and strike severity can inform operational decisions. Airlines may consider adjusting flight schedules or implementing additional safety measures during high-risk times, potentially reducing the severity of strikes and minimizing the associated costs.