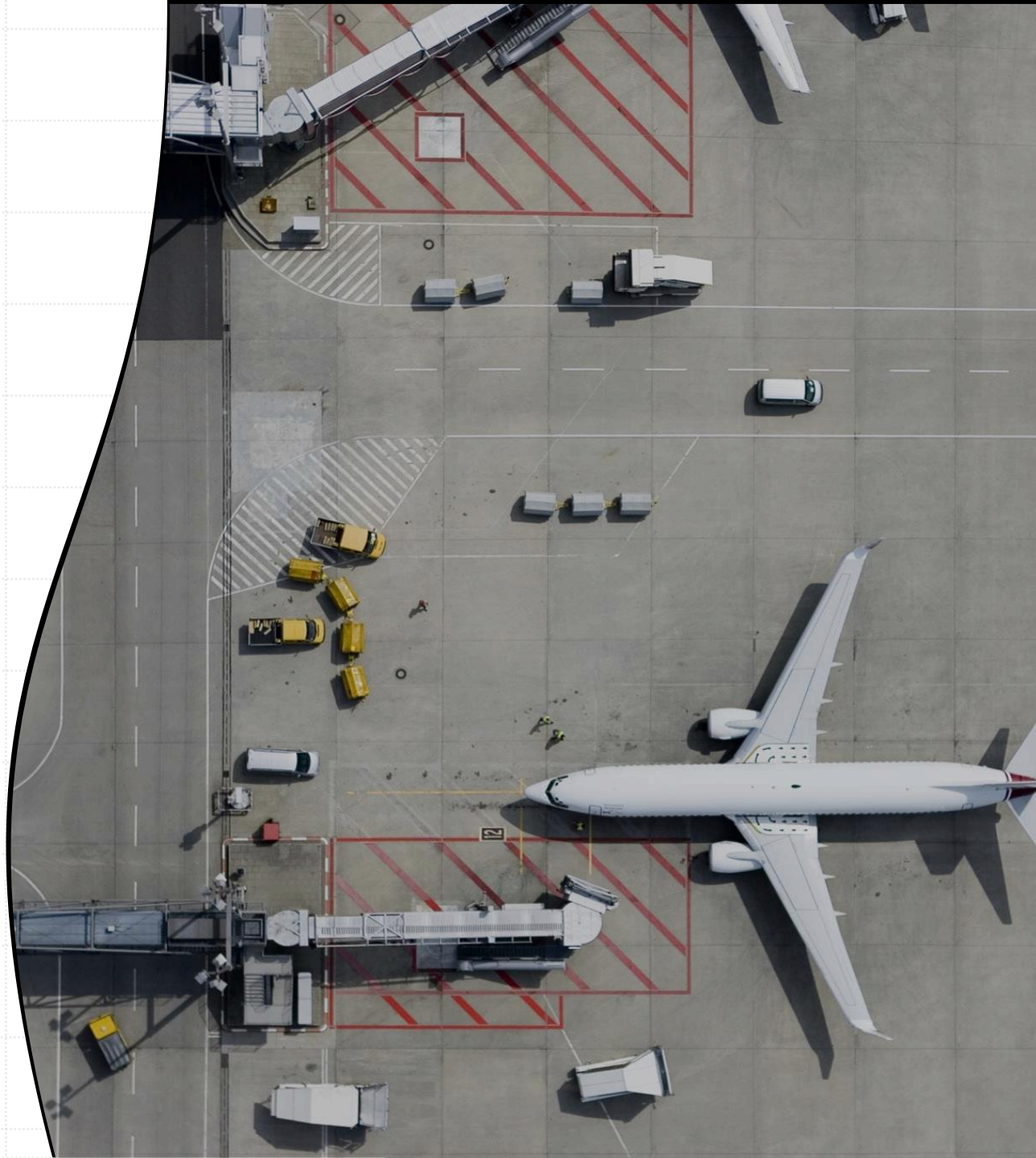
Data Visualization of Bird Strikes between 2000 – 2011

INTRODUCTION

Bird strikes, collisions between birds and aircraft, pose significant aviation safety threats, potentially causing severe damage and fatal accidents. This report analyzes FAA bird strike data from 2000 to 2011, focusing on incident numbers, trends, affected airlines, and airports.

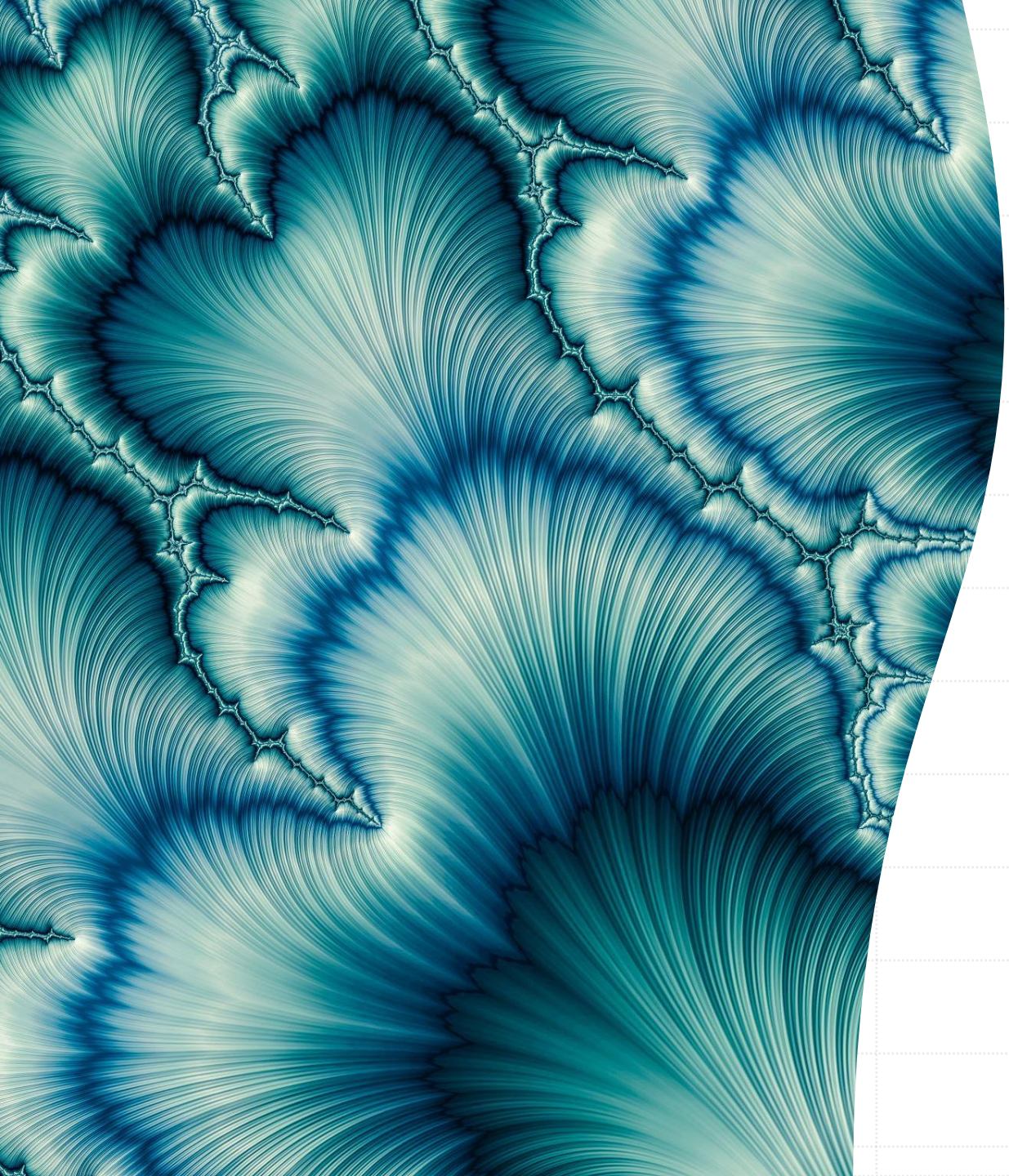


PROBLEM STATEMENT

Analyze the bird strike data from 2000 to 2011 to identify patterns and trends in bird strikes, including the frequency, timing, and impact on flights.

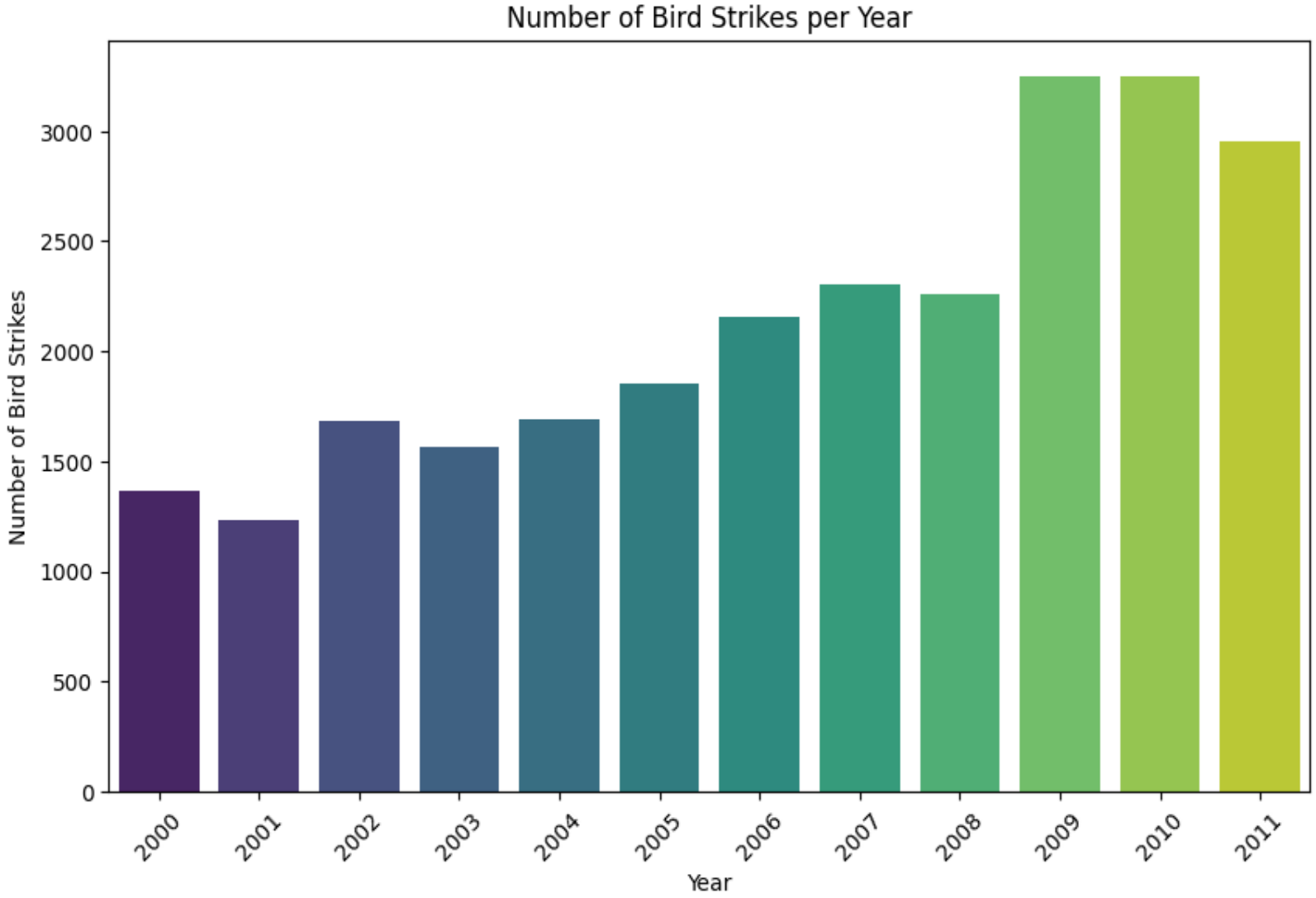
OBJECTIVE

This involves analyzing various factors such as the time, location, altitude, and type of aircraft involved in the strikes to understand the conditions under which bird strikes occur most frequently



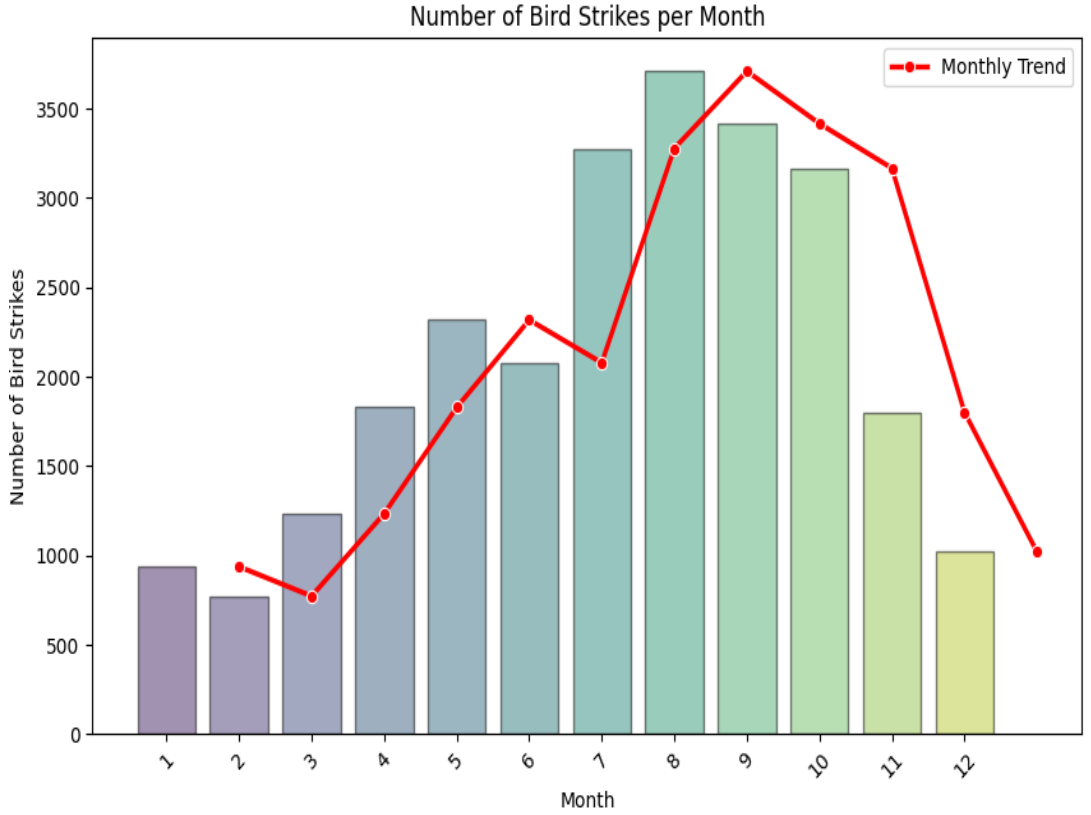
Visualization

Visuals depicting the number of bird strikes



- **Trend**: Increasing from 2000 to 2011.
- **2000**: ~1500 strikes.
- **2001**: ~1200 strikes.
- **2007**: ~2500 strikes.
- **2009-2010**: ~3200 strikes each year.
- **2011**: ~3000 strikes.

VISUALS DEPICTING THE NUMBER OF BIRD STRIKES



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- **2000**: ~1500 strikes.
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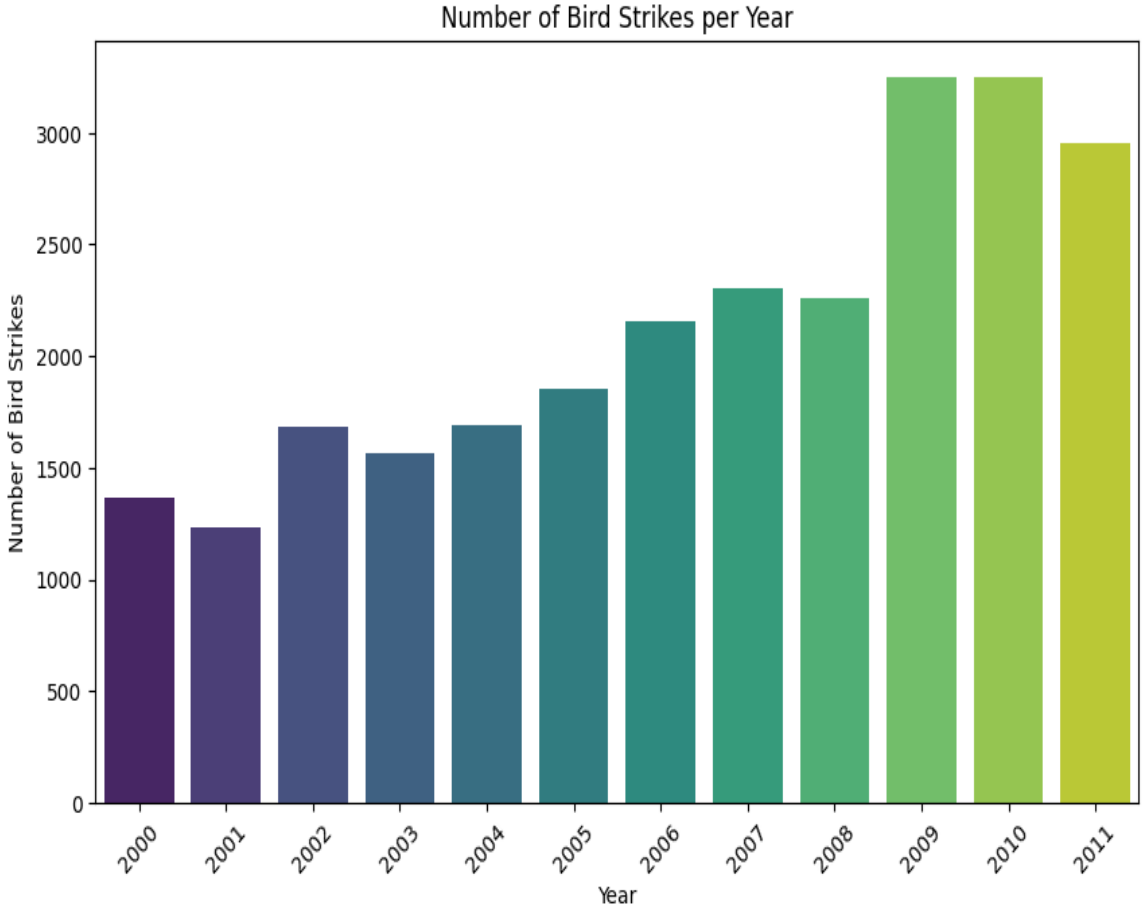
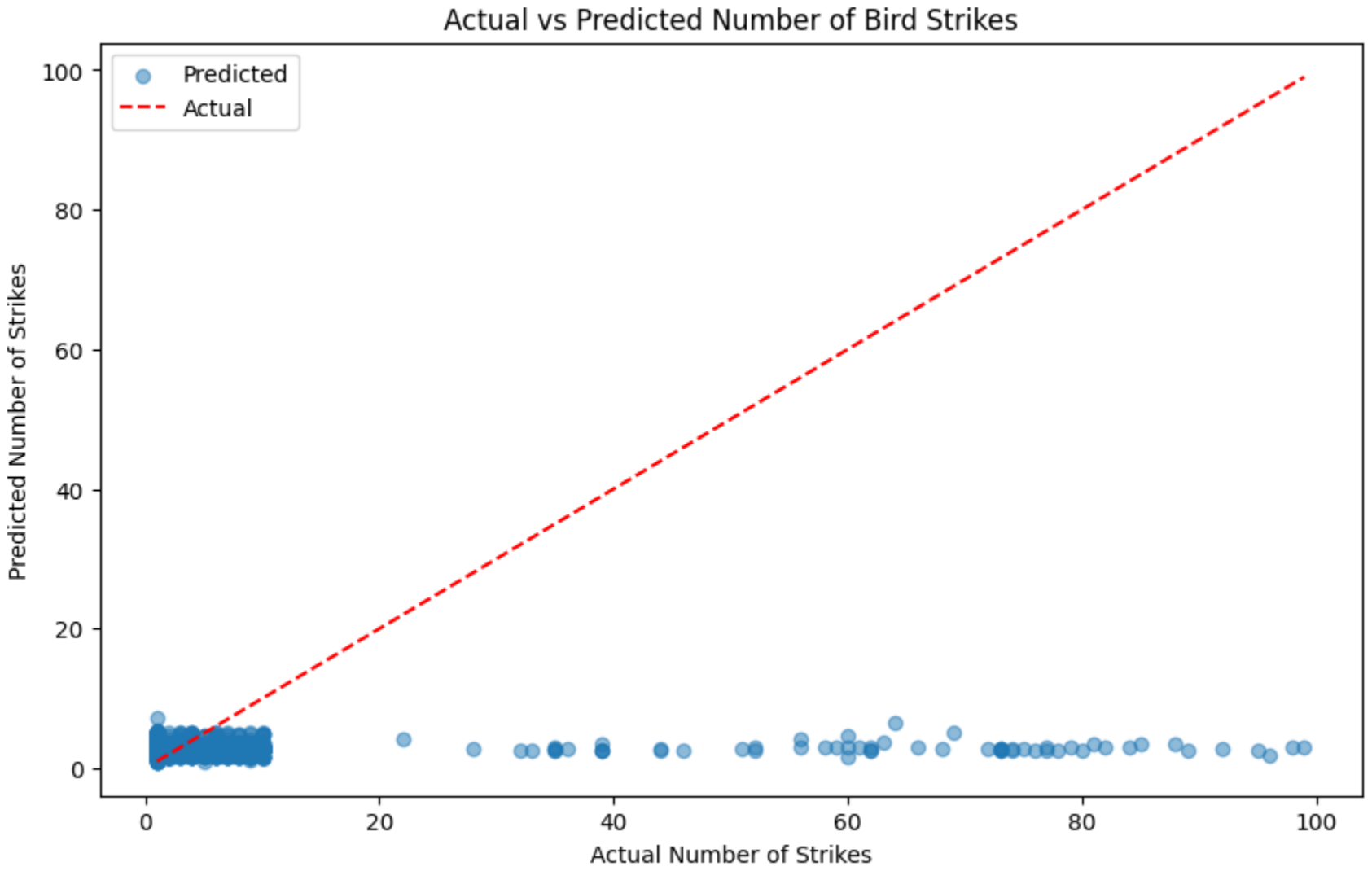
- **2011**: ~3000 strikes.

- **Significant Growth**: 2011 had notably more strikes than 2000.

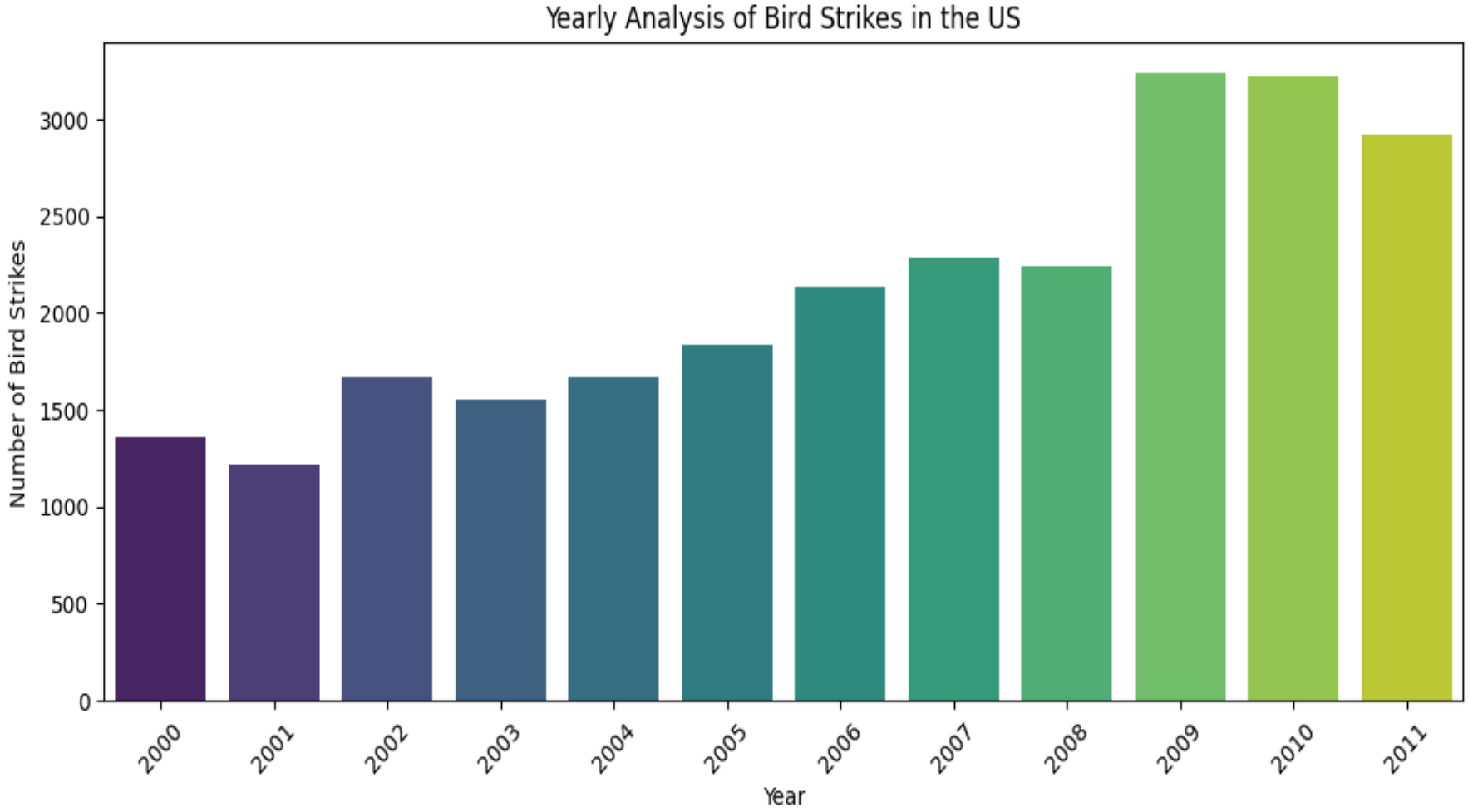


TREND OVER BIRD STRIKE

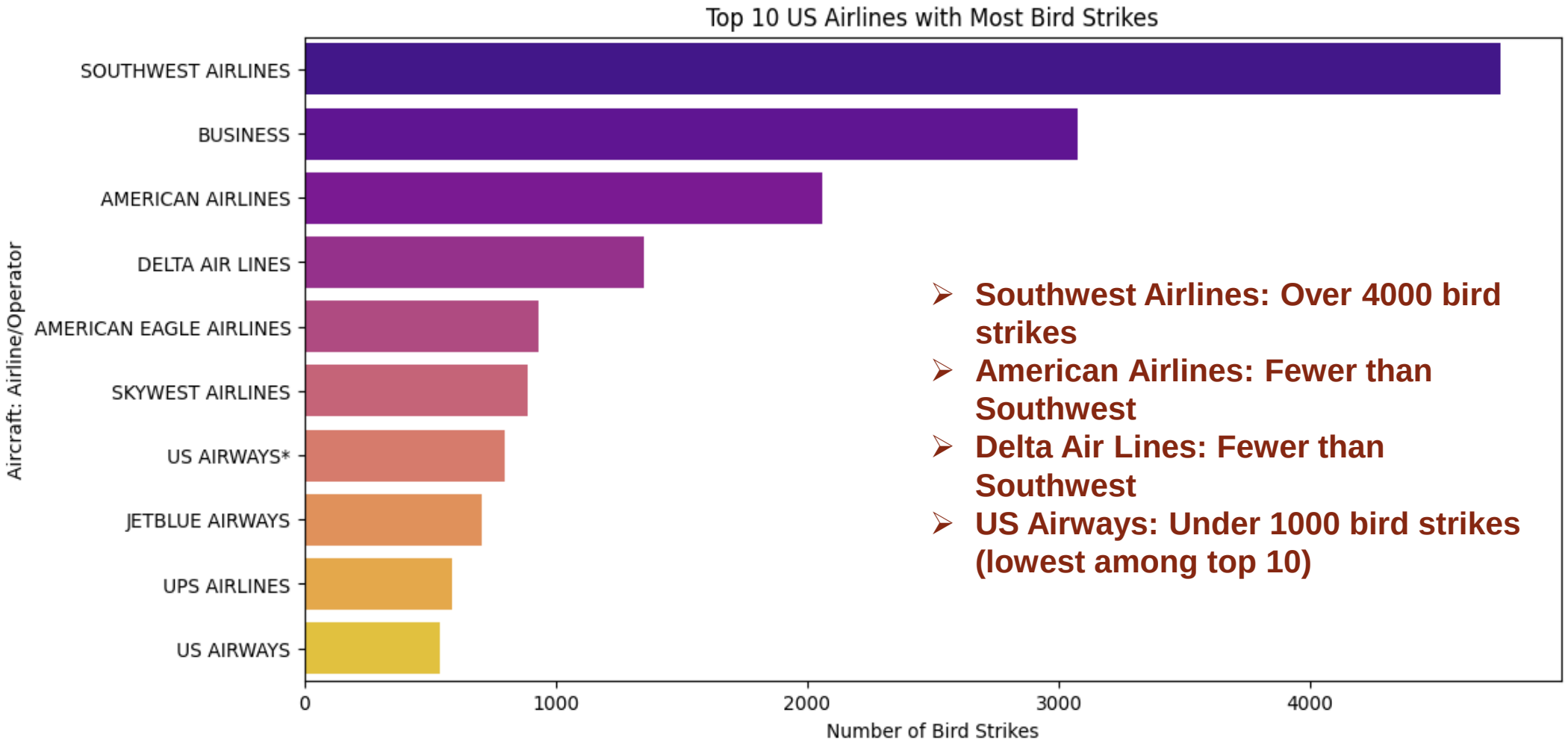


Yearly Analysis of Bird Strikes in the US

- **Increasing Trend**: Bird strikes increased each year from 2009 to 2012.
- **Lowest in 2009**: The fewest bird strikes occurred in 2009.
- **Highest in 2012**: The number of bird strikes peaked in 2012.
- **Consistent Growth**: There was no decrease in bird strikes over these four years.

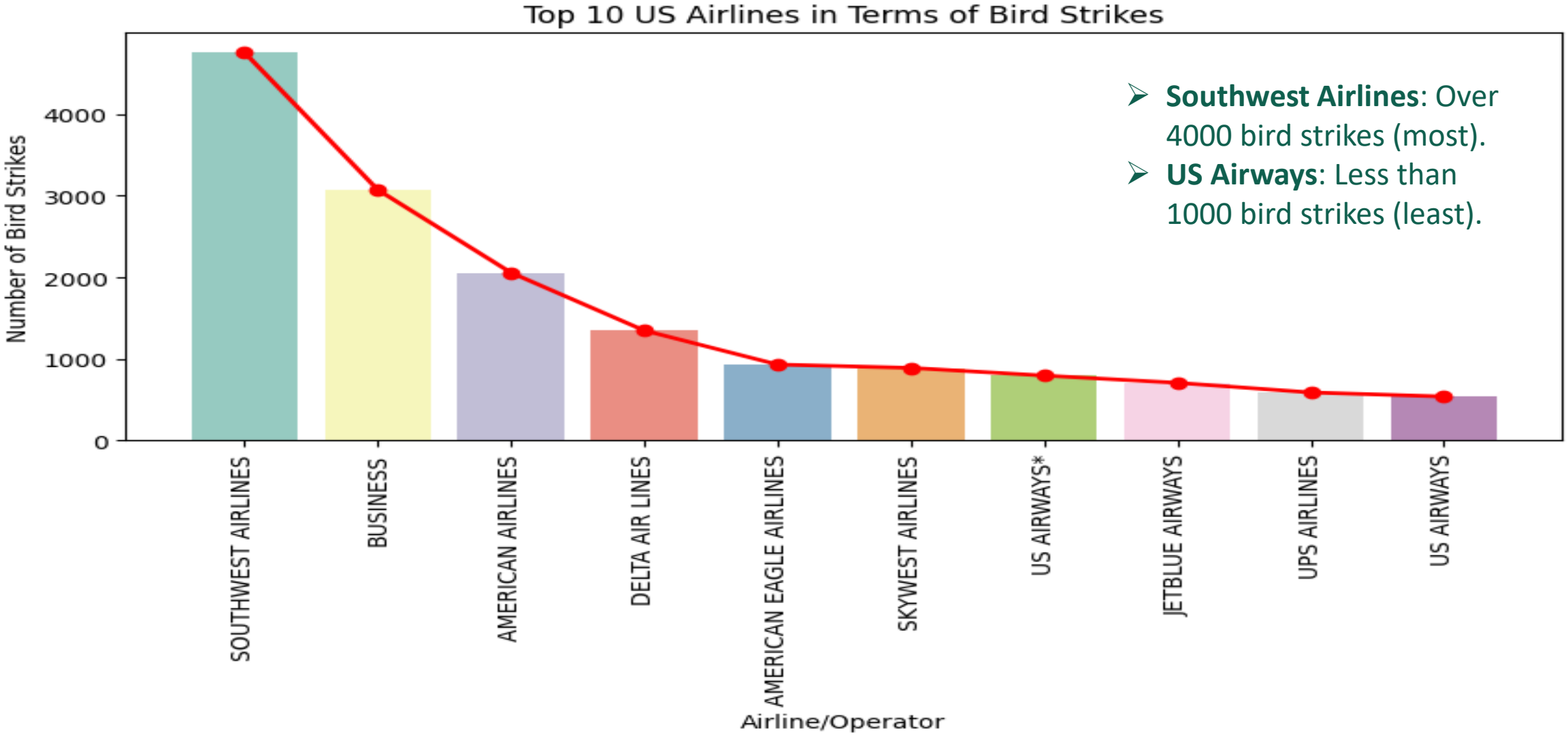


TOP 10 US AIRLINES IN TERMS OF HAVING ENCOUNTERED BIRD STRIKES



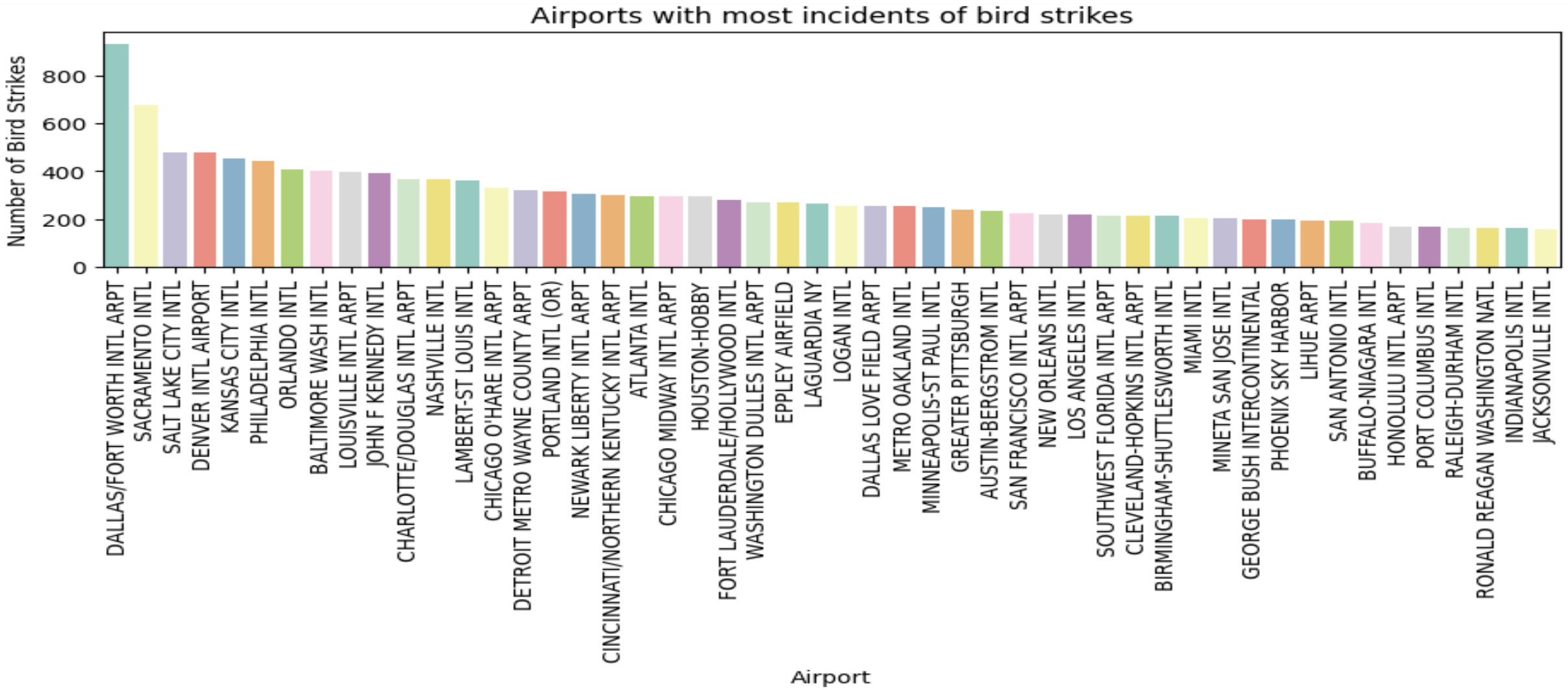
- **Southwest Airlines: Over 4000 bird strikes**
- **American Airlines: Fewer than Southwest**
- **Delta Air Lines: Fewer than Southwest**
- **US Airways: Under 1000 bird strikes (lowest among top 10)**

TOP 10 US AIRLINES IN TERMS OF HAVING ENCOUNTERED BIRD STRIKES

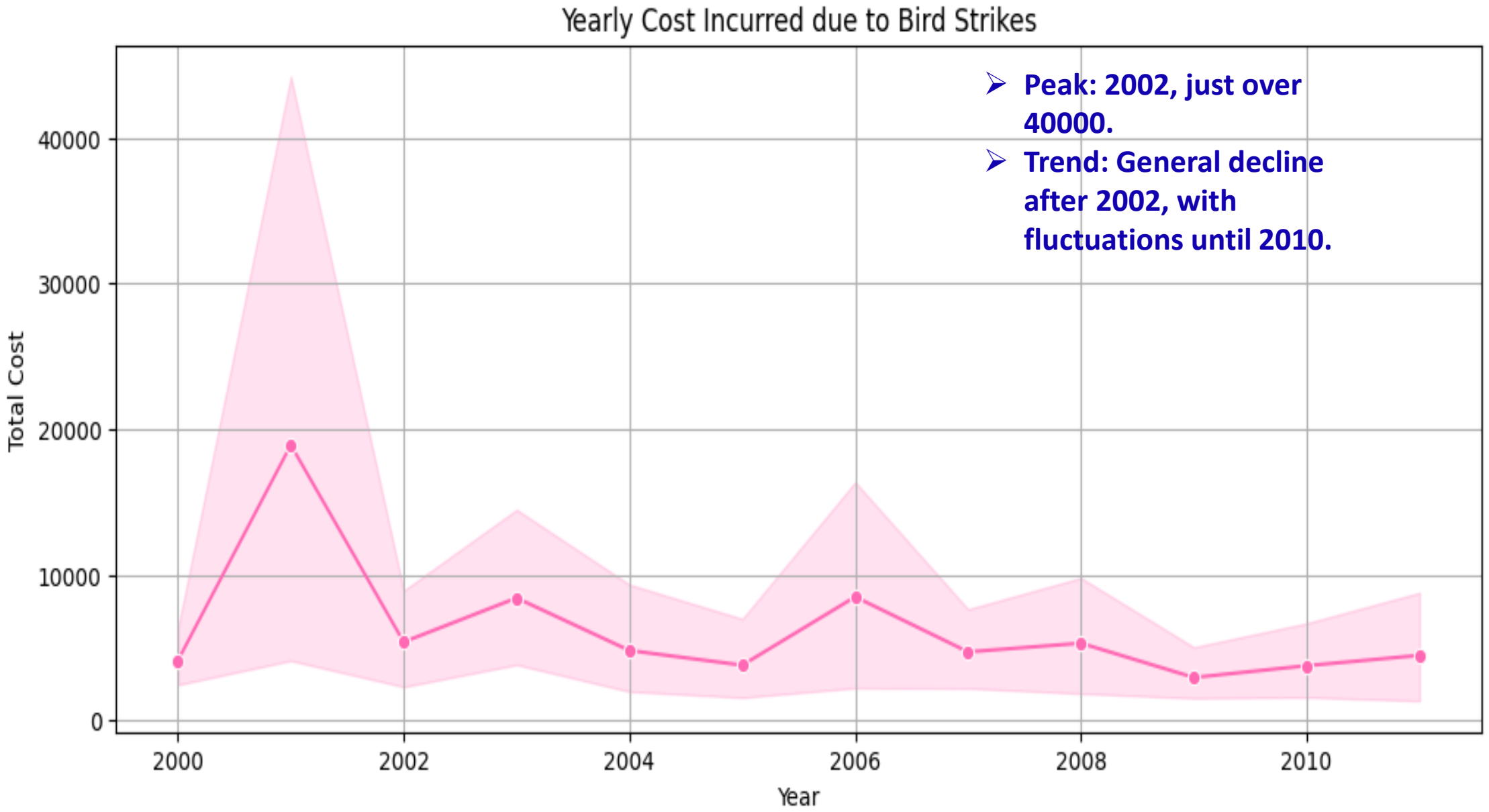


- **Southwest Airlines**: Over 4000 bird strikes (most).
- **US Airways**: Less than 1000 bird strikes (least).

AIRPORTS WITH MOST INCIDENTS OF BIRD STRIKES – TOP 50

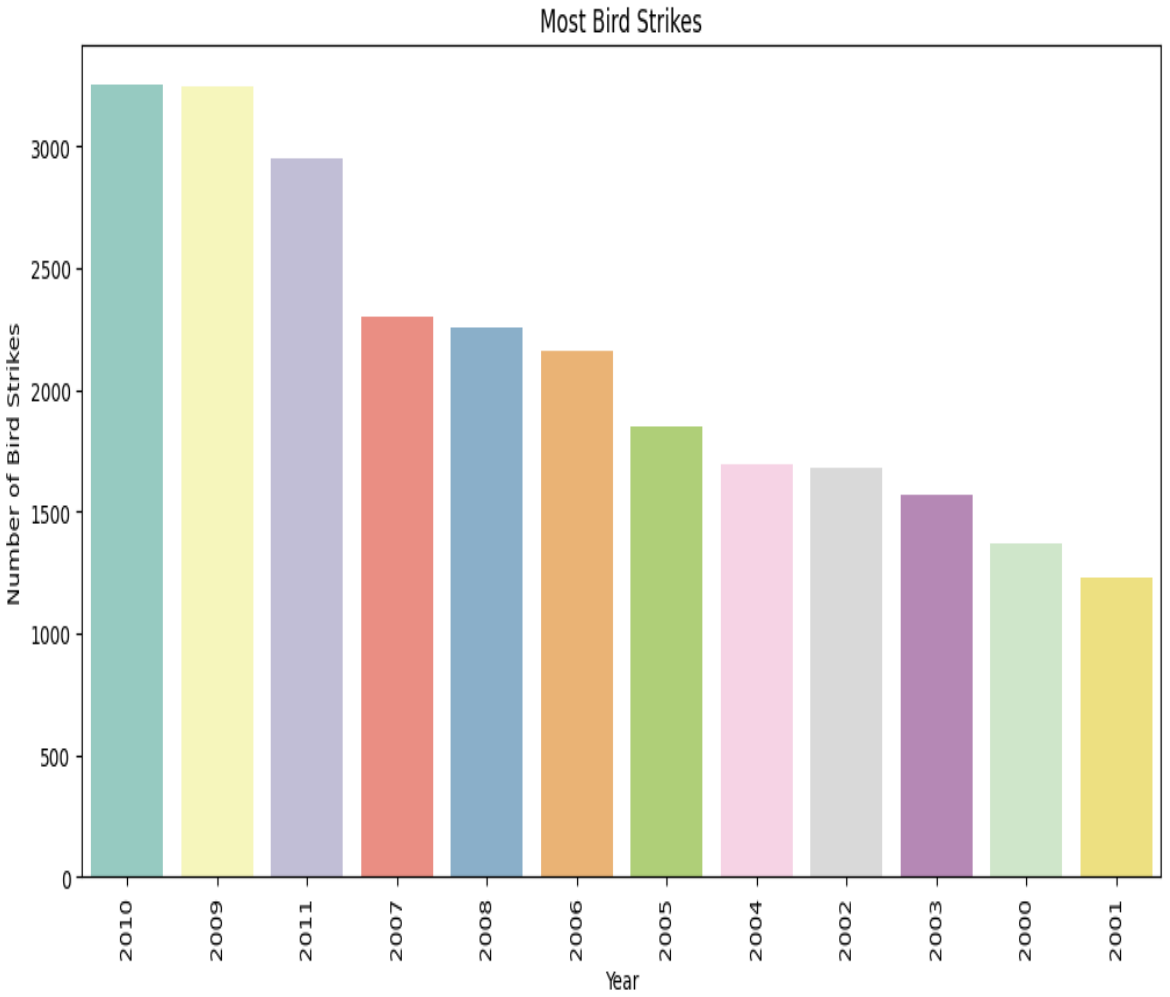


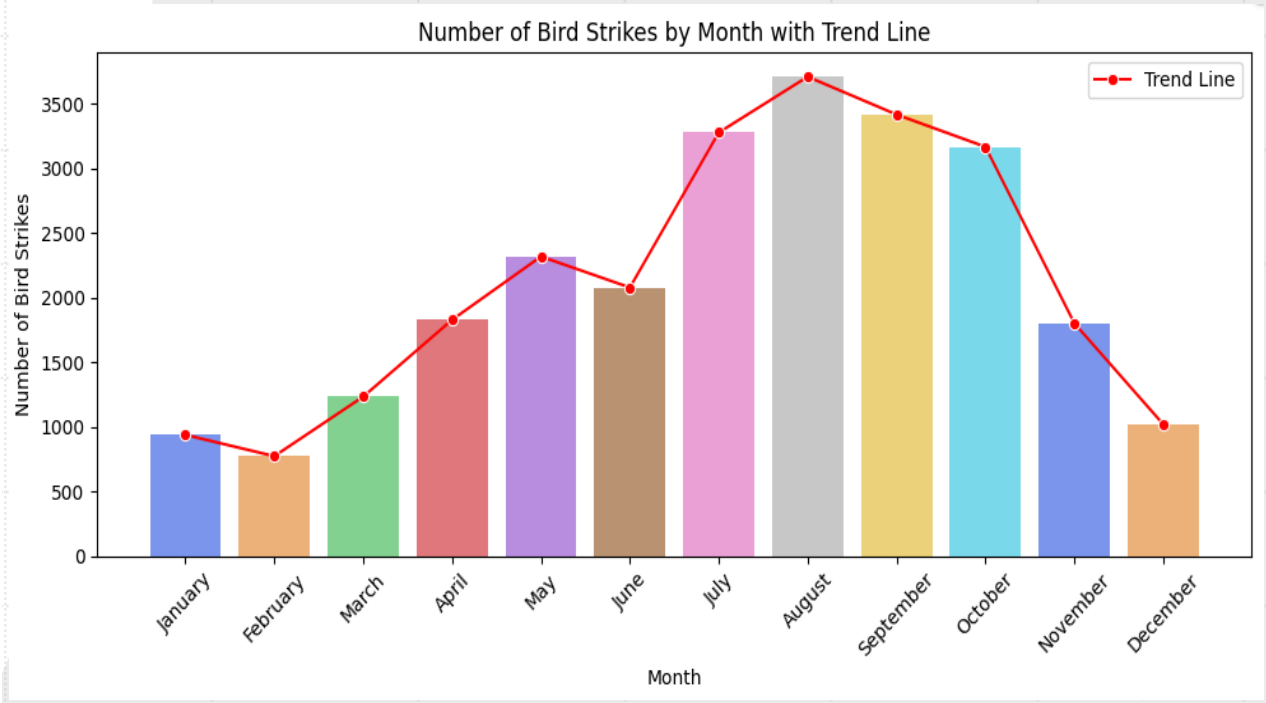
YEARLY COST INCURRED DUE TO BIRD STRIKES

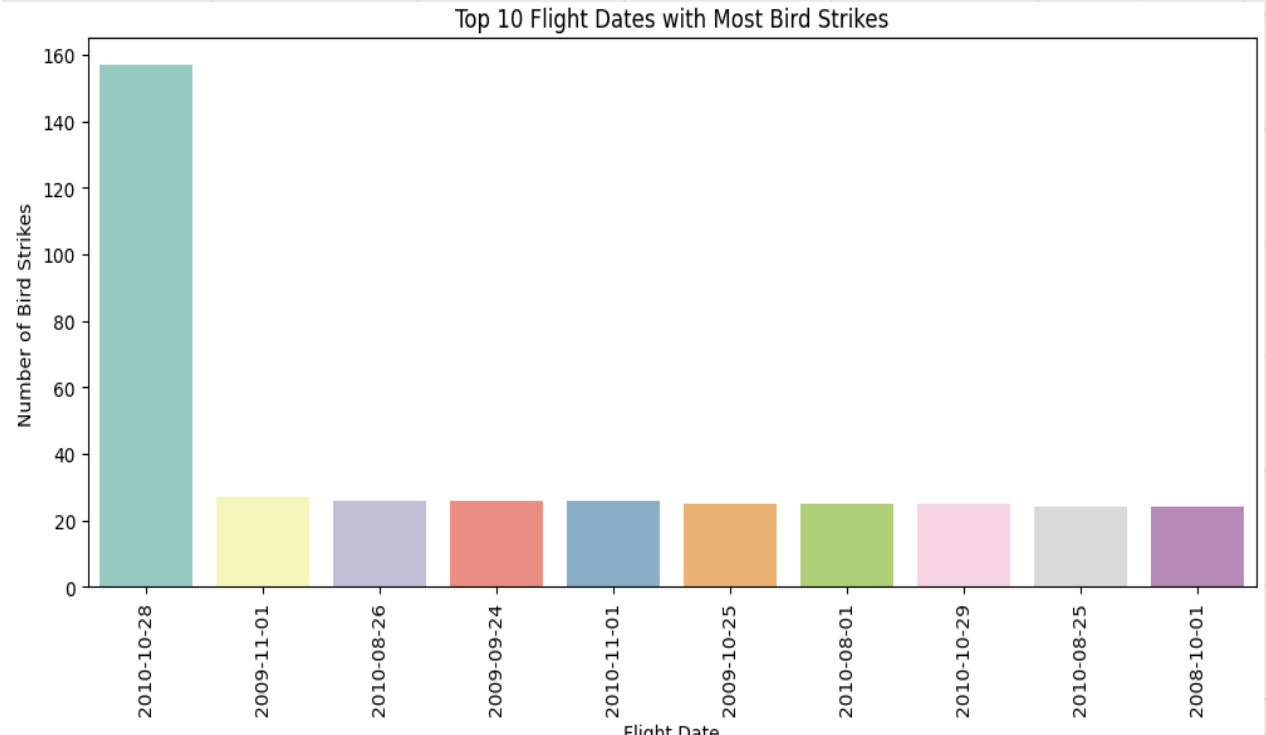


- **Peak: 2002, just over 40000.**
- **Trend: General decline after 2002, with fluctuations until 2010.**

WHEN DO MOST BIRD STRIKES OCCUR?

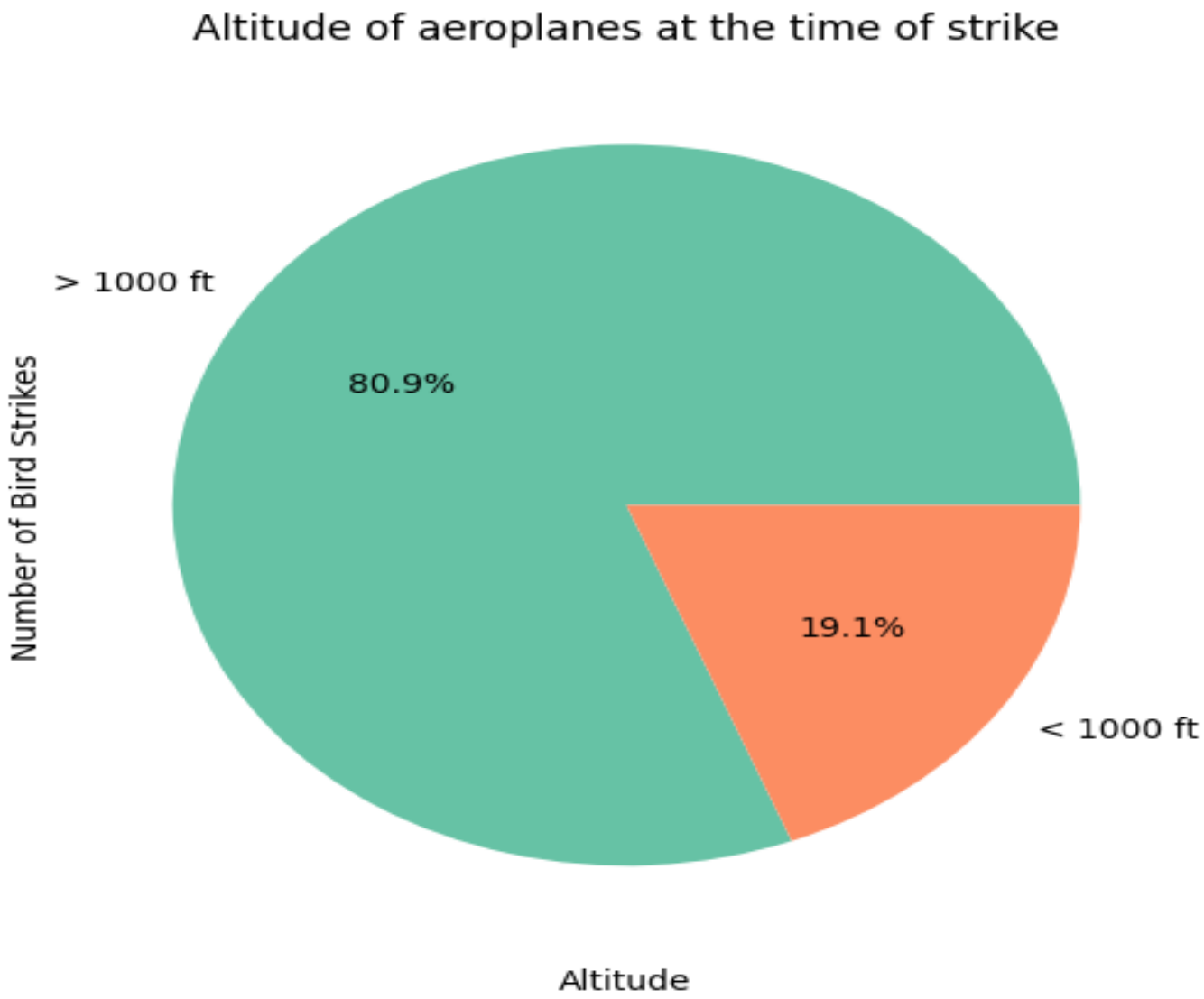




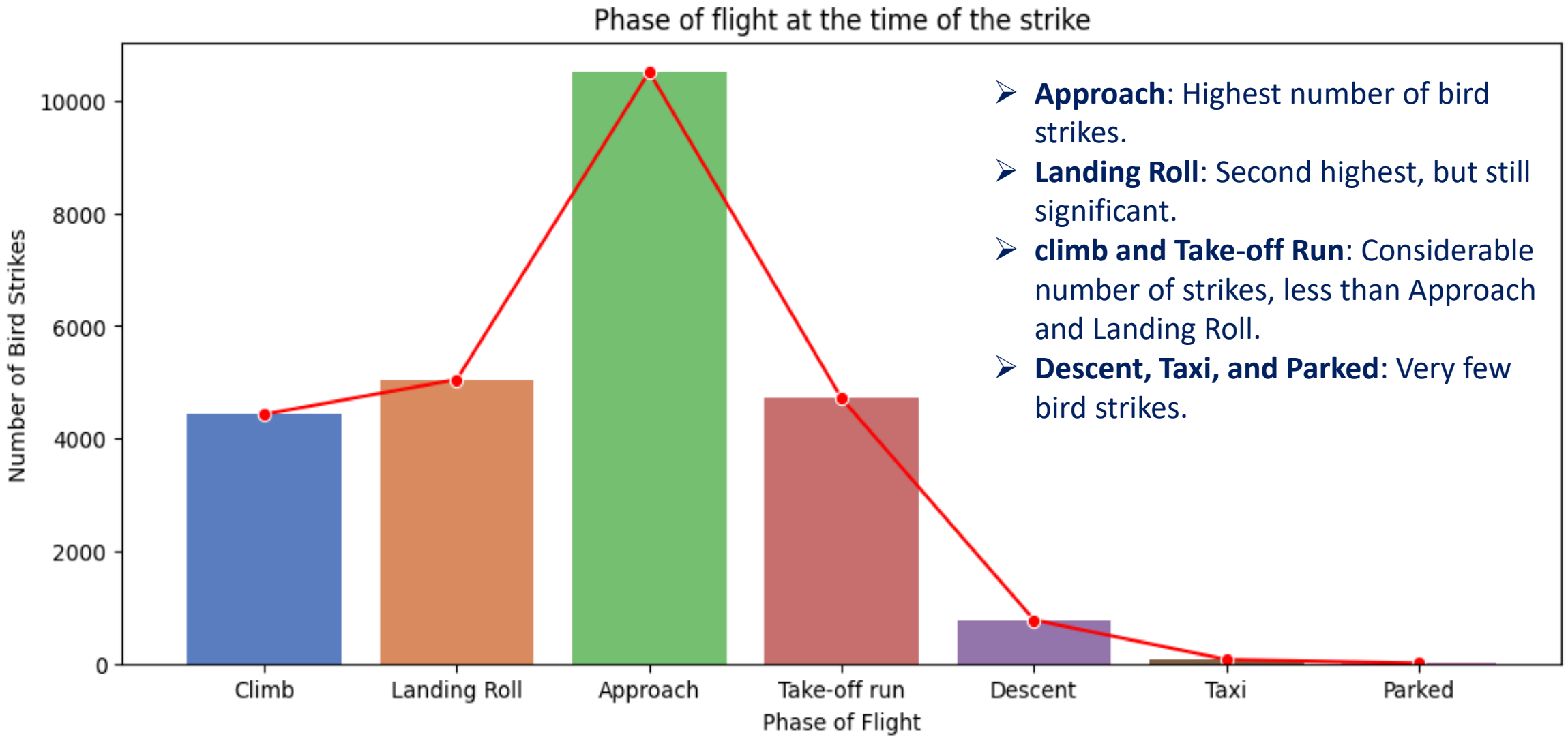


ALTITUDE OF AEROPLANES AT THE TIME OF STRIKE

- **Above 1000 ft: The majority of bird strikes (80.9%) occur at altitudes above 1000 feet.**
- **Below 1000 ft: A smaller portion (19.1%) of bird strikes happen below 1000 feet.**

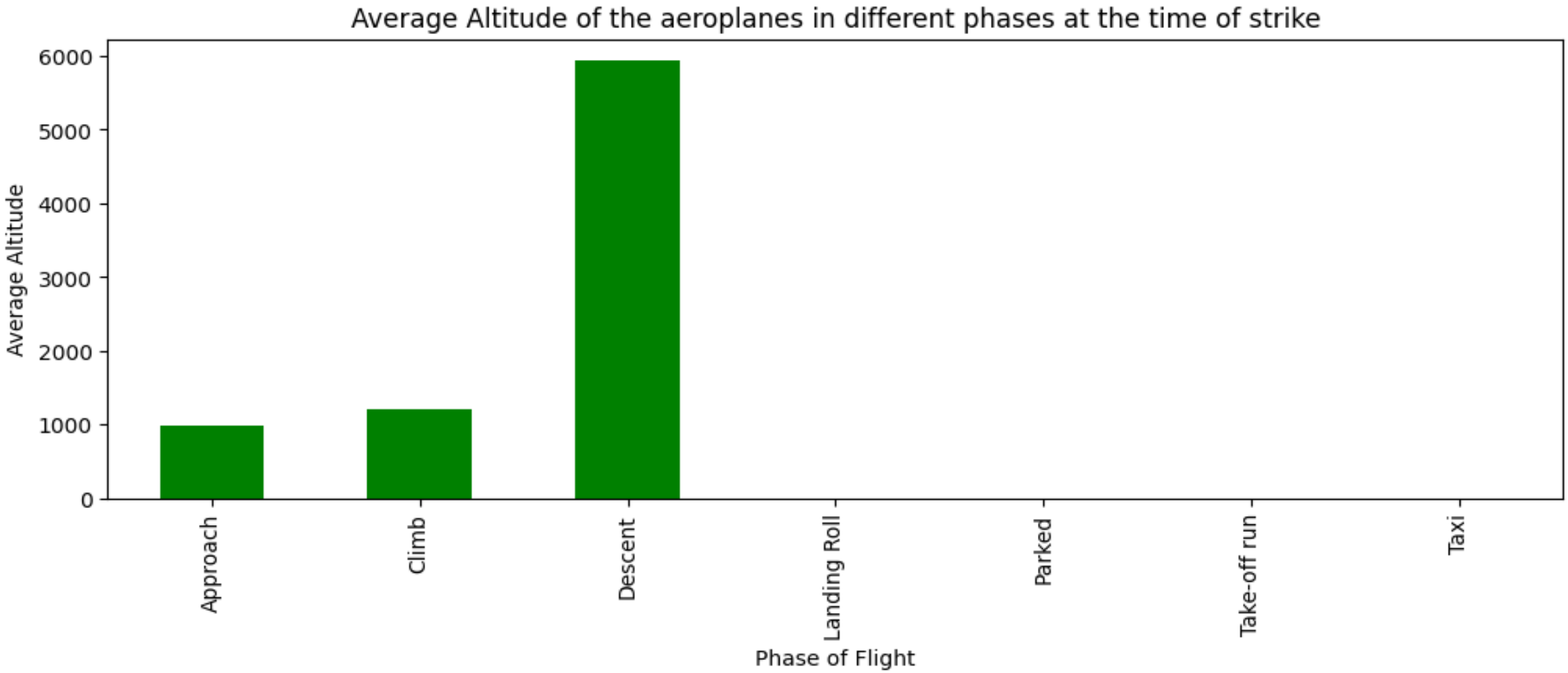


PHASE OF FLIGHT AT THE TIME OF STRIKE

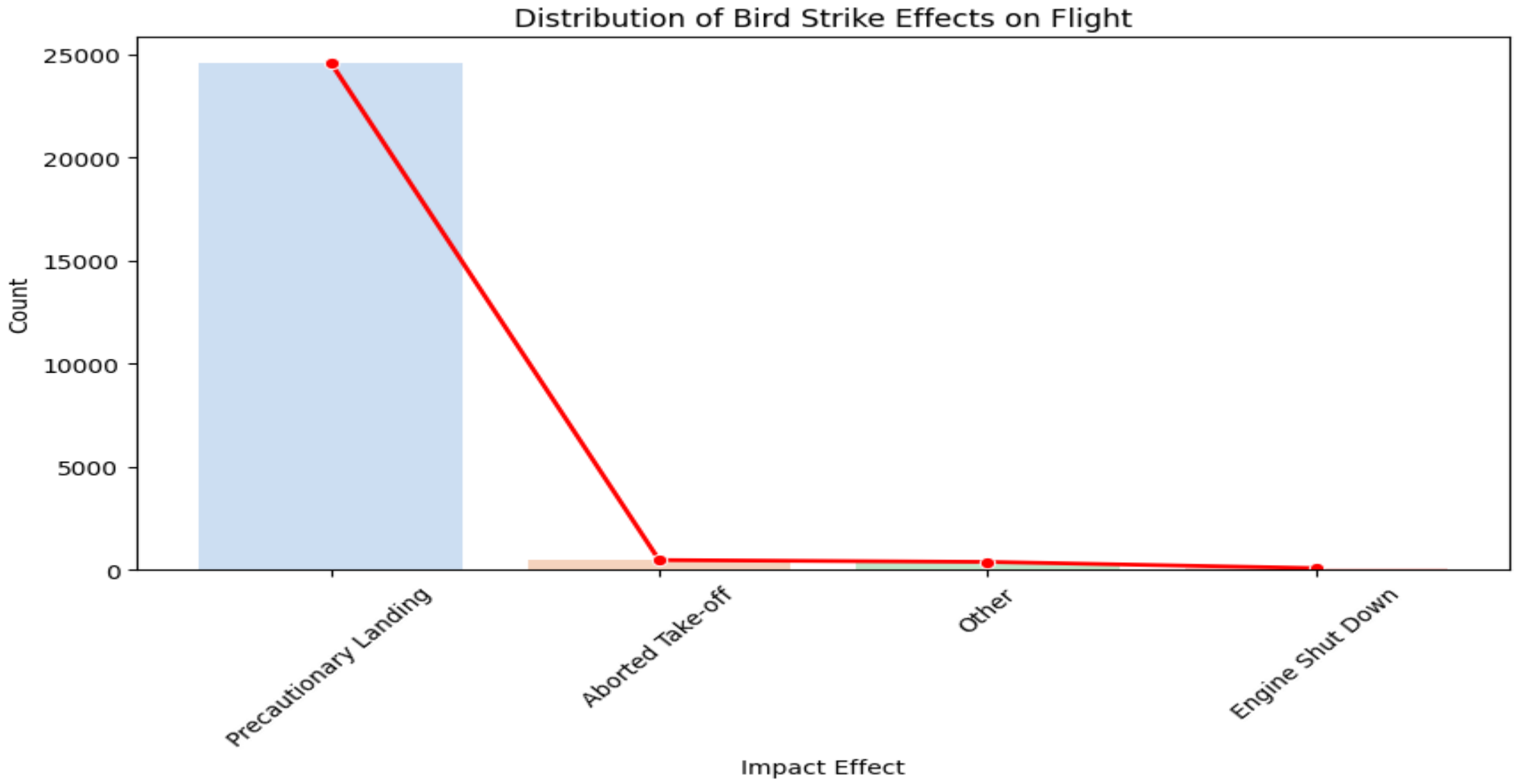


- **Approach**: Highest number of bird strikes.
- **Landing Roll**: Second highest, but still significant.
- **climb and Take-off Run**: Considerable number of strikes, less than Approach and Landing Roll.
- **Descent, Taxi, and Parked**: Very few bird strikes.

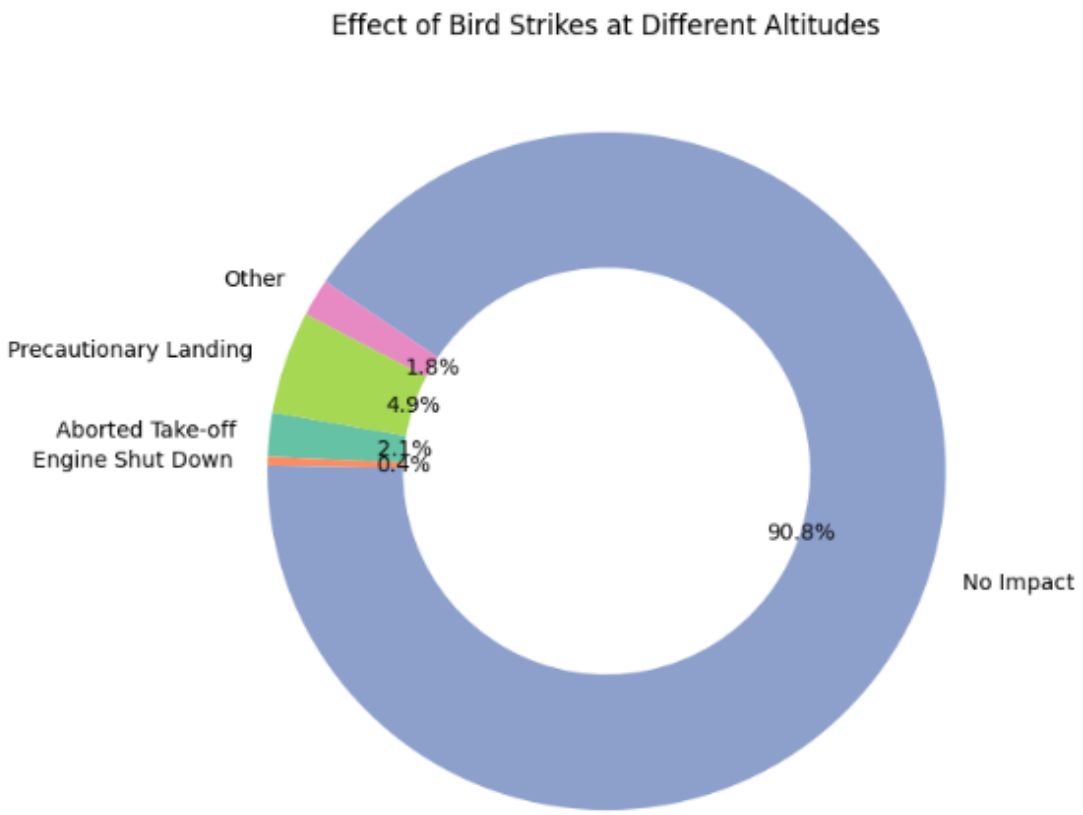
AVERAGE ALTITUDE OF THE AEROPLANES IN DIFFERENT PHASES THE TIME OF STRIKE

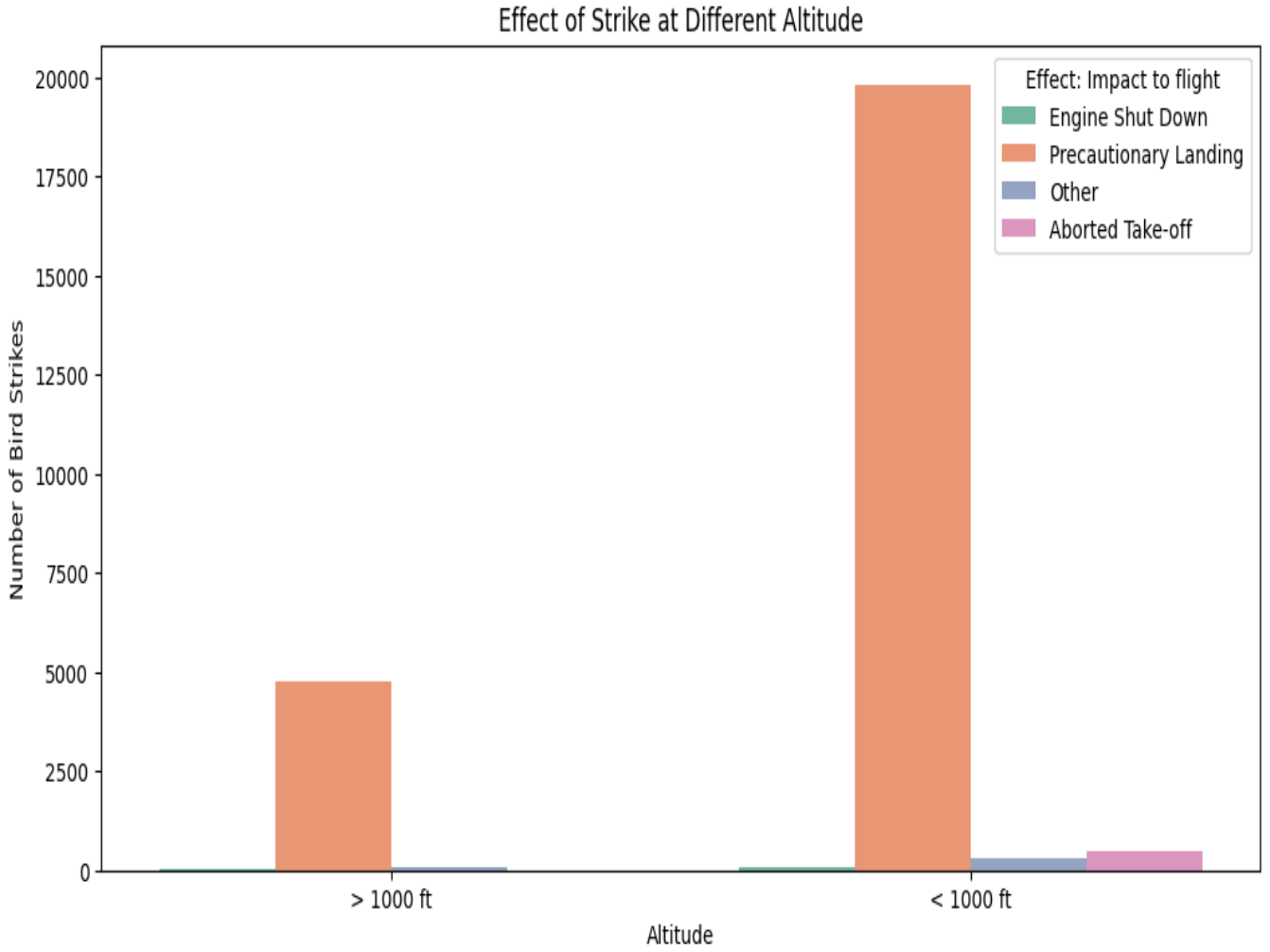


EFFECT OF BIRD STRIKES & IMPACT ON FLIGHT

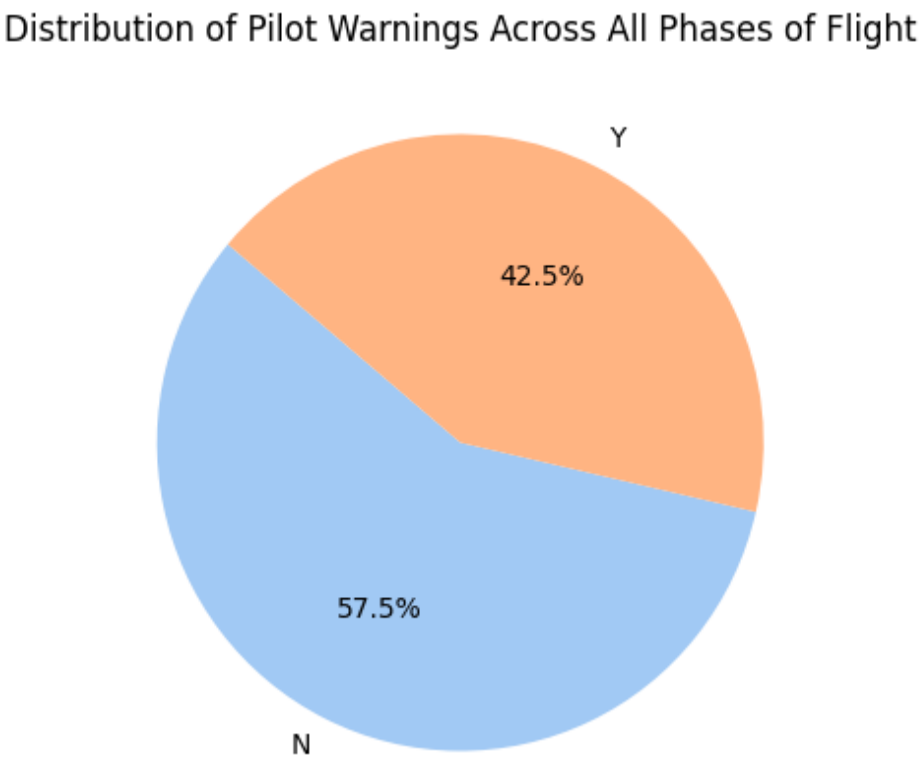


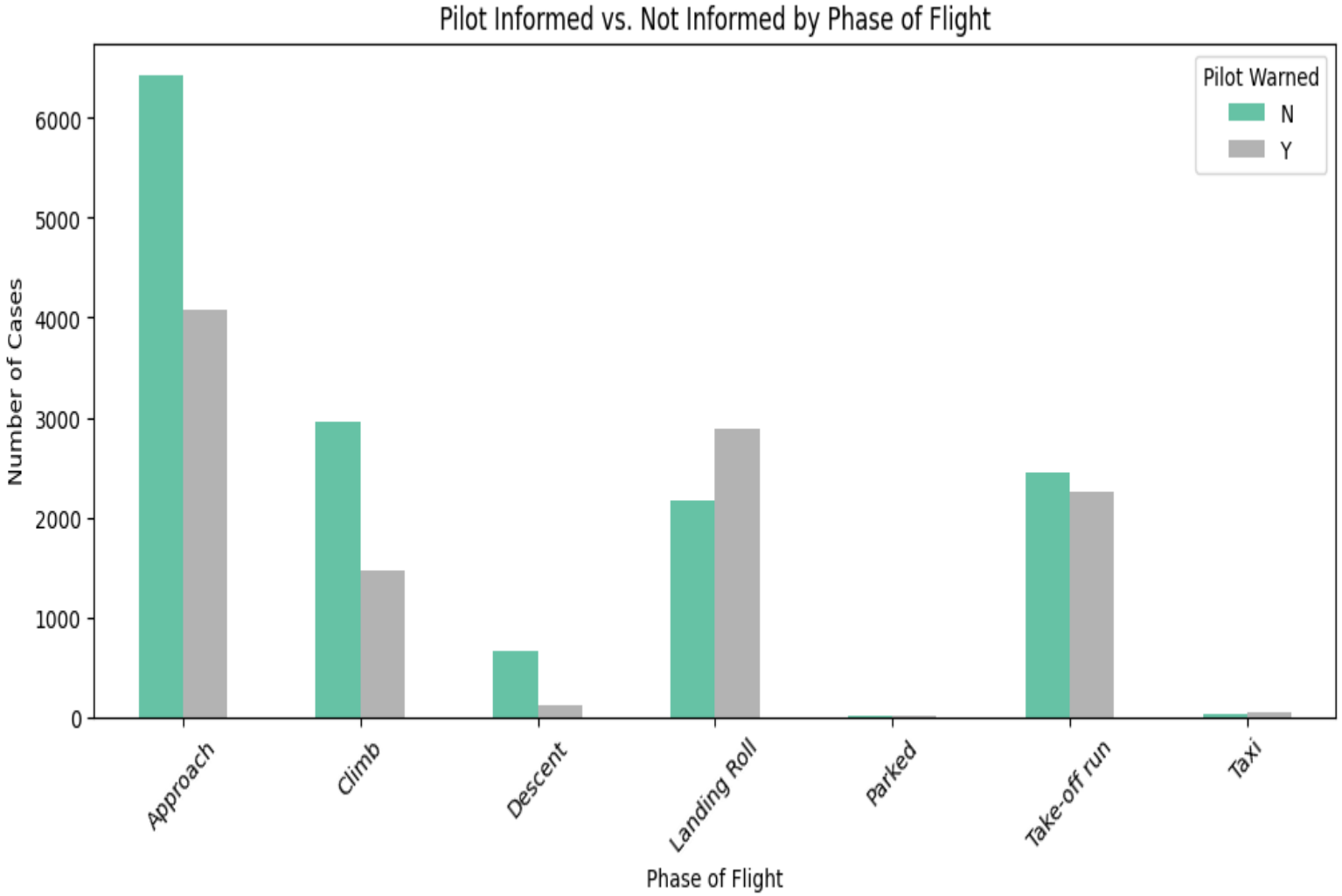
EFFECT OF STRIKE AT DIFFERENT ALTITUDE



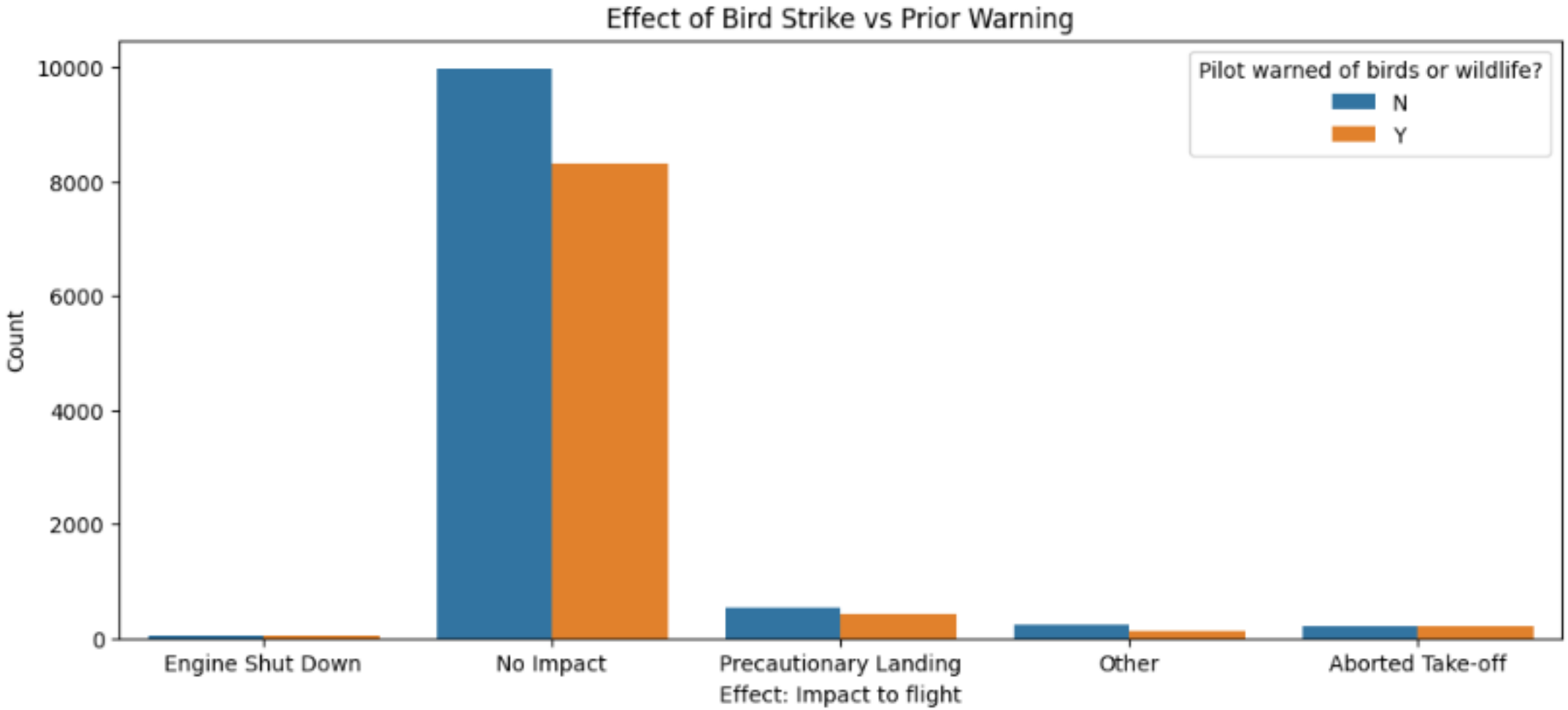


WERE PILOTS INFORMED?

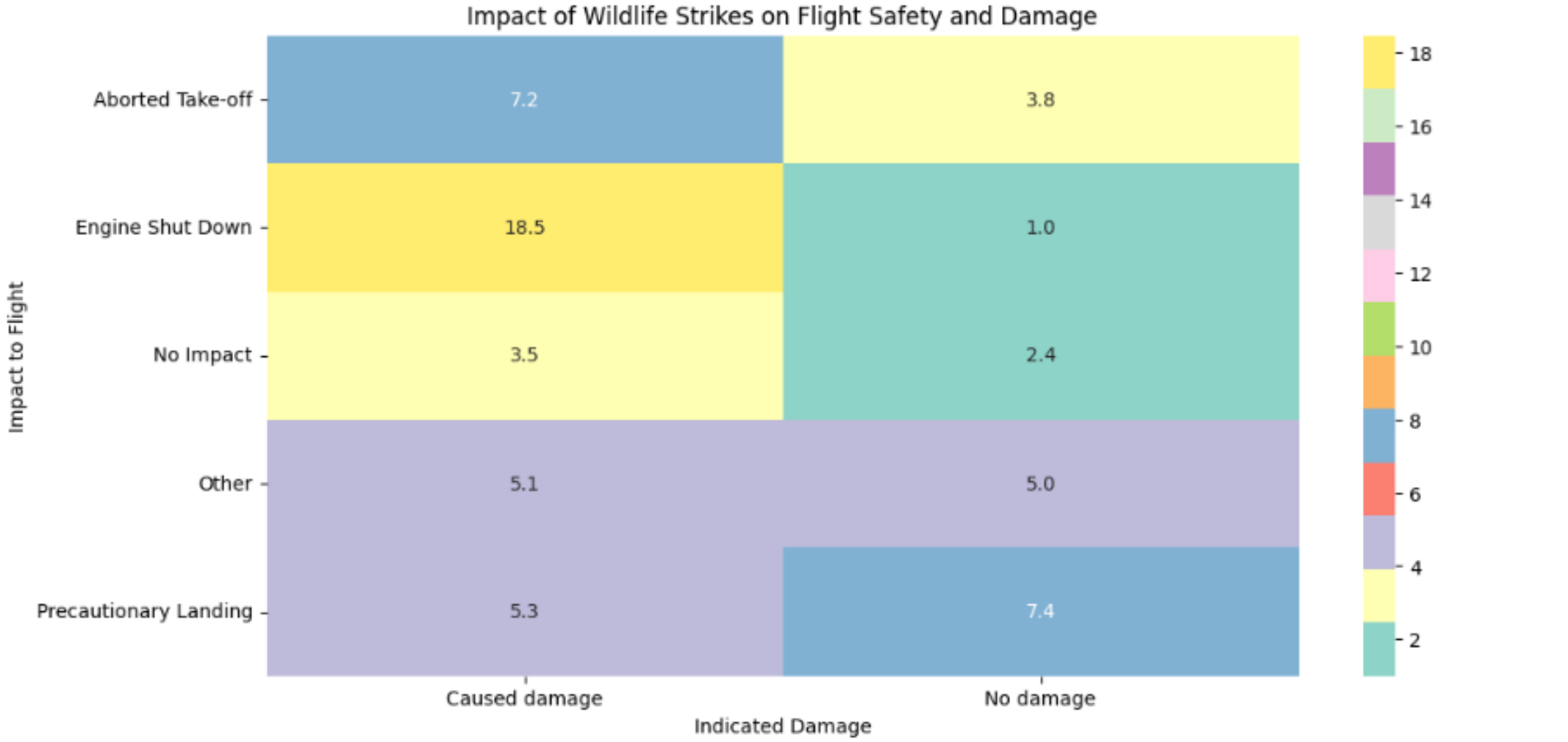




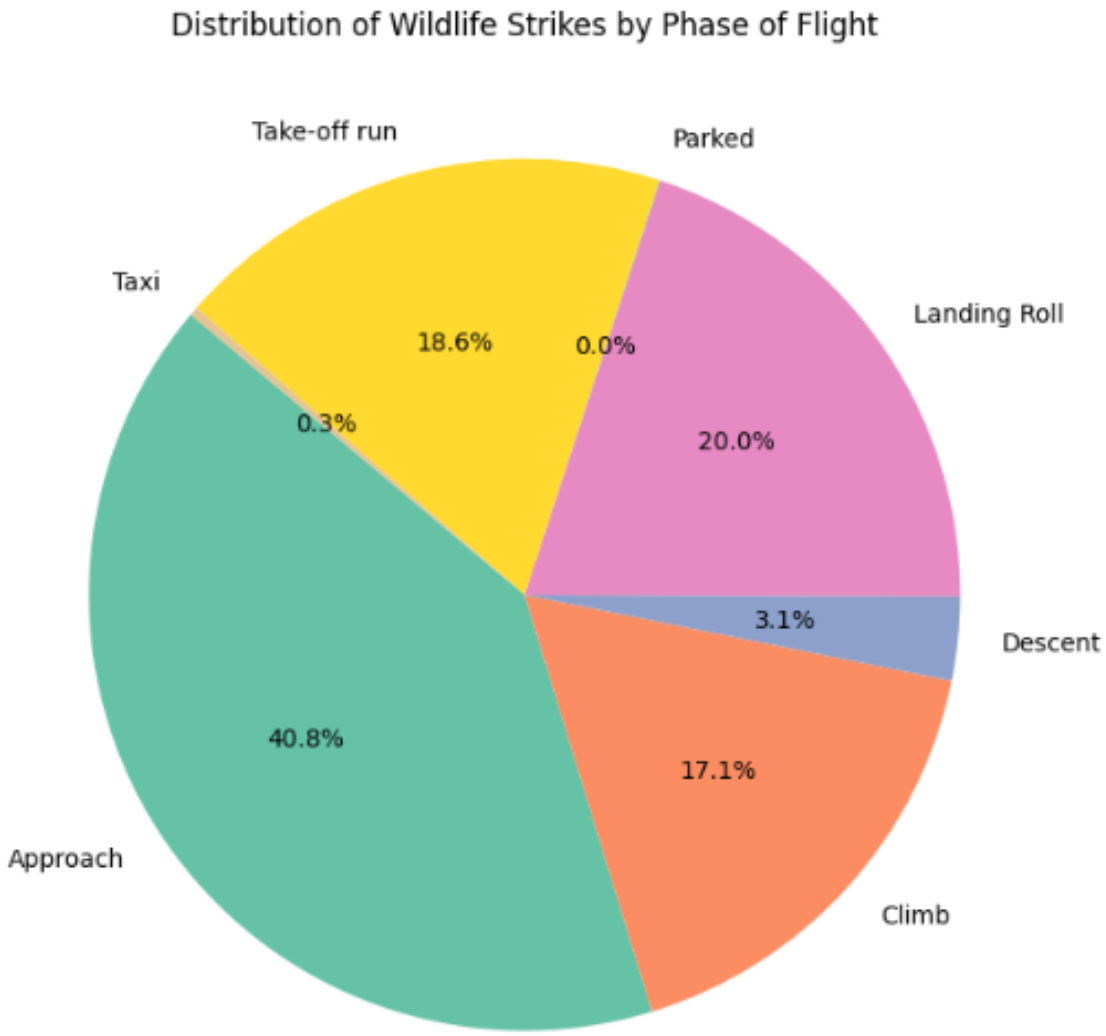
PRIOR WARNING AND EFFECT OF STRIKE RELATION



IMPACT OF WILDLIFE STRIKES & FLIGHT SAFTY AND DAMAGE

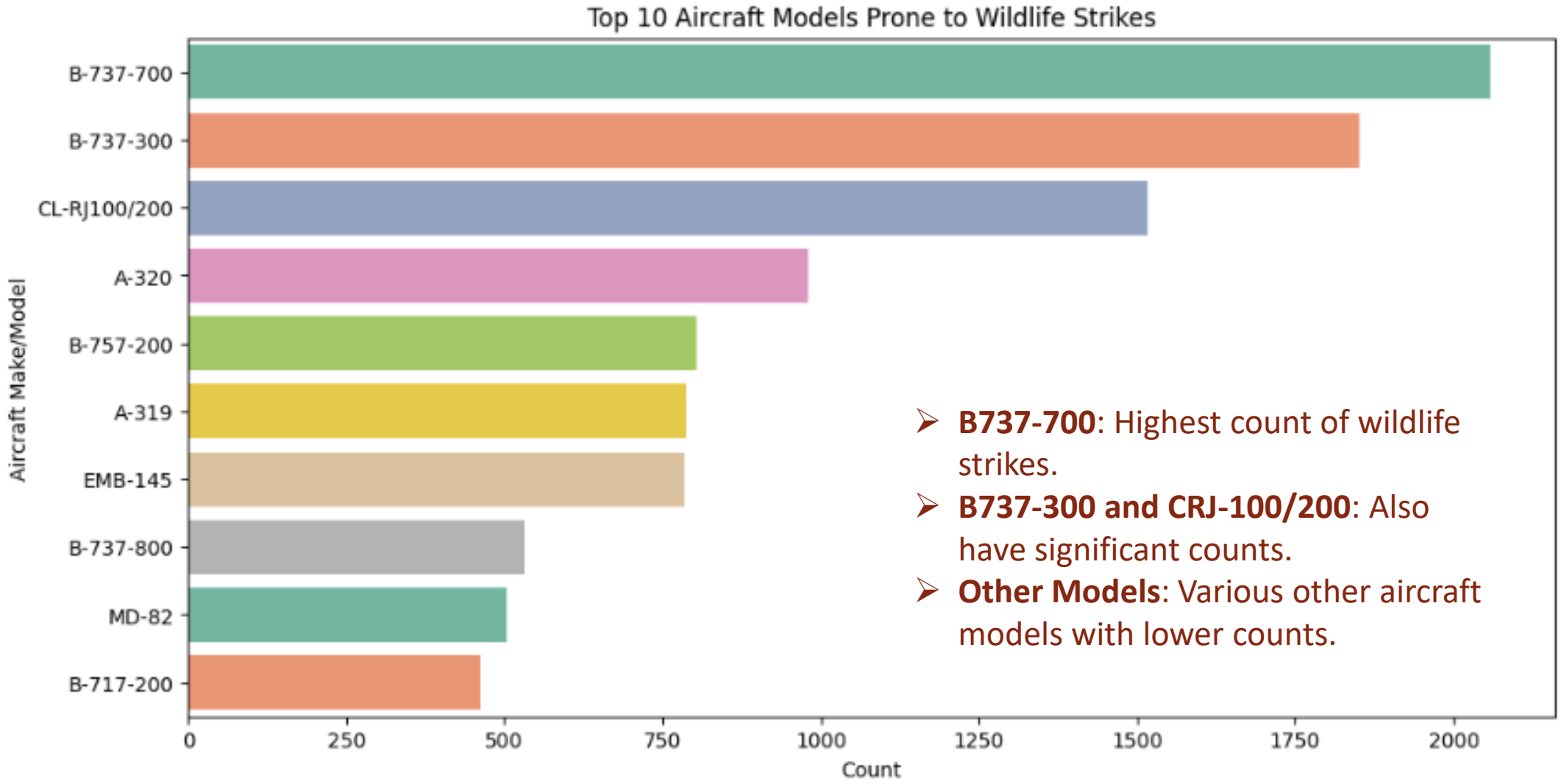


DISTRIBUTION OF WILDLIFE STRIKE BY PHASE OF FLIGHT



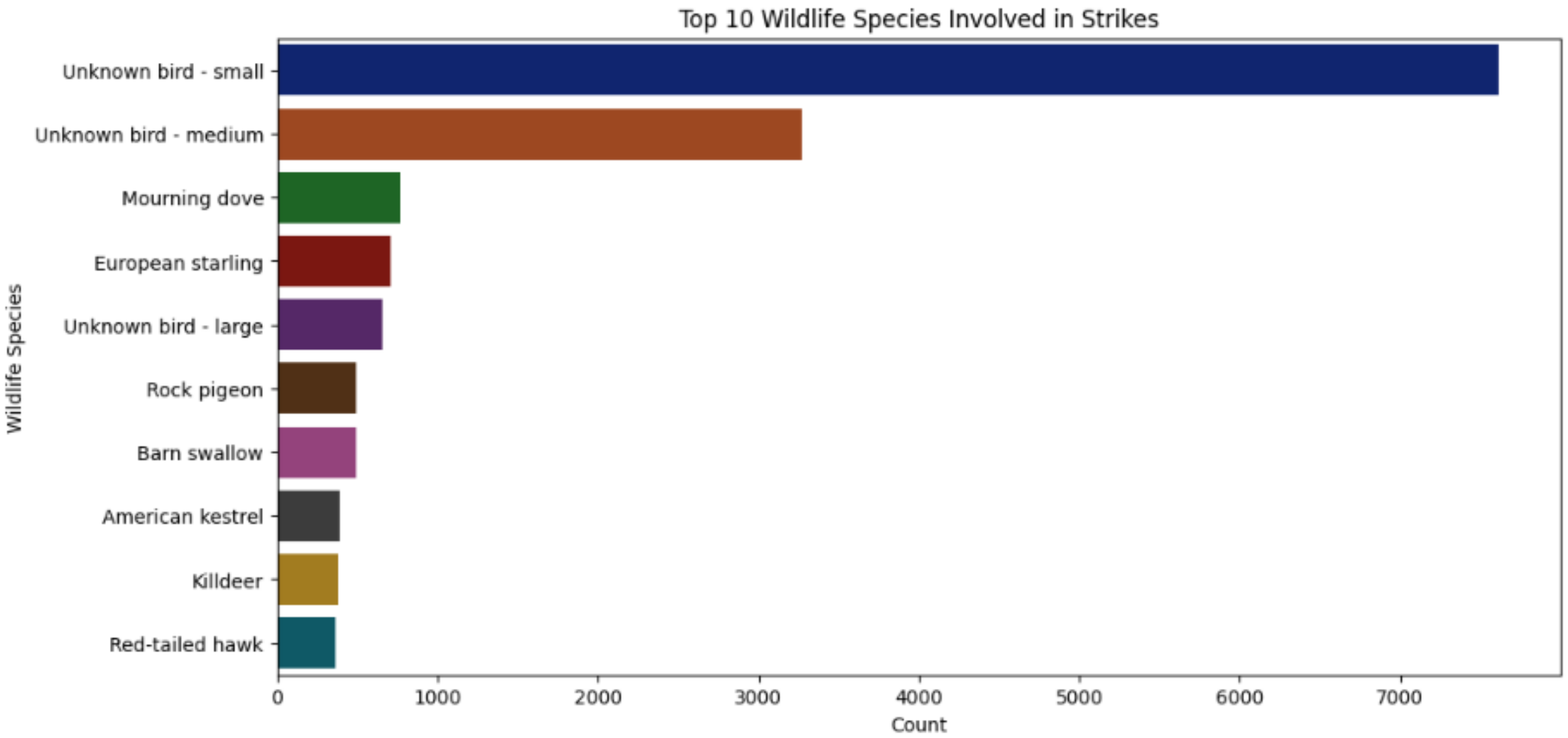
- **Approach Phase:** Most wildlife strikes (40.8%) occur here.
- **Climb Phase:** Second highest (17.1%).
- **Landing Roll and Take-off Run:** Significant strikes during landing roll (20.0%) and take-off run (18.6%).
- **Minimal Strikes:** Few during taxi (0.3%) and descent (3.1%)

TOP 10 AIRCRAFT MODELS PRONE TO WILDLIFE STRIKES

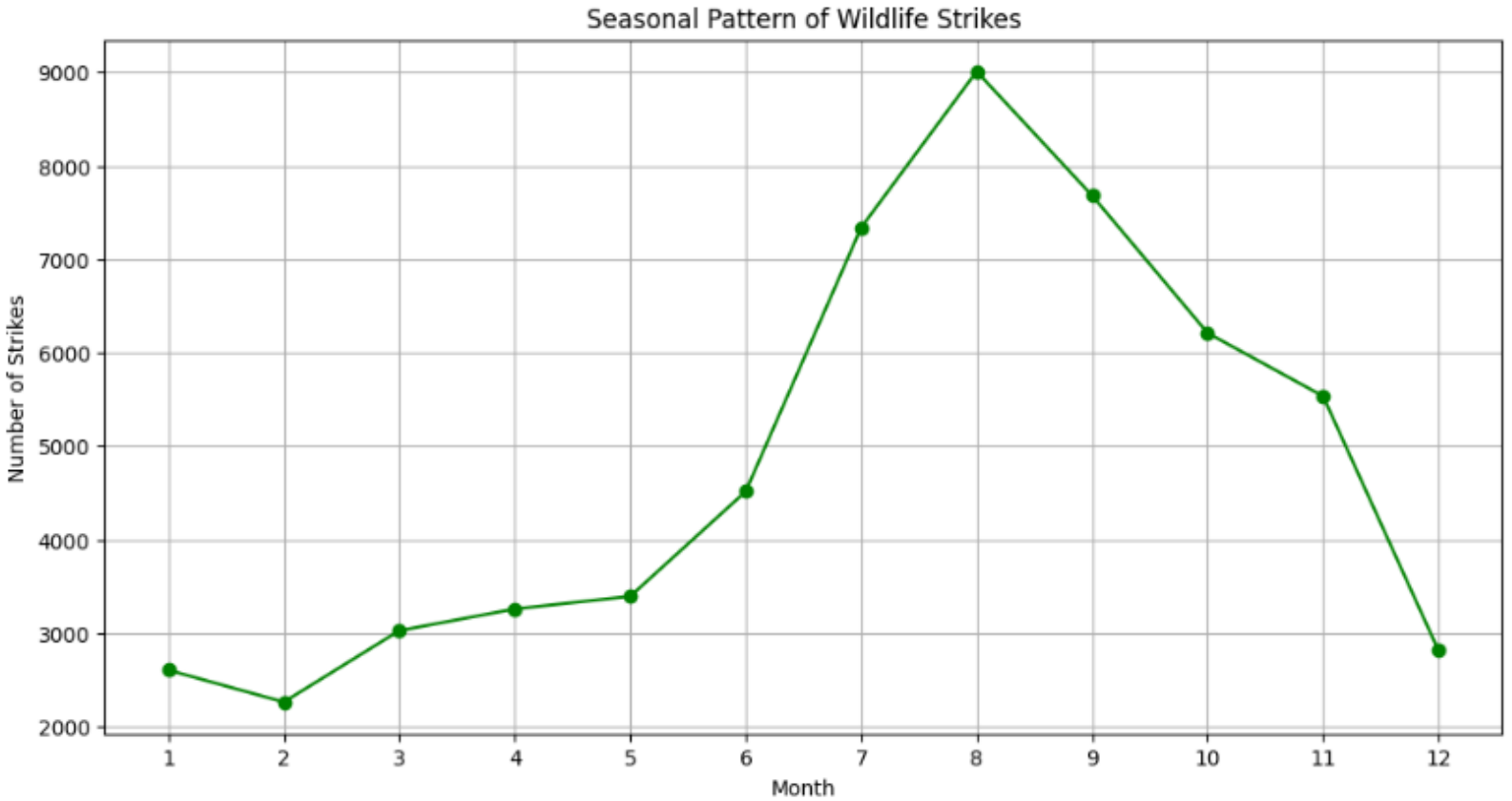


- **B737-700**: Highest count of wildlife strikes.
- **B737-300 and CRJ-100/200**: Also have significant counts.
- **Other Models**: Various other aircraft models with lower counts.

TOP 10 WILDLIFE SPECIES INVOLVED IN STRIKES

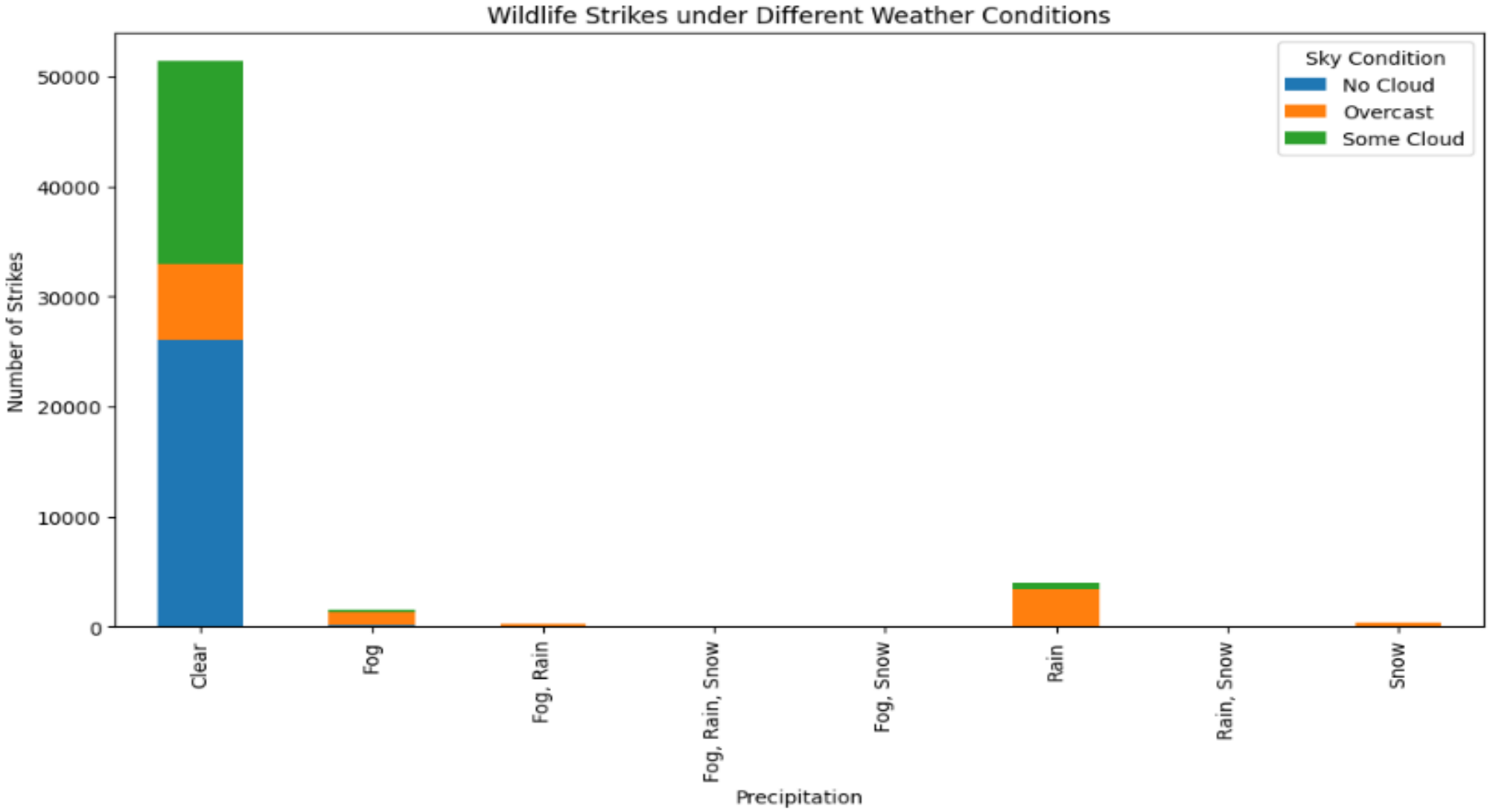


IS THERE ANY SEASONAL PATTERN IN WILDLIFE STRIKE

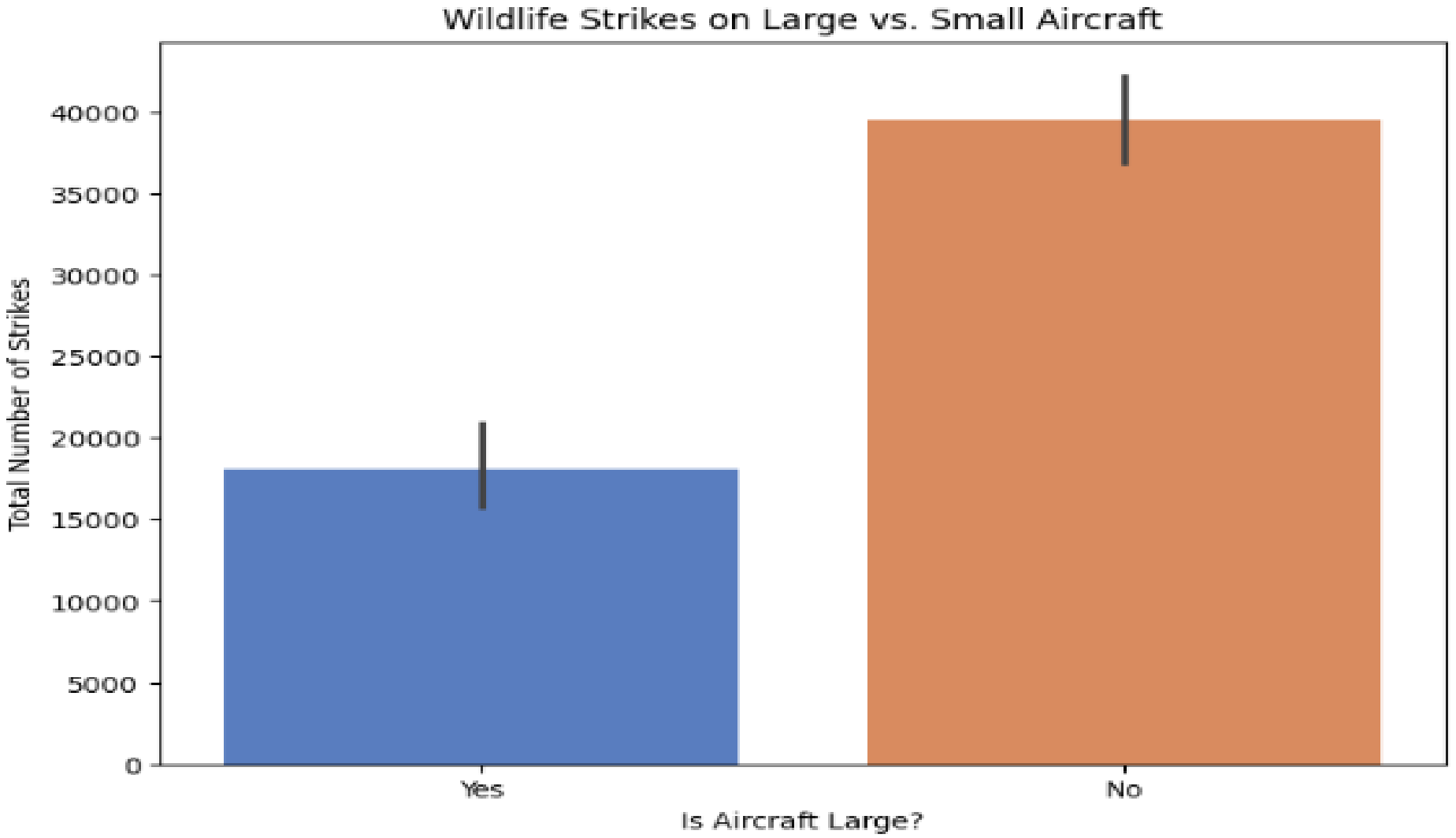


- **Peak in July:** Highest number of wildlife strikes.
- **Low at Year Start and End:** Fewest strikes in January and December.
- **Increasing Trend:** Strikes rise from January, peak in July, and decrease towards December.

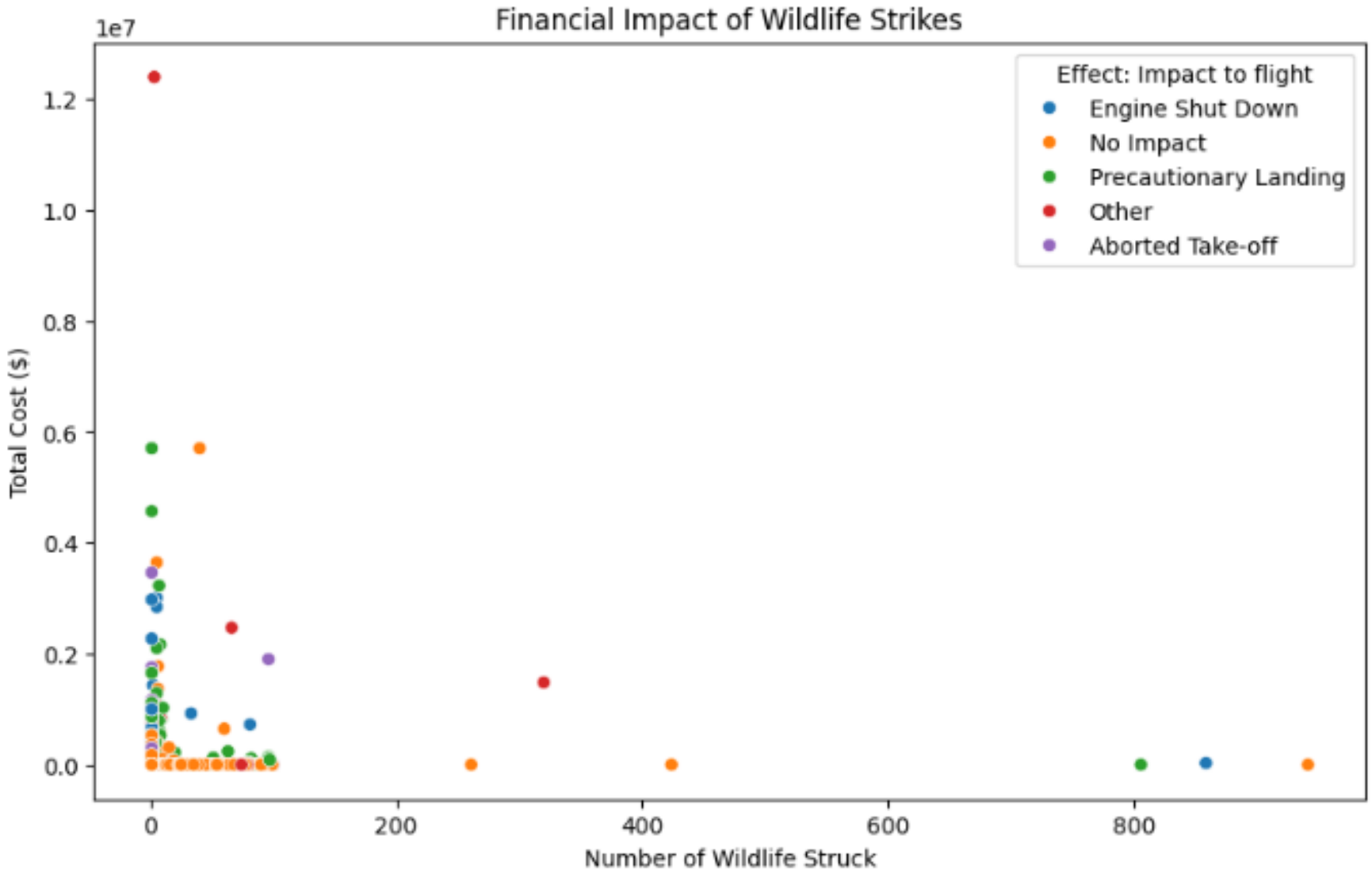
How does weather condition affect wildlife strike?



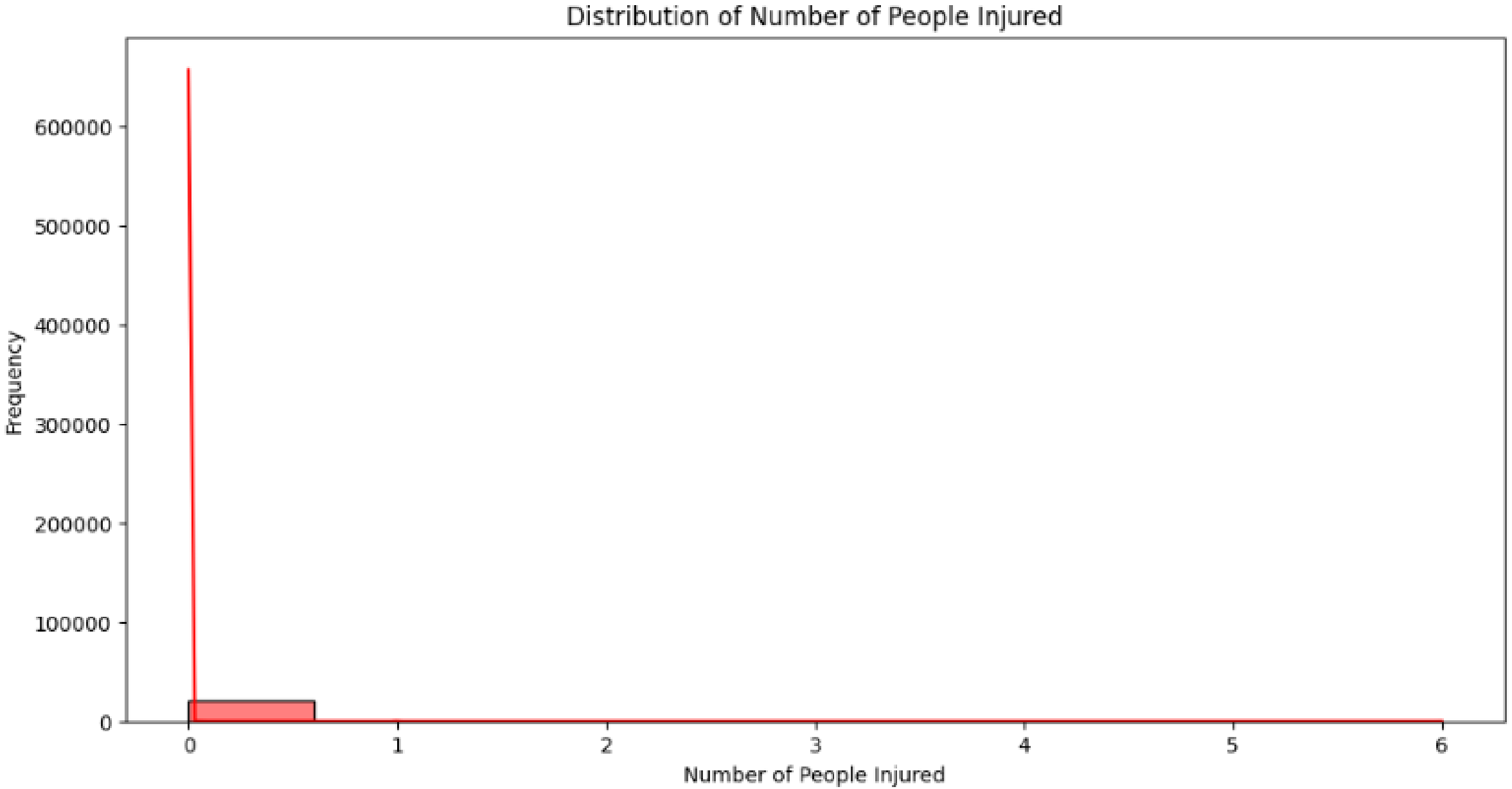
Do Larger Aircraft Experience More Wildlife Strikes?



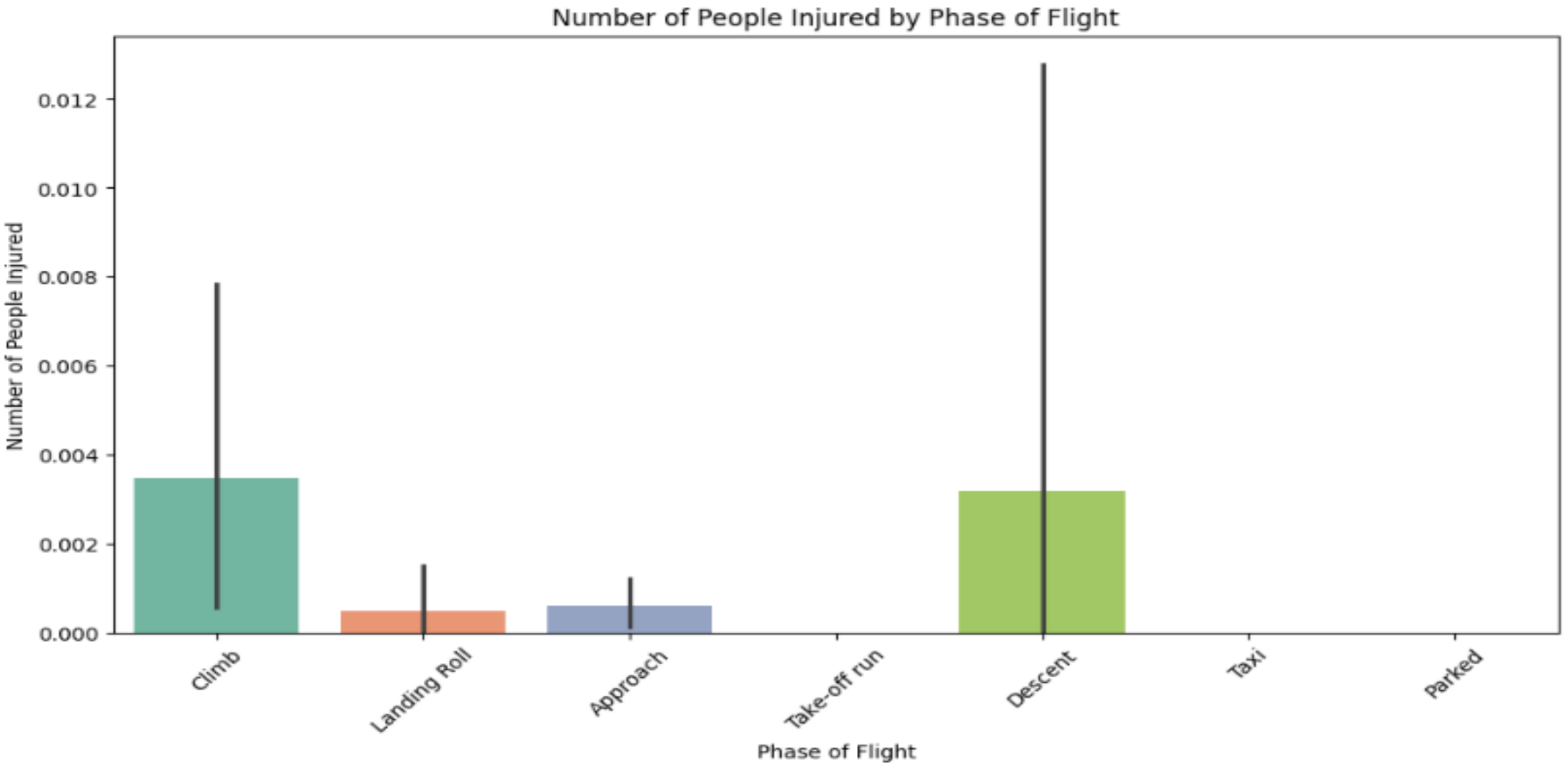
What is the financial impact of wildlife strikes?



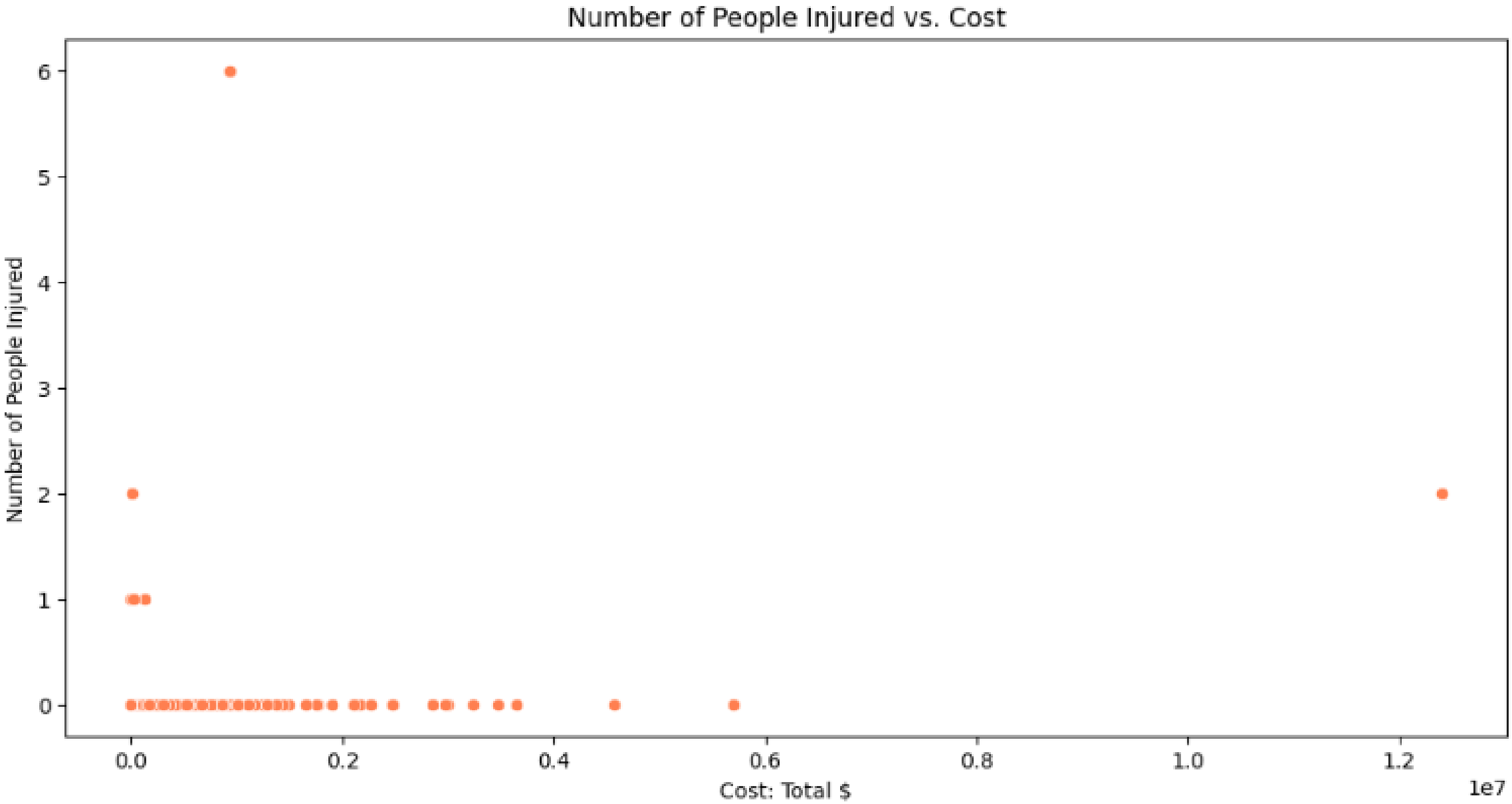
DISTRIBUTION OF NUMBER OF PEOPLE INJURED



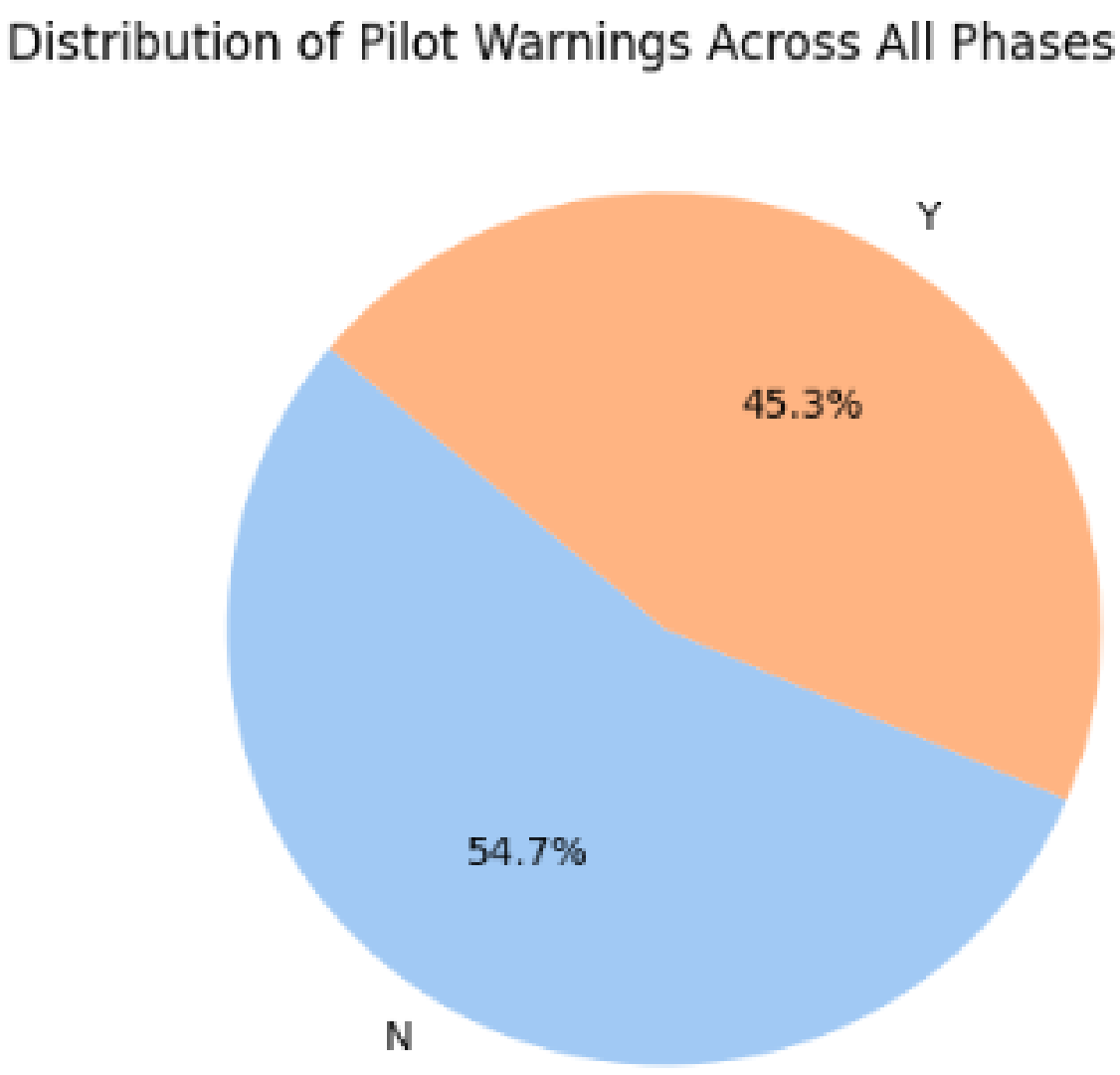
NUMBER OF PEOPLE INJURED BY PHASE OF FLIGHT



NUMBER OF PEOPLE INJURED VS. COST

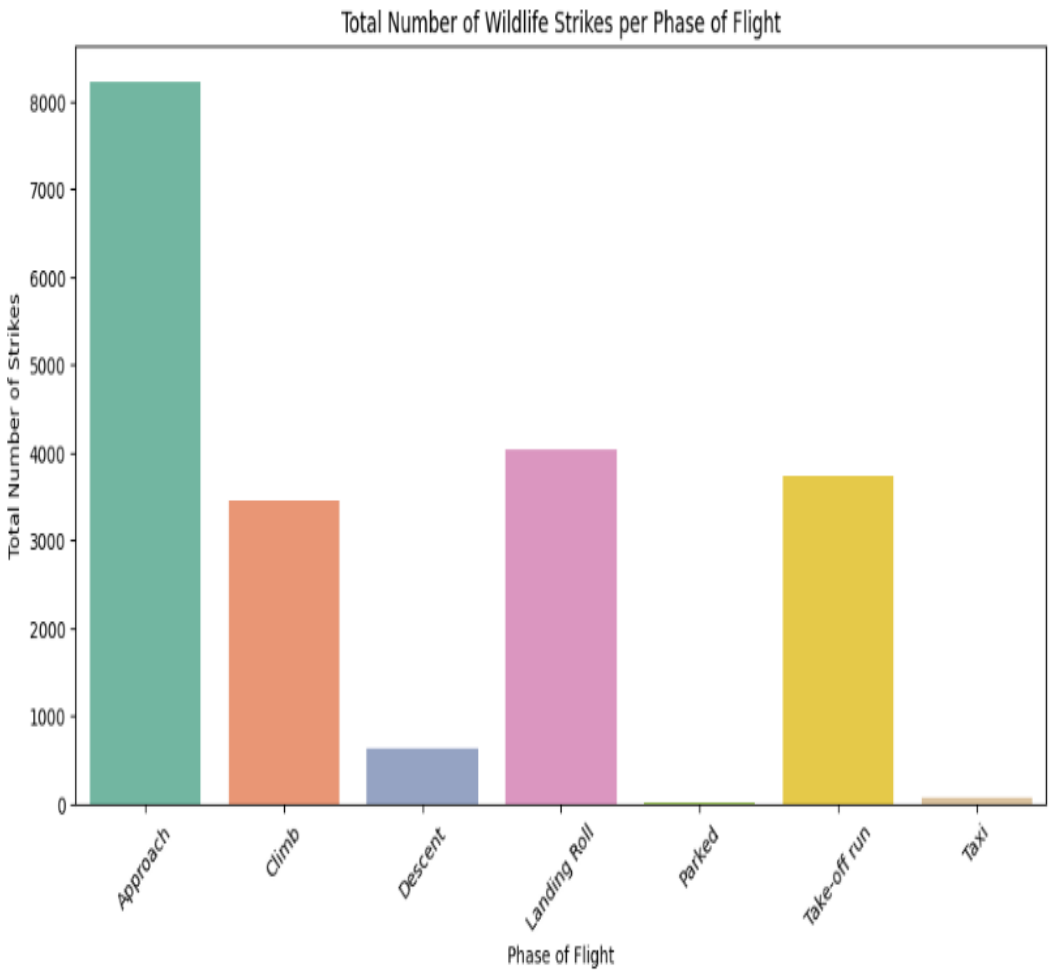


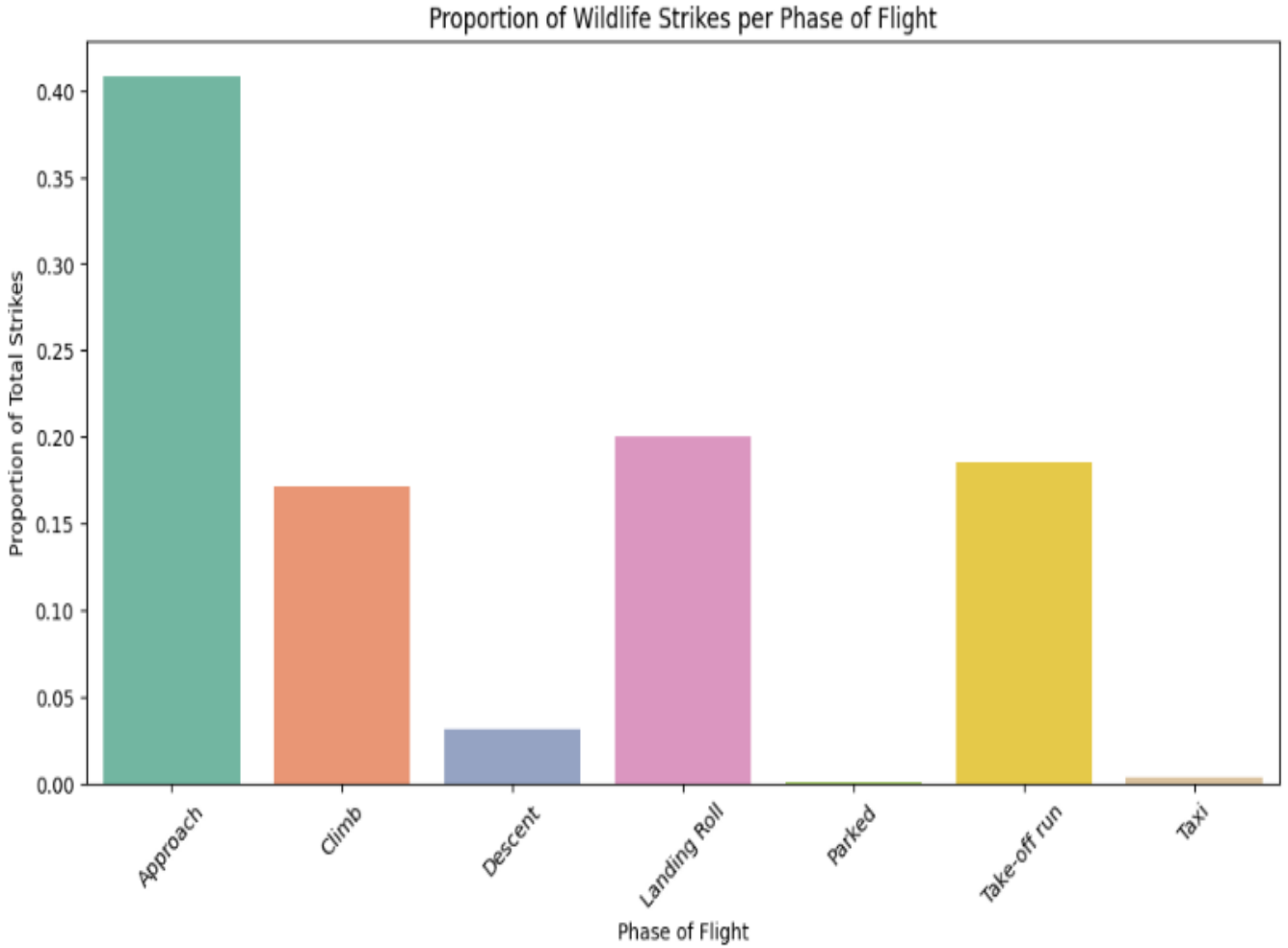
DISTRIBUTION OF PILOT WARNING S ACROSS ALL PHASE OF FLIGHT



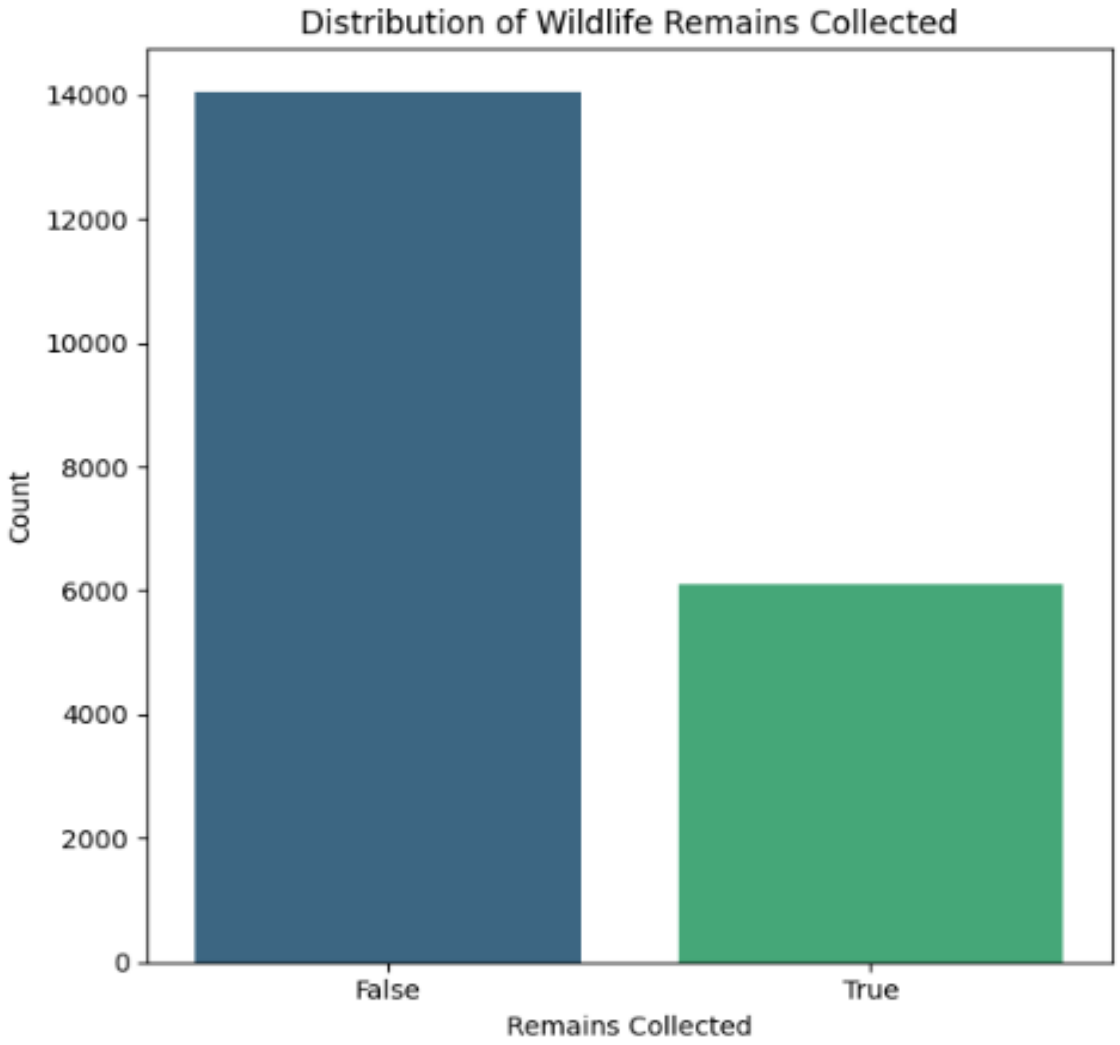
- **No Warnings (54.7%)**: The majority of flights did not have pilot warnings.
- **Warnings (45.3%)**: A significant portion of flights had pilot warnings.

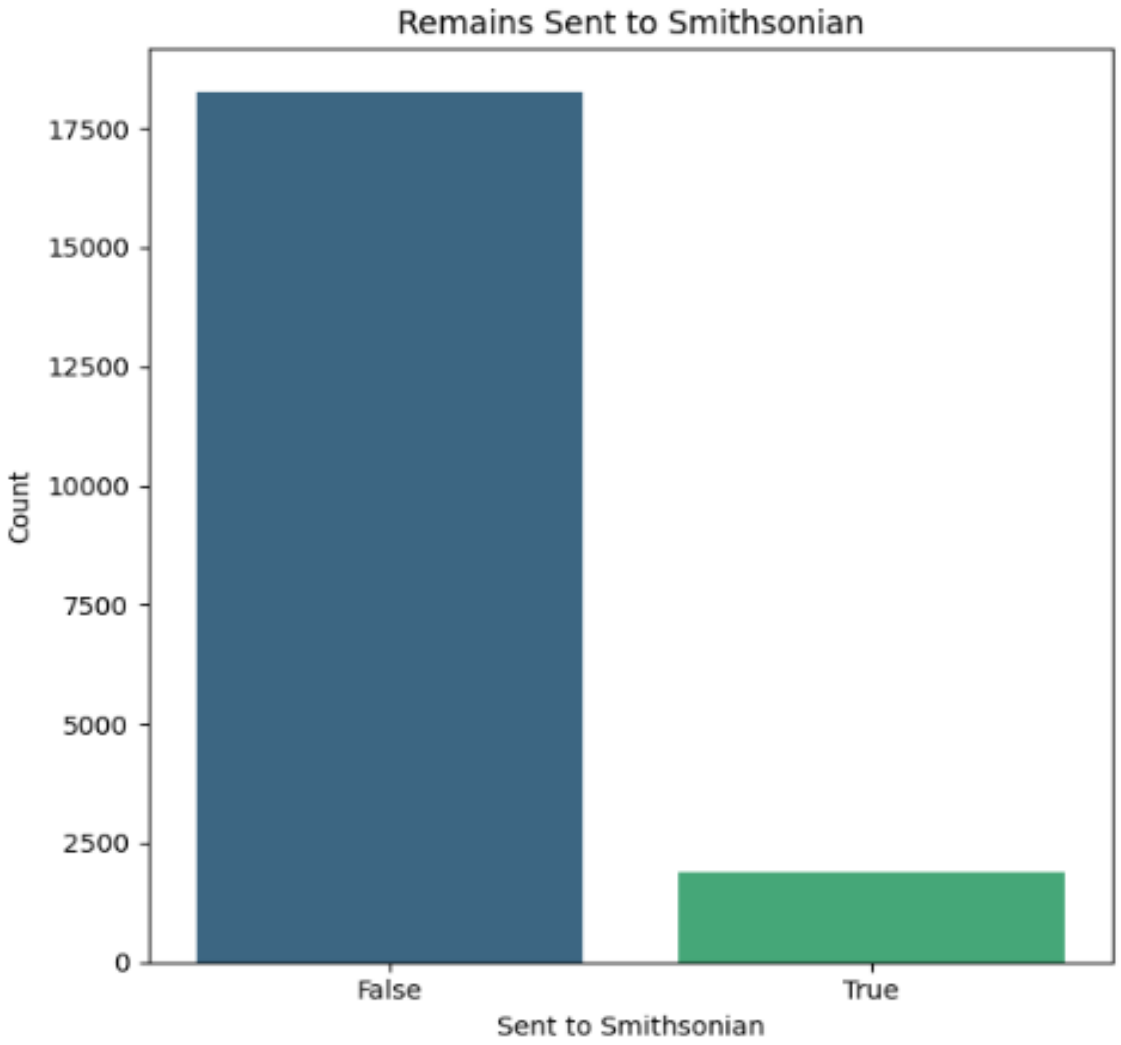
DOES THE PHASE OF FLIGHT AFFECT THE LIKELIHOOD OF WILDLIFE STRIKES?



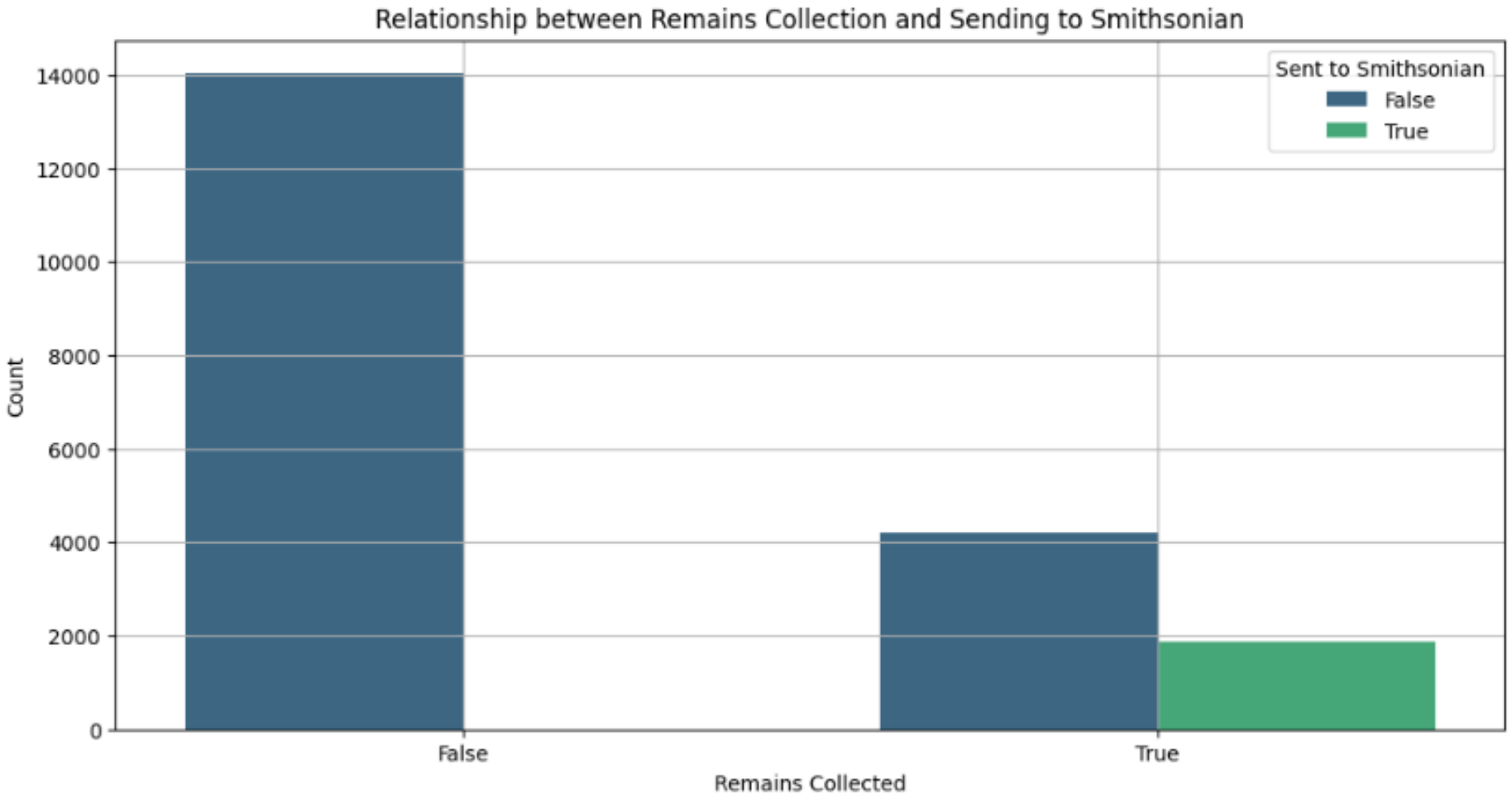


Distribution of Wildlife Remains Collected Sent to Smithsonian

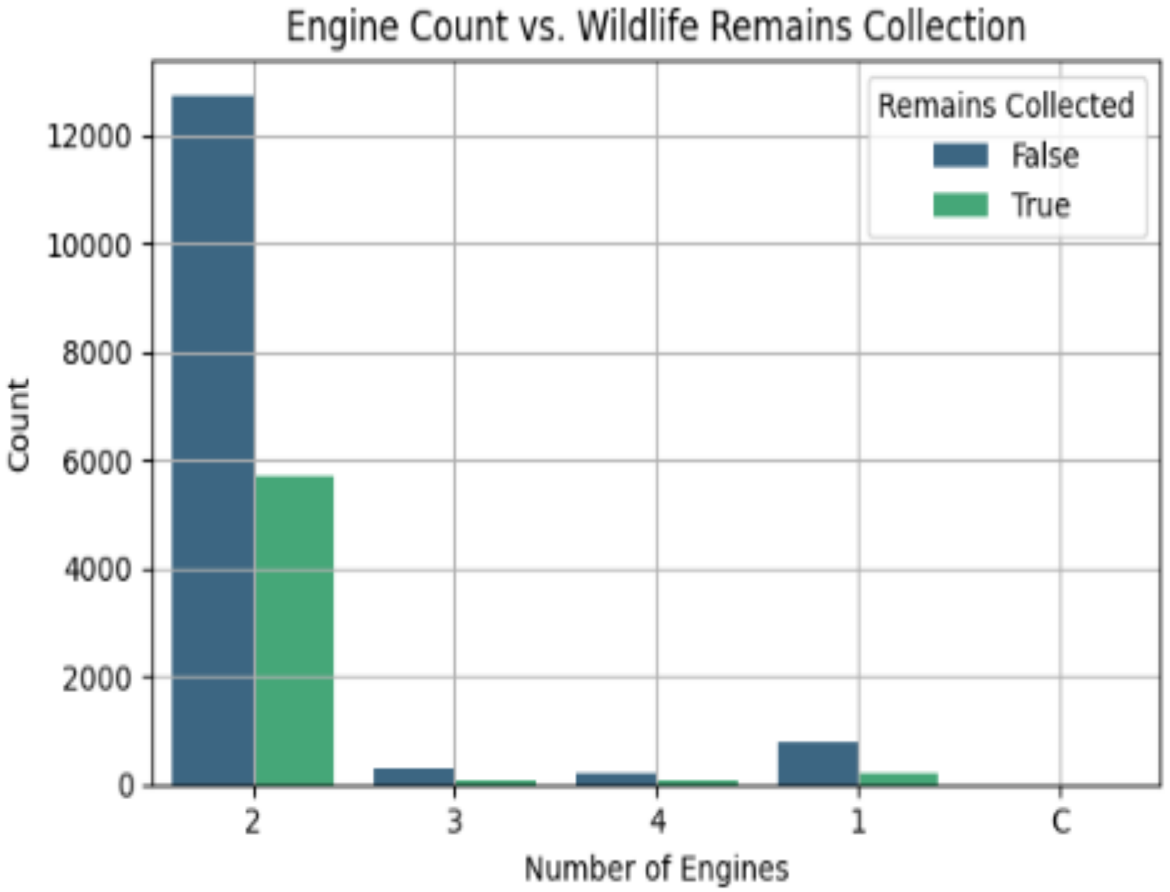


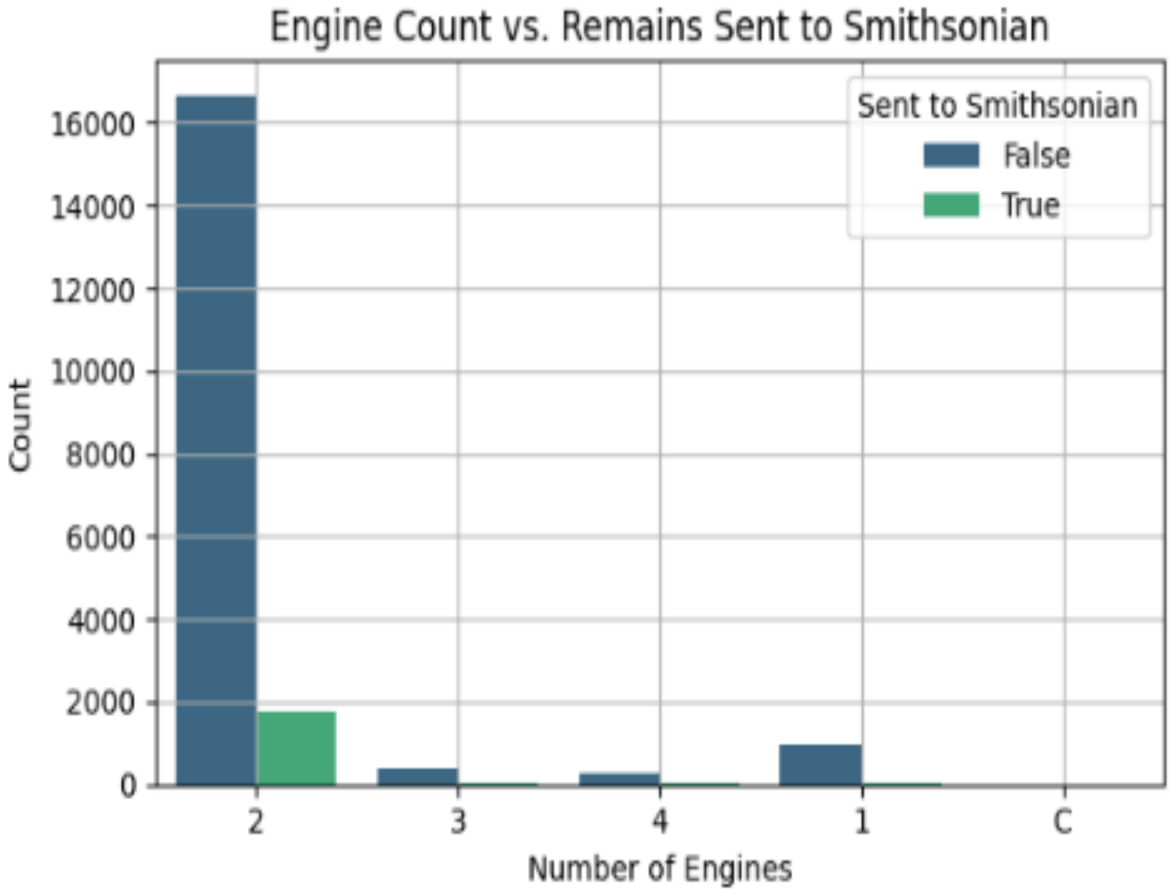


Relationship between Remains Collection Sending to Smithsonian

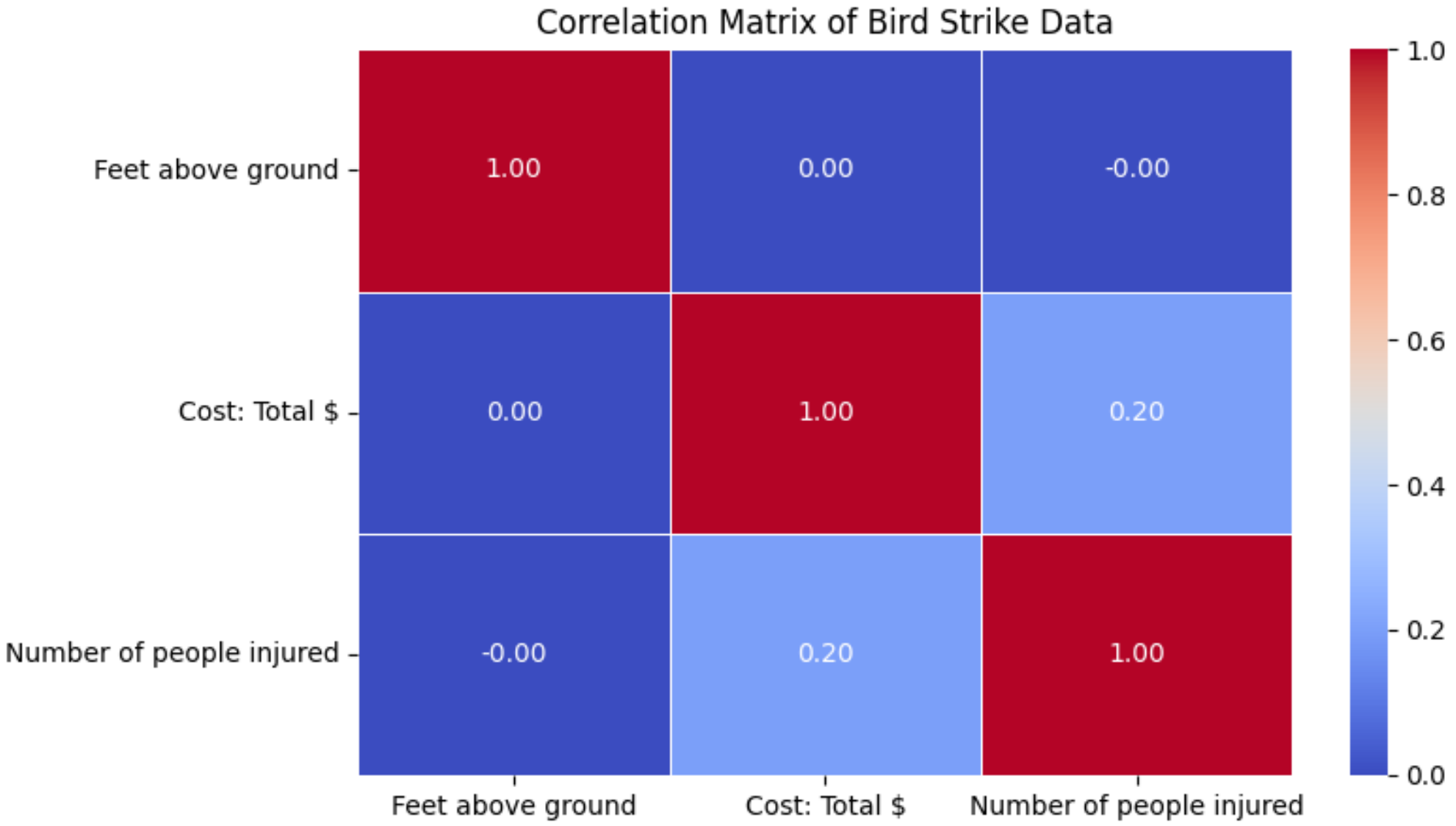


Engine Count Vs. Wildlife Remains Collection & Engine Count Vs. Smithsonian





EFFECT OF BIRD STRIKES & IMPACT ON FLIGHT



KEY FINDINGS

- **Increasing Trend of Bird Strikes:** The number of bird strikes increased significantly from 2000 to 2011, with notable peaks in 2009 and 2010, reaching around 3200 strikes each year.
- **Top Affected Airlines:** Southwest Airlines experienced the highest number of bird strikes, over 4000, whereas US Airways had the fewest among the top 10, with less than 1000 strikes.
- **Cost Implications:** The financial impact peaked in 2002, just over $40,000, with a general decline and fluctuations in subsequent years until 2010.
- **Altitude and Flight Phase:** Bird strikes occurred at various altitudes and flight phases, affecting aircraft differently based on these factors.

KEY FINDINGS

- **Pilot Warnings:** The presence and effect of prior warnings about wildlife varied, influencing the impact of the strikes.
- **Wildlife Species and Aircraft Models:** Specific wildlife species and aircraft models were more prone to strikes, indicating patterns in the data.
- **Seasonal and Weather Effects:** Seasonal patterns and weather conditions influenced the frequency and impact of bird strikes.
- **Collection of Remains:** The relationship between collecting wildlife remains and sending them to the Smithsonian, along with the impact of engine count on these processes, was analyzed.

CONCLUSION

- The report underscores the growing concern of bird strikes in aviation, highlighting the importance of understanding the conditions and factors contributing to these incidents.
- The increasing trend over the years calls for enhanced measures in wildlife management and pilot awareness.
- The financial implications and the varying impact on different airlines and aircraft models suggest a need for targeted strategies to mitigate risks.
- Collecting and analyzing wildlife remains provide valuable insights for improving safety protocols and preventing future incidents.


Thank You