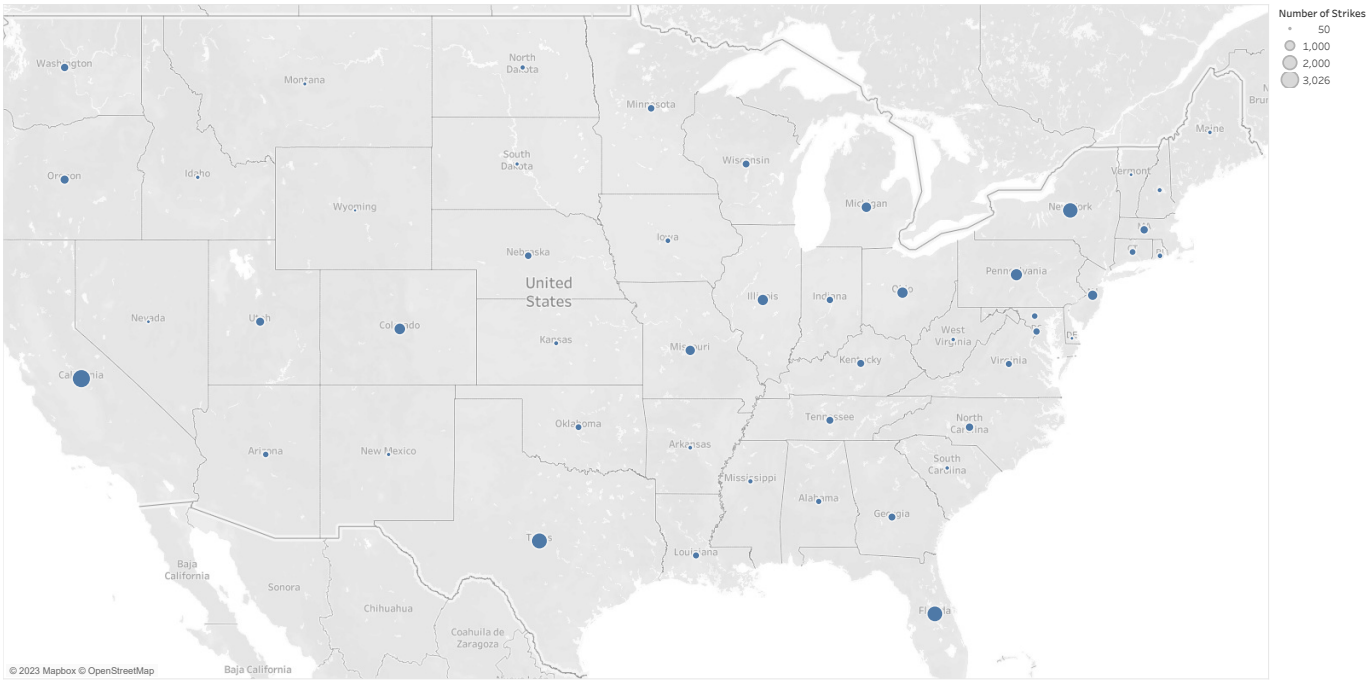
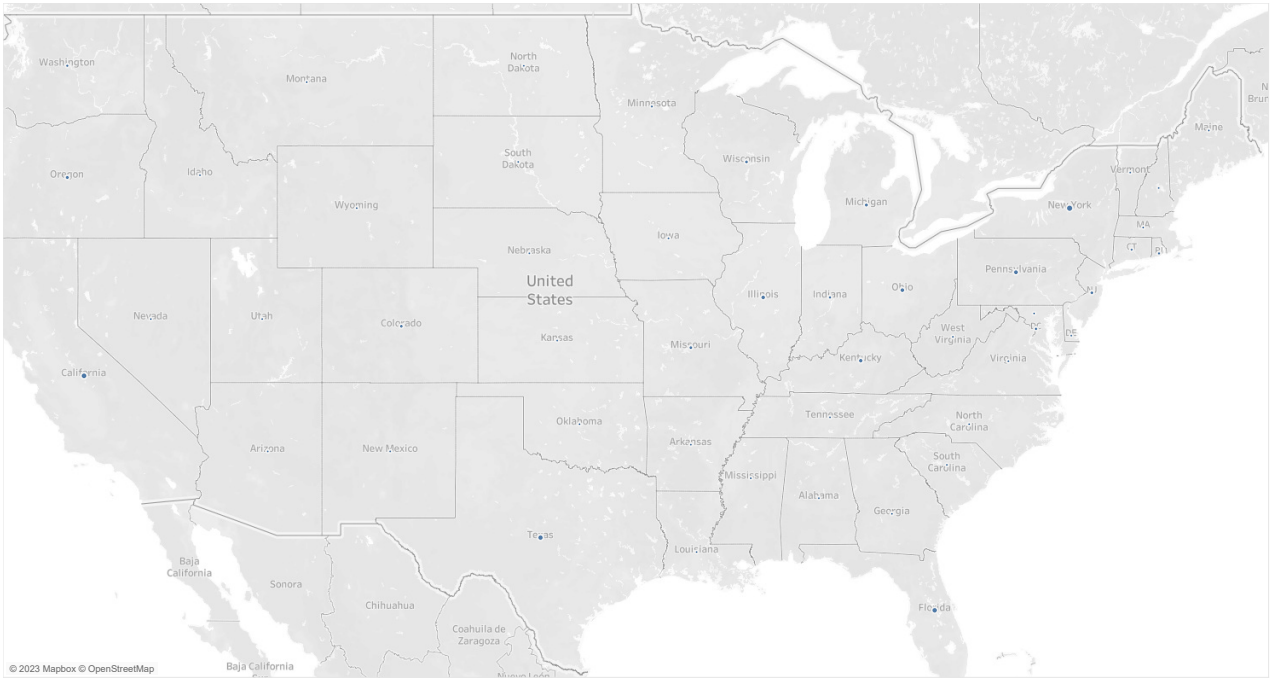
Location/Count




Map based on Longitude (generated) and Latitude (generated). Size shows sum of Number of Strikes. Details are shown for Country and Origin State. The data is filtered on Collision Date and Time Year, which keeps 16 of 16 members.

Wildlife Strike Location and Sizes in the US over time (Currently showing 2000)




# Strikes (Running Sum)
1
1,000
2,000
3,026

Map based on Longitude (generated) and Latitude (generated). Size shows Running Sum of Count of FAA Wildlife Strikes. Details are shown for Country and Origin State.

# Collision Time vs. Categorized Time of Day (Time vs. When TOD)

| | Collision Date and Time | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| When: Time.. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Null | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Dawn | | | | | 4 | 5 | 6 | 7 | 8 | 9 |
| Day | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Dusk | | | 2 | | | 5 | 6 | | 8 | |
| Night | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

Collision Date and Time Hour broken down by Collision Date and Time Hour vs. When: Time of day.

# Collision Time vs. Categorized Time of Day (Time vs. When TOD)

| | Collision Date and Time | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| When: Time.. | 10 | 11 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| Null | 10 | 11 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| Dawn | 10 | | | 14 | 15 | | 17 | | | |
| Day | 10 | 11 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| Dusk | | | | | 15 | 16 | 17 | 18 | 19 | 20 |
| Night | 10 | 11 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |

Collision Date and Time Hour broken down by Collision Date and Time Hour vs. When: Time of day.

# Collision Time vs. Categorized Time of Day (Time vs. When TOD)

| | Collision Date and Time | | |
|---|---|---|---|
| When: Time.. | 21 | 22 | 23 |
| Null | 21 | 22 | 23 |
| Dawn | | | |
| Day | 21 | 22 | 23 |
| Dusk | 21 | 22 | 23 |
| Night | 21 | 22 | 23 |

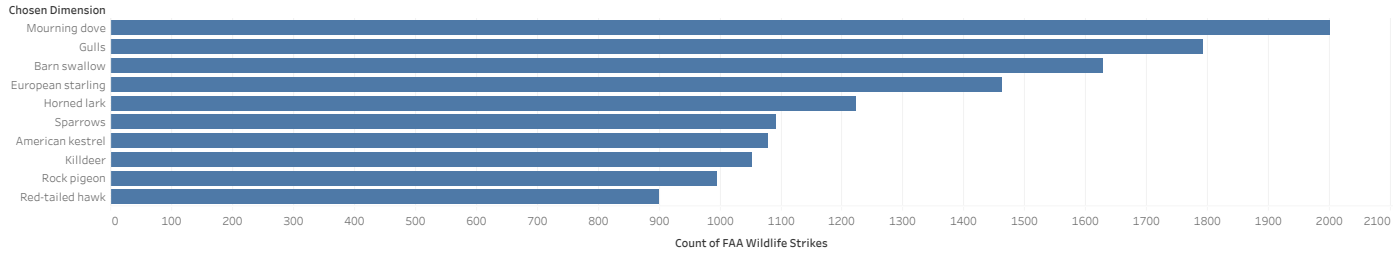
Collision Date and Time Hour broken down by Collision Date and Time Hour vs. When: Time of day.

# Count Strikes

| Wildlife: Species | Rank of Number of Strikes along .. | Count of FAA Wildlife Strikes |
|---|---|---|
| Mourning dove | 1 | 2,002 |
| Gulls | 2 | 1,792 |
| Barn swallow | 3 | 1,629 |
| European starling | 4 | 1,462 |
| Horned lark | 5 | 1,223 |
| Sparrows | 6 | 1,091 |
| American kestrel | 7 | 1,079 |
| Killdeer | 8 | 1,052 |
| Rock pigeon | 9 | 995 |
| Red-tailed hawk | 10 | 899 |

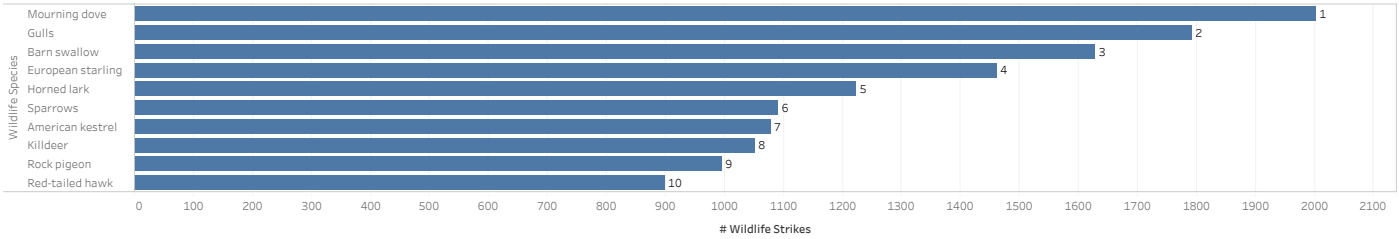
Rank of Number of Strikes along Wildlife: Species and count of FAA Wildlife Strikes broken down by Wildlife: Species. The view is filtered on Wildlife: Species, which keeps 10 of 469 members.

## Interactive Top N Count Strikes



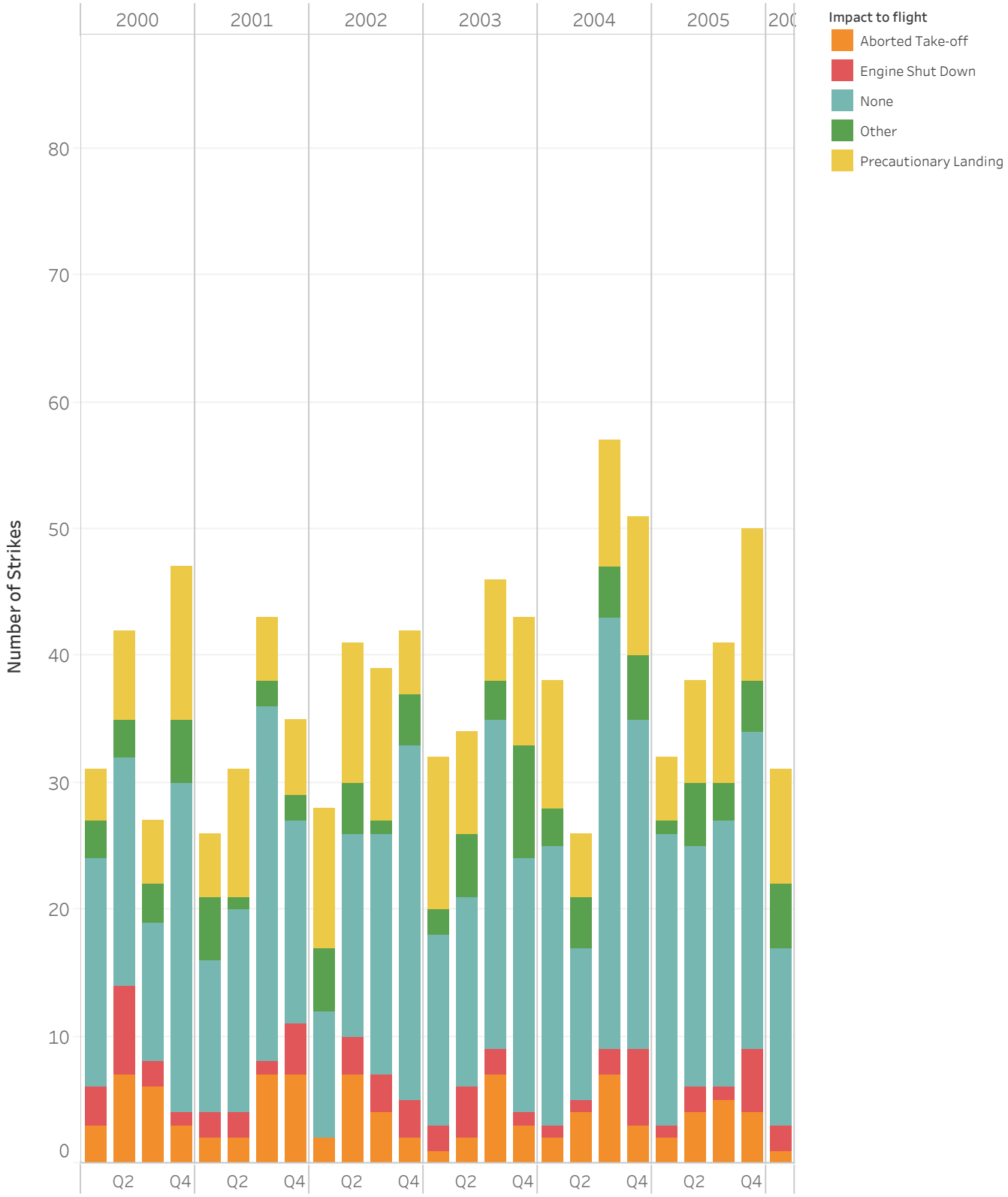

Count of FAA Wildlife Strikes for each Chosen Dimension. The view is filtered on Chosen Dimension, which has multiple members selected.

Top 10 Wildlife Species Causing Strikes



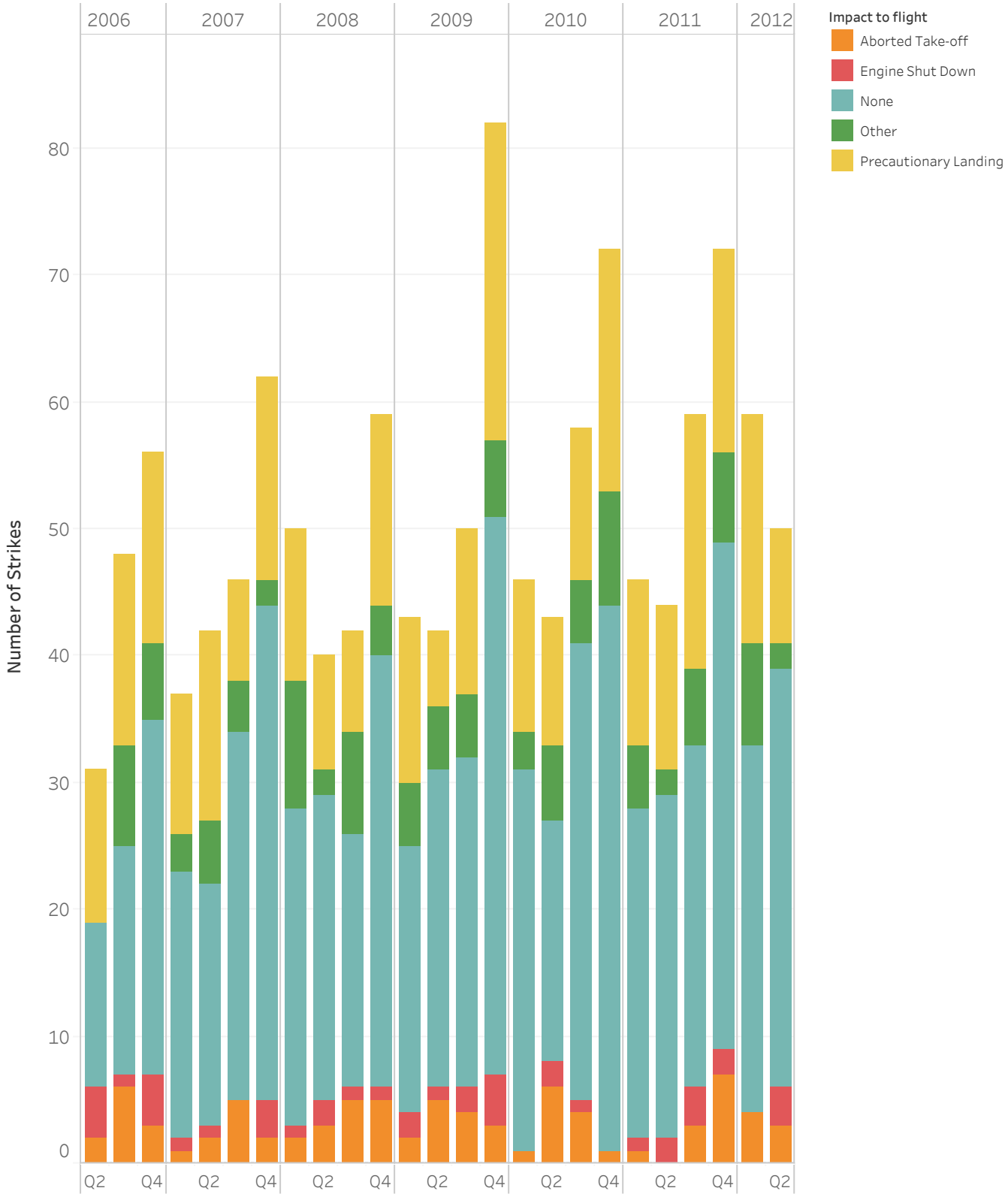

Count of FAA Wildlife Strikes for each Choose Dimension (Parameters) broken down by Chosen Dimension. The marks are labeled by Rank of Number of Strikes. The view is filtered on Chosen Dimension, which has multiple members selected.

# Strikes Over Time: **Caused damage** Reported



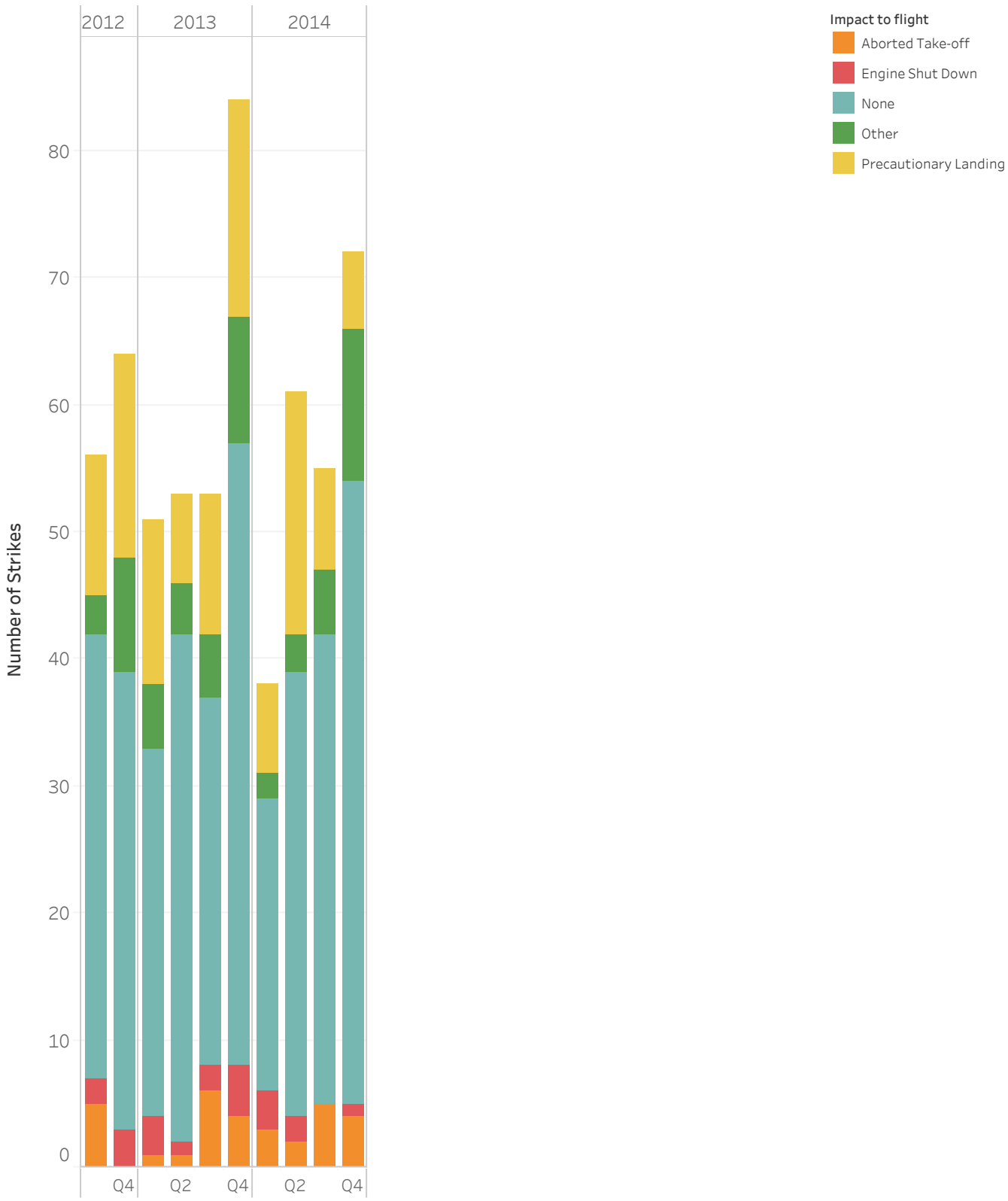

Number of Strikes for each Quarter of Collision Date and Time broken down by Year of Collision Date and Time. Color shows details about Effect: Impact to flight. The marks are labeled by Number of Strikes. The data is filtered on Effect: Impact to flight and Effect: Indicated Damage. The Effect: Impact to flight filter excludes Null. The Effect: Indicated Damage filter keeps Caused damage. The view is filtered on Year of Collision Date and Time, which excludes 2015.

# Strikes Over Time: **Caused damage** Reported



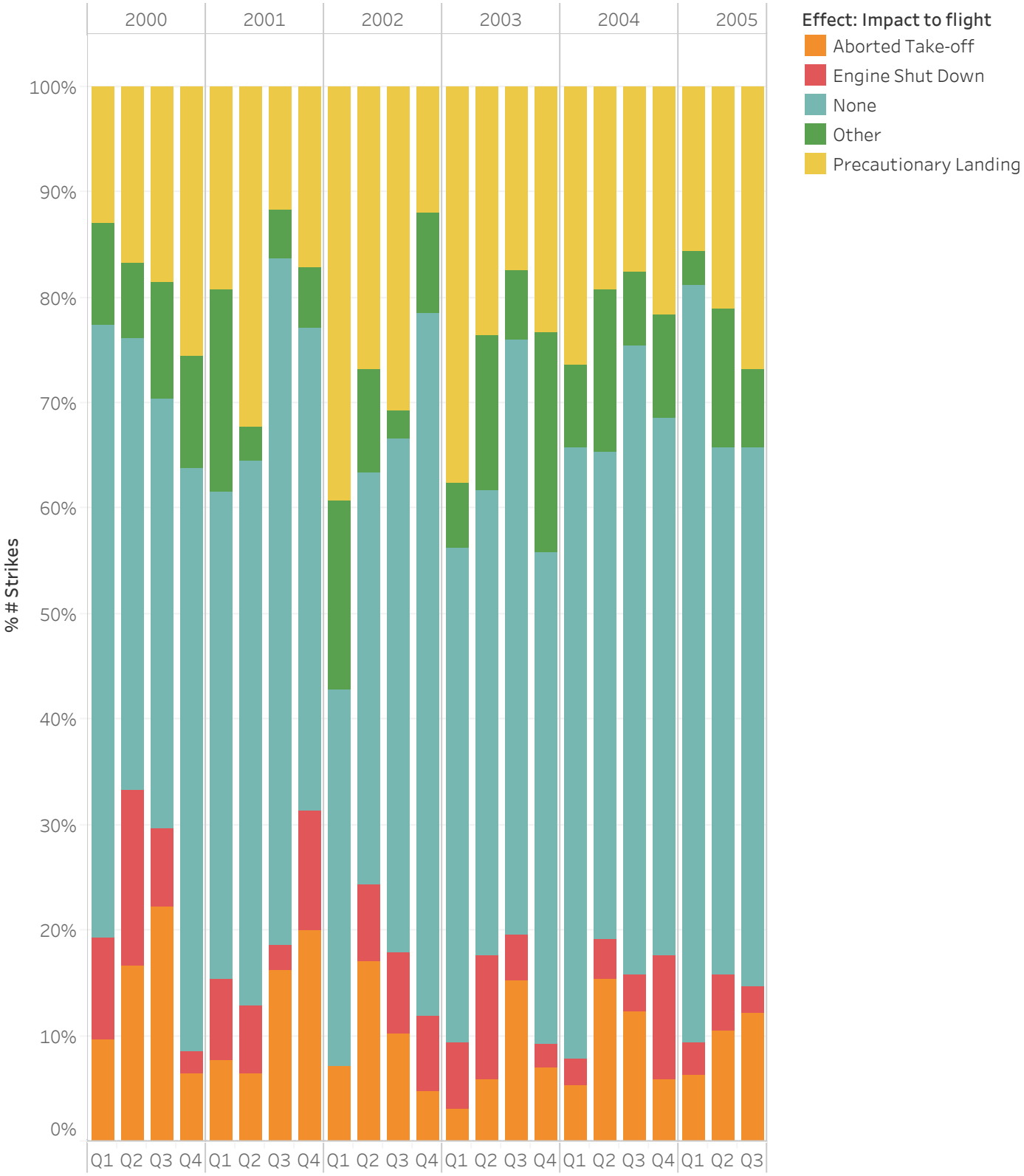

Number of Strikes for each Quarter of Collision Date and Time broken down by Year of Collision Date and Time. Color shows details about Effect: Impact to flight. The marks are labeled by Number of Strikes. The data is filtered on Effect: Impact to flight and Effect: Indicated Damage. The Effect: Impact to flight filter excludes Null. The Effect: Indicated Damage filter keeps Caused damage. The view is filtered on Year of Collision Date and Time, which excludes 2015.

# Strikes Over Time: **Caused damage** Reported



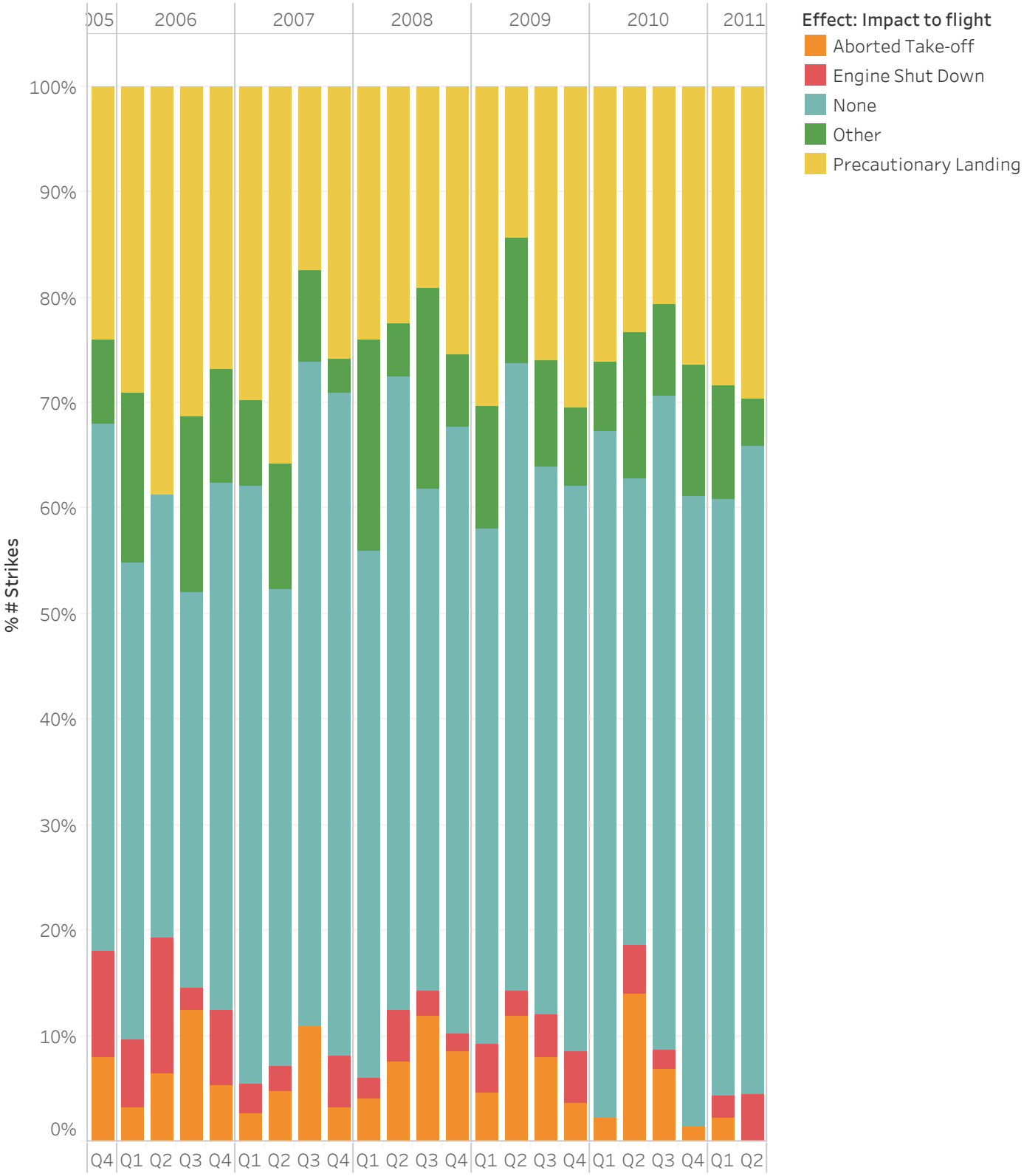

Number of Strikes for each Quarter of Collision Date and Time broken down by Year of Collision Date and Time. Color shows details about Effect: Impact to flight. The marks are labeled by Number of Strikes. The data is filtered on Effect: Impact to flight and Effect: Indicated Damage. The Effect: Impact to flight filter excludes Null. The Effect: Indicated Damage filter keeps Caused damage. The view is filtered on Year of Collision Date and Time, which excludes 2015.

# Strikes Over Time: **Caused damage** Reported



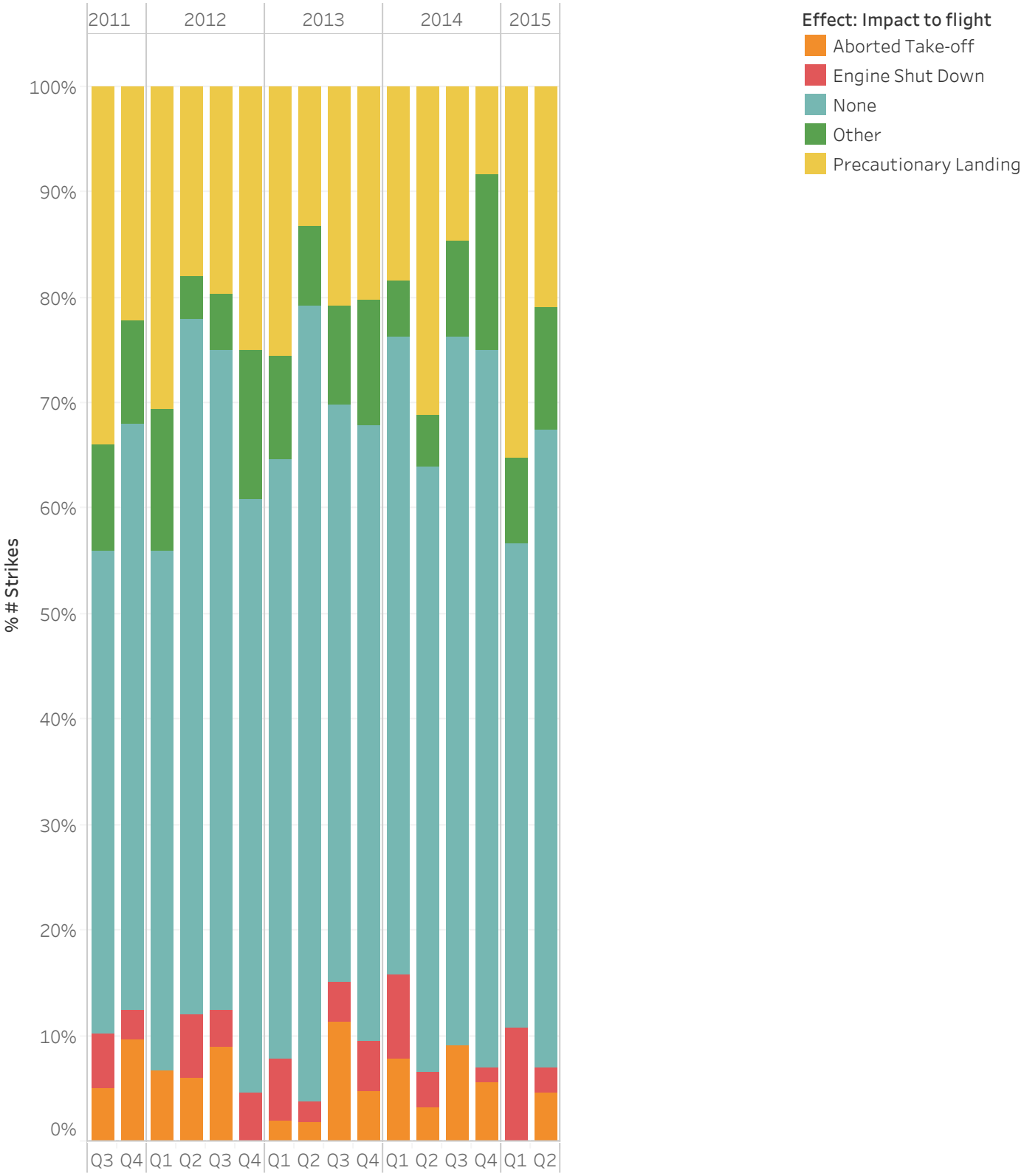

% of Total Number of Strikes for each Quarter of Collision Date and Time broken down by Year of Collision Date and Time. Color shows details about Effect: Impact to flight. The data is filtered on Effect: Impact to flight and Effect: Indicated Damage. The Effect: Impact to flight filter excludes Null. The Effect: Indicated Damage filter keeps Caused damage. Percents are based on each column of each pane of the table.

# Strikes Over Time: **Caused damage** Reported



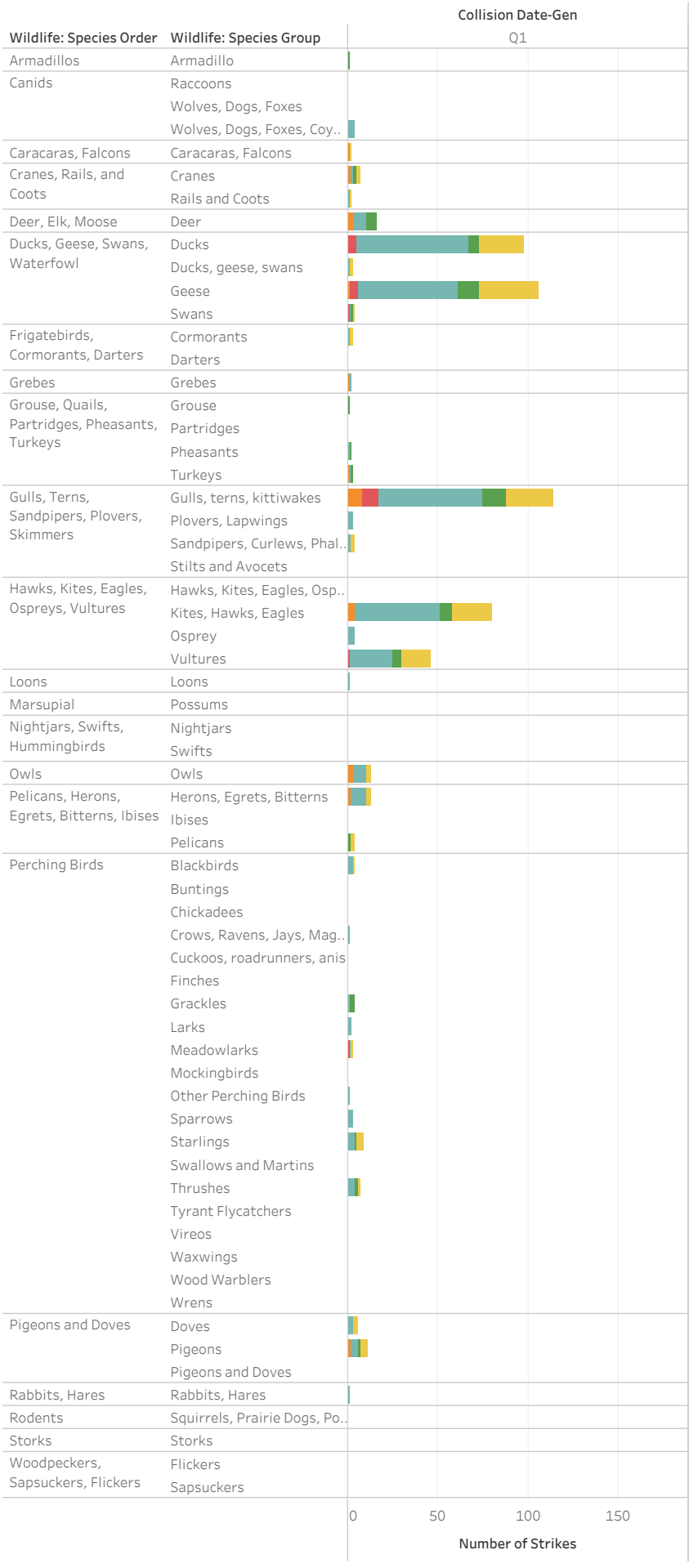

% of Total Number of Strikes for each Quarter of Collision Date and Time broken down by Year of Collision Date and Time. Color shows details about Effect: Impact to flight. The data is filtered on Effect: Impact to flight and Effect: Indicated Damage. The Effect: Impact to flight filter excludes Null. The Effect: Indicated Damage filter keeps Caused damage. Percents are based on each column of each pane of the table.

# Strikes Over Time: **Caused damage** Reported



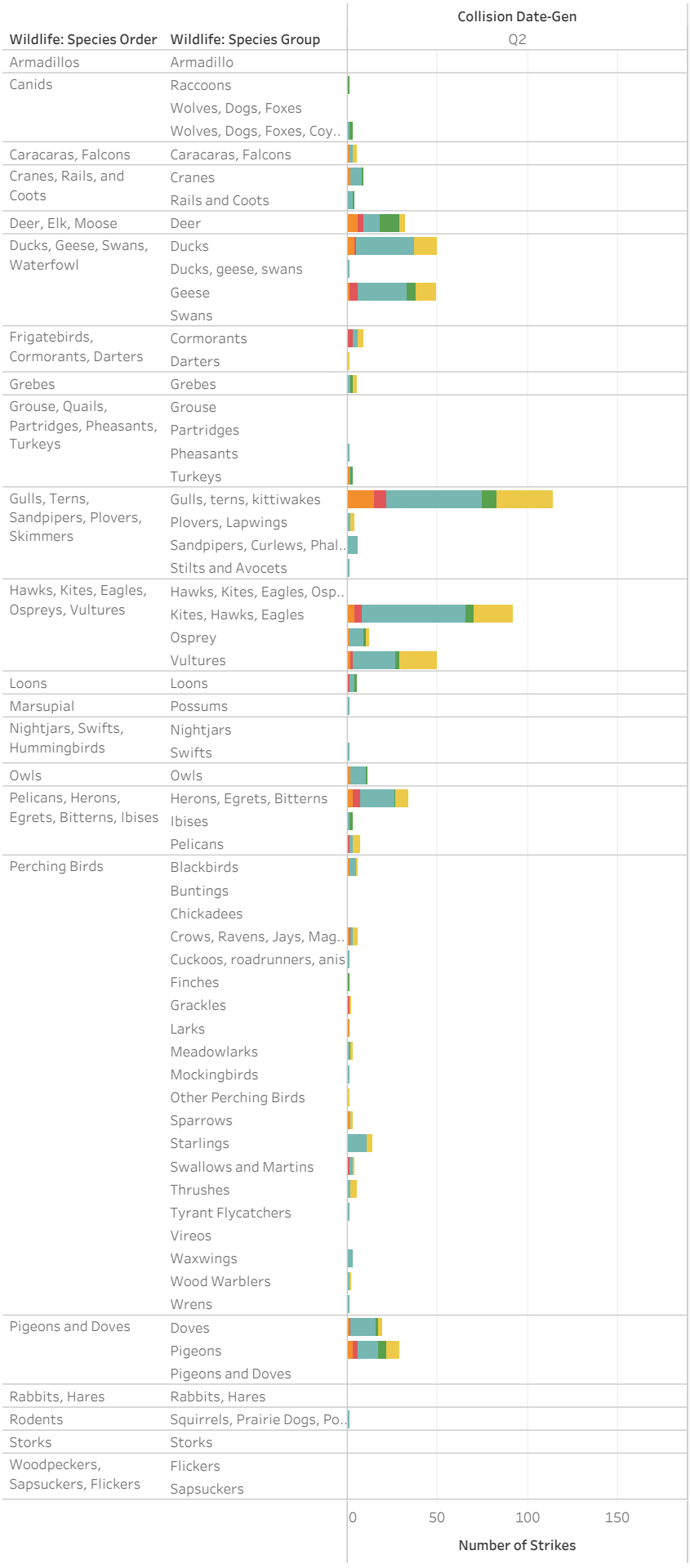

% of Total Number of Strikes for each Quarter of Collision Date and Time broken down by Year of Collision Date and Time. Color shows details about Effect: Impact to flight. The data is filtered on Effect: Impact to flight and Effect: Indicated Damage. The Effect: Impact to flight filter excludes Null. The Effect: Indicated Damage filter keeps Caused damage. Percents are based on each column of each pane of the table.

# Count Strikes/Impact/Damage over Time - Animals



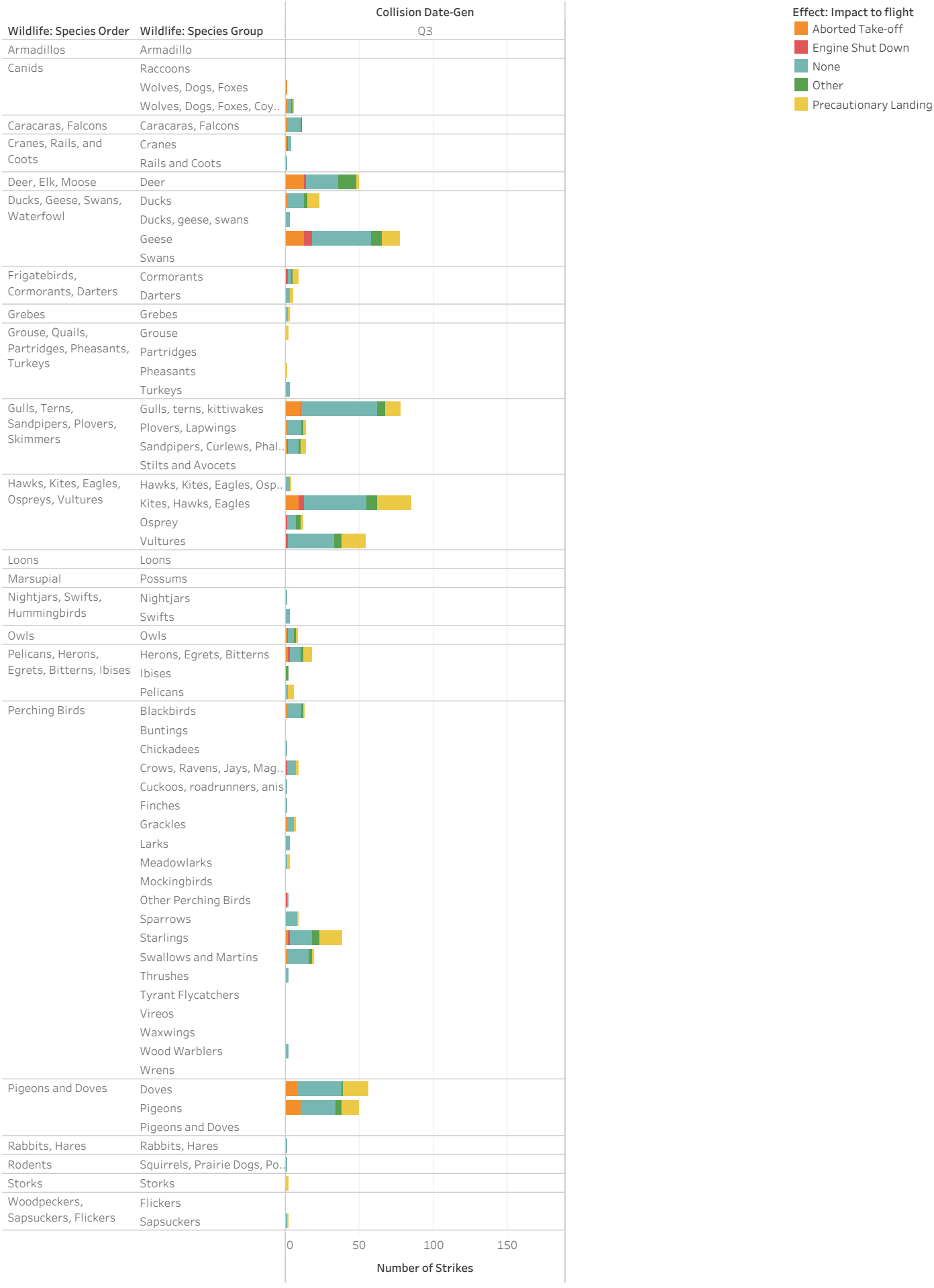

Number of Strikes for each Wildlife: Species Group broken down by Quarter of Collision Date-Gen vs. Wildlife: Species Order. Color shows details about Effect: Impact to flight. The data is filtered on Effect: Impact to flight, Effect: Indicated Damage and Year of Collision Date-Gen. The Effect: Impact to flight filter excludes Null. The Effect: Indicated Damage filter keeps Caused damage. The Year of Collision Date-Gen filter excludes 2015.

# Count Strikes/Impact/Damage over Time - Animals



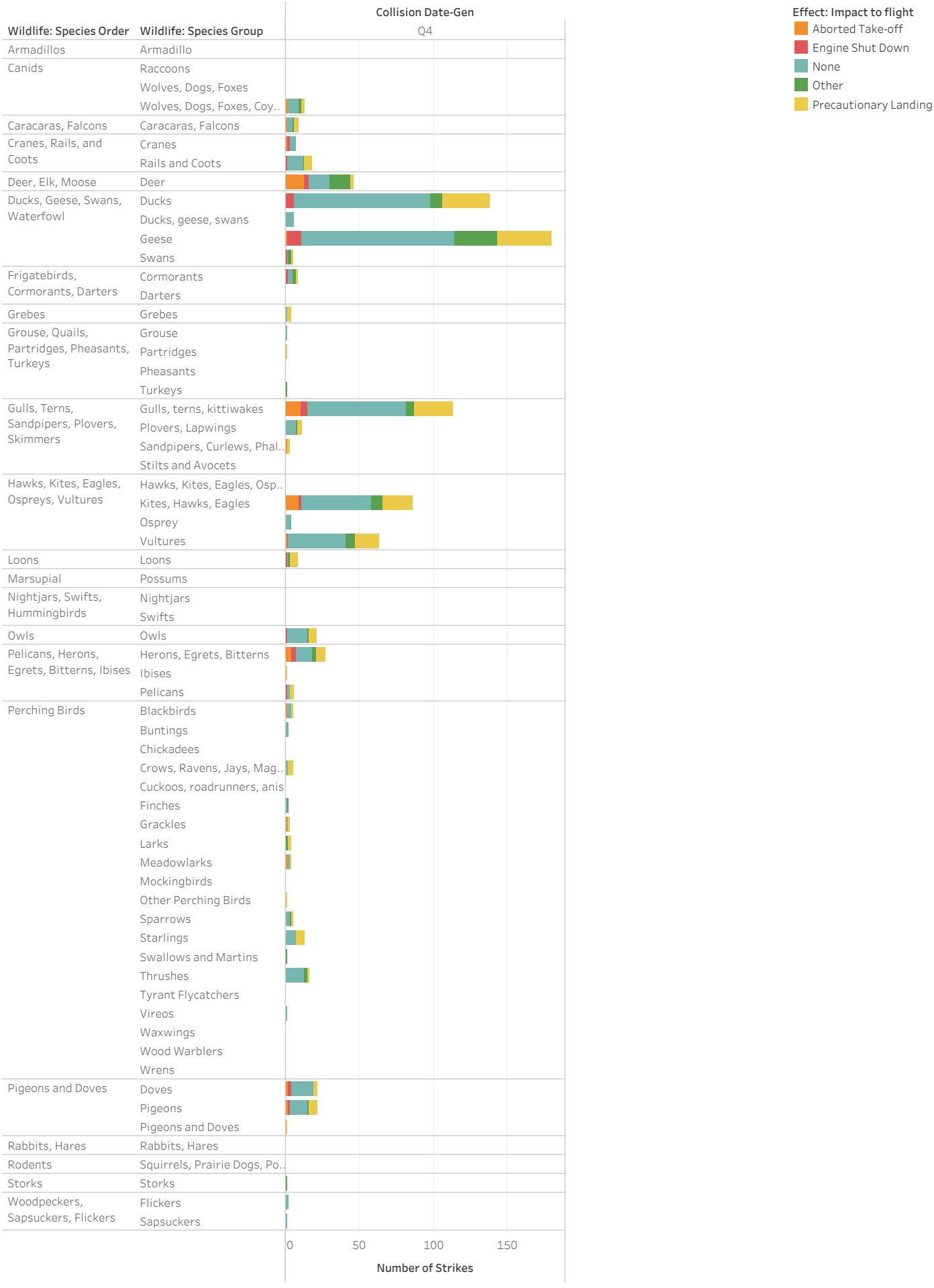

Number of Strikes for each Wildlife: Species Group broken down by Quarter of Collision Date-Gen vs. Wildlife: Species Order. Color shows details about Effect: Impact to flight. The data is filtered on Effect: Impact to flight, Effect: Indicated Damage and Year of Collision Date-Gen. The Effect: Impact to flight filter excludes Null. The Effect: Indicated Damage filter keeps Caused damage. The Year of Collision Date-Gen filter excludes 2015.

# Count Strikes/Impact/Damage over Time - Animals



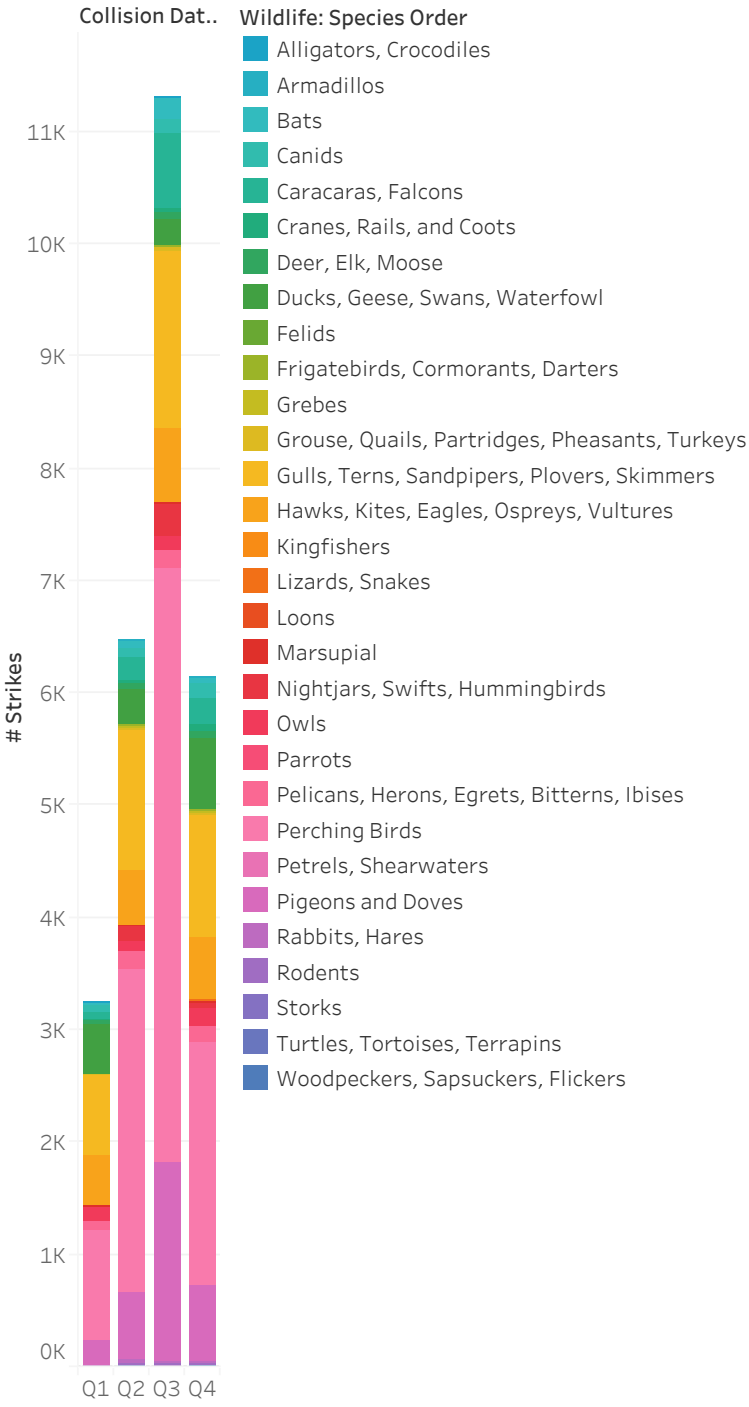

Number of Strikes for each Wildlife: Species Group broken down by Quarter of Collision Date-Gen vs. Wildlife: Species Order. Color shows details about Effect: Impact to flight. The data is filtered on Effect: Impact to flight, Effect: Indicated Damage and Year of Collision Date-Gen. The Effect: Impact to flight filter excludes Null. The Effect: Indicated Damage filter keeps Caused damage. The Year of Collision Date-Gen filter excludes 2015.

# Count Strikes/Impact/Damage over Time - Animals



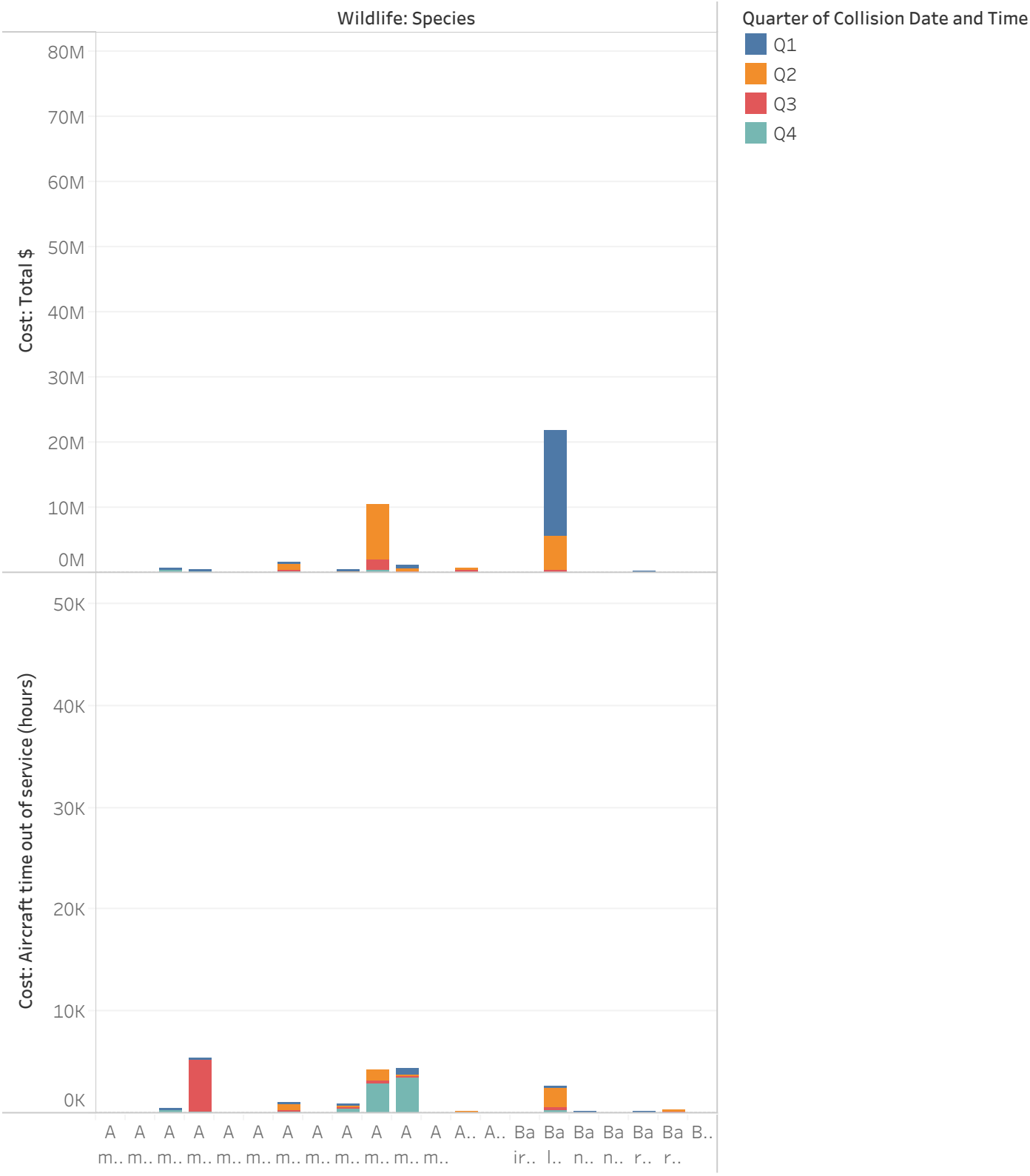

Number of Strikes for each Wildlife: Species Group broken down by Quarter of Collision Date-Gen vs. Wildlife: Species Order. Color shows details about Effect: Impact to flight. The data is filtered on Effect: Impact to flight, Effect: Indicated Damage and Year of Collision Date-Gen. The Effect: Impact to flight filter excludes Null. The Effect: Indicated Damage filter keeps Caused damage. The Year of Collision Date-Gen filter excludes 2015.

Strikes by Quarter by Animal (Order)



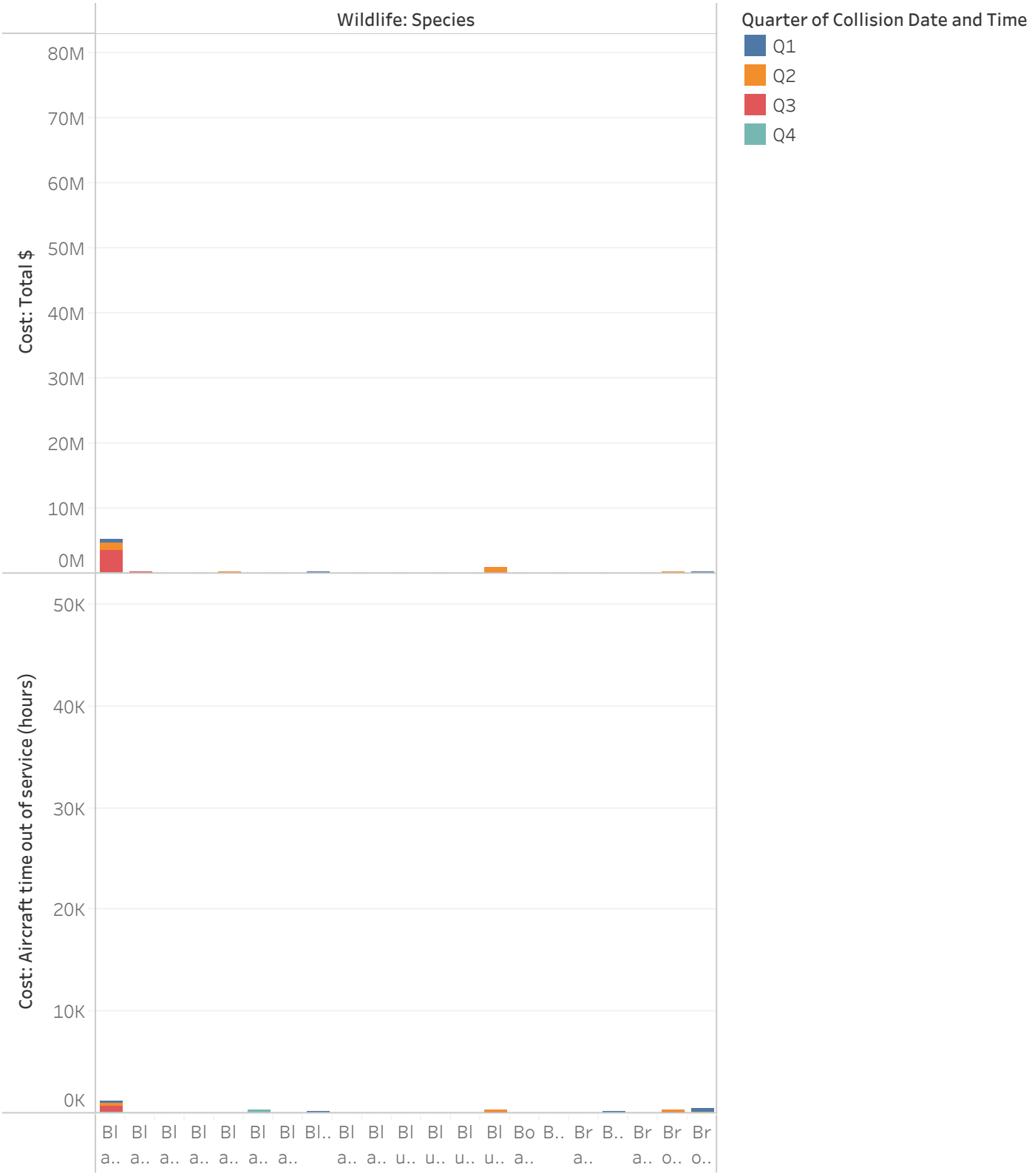

Number of Strikes for each Quarter of Collision Date and Time. Color shows details about Wildlife: Species Order. Details are shown for Wildlife: Species Group. The data is filtered on Effect: Impact to flight and Year of Collision Date-Gen. The Effect: Impact to flight filter excludes Null. The Year of Collision Date-Gen filter excludes 2015.

# $/Hours Impact by Species-Static



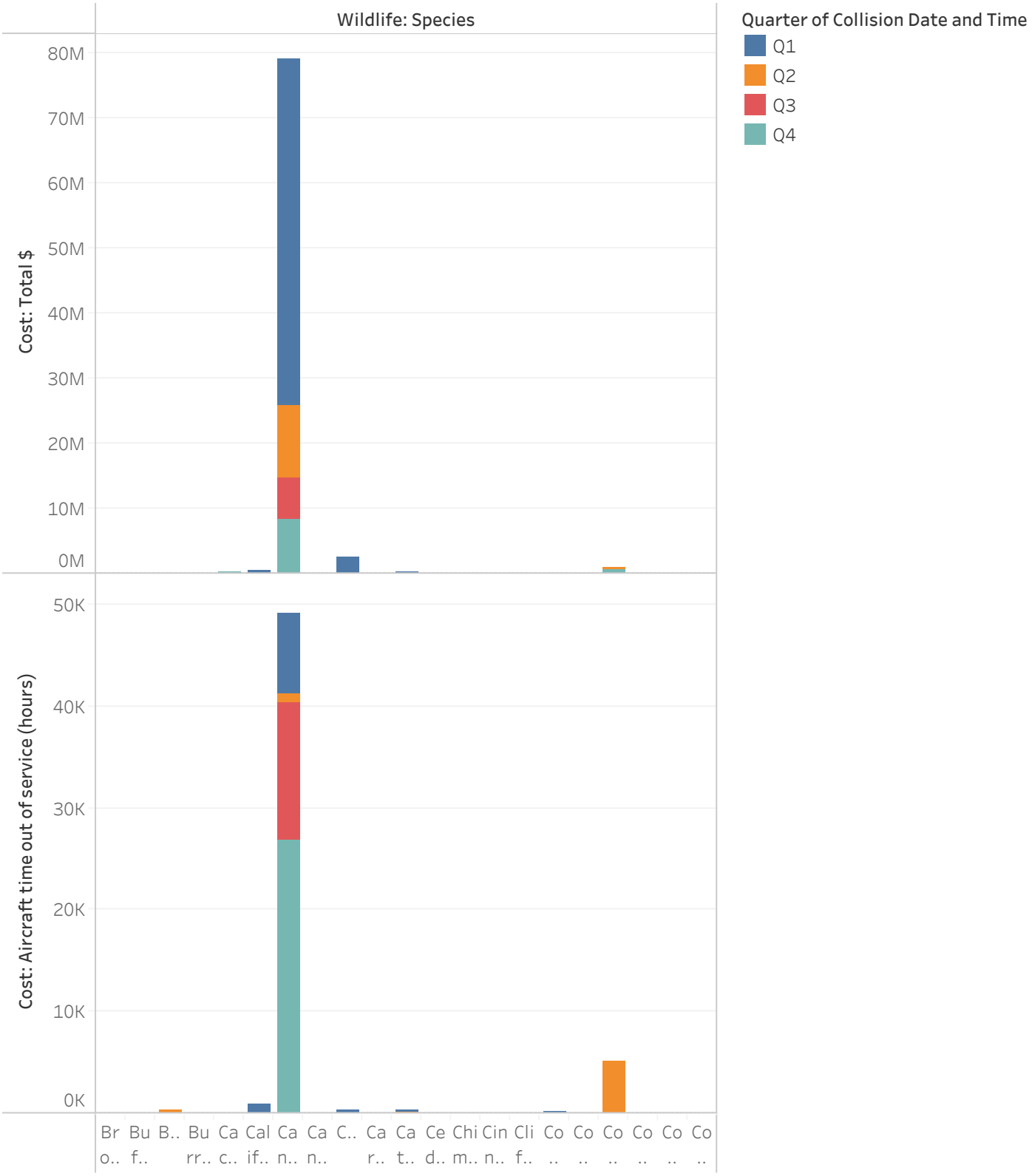

Sum of Cost: Total $ and sum of Cost: Aircraft time out of service (hours) for each Wildlife: Species. Color shows details about Collision Date and Time Quarter. The view is filtered on sum of Cost: Aircraft time out of service (hours), which keeps non-Null values only.

# $/Hours Impact by Species-Static



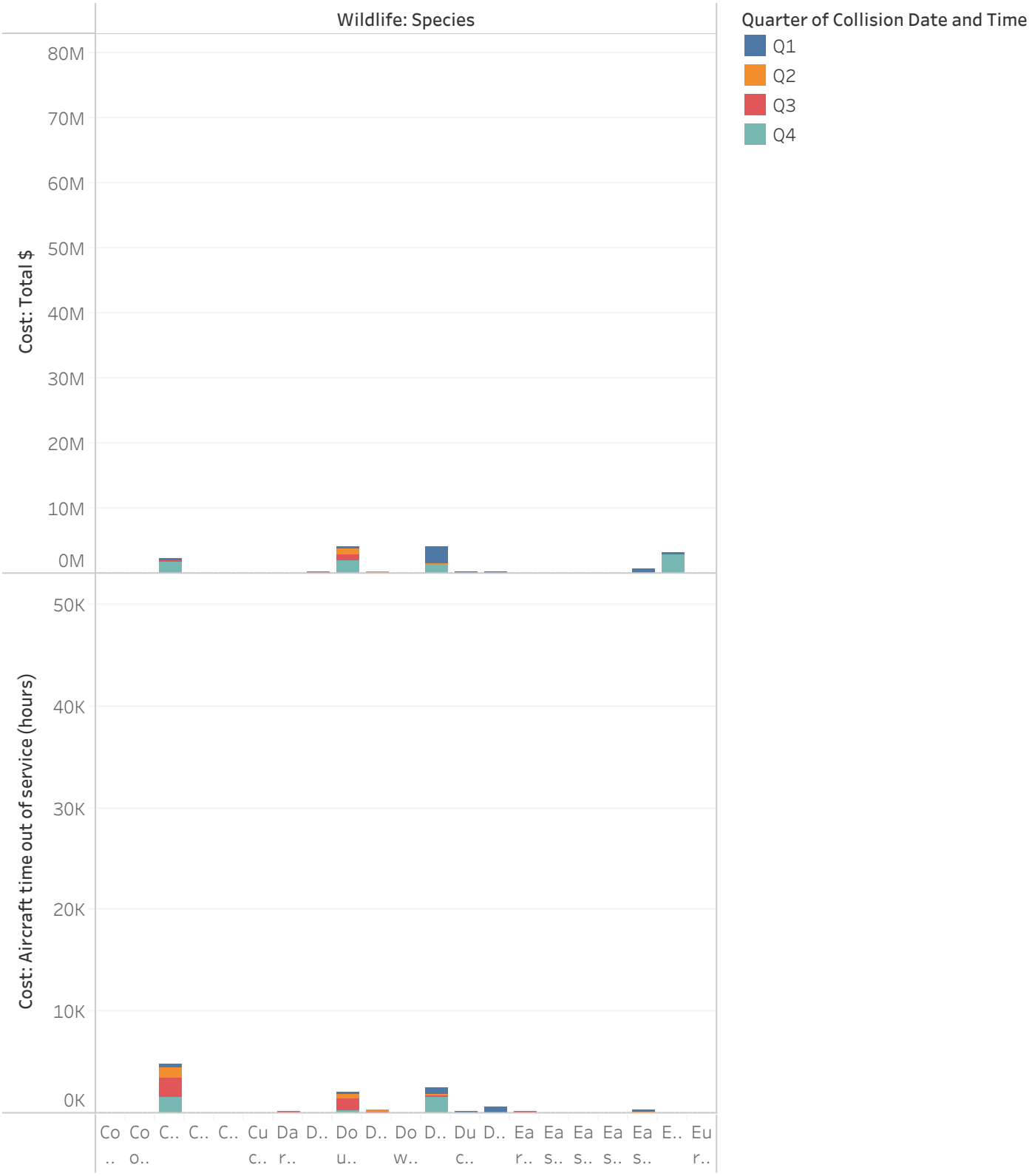

Sum of Cost: Total $ and sum of Cost: Aircraft time out of service (hours) for each Wildlife: Species. Color shows details about Collision Date and Time Quarter. The view is filtered on sum of Cost: Aircraft time out of service (hours), which keeps non-Null values only.

# $/Hours Impact by Species-Static



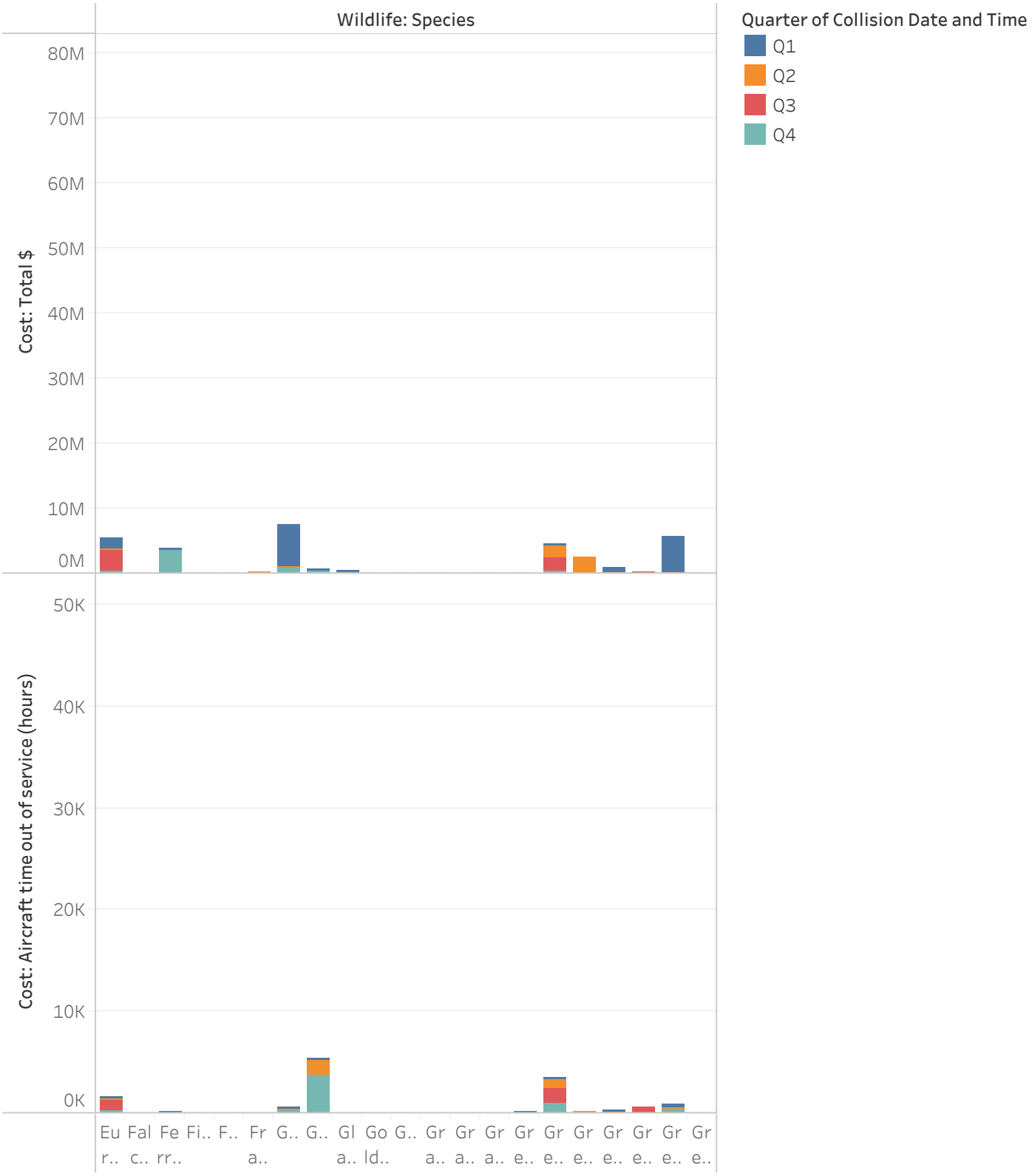

Sum of Cost: Total $ and sum of Cost: Aircraft time out of service (hours) for each Wildlife: Species. Color shows details about Collision Date and Time Quarter. The view is filtered on sum of Cost: Aircraft time out of service (hours), which keeps non-Null values only.

# $/Hours Impact by Species-Static



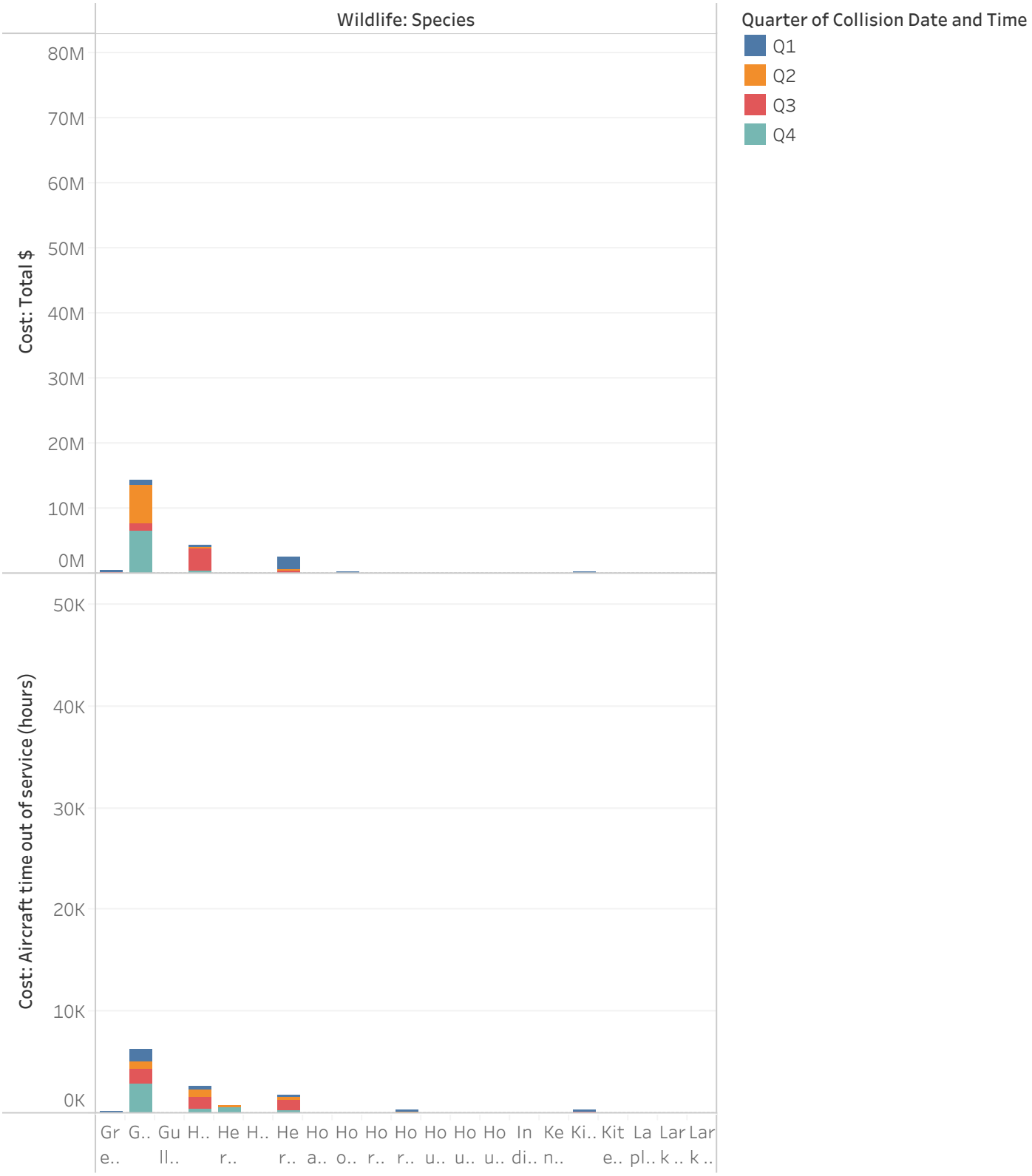

Sum of Cost: Total $ and sum of Cost: Aircraft time out of service (hours) for each Wildlife: Species. Color shows details about Collision Date and Time Quarter. The view is filtered on sum of Cost: Aircraft time out of service (hours), which keeps non-Null values only.

# $/Hours Impact by Species-Static



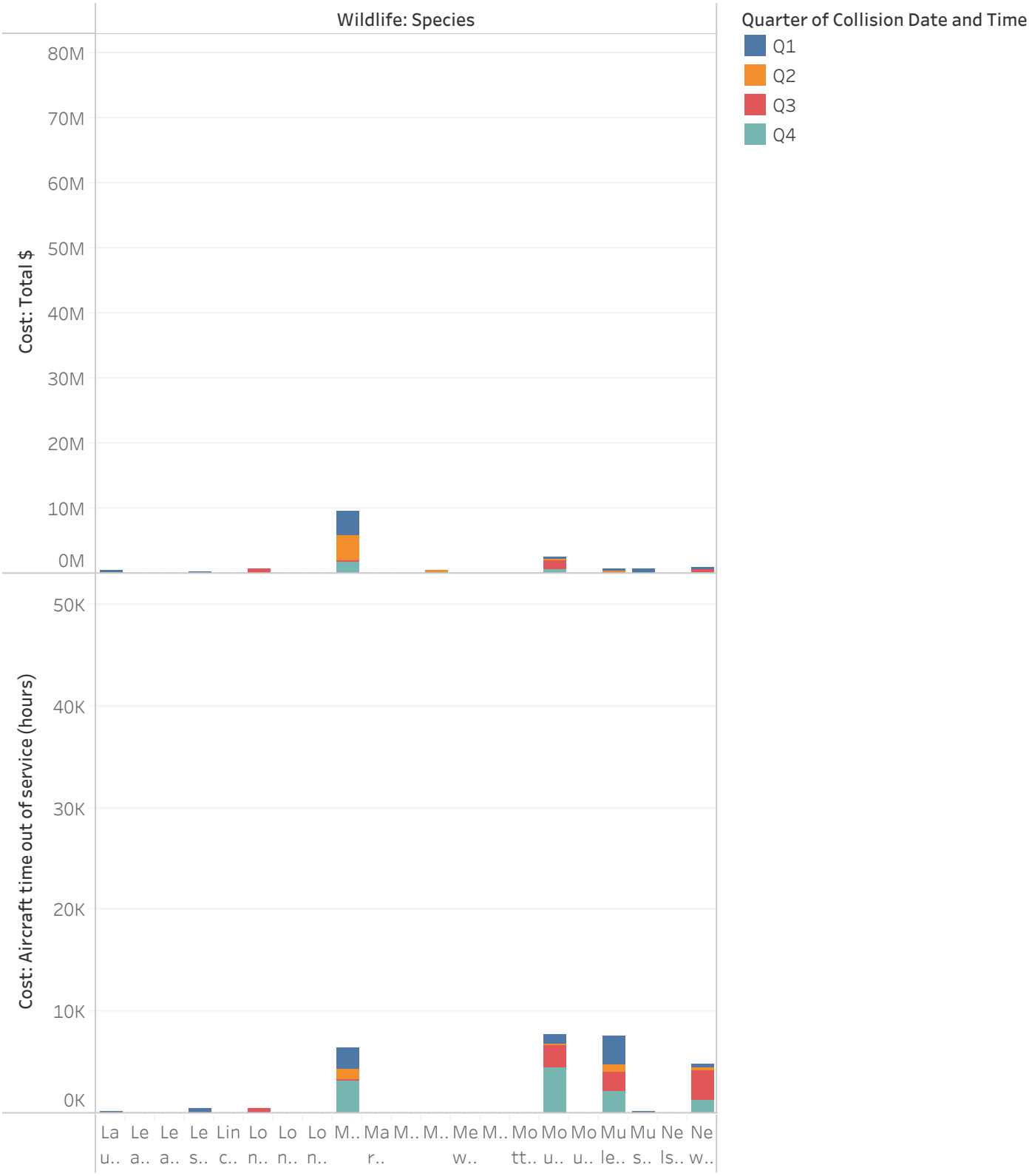

Sum of Cost: Total $ and sum of Cost: Aircraft time out of service (hours) for each Wildlife: Species. Color shows details about Collision Date and Time Quarter. The view is filtered on sum of Cost: Aircraft time out of service (hours), which keeps non-Null values only.

# $/Hours Impact by Species-Static



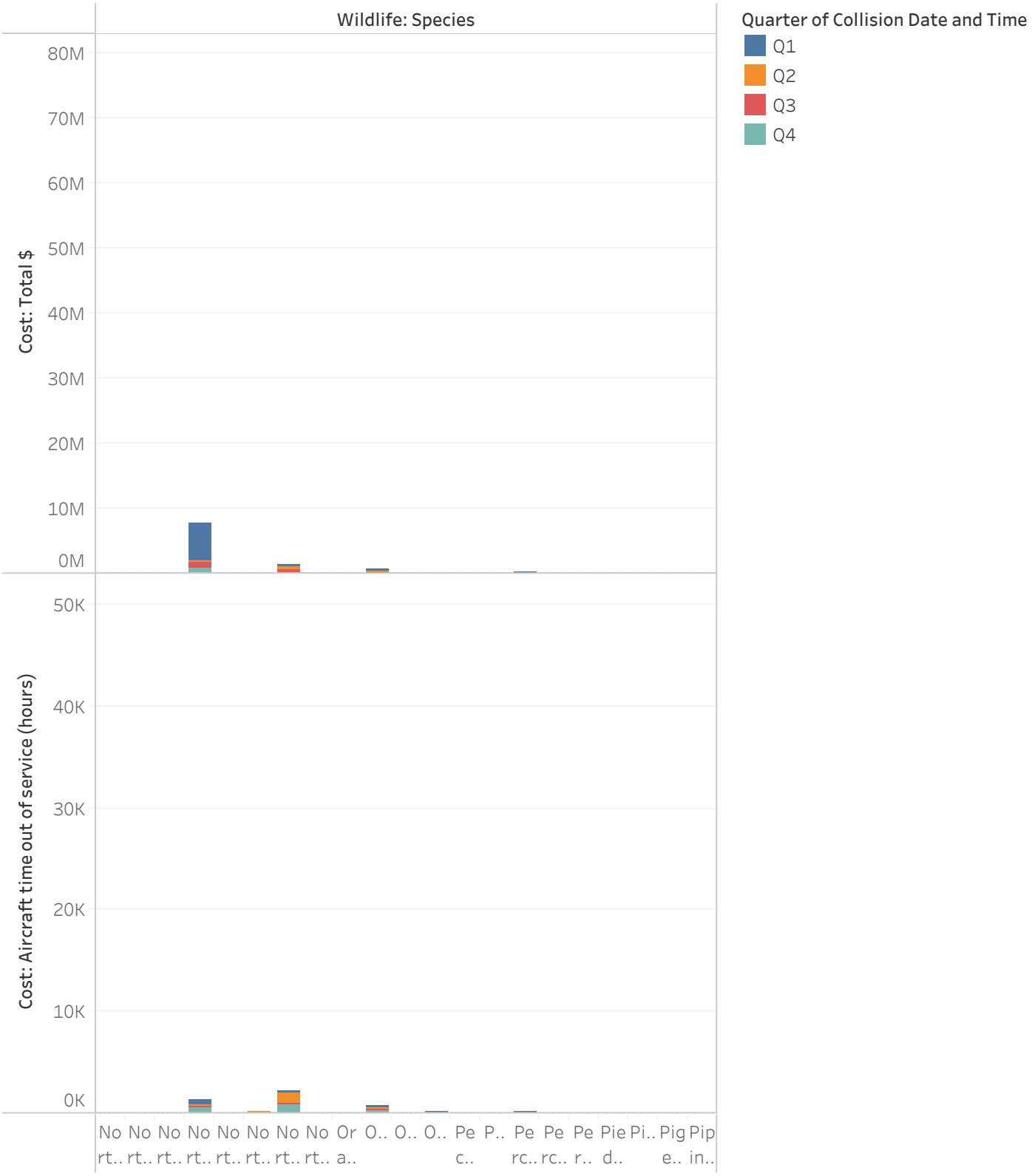

Sum of Cost: Total $ and sum of Cost: Aircraft time out of service (hours) for each Wildlife: Species. Color shows details about Collision Date and Time Quarter. The view is filtered on sum of Cost: Aircraft time out of service (hours), which keeps non-Null values only.

# $/Hours Impact by Species-Static



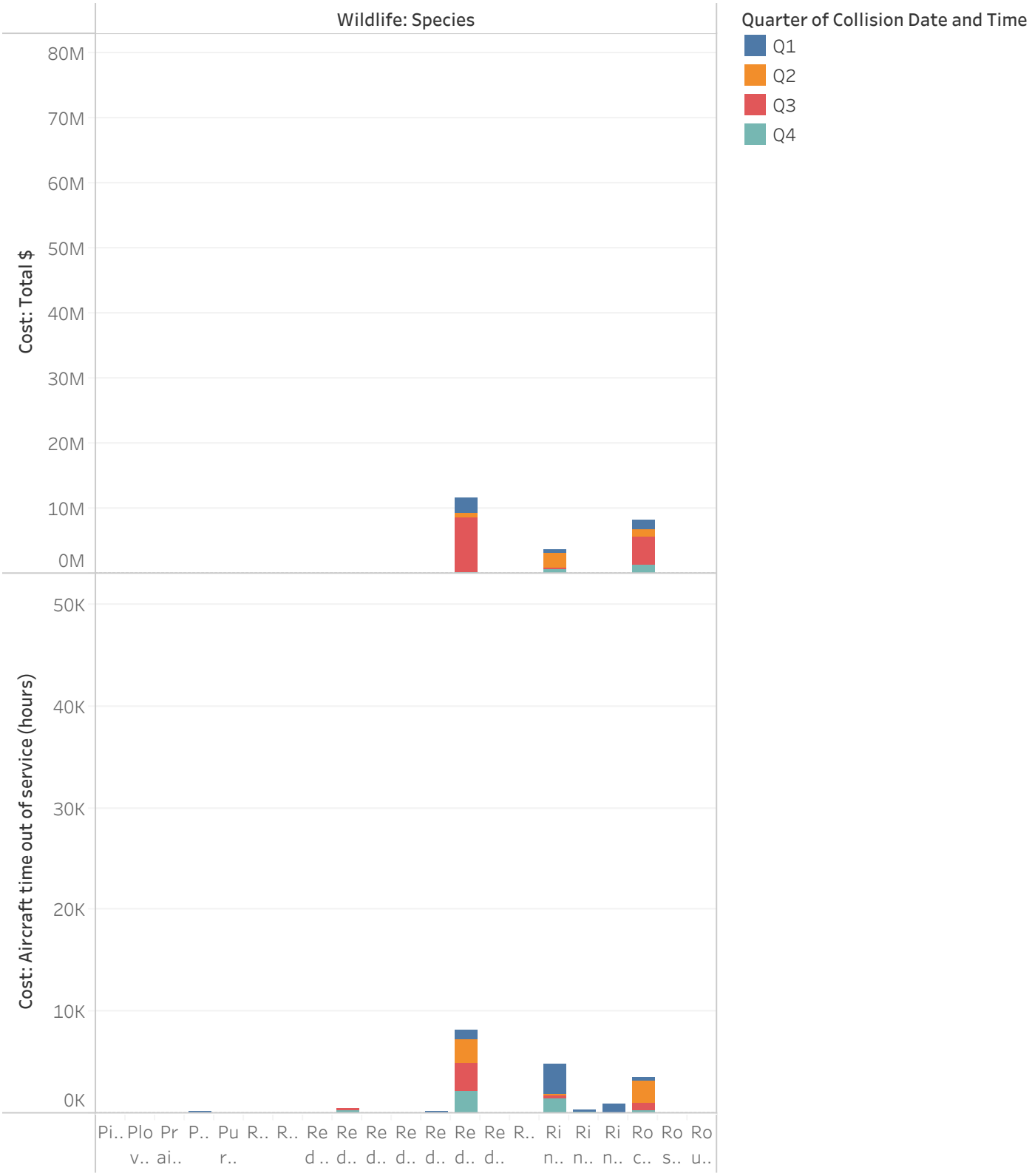

Sum of Cost: Total $ and sum of Cost: Aircraft time out of service (hours) for each Wildlife: Species. Color shows details about Collision Date and Time Quarter. The view is filtered on sum of Cost: Aircraft time out of service (hours), which keeps non-Null values only.

# $/Hours Impact by Species-Static



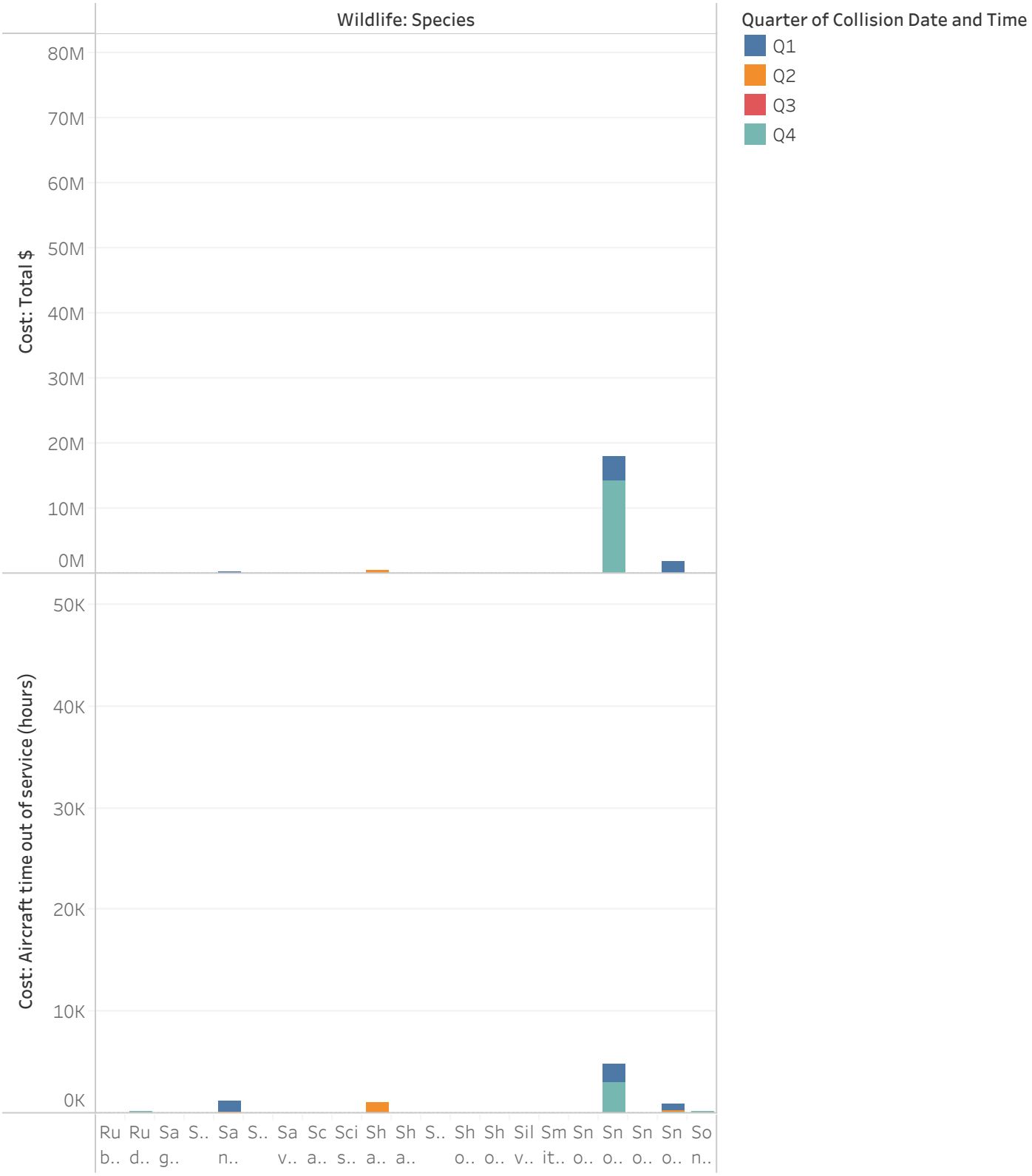

Sum of Cost: Total $ and sum of Cost: Aircraft time out of service (hours) for each Wildlife: Species. Color shows details about Collision Date and Time Quarter. The view is filtered on sum of Cost: Aircraft time out of service (hours), which keeps non-Null values only.

# $/Hours Impact by Species-Static



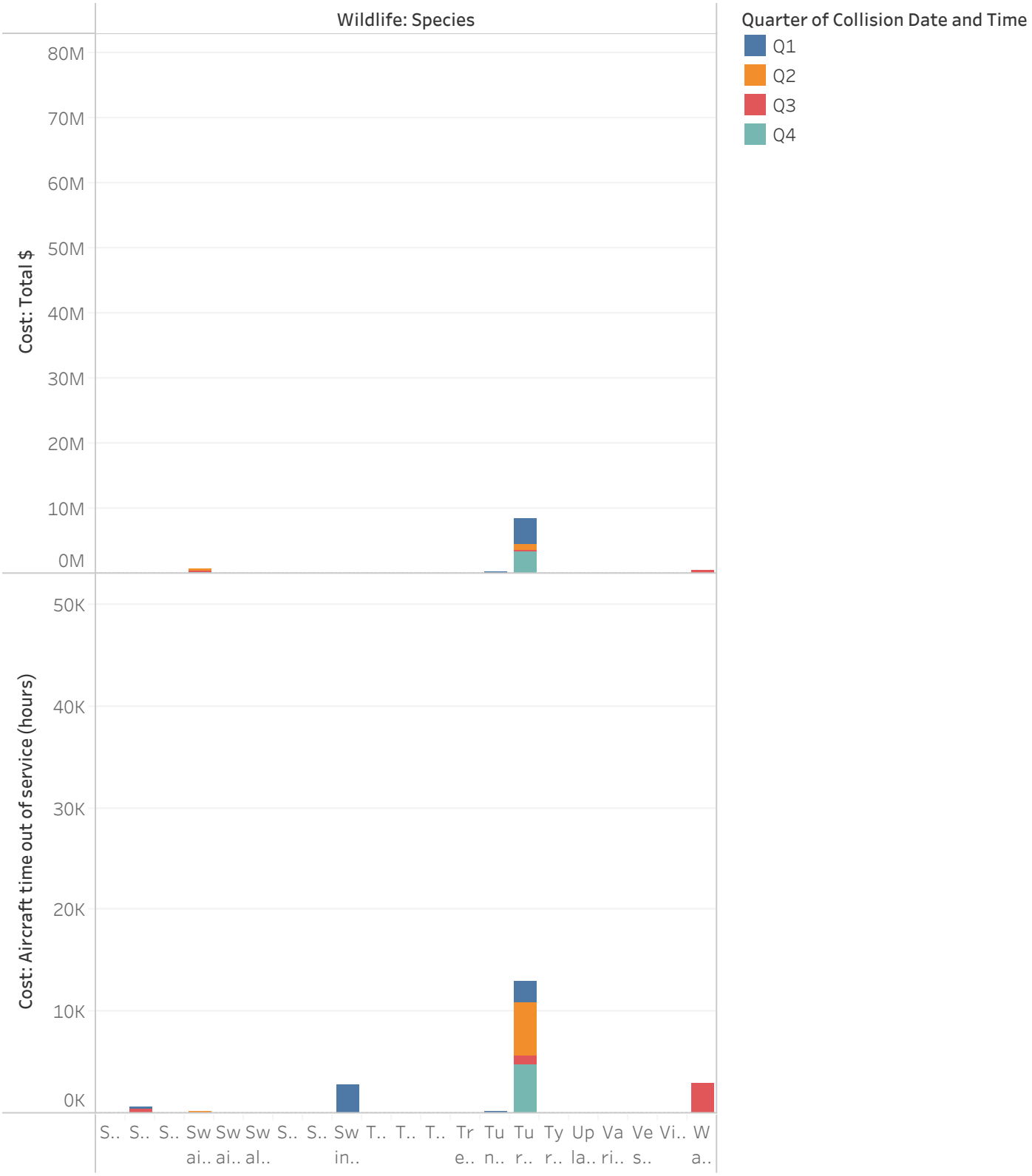

Sum of Cost: Total $ and sum of Cost: Aircraft time out of service (hours) for each Wildlife: Species. Color shows details about Collision Date and Time Quarter. The view is filtered on sum of Cost: Aircraft time out of service (hours), which keeps non-Null values only.

# $/Hours Impact by Species-Static



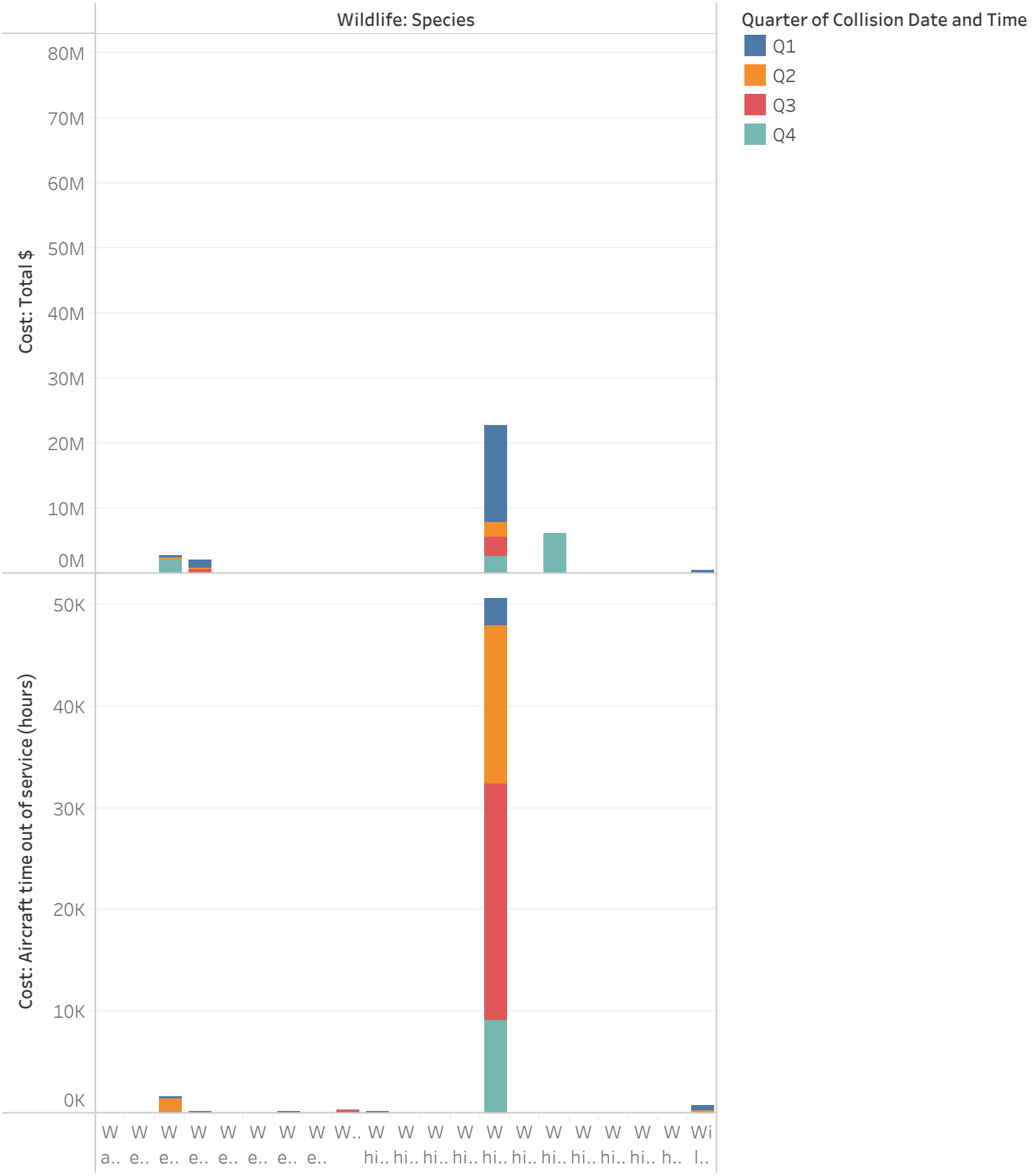

Sum of Cost: Total $ and sum of Cost: Aircraft time out of service (hours) for each Wildlife: Species. Color shows details about Collision Date and Time Quarter. The view is filtered on sum of Cost: Aircraft time out of service (hours), which keeps non-Null values only.

# $/Hours Impact by Species-Static



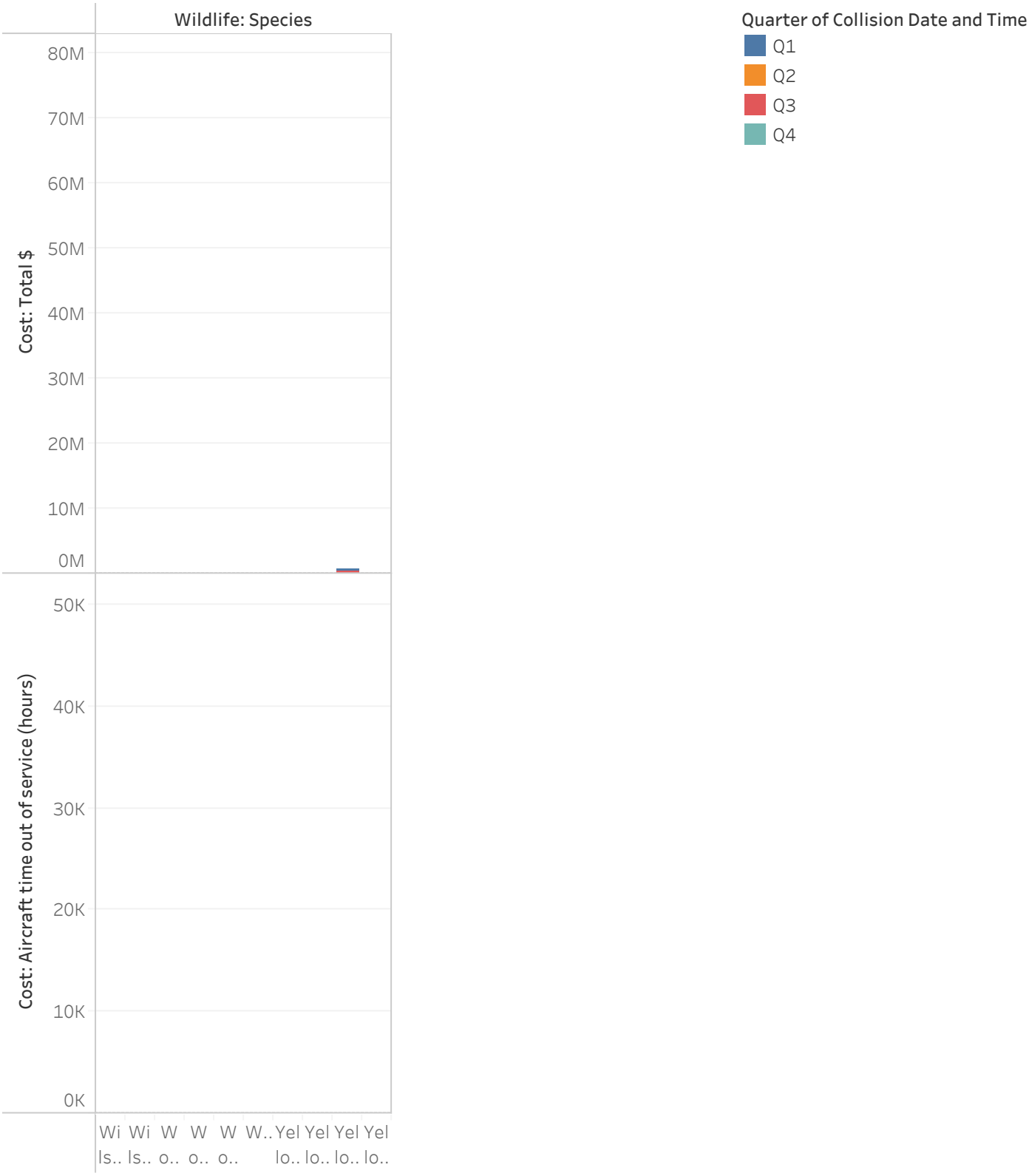

Sum of Cost: Total $ and sum of Cost: Aircraft time out of service (hours) for each Wildlife: Species. Color shows details about Collision Date and Time Quarter. The view is filtered on sum of Cost: Aircraft time out of service (hours), which keeps non-Null values only.

# $/Hours Impact by Species-Static



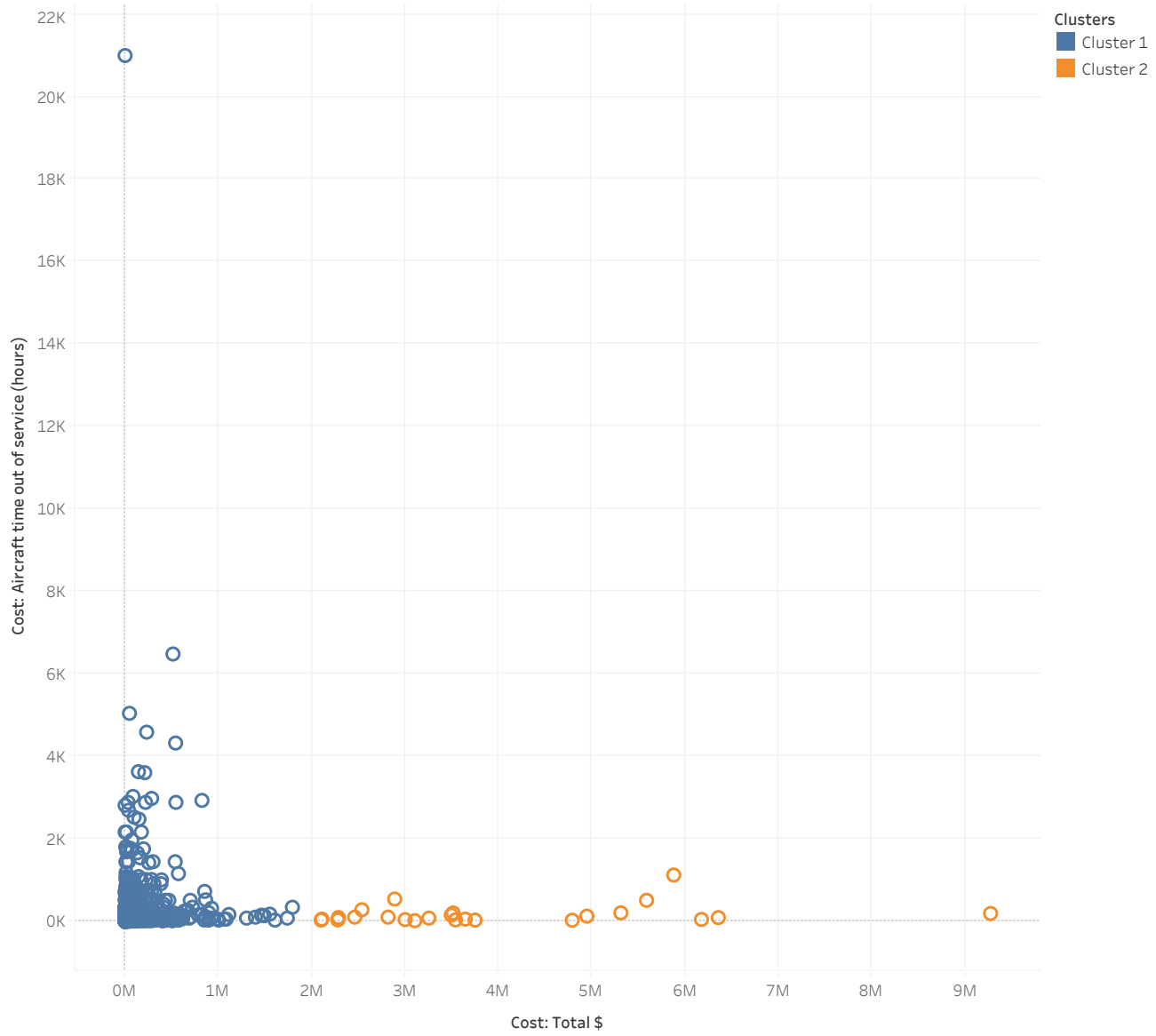

Sum of Cost: Total $ and sum of Cost: Aircraft time out of service (hours) for each Wildlife: Species. Color shows details about Collision Date and Time Quarter. The view is filtered on sum of Cost: Aircraft time out of service (hours), which keeps non-Null values only.

# $/Hours Impact by Species-Static



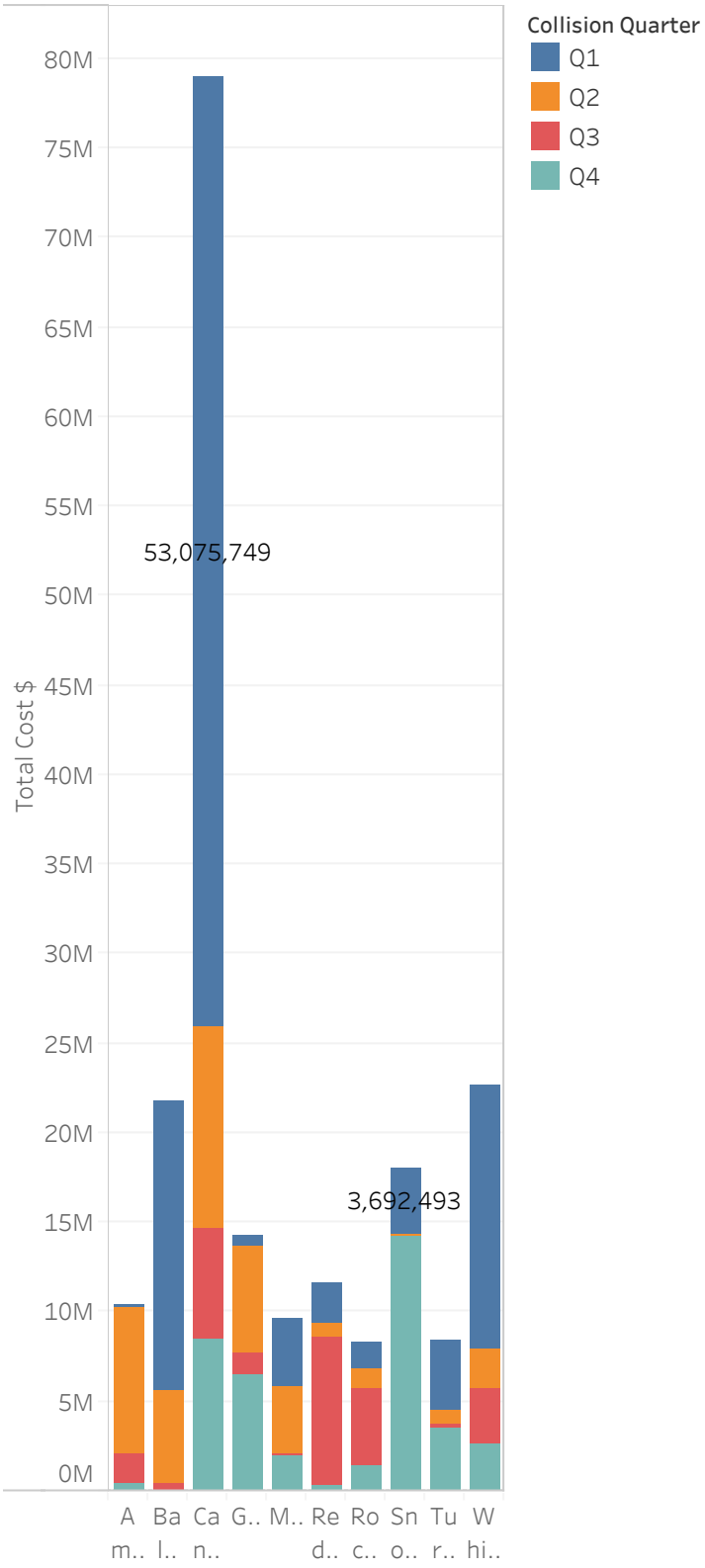

Sum of Cost: Total $ and sum of Cost: Aircraft time out of service (hours) for each Wildlife: Species. Color shows details about Collision Date and Time Quarter. The view is filtered on sum of Cost: Aircraft time out of service (hours), which keeps non-Null values only.

Clusters by Impact: **Total Cost $**



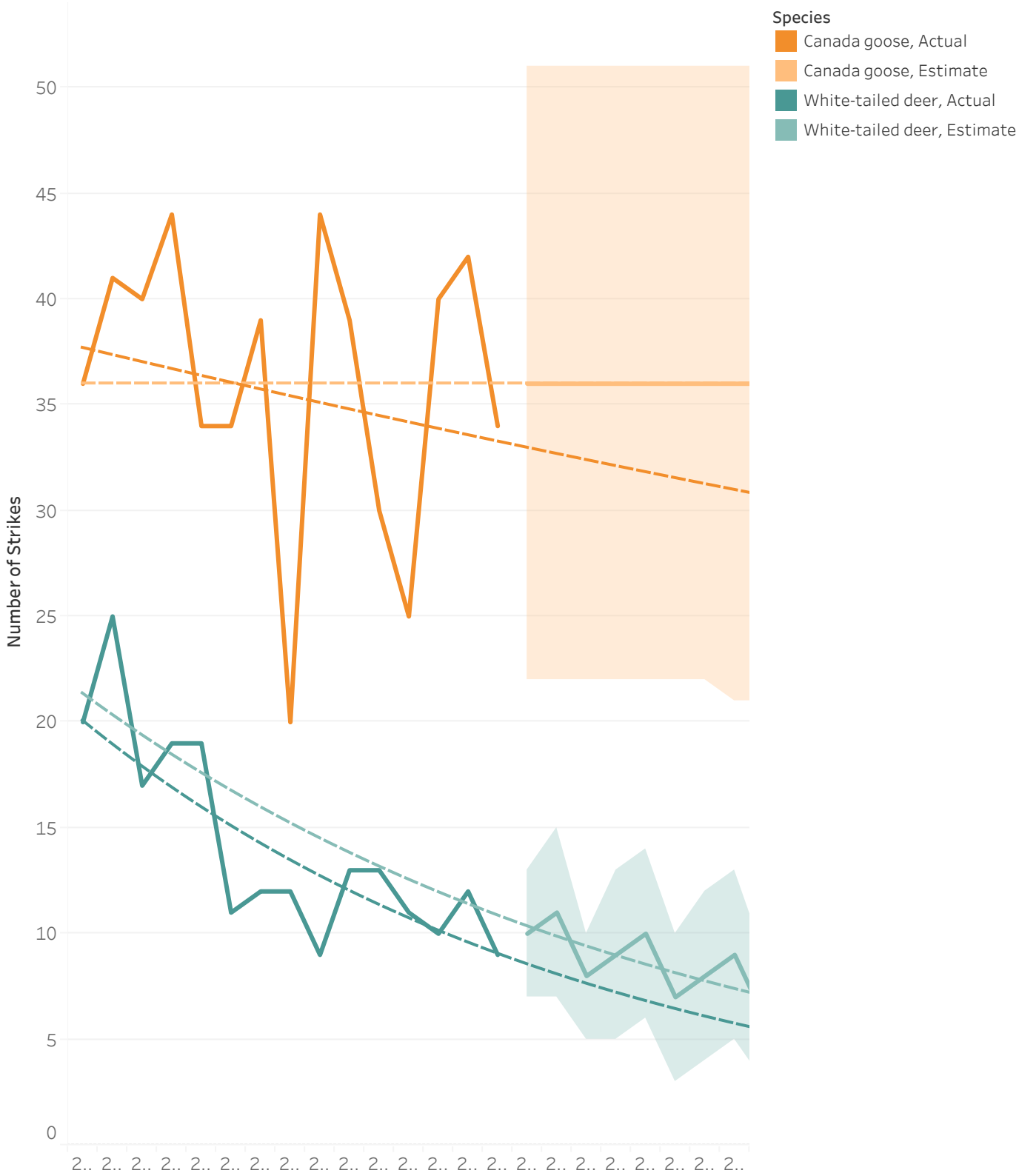

Cost: Total $ vs. Cost: Aircraft time out of service (hours). Color shows details about Clusters (5). Details are shown for Wildlife: Species. The data is filtered on Cost: Aircraft time out of service (hours), which keeps non-Null values only.

**Total Cost $** by Wildlife Species




Choose Impact Field (Parameters) and Chosen Impact Field for each Wildlife: Species. Color shows details about Collision Date and Time Quarter. The marks are labeled by Chosen Impact Field. The view is filtered on Wildlife: Species, which keeps 10 of 469 members.

High Risk Wildlife Strike Forecast




The trend of sum of Number of Strikes (actual & forecast) for Collision Date and Time Year. Color shows details about Wildlife: Species and Forecast indicator. The view is filtered on Wildlife: Species, which keeps Canada goose and White-tailed deer.

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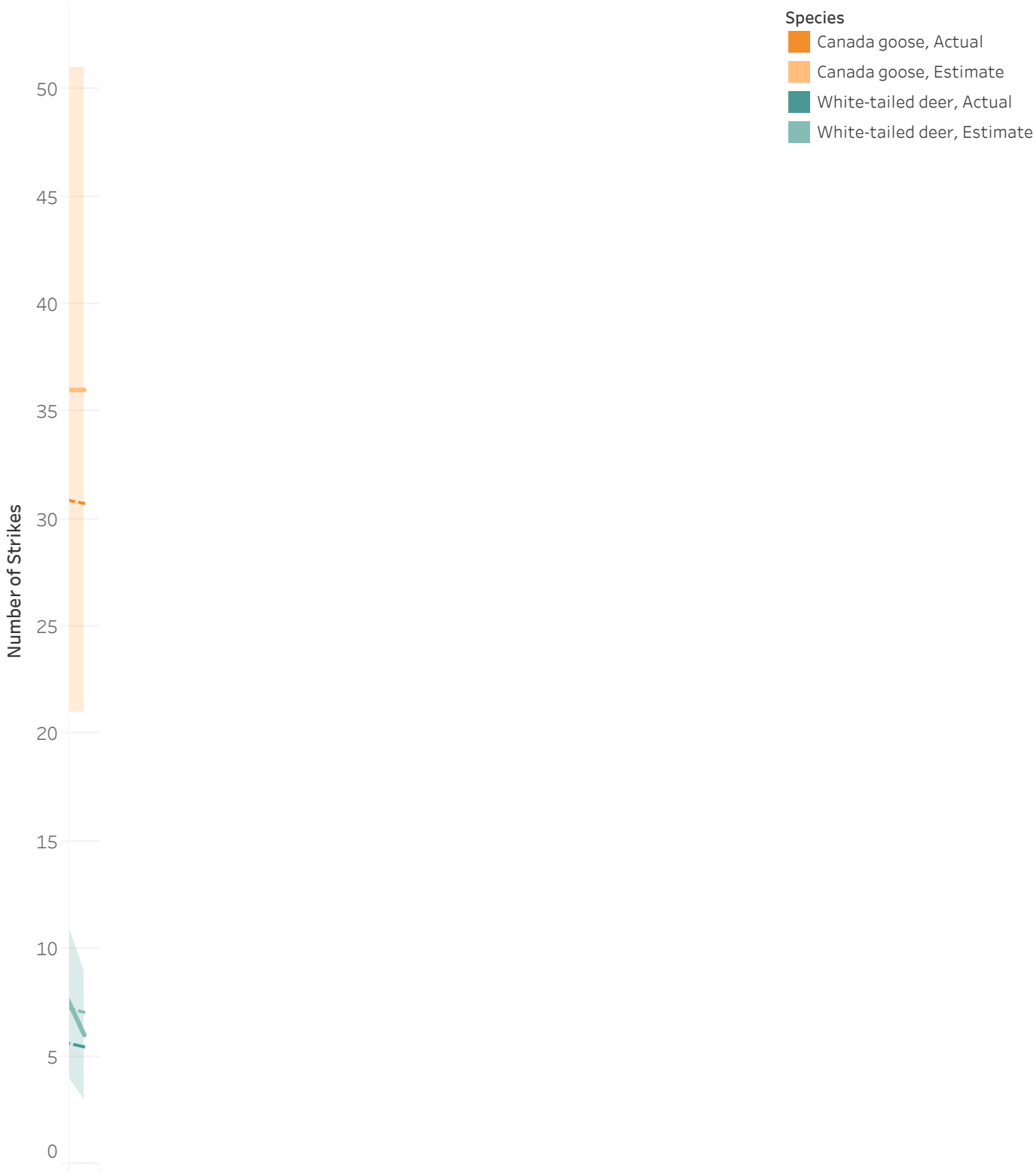


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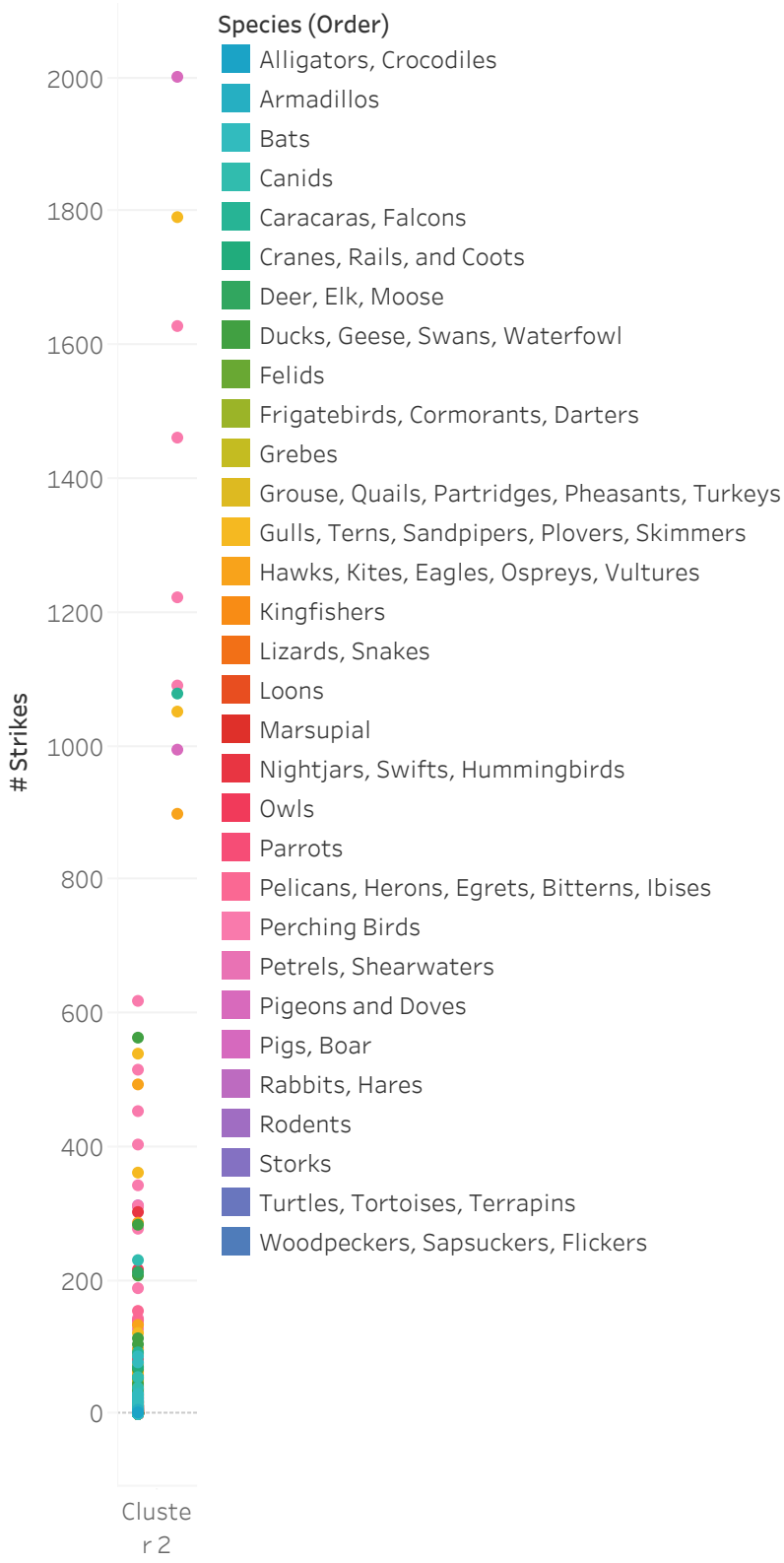
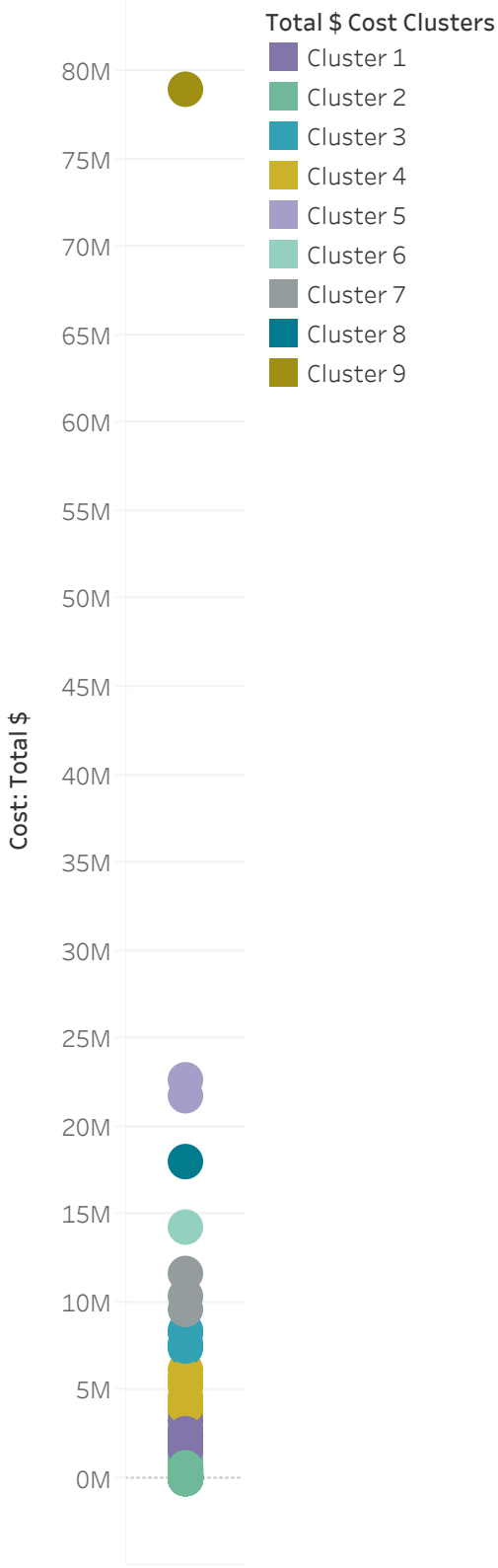


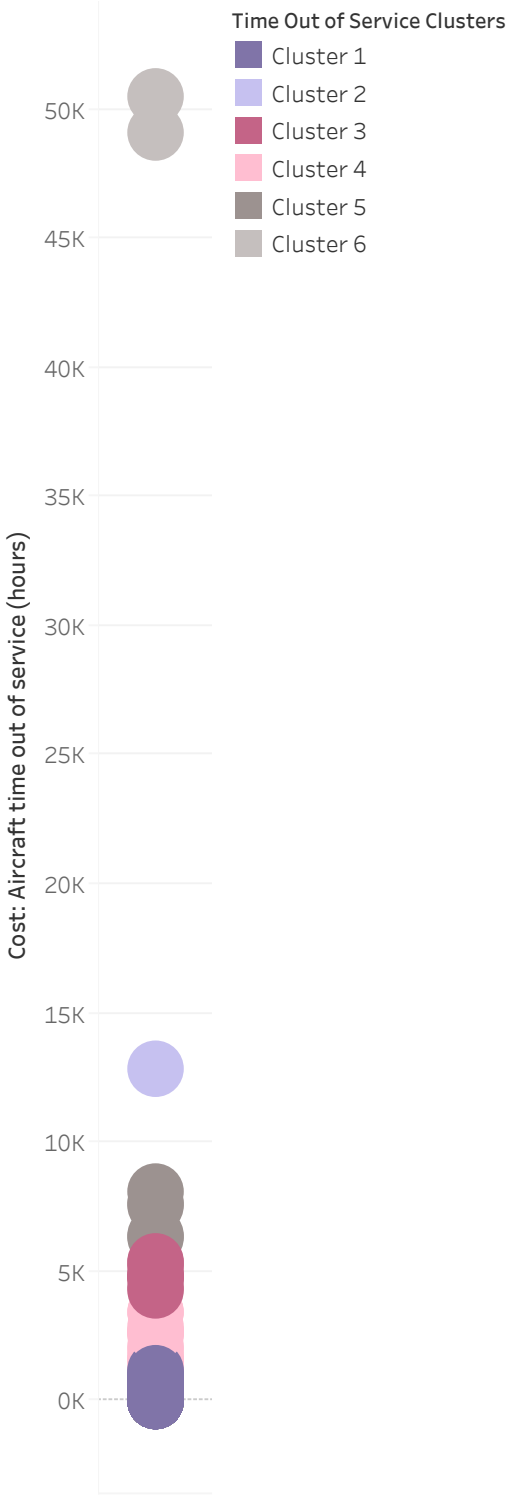

Sum of Number of Strikes for each Clusters. Color shows details about Wildlife: Species Order. Details are shown for Wildlife: Species ID.

Clusters by Total $ Cost Impact




Sum of Cost: Total $. Color shows details about Clusters (10). Details are shown for Wildlife: Species.

Clusters by Aircraft Time out of Service Impact

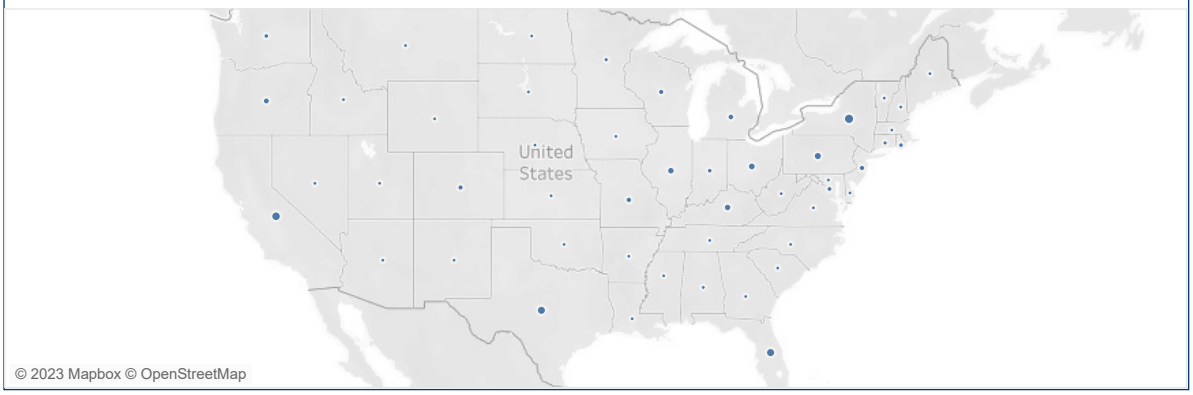



Sum of Cost: Aircraft time out of service (hours). Color shows details about Clusters (14). Details are shown for Wildlife: Species. The view is filtered on sum of Cost: Aircraft time out of service (hours), which keeps non-Null values only.

Blank.

# Trends in Wildlife Strikes (FAA) 2002-2015

Wildlife Strike Location and Sizes in the US over time (Currently showing 2000)

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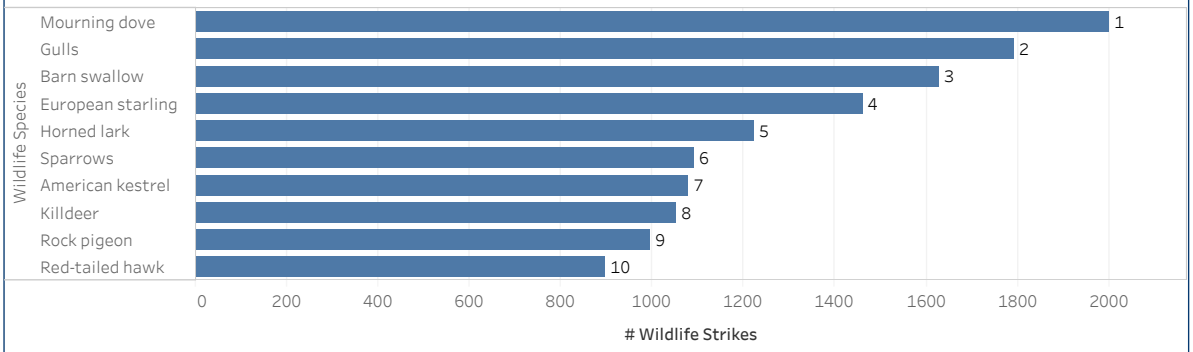
1,000
2,000
3,026

Collision Year
2000
Show history

Top 10 Wildlife Species Causing Strikes




**Choose Dimension**

- (●) Wildlife Species
- ( ) Phase of flight
- ( ) Time of day
- ( ) Amt. damage
- ( ) Airport
- ( ) State

**Top N**
10


More information about project: https://github.com/jtwleung/Final-Project-Tableau/blob/main/README.md

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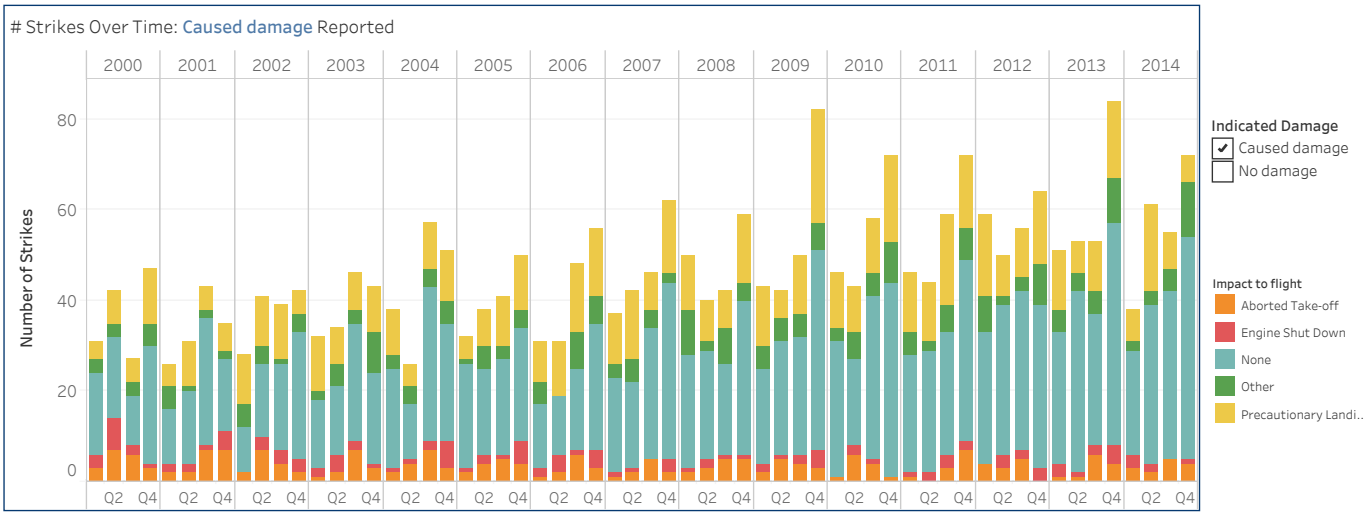


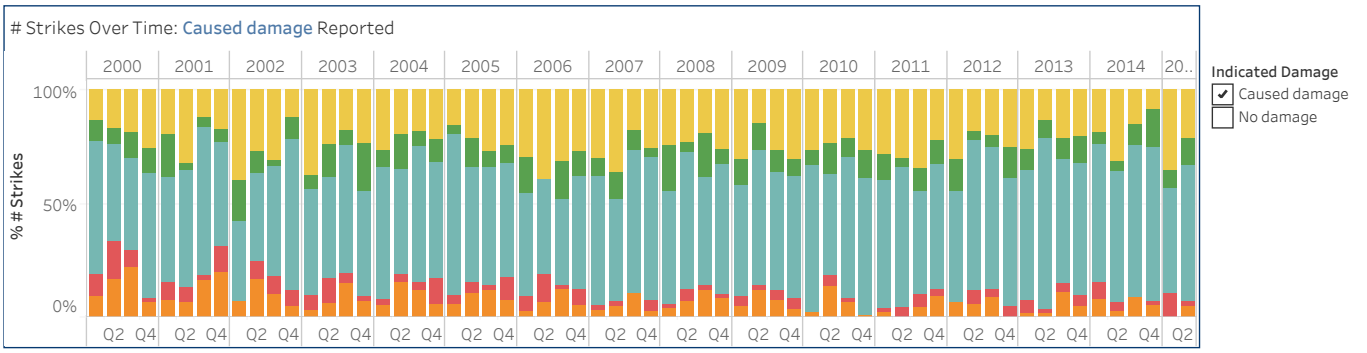



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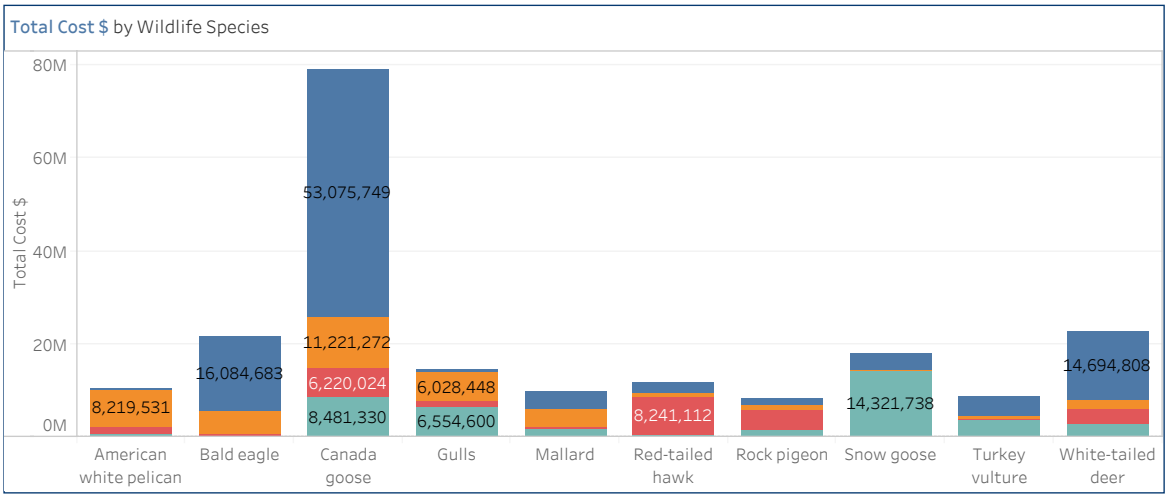


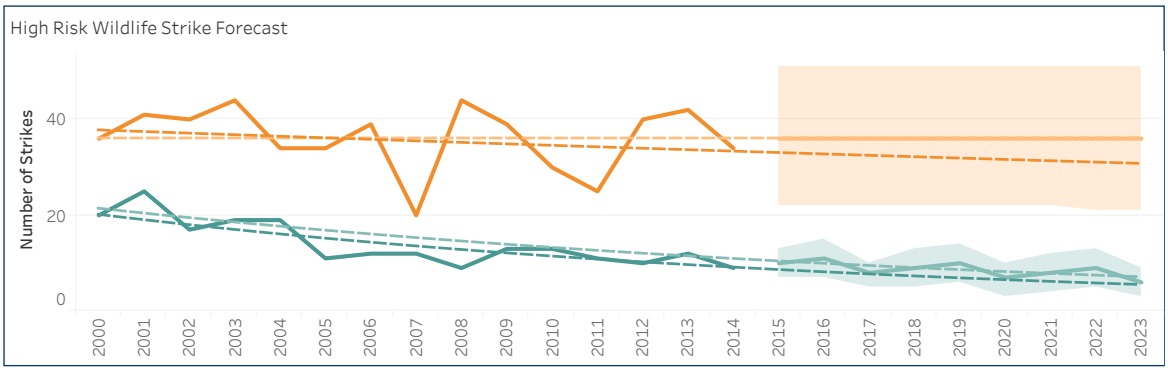



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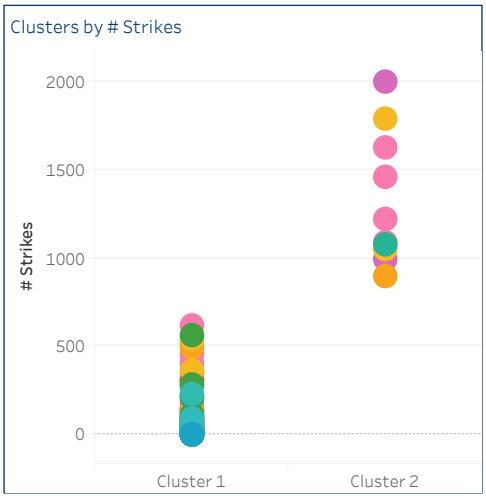
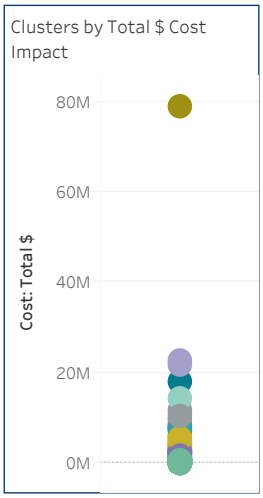
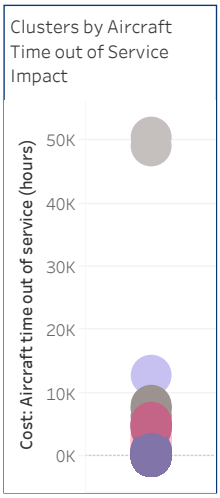


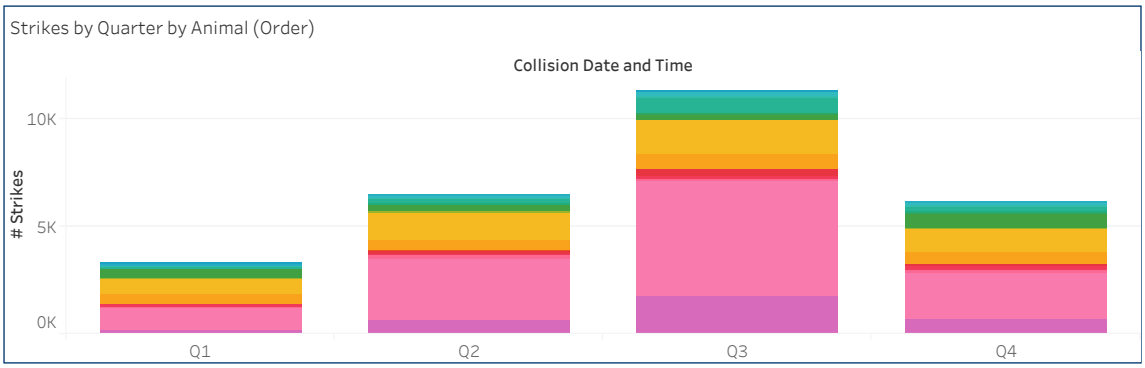




Total $ Cost Cluste..
- Cluster 1
- Cluster 2
- Cluster 3
- Cluster 4
- Cluster 5
- Cluster 6
- Cluster 7
- Cluster 8
- Cluster 9

Time Out of Service C..
- Cluster 1
- Cluster 2
- Cluster 3
- Cluster 4
- Cluster 5
- Cluster 6

Species (Order)
- Alligators, Crocodiles
- Armadillos
- Bats
- Canids
- Caracaras, Falcons
- Cranes, Rails, and Coo..
- Deer, Elk, Moose
- Ducks, Geese, Swans, ..
- Felids
- Frigatebirds, Cormora..
- Grebes
- Grouse, Quails, Partri..
- Gulls, Terns, Sandpipe..
- Hawks, Kites, Eagles, ..
- Kingfishers
- Lizards, Snakes
- Loons
- Marsupial
- Nightjars, Swifts, Hu..
- Owls
- Parrots
- Pelicans, Herons, Egre..
- Perching Birds
- Petrels, Shearwaters
- Pigeons and Doves
- Pigs, Boar
- Rabbits, Hares
- Rodents
- Storks
- Turtles, Tortoises, Ter..
- Woodpeckers, Sapsuc..





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# Trends in Wildlife Strikes (FAA) 2002-2015

## Salient Points and Takeaways For The Reader

(who didn't receive a verbal presentation)

**Top 3 Wildlife Species for number of strikes is:**
1) Mourning dove
2) Gulls
3) Barn swallow

**Top 3 for # Strikes Disproportionate to Top 3 Species for Total $ Cost damage:**
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- Majority of strikes have "No indicated damage" and Impact to flight of "None"
- When "Damage" is indicated, there are a lot more Impacts of "Precautionary Landing", "Aborted takeoff", "Engine shutdown", "Other", as would be expected.

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- When "No indicated damage", the incident of "Precautionary Landing" (yellow) and "Aborted takeoff" (orange) is relatively higher during the years 2001 Q3-2005 Q1.
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- Animals causing most costly monetary damage or aircraft "out of service" impact are Canada goose and White-tailed deer, respectively
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- Given the high cost ($ and opportunity cost/out of service time) of strikes by Canada geese and White-tailed deer, a forecast for expected # of strikes from 2016-2023 was completed. Expected # of strikes per year as follows:
  - Canada goose: 36 strikes expected each year with flat trend
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**Cluster Analysis:**
- Clustering on # Strikes reveals 2 clusters, one with mean=33, and the other with mean=1322
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# FAA Wildlife Strikes Presentation



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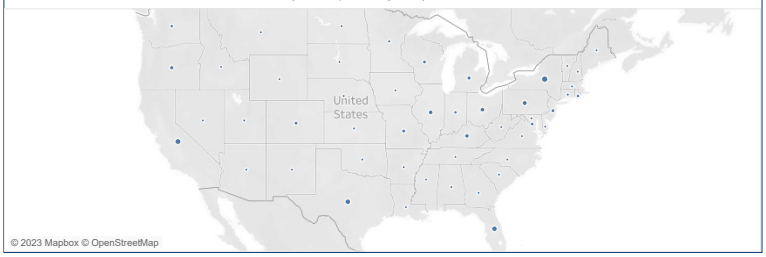


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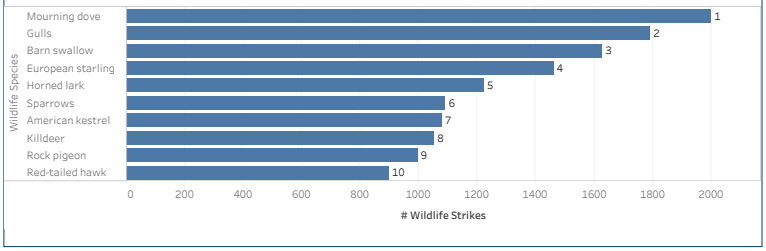


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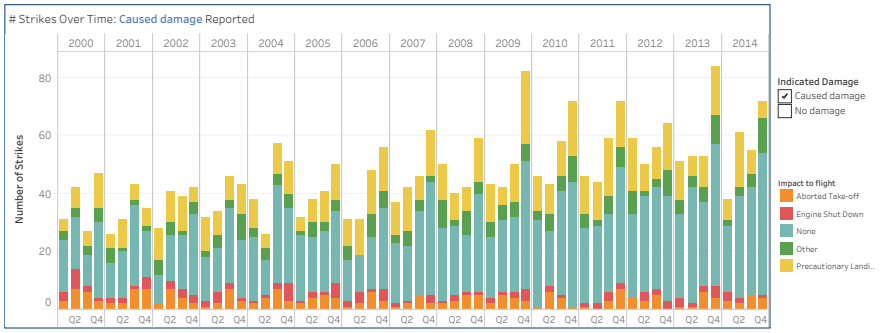


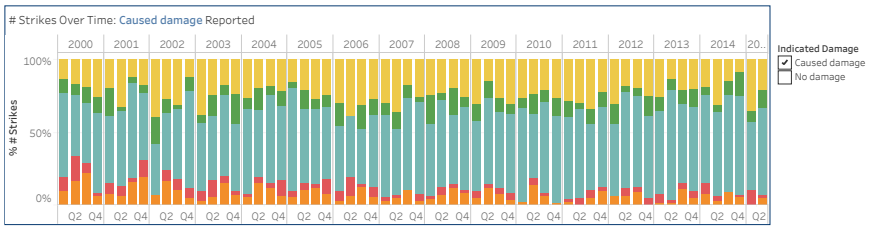

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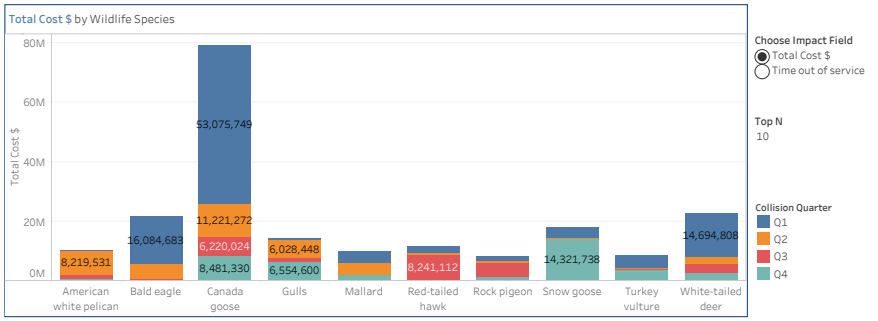


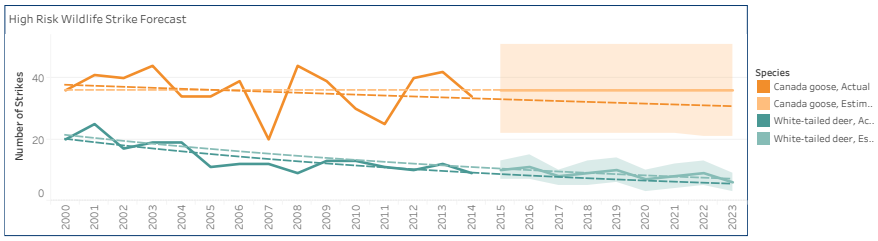

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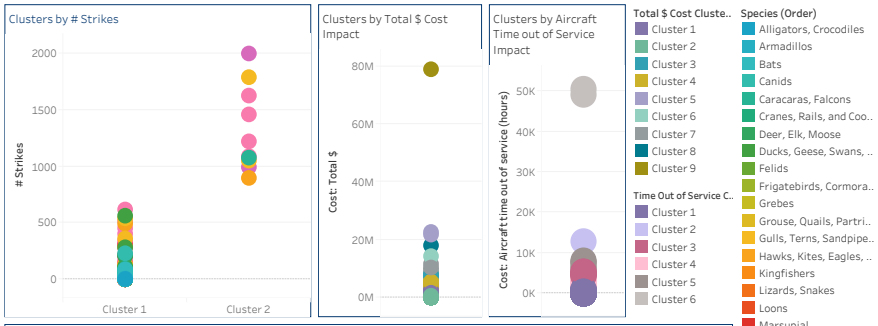

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