

An Airline Perspective on Wildlife Strikes



Troy Levanen

**Manager,
Maintenance Safety
Alaska Air Group**

**Bird Strike USA Steering
Committee Member**

**Certified Aircraft Accident
Investigator**

30 years airline experience

Alaska Air Group Information

The following information represents Alaska Air Group (AAG)

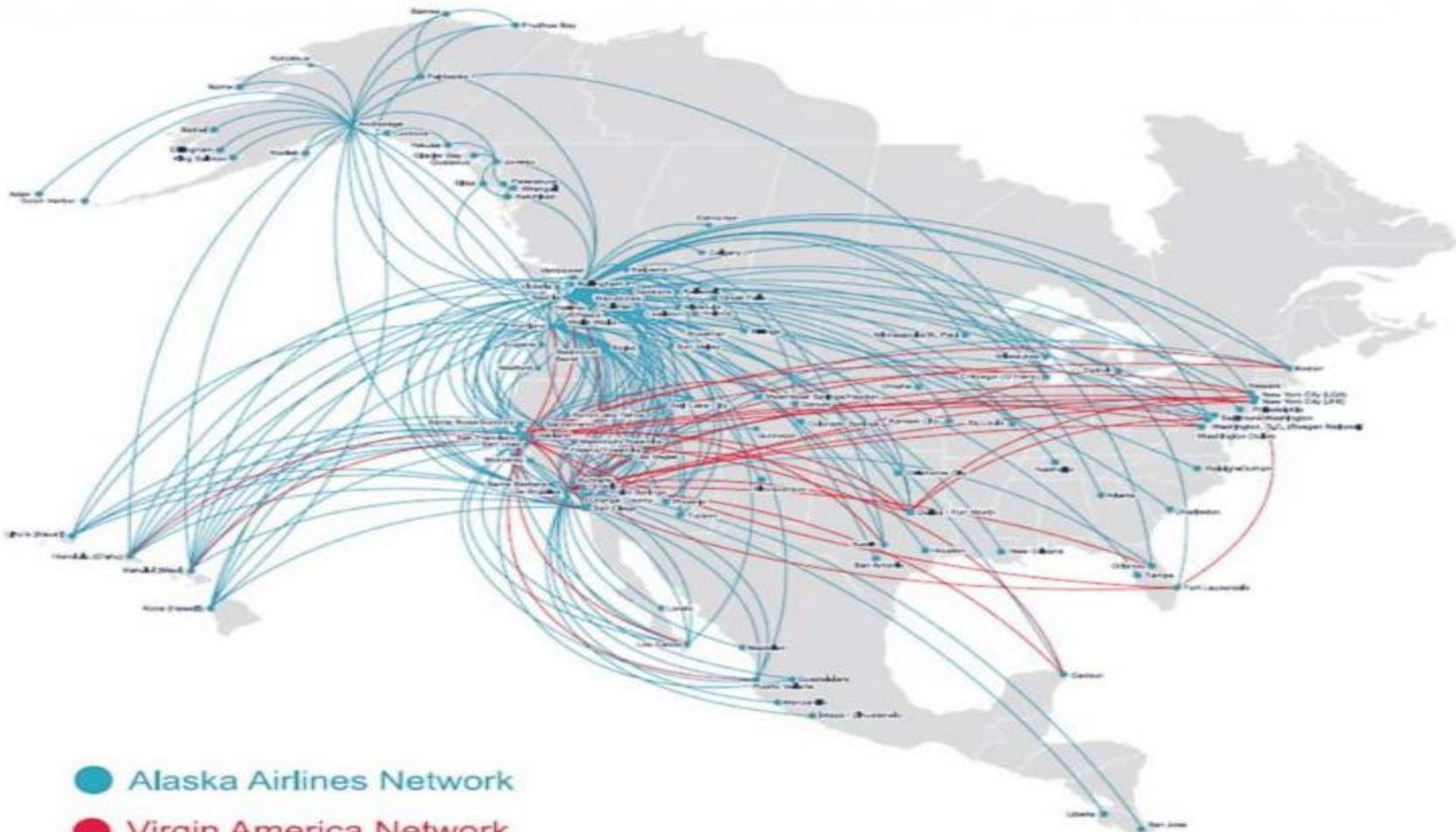
AAG includes Alaska, Horizon, and what was formerly Virgin America (now part of Alaska Airlines).

The current AAG operational fleet is:

- 164 Boeing 737 aircraft
- 72 Airbus A320 family aircraft
- 33 Bombardier Q400 aircraft
- 30 Embraer E175 aircraft.



Alaska Air Group Information – Route Map



Why is Alaska so interested in Wildlife Strikes?

While processing reports and tracking aircraft maintenance, we identified that we were performing strike inspections on an average of more than 3 wildlife strikes per day.

So we asked ourselves “What can we do”?

We decided to dig a little deeper to see if we could identify any opportunities to reduce our strikes and improve aviation safety.

The fact that every strike costs our company money was additional incentive.

We started by collecting information on our strikes.



Methods:

**How did we gather
our information?**

Strike data from:

Aircraft Maintenance Records: Provide detail for *every* strike inspection performed by our Technicians.

Used to determine strike *count* and *rate* per 10k departures by airports in which AAG has 900+ departures.

Note: All Aircraft Maintenance Manuals require technicians to perform a cleaning and inspect for damage on every strike reported.

Pilot Irregularity Reports: Voluntarily submitted by AAG pilots. Provide strike information beyond aircraft log book or maintenance records, such as phase of flight or altitude.

These sources were also compared with FAA National Wildlife Strike Database.



What did we find?

Findings:

We studied our strike data and identified differences between what we saw and what others saw, especially with regard to reporting.

Using 2018 data for example, we found that only 30% of our total AAG strikes were submitted to the National Wildlife Strike Database (346 of 1170 total).

Also, we discovered that airport wildlife teams were aware of only a fraction of the AAG total.

Findings (cont.):

We went back to the beginning of 2017 with our research, so at this point we are nearing the 3 year data collection point.

Another thing that we noticed when looking at our records over the entire span was that our AAG average strike rate per 10k departures looks to be increasing (2017=26; 2018=27; 2019 YTD=28). This increase equates to about 100 strikes per year on 400k flights.

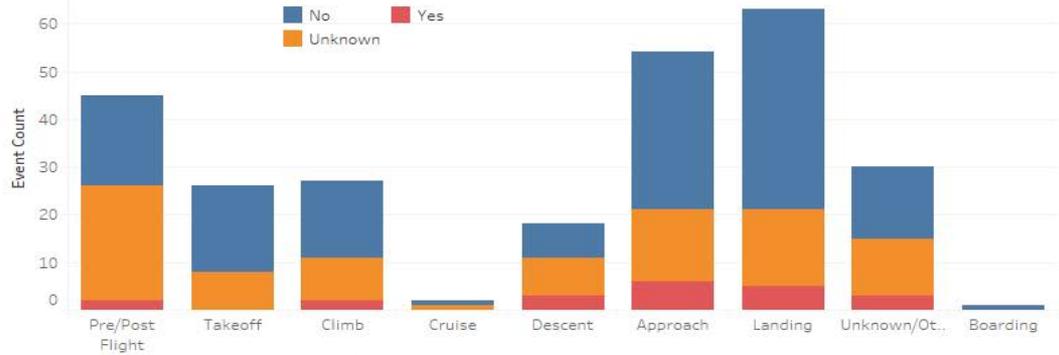
Note: As mentioned, our focus was airports with 900+ departures per year (68 of the 200+ AAG airports).

We then created a 1st version Dashboard to get better detail of all wildlife strikes; by airport & all AAG flights

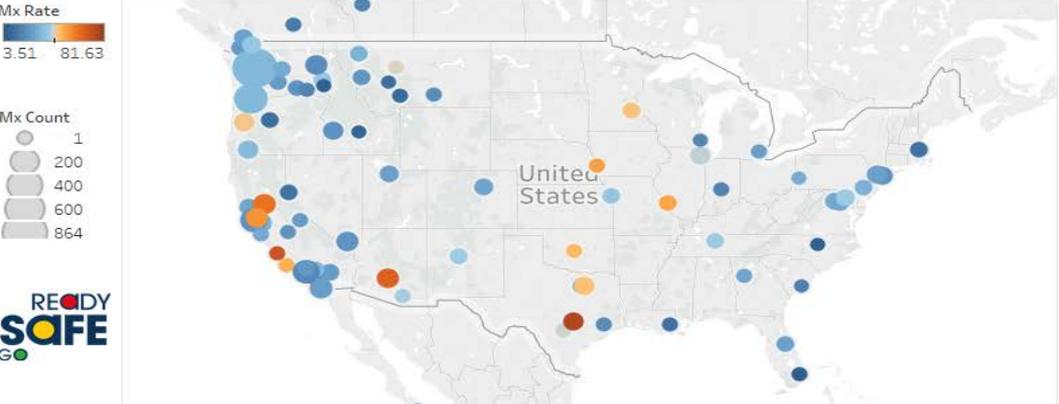
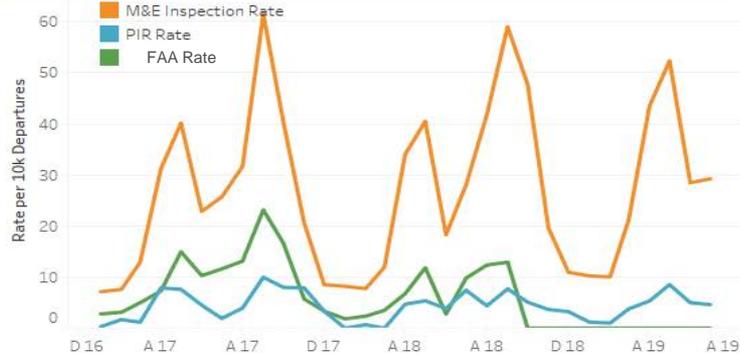
Birdstrike Events

Airline All

Damage by Phase of Flight

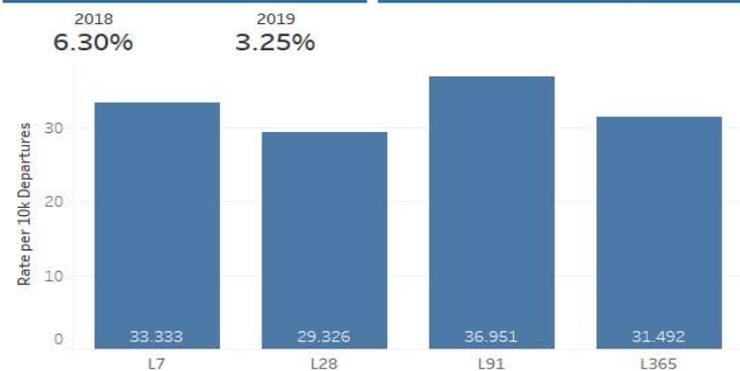


Reporting Rate by Source



Rolling YoY % Change

2018: 6.30% 2019: 3.25%





**How does our
Dashboard work?**

Alaska Air Group Wildlife Strike Dashboard

Collects strike data over a rolling 2 year period.

Presents data in maps and graphs; including things such as strike counts and rates.

Can also present phase of flight and tell us whether the strike was a damaging strike (from Pilot Irregularities).

Compares total strikes recorded in AAG maintenance records to total strike reports submitted by pilots to AAG internal safety reporting system *and* to total AAG strikes submitted to the National Wildlife Strike Database.

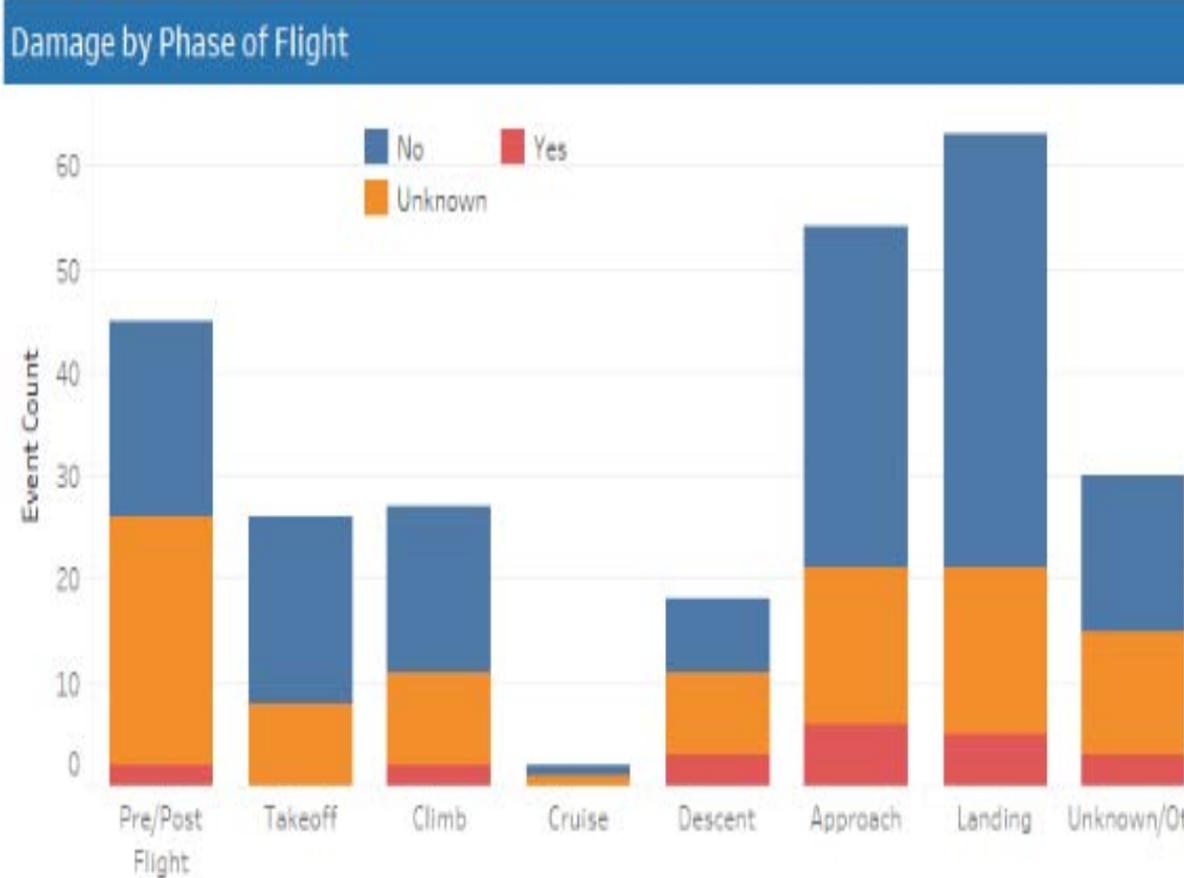
Alaska Air Group Wildlife Strike Dashboard

The information in the Dashboard can then be shared the individual airport wildlife mitigation teams to help them focus their mitigation efforts as well as see what their trends are - including year over year and month over month – according to our records.

It also helps us provide information to our own teams - particularly our pilots - to heighten awareness at key locations during higher risk times of year.

The next few slides will provide a bit more specific detail.

Phase of Flight – What this graph tells us:



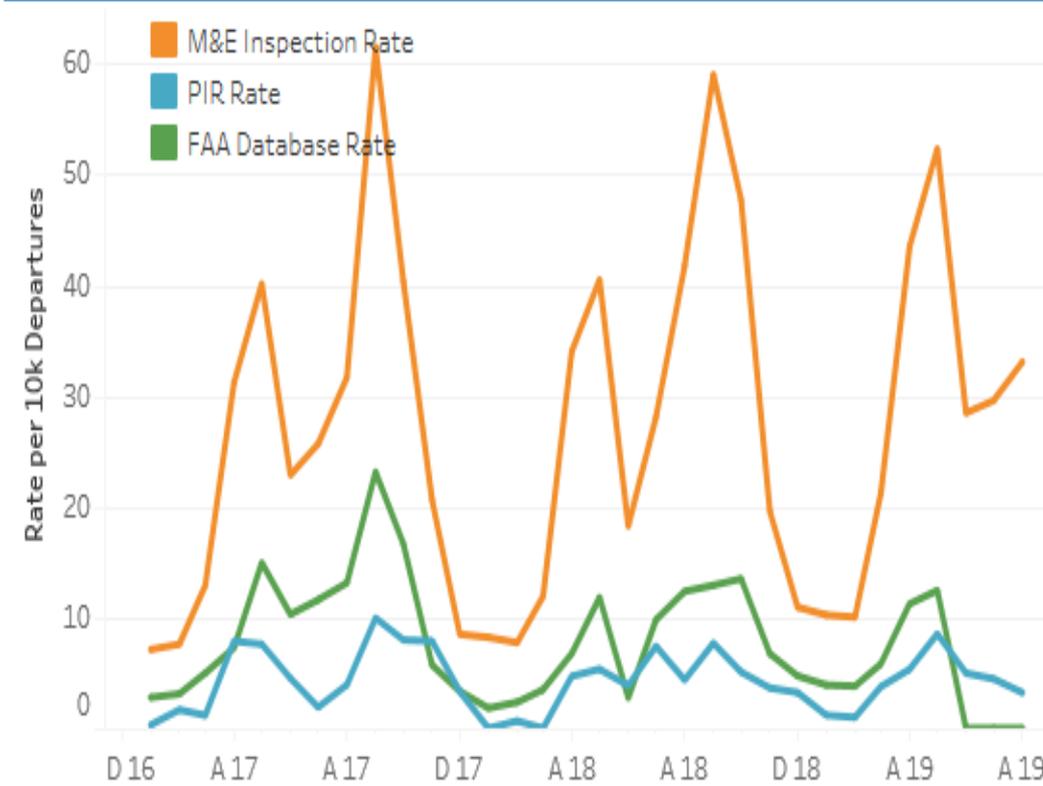
That our strikes are happening near airports, particularly approach and landing.

That many of our strikes are found Pre/Post Flight on walkarounds.

That a high % of our strikes are non-damaging.

Reporting Rate by Source – What this graph tells us:

Reporting Rate by Source



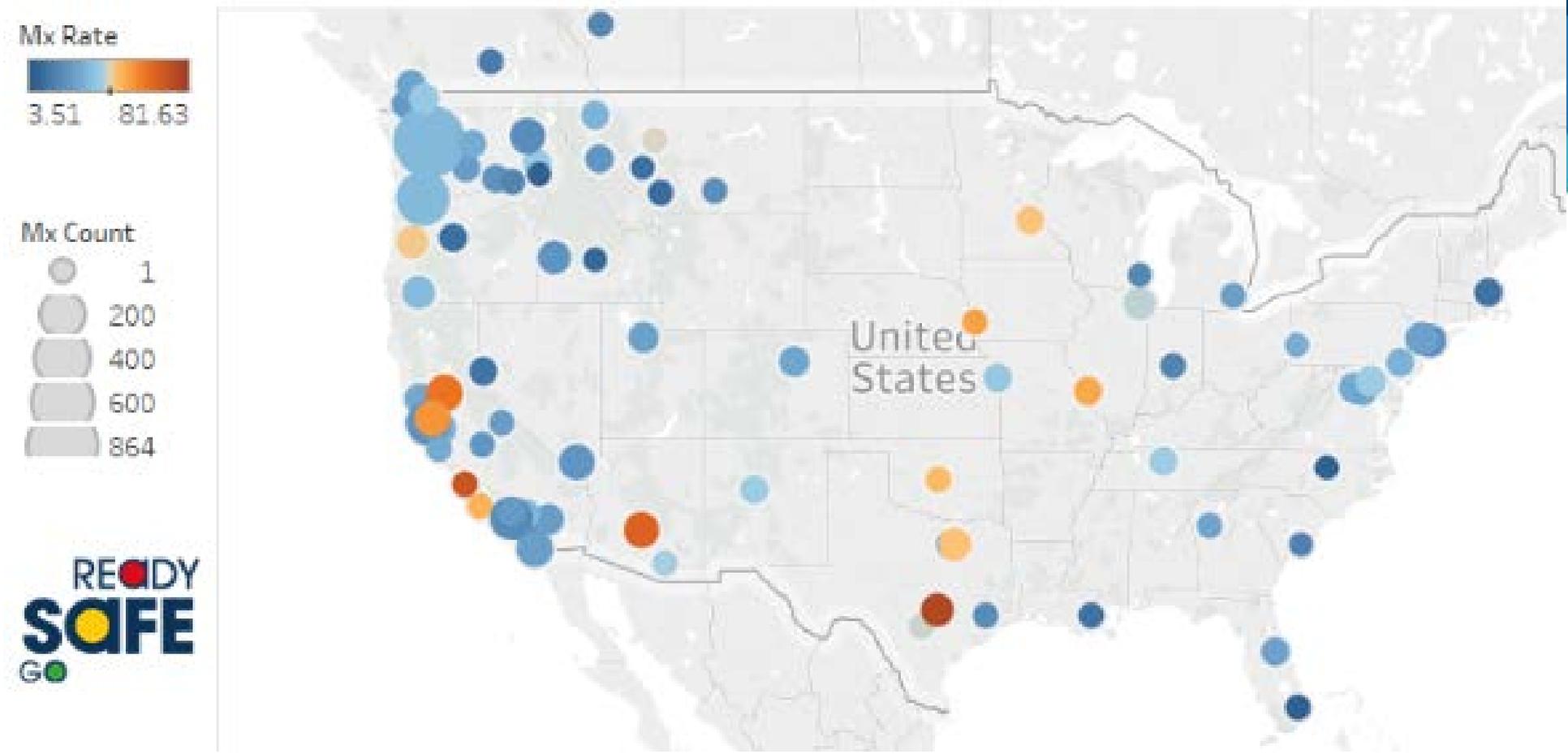
Which report database strikes were reported to:

- Aircraft Maintenance Log
- AAG Pilot Internal Safety Reporting System
- FAA National Wildlife Strike Database

When strikes happen: 2 year historical

Alaska Air Group Bird Strike “Map”

(See next slide for detail)



Alaska Airlines Bird Strike “Map”

What this map tells us:

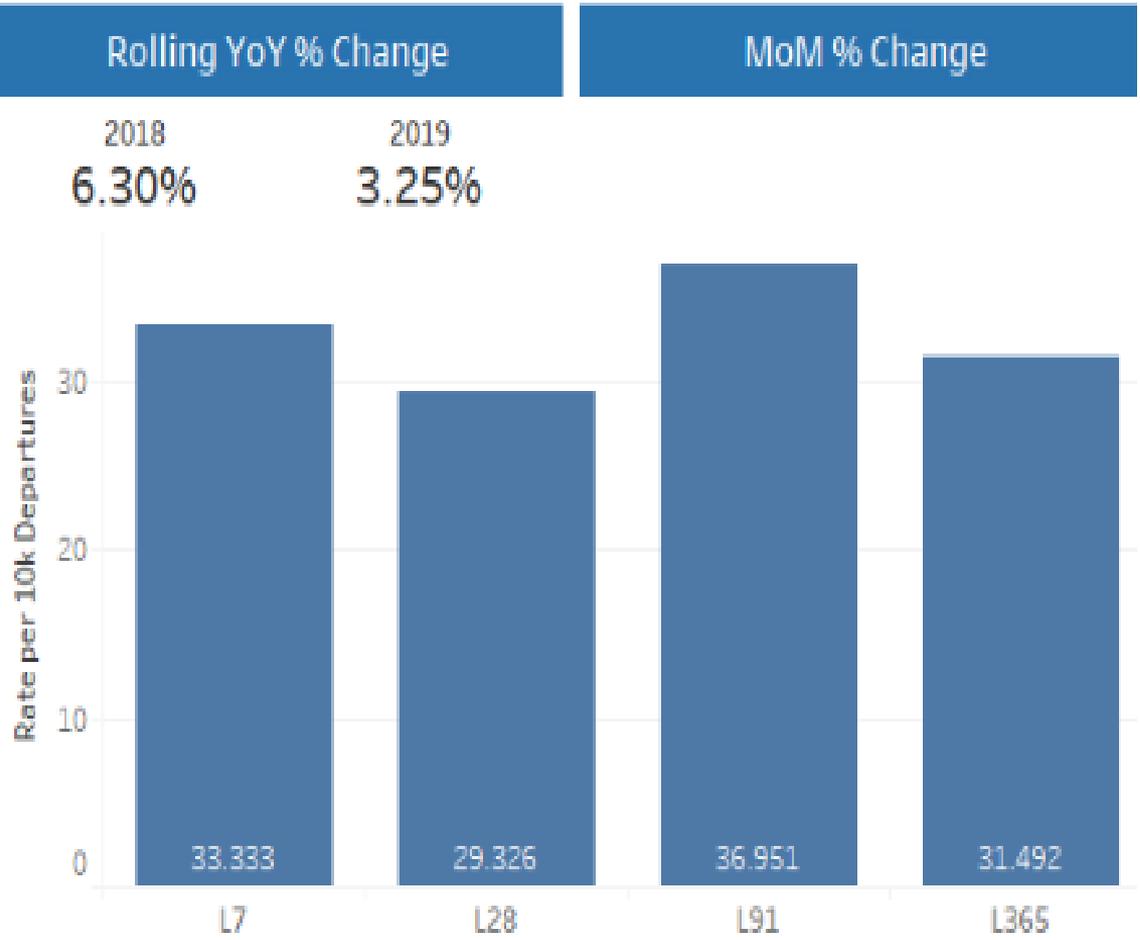
Size of ball is *Count* of total strikes for rolling 2 year period for each of our airports.

Color of ball is *Rate* (per 10k departures) of strikes for rolling 2 year period for each of our airports.

We can glance at the size and color of the ball for each airport and quickly see what that airport’s status is.

If we hover over a given ball, it provides specific detail including: *Airport*, *Total count* for 2 year rolling period, *Total rate* for 2 year rolling *period*, and a 2 year graph of strikes by month - similar to “Reporting Rate by Source” graph.

Rate by Time Period – What this chart tells us:



Our *rate* of strikes (as pulled from Maintenance Records) for last *week, month, quarter, and year.*

Rolling Year over Year and Month over Month changes (in progress).

Considerations:

Species type:

Hard to quantify within the Dashboard. We rely on the National Wildlife Strike Database for this, but as mentioned, our dashboard shows that less than 1/3rd of our total strikes are getting *to* the Database. If we knew species type for a higher number of our strikes, it would help airport wildlife teams focus their efforts.

Disparity between reporting systems:

Note the big differences between our pilot reports, maintenance inspections performed, and national strike database reports. One of our goals is to have those 3 lines align more closely.

Considerations(cont.):

Phase of Flight:

Our *phase of flight* capture rate is not good, mainly because our voluntary pilot irregularity reporting rate is not good.

While the work on the ground is the best place to capture the ever important snarge and damage findings, the additional pilot reports are *critical* to collecting phase of flight. When the phase of flight is unknown, it can leave a question to the airports on both ends.

Not knowing phase of flight also makes it more challenging for the airport where the strike is reported to have good information to help focus their mitigation efforts.

Considerations (cont.):

Margin for error:

Our dashboard uses the safety analytics systems that we have in place. This gets us the most accurate information possible, but there is still margin for error.

For example, it can't accurately determine whether our strike counts/rates are inflated at crew/maintenance bases. With more total walk-arounds (by pilots and technicians) being performed, it can drive the counts up at these stations, especially with the pre/post flight and maintenance findings.

We feel it would be safe to assume as much as a 10% strike count/rate inflation at our AAG crew/maintenance bases.

Examples would be **SEA/PDX/LAX/SFO/ANC**.

Other Airline Strike Rates:

We are confident that our data is fairly accurate for Alaska Air Group, but we felt it was important to compare it to other airlines that fly to the same places that we do.

We reached out to the largest airline in the world to help validate our findings.

They were gracious enough perform a similar study using the same methods as us – based on their maintenance records. They provided us graphs and counts for their strikes for a one year time frame up to May 2019.

Other Airline Strike Rates (cont.):

We compared their findings to ours - including specific shared stations by rate - and found that their strike rates were *very* similar to ours.

We also compared their FAA Strike Database reports to their total strikes and found their reporting percentages to be quite similar to ours.

Note: The 3rd largest airline in the US is also working on a similar study.



Next Steps:

We then asked ourselves “Where do we go from here”?

Next Steps – Aircraft Technician Reporting:

One thing in common with every strike is that it requires an Aircraft Maintenance Manual Chapter 5 Inspection.

We would like to change the aircraft manuals to require technicians to contact local Airport Ops or Wildlife Teams when performing a strike inspection.

Another option might be to require that aircraft maintenance technicians file the FAA strike form, but typically airport teams prefer to collect samples and submit the strike form themselves.

Could this have the potential to overwhelm Airport, FAA, or Smithsonian support teams?

Next Steps – Pilot Reporting:

Should internal pilot irregularity reports be mandatory? These are typically voluntary. This would be a great way to capture phase of flight information.

Should internal pilot irregularity reports link directly to the FAA Wildlife Strike Database? One airline has a link to the FAA database for all pilot *voluntary* reports.

Another way to capture this would be through the “Event Marker”. This would work well when the pilots recognize the strike in flight.

If pilot reporting to the database was mandatory, how would it affect the FAA Database? This too could have the potential to overwhelm FAA, Airport or Smithsonian support teams.

Next Steps – Work with Airport Teams:

The Alaska Safety Team performs wildlife visits to our airports – both proactively and reactively. Airports with high “counts” are a priority, followed by airports with high “rates”.

The visits typically include completing a worksheet, meeting with airport wildlife teams, and performing “ride-alongs” to get a true flavor of the challenges that each airport is facing.

We provide the airports with our Dashboard information as well as offer our support.

This also gives us an opportunity to appreciate all the good things that are happening to mitigate and manage wildlife on a regular basis. We can't be thankful enough!

Next Steps – Other ideas:

The Alaska Safety Team also discusses Wildlife Mitigation at other venues to help promote engagement and collaboration. Some venues of note include:

- Individual Airport or Region Wildlife Task Force Meetings**
- FAA Info-Share Conferences**
- Airlines for America and RAA Meetings/Conferences**
- Aircraft Manufacturer Safety Meetings**
- ISASI (International Society of Air Safety Investigators)**

Another idea would be more “Global” discussions – IE equivalent agencies to FAA, etc.

Does anyone have any ideas?

Closing:

We now realize that there are gaps in strike reporting, and that we *can* help move the needle on reporting.

We also recognize that any given airport can only “own” strikes that they can verify happened at or near their airport. This is understandable.

But at the end of the day - regardless of the airport - we are still recording greater than 1000 wildlife strikes per year on Alaska Air Group aircraft.

Our goal is to lower the number of total wildlife strikes to decrease our risk and improve aviation safety.

Closing:

Hopefully this helps give you a better understanding of an airline perspective on wildlife strikes.

Any thoughts or questions?

Thanks so much for your time and for your interest in Aviation Safety!!

