AN AIRPORT PERSPECTIVE ON AIRLINE-WILDLIFE STRIKE REPORTING

SEATTLE-TACOMA INTERNATIONAL AIRPORT

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Two-Part Presentation

A. Strike Kit Program at the Seattle-Tacoma International Airport (SEA)
   Patrick Viehoever, USDA-WS SEA

B. A Comparison of 2018 Alaska Air Group (AAG) Strike Data with SEA's database

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A. An Evaluation of SEA Wildlife Strike Kit Program

- In 2011 we began distributing strike kits to each airline maintenance office
- Quarterly visits ensured facetime and that they had 10 or more kits

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Goals Were Simple

1. Improve airport's baseline strike rate by creating consistency in the "ask"
2. Improve species identification rate by collecting more snarge
3. Improve reporting rates for all airlines

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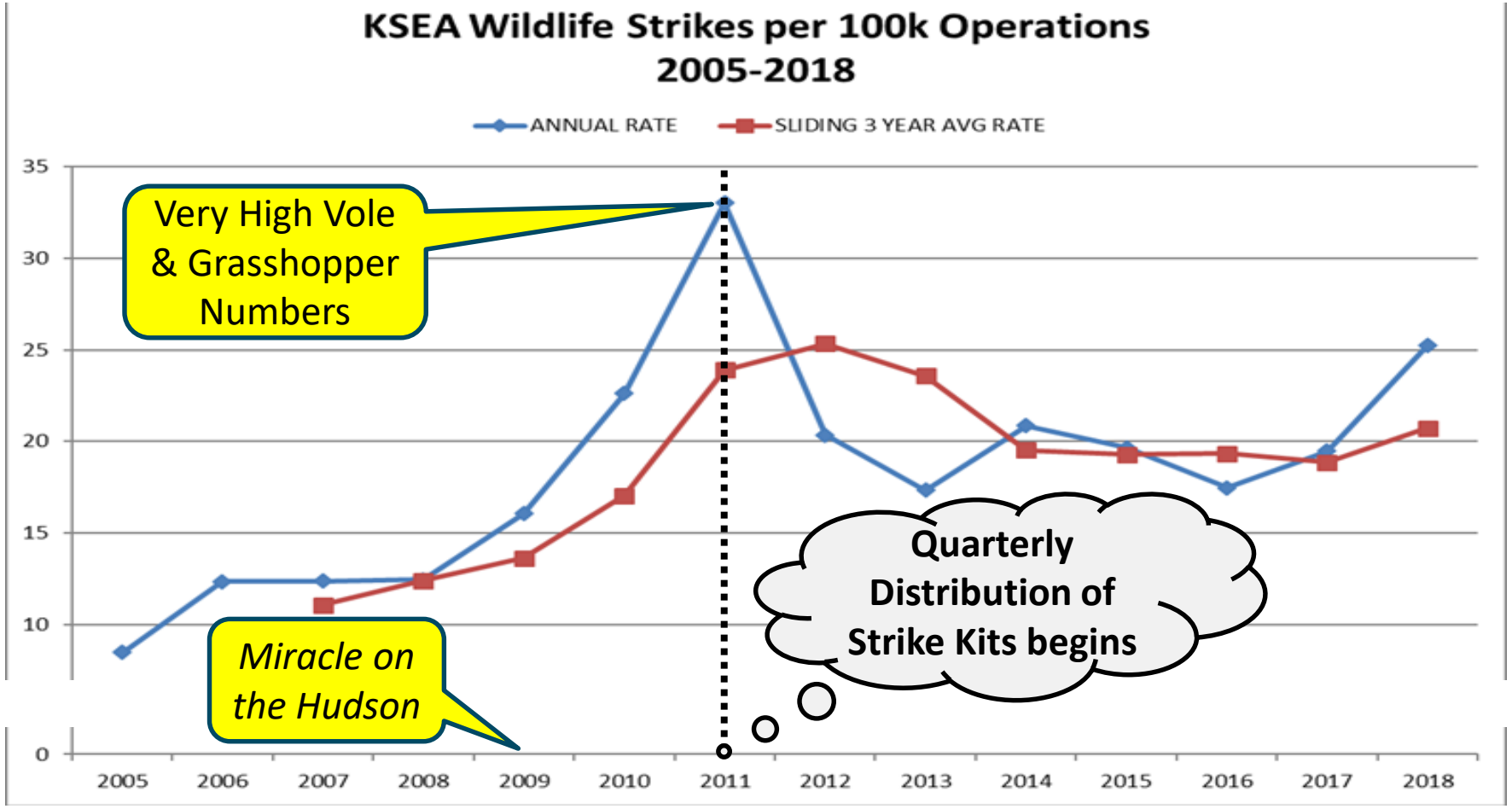
Goal 1 – Baseline Strike Rate Improved *



* = No AAG Dashboard data was used

Goal 2 – Species ID Rate Improved Significantly

* = Thanks Bird ID Lab, Smithsonian Institution

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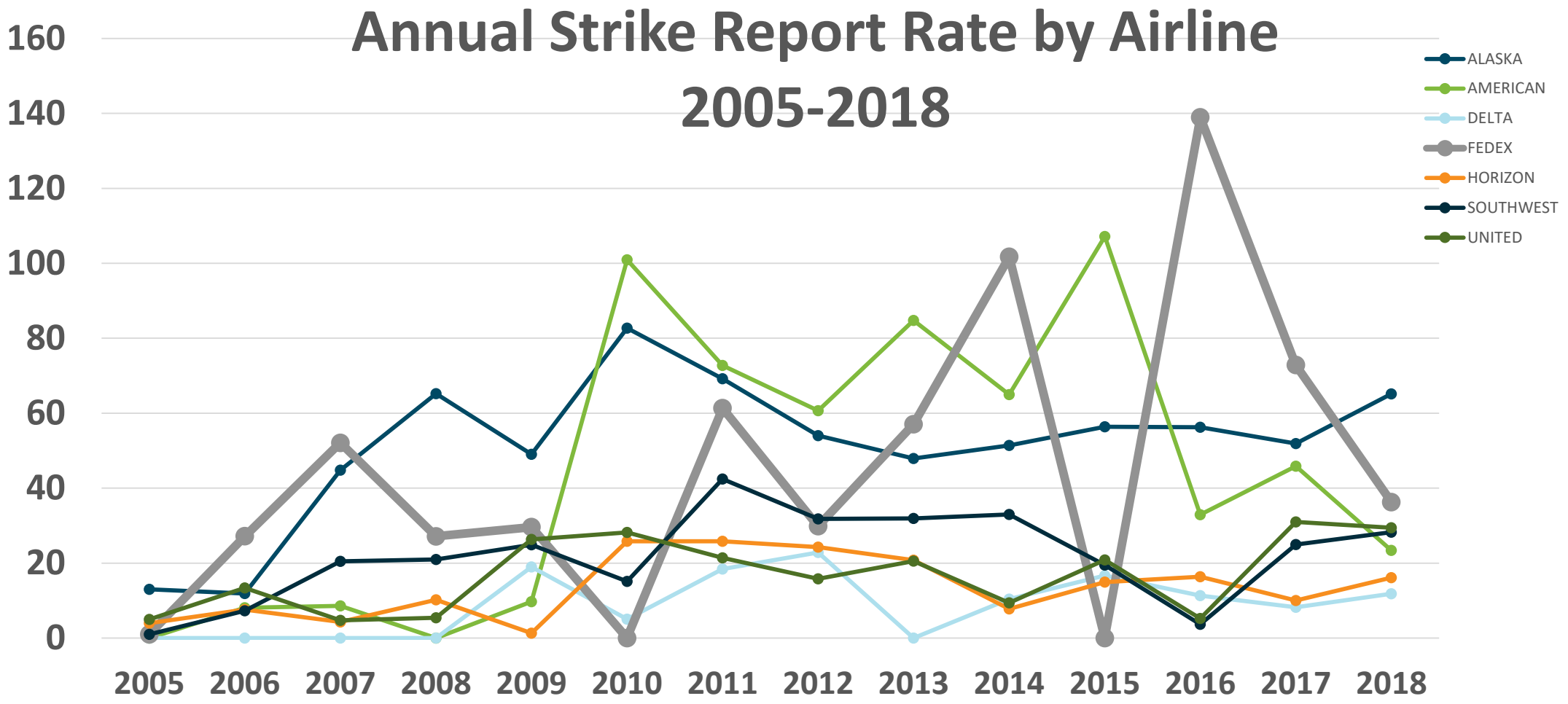
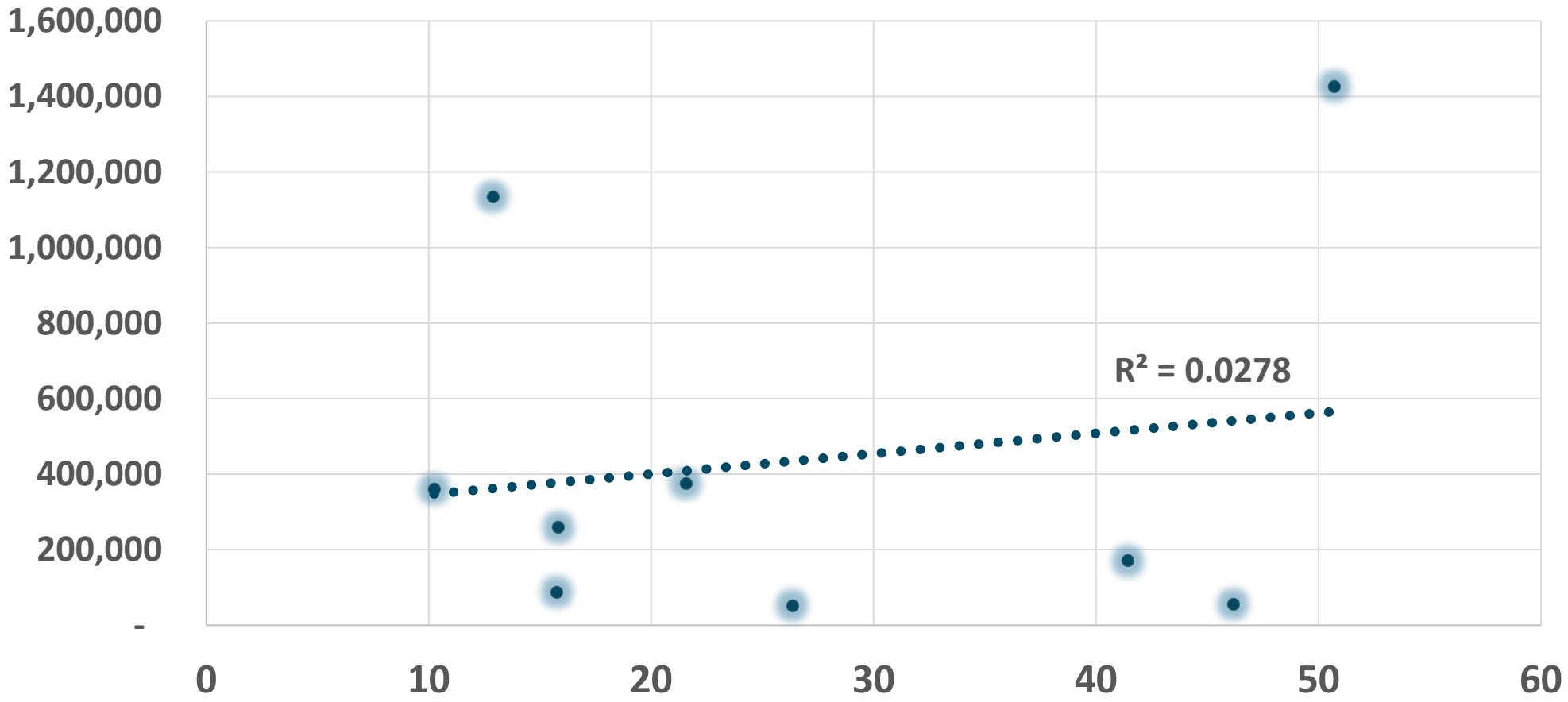
Goal 3 – Reporting Significantly Improved

Year to Year Variation Can Be High



Airline Reporting Rate vs Airline Size @ SEA



Benefits of Providing Strike Reporting Kits

- **Pros**
  - Overall increase in:
    - Baseline rate became more consistent
    - More snarge collected & species ID’d
    - Significant improvement in reporting
    - Hard to quantify but data quality improved
    - Kits are inexpensive $1 each

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Strike Reporting Kits Can't Fix Everything

- **Cons**
  - Individual airline reporting rates remained dissimilar
    - Between years and even within an air group
  - Airline "size" no influence on reporting rate
  - Kits alone get lost in drawers or repurposed
    - Receive less than 20% back
    - 2018 Port recently provided kit "holders"
      - More improvement still

Changing Out Hazardous Species Fact Sheets Each Quarter

Have you seen me?

I can cause serious damage!

Common name
Bald Eagle

Scientific name
Haliaeetus leucocephalus

Length	38 inches
Wingspan	80 inches
Weight	14 pounds

Protected under both the international *Migratory Bird Treaty Act* (1916) and US Bald and Gold Eagle Protection Act (1940), this species population is increasing in Washington and the Pacific NW.

The nose, antenna and perhaps the bulkhead of this Bombardier Q400 was damaged when it struck a Bald Eagle.

$$E = \tfrac{1}{2} m v^2$$

A 400 mph (v) aircraft hitting a 14 lb. (m) bird creates a 39 ton strike impact force (E).

Think about it!
That's the energy required to lift a soccer ball weighing

78,000 lbs.

Have you seen me?

I can cause serious damage!

Common name
Glaucous-winged Gull

Scientific name
Larus glaucescens

Length	25 inches
Wingspan	52 inches
Weight	2.5 pounds

Protected under the international *Migratory Bird Treaty Act* of 1916, some species of gulls are scavengers and are attracted to garbage.

A Glaucous-winged Gull was struck by this Robinson R44 helicopter, causing substantial damage to the aircraft's windshield and instrument panel.

$$E = \tfrac{1}{2} m v^2$$

A 400 mph (v) aircraft hitting a 2.5 lb. (m) bird creates a 7 ton strike impact force (E).

Think about it!
That's the energy required to lift a soccer ball weighing

14,000 lbs.

B. An Evaluation of “Version 1.0” AAG Dashboard Data

Using 2018 Data Only

Virgin Air Was New to AAG & Not Included

Alaska Air Group Contacted Port of Seattle

- October 2018 - AAG contacted SEA noticing a pronounced increase in wildlife strikes
  - AAG recorded 69 strikes in September whereas SEA recorded 13 strikes
- The end of 2018 we dug deeper
  - **AAG's rate for SEA ~25 strikes/10,000 ops (47% of all SEA ops)**
  - **SEA's baseline rate for ALL airlines = ~2.5 strikes/10,000 ops**
- I had many questions regarding AAG's Dashboard; Reviewed 2018 data

AAG = 367 strikes @ SEA (~5 times more strikes) vs SEA's 80 strikes for AAG

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How Could AAG & SEA Numbers Be So Different?

- First question: How is a strike assigned to an airport?
  - The arrival airport gets it, unless strike location is known
    - Seems reasonable - National Wildlife Strike Database found more strikes (64%) occur during the approach/landing phases of flight rather than other flight phases
    - Consistent with how AAG maintenance (MX) logs record other kinds of incidents

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Double Counting?

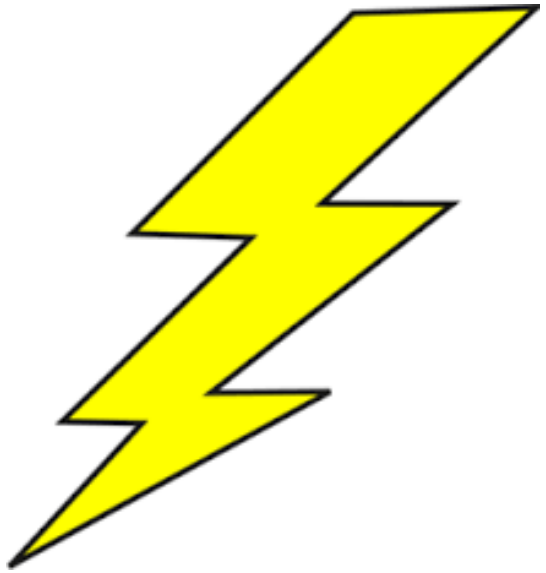
- Could a bird strike inspected today be counted again by MX at another airport later?
  - No, the impact area on an aircraft is wiped clean when looking for damage per aircraft maintenance procedures.

Other Answers to Questions

- Yes, a primary hub like SEA, could have more strikes discovered there because typically more time is spent there servicing aircraft.

Other Answers to Questions

- Yes, the dashboard is designed to catch/omit maintenance records with the words like “lightning”, “striker”, ...



Still the AAG Strike Rate for SEA Seemed Too High

- AAG & Port - Recently learned one reason why:
  - Airlines and airports count an “aircraft operation” differently:
    - Airlines: 1 Flight = 1 Operation
    - Airports: 1 Take-off + 1 Landing = 2 Operations

Take away – Can’t assume aircraft operations are counted the same way

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Results & Discussion

Sharing data had a positive effect on the quality and number of strikes for both cooperators

Comparison of All SEA 2018 Strike Data From AGG

- AAG initially assigned 367 strikes to SEA
  - 50 (13.6%) were found to have occurred elsewhere based on maintenance log comments
  - Some were duplicates - an aircraft that strikes multiple birds has multiple records in the maintenance logs

- A total of 317 AAG strikes remained for further evaluation.

Diving Deeper

- Of the 317 AAG strikes initially assigned to SEA, 56 (18%) had location data making them likely to have occurred within 5-miles and 2,500’ AGL of SEA (“approach”, landing gear or flaps impacted, etc.).
  - 2 of those were damaging and were previously unknown
- Of the 56 probable strikes, 16 (5%) definitely occurred at SEA because location information was excellent.
- There was no information to help with species ID from the records

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AAG's Impact to Port's 2018 baseline

YEAR	OPERATIONS*	ALL REPORTED UNK & SEA STRIKES	KSEA STRIKES	KSEA STRIKE RATE/100K	DAMAGING/ ADVERSE EFFECT
2018	432,190	206	109	25	2
2018 w AAG	432,190	523 (317)	165 (56)	38	4 (2)
* = One take off and one landing equals 2 movements					

- Results above are with 18% of AAG strikes w/ geographic location
- If all had location: 317 x 64% (approach/landing%) = ~170
- Extrapolated airport wide (AAG is 47%) ~ 360 strikes annually

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Strikes Undocumented in the AAG Database

- Port also had 8 new AAG strikes that were detected by the Port's center-runway FOD detection system

Summary of AAG Database Findings

- Dashboard is a great start for quickly obtaining strike data
- Gave SEA a better understanding of an expected strike rate
- Index – Dashboard appears to be sensitive to changes in strike rate
- We now have a huge opportunity and challenge collecting snarge samples

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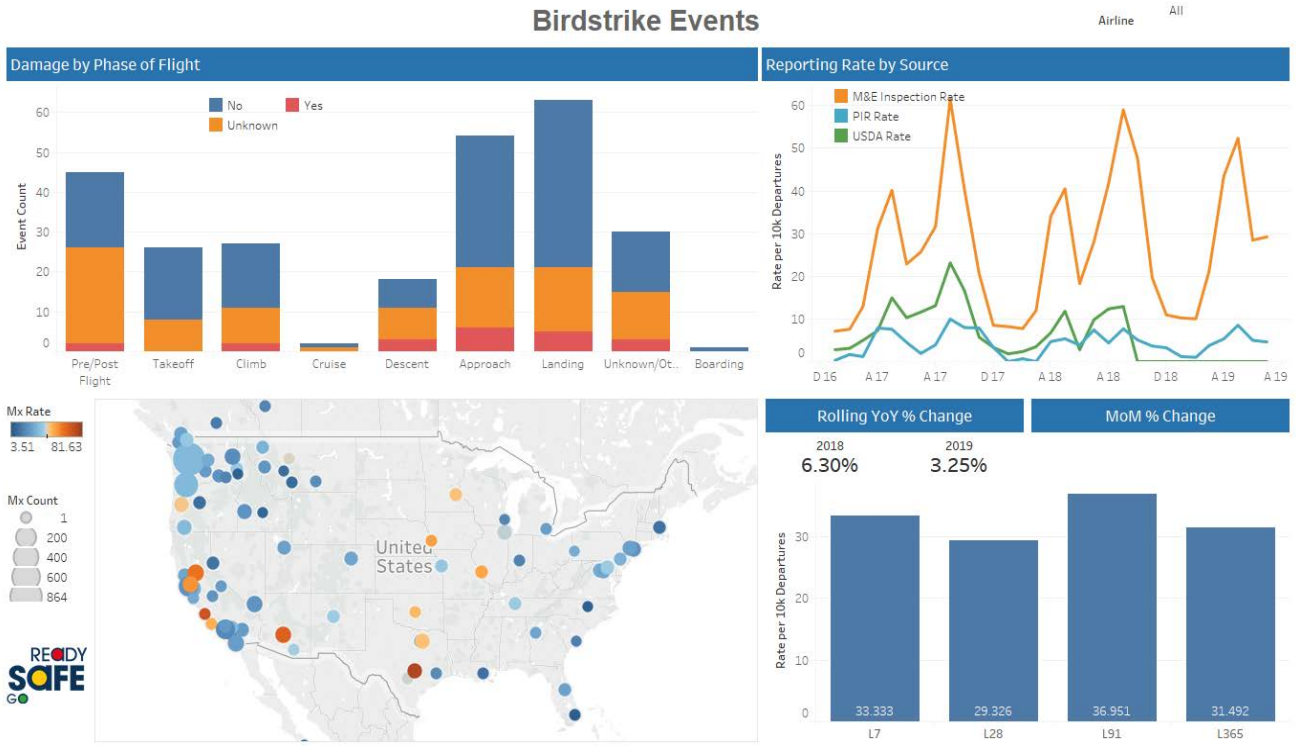
Thank You Alaska Air Group - A Turning Point

- Access to airline maintenance (MX) data has:
  - Already helped increase resources for SEA



Questions

AAG Dashboard Very Timely

AC 150/5200-32B Reporting Wildlife Aircraft Strikes

- Bird Strike Committee USA voluntarily reviewing the AC
  - Comments thus far to data consistency & quality:
    - Agreement between paper and electronic forms
    - Additional Fields: “Departure” & “Arrival” Airport
      - Provide a better understanding of strike rates by airport-to-airport route
    - Expanded definitions on what's considered a strike re:
      - Age and condition of a remains
      - Criteria for assigning a strike to an airport
        - » Advisory Circular 150/5200-33C suggests strikes < 10,000’ from airport
    - Move away from “bins” to record the number of animals seen/struck

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AC 32B Review

- What Data is Really Needed?
  - Location
  - Adverse Effect
  - Snarge
- Better Location Information is Needed
  - Departure and Arrival Airport (Flight Number is Already There)
  - Distance from Airport
  - Altitude
  - Event Marker

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