Integration of Bird Banding Laboratory and National Wildlife Strike Databases to enhance data quality and aviation safety

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Bird Strike Committee-USA, 21-23 Aug 2018, Baltimore

Acknowledgements

U.S. Federal Aviation Administration

U.S. Department of Agriculture, Wildlife Services

U.S. Geological Survey, Bird Banding Laboratory

Findings and recommendations do not necessarily represent the position of the Federal Aviation Administration

USGS Bird Banding Laboratory Database (BBLD):

- Established in 1920.
- Collection, management and dissemination of information from banded birds in North America.
- About 100,000 band encounter reports /year.

FAA National Wildlife Strike Database (NWSD):

- Established in 1990.
- Collection, management and dissemination of information from civil aircraft strikes with birds/other wildlife in USA.
- Over 13,000 bird strikes reported/year (200,000 total).

FAA Form 5200-7 (Reporting a bird/other wildlife strike)

17. Bird/Other Wildlife Species

18. Number Seen and/or Struck

Number	Seen	Struck
1	☐	☐
2 - 10	☐	☐
11 - 100	☐	☐
more than 100	☐	☐

19. Size of Bird(s)

- ☐ Small
- ☐ Medium
- ☐ Large

20. Pilot Warned of Birds/Wildlife? ☐ Yes ☐ No

21. Remarks (Describe damage, injuries, and other pertinent information such as bird band numbers, fuel jettisons)

Developing the Bird Band Strike Database (BBSD)

NWSD: Search Remarks field (200,000 records) for band #s.

BBSD:

Enter from NWSD: Index #, band #, species, strike date, airport.

Send band #s to BBL to obtain:

- ***Date, species, and age at banding,**
- ***Banding status (released at capture site or relocated),**
- ***Lat/Long of capture (and release site if relocation),**
- ***Date and Lat/Long (airport) of band encounter.**

BBLD:

***Obtain "Band encounter" records for birds struck by aircraft.**

***Cross check with NWSD; add new strikes into NWSD & BBSD.**

Voilà!!

Bird Band Strike Database (BBSD)

ID	Index_Nr	USGS_Band_	Band_Date	Band_Age	Band_Stat	Band_Lat	Band_Lon	Banded_Species	B_Band_Status	B_
1	125342	78822027	6/26/1995	4	WI	44.58333	-89.91667	OSPREY	3	
2	226856	90842064	6/23/1998	1	NJ	39.41667	-74.58333	CANADA GOOSE	3	
3	311877	233120340	7/5/2008	4	NJ	39.45833	-74.49167	PURPLE MARTIN	3	
4	311849	241142824	7/5/2009	4	NJ	39.14167	-74.85833	PURPLE MARTIN	3	
5	115820	60881110	5/19/1989	1	MA	41.58333	-71.08333	OSPREY	3	
6	313747	112614049	5/24/2011	4	OH	41.58333	-81.75	PEREGRINE FALCON	3	
7	261799	162333156	6/25/2007	2	OH	41.742366	-80.854989	AMERICAN KESTREL	2	
8	307794	168700510	5/19/2010	4	PA	41.35833	-75.79167	PEREGRINE FALCON	3	
9	326943	113828109	6/21/2011	1	PA	40.08333	-77.08333	CANADA GOOSE	3	
10	325584	190702851	5/22/2012	4	IN	41.67194	-87.44806	PEREGRINE FALCON	3	
11	109825	80743247	9/28/1992	2	WI	43.58333	-87.75	RED-TAILED HAWK	3	
12	316620	112614418	6/14/2011	4	WI	43.03833	-87.90278	PEREGRINE FALCON	3	
13	320516	117748823	4/12/2010	5	IL	39.70833	-89.725	RED-TAILED HAWK	2	
14	319785	168721324	5/21/2009	4	MN	44.44167	-92.27194	PEREGRINE FALCON	3	
15	231788	180788999	11/16/2004	1	IL	41.58333	-88.75	RED-TAILED HAWK	2	
16	319846	185709773	5/18/2009	6	IL	41.975	-89.375	RED-TAILED HAWK	2	
17	304214	190702604	5/26/2010	4	IL	42.08333	-87.75	PEREGRINE FALCON	3	
18	242388	220672363	6/1/2006	4	IL	41.91667	-87.58333	PEREGRINE FALCON	3	
19	263465	98725209	12/11/2008	2	ON	42.58333	-80.41667	ROUGH-LEGGED HAWK	3	
20	237006	98740269	5/21/2006	4	OH	41.58333	-81.75	PEREGRINE FALCON	3	
21	300623	117749310	4/4/2008	1	OH	41.40833	-83.00833	RED-TAILED HAWK	2	
22	301987	117749356	4/5/2010	1	OH	41.375	-82.65833	RED-TAILED HAWK	2	

Record: 14 of 284 | No Filter | Search

More data = Better decisions = Safer skies

When you band birds during relocation programs:

- **Timely report banding data to BBL (within 90 days):**
- **Banding status code = 02 (bird relocated from capture site),**
- **Airport where bird captured (this is in remarks),**
- **Location where released (this is banding location).**

When you find a band on a bird struck at your airport:

- **Enter band numbers/tags in Remarks section of 5200-7 (e.g., USGS band 1427-15630),**
- **Report band numbers to BBL (date, species, location, "how obtained" code = 39).**

The Tragic Life of Jetta

By Ricky Dolbeer

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Chapter 1. Spring 2008.

A Red-tailed hawk is hatched into a good nest in an affluent suburb of Milwaukee.

Like most suburban youngsters, he is surrounded by love and well provisioned.

He is an above-average student who enjoys playing Whac-a-Mole with friends.

Chapter 2. Fall 2008.

When the teenager leaves the supervision of his parents, he starts hanging out with a bad crowd at MKE and huffing Jet A fuel.

His punk friends start calling him Jetta.

He develops an “attitude”.

After repeated, unheeded warnings from the authorities, Jetta is captured and incarcerated on September 15, 2008.

After a stern lecture, the teenager has a tarsal monitor attached and is released on probation at a Wildlife Refuge, 21 miles from MKE.

The authorities believe the clean air, pastoral surroundings, and good role models in this foster home will be therapeutic for Jetta, transitioning him to a productive, virtuous life.

The Tragic Life of Jetta

Chapter 3. Year 2010. Jetta struggles to stay clean but cannot establish a territory in the already overcrowded foster home. He leaves the home and relapses into his old lifestyle.

Jetta gets flipped on his back by a Fed-X truck while snorting diesel fumes along a busy highway on January 31, 2010.

The Tragic Life of Jetta

Medics take the stunned bird to a rehab/detox facility to sober up and undergo PT and counselling for 2 weeks.

Then Jetta has a second tarsal monitor (USGS band) attached and is released into another wildlife park-foster home 10 miles from MKE on February 12, 2010.

The Tragic Life of Jetta

Chapter 4. Year 2011. Jetta stays clean for over a year and things are looking up.

He finds a girlfriend and considers marriage but cannot find a good territory due to his disruptive relocations.

Thus, Jetta suffers a third relapse. He violates his restraining order and starts huffing Jet A at MKE again.

This time his luck runs out.

Jetta is fatally struck by an aircraft on Runway 19R on October 22, 2011 at age 3.5 years.

Epilogue:

- **Jetta was buried in a pauper's grave at MKE alongside the remains of other notable birdstrike victims.**

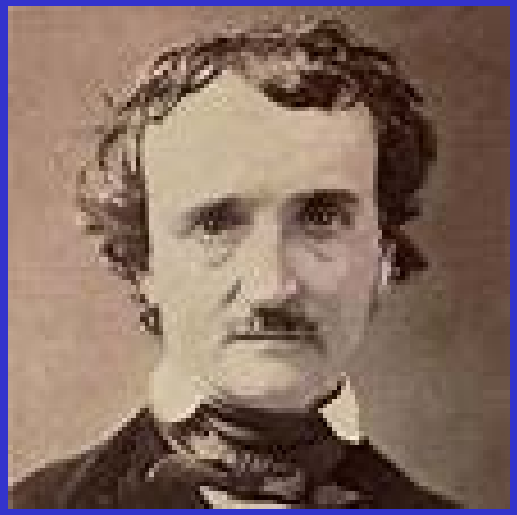
- Jetta's family is suing MKE & others for the repeated exposures to petroleum fumes and disruptive relocations to overcrowded foster homes. The claimants state these actions resulted in Jetta's loss of self esteem and untimely death.

A “Tail” of Two Airports

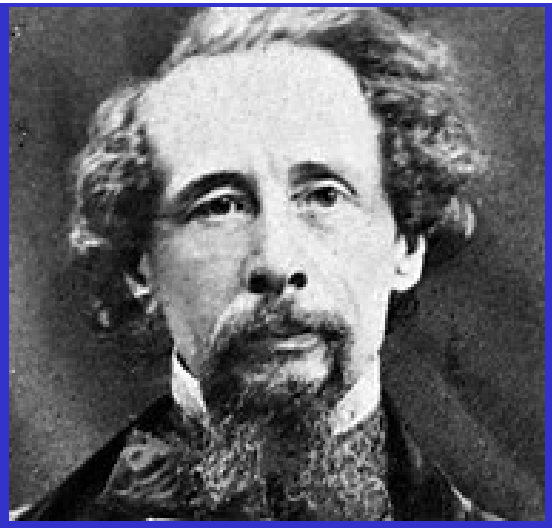
By Ricky Dolbeer, PhD (Piled higher & Deeper)

The eerie story of the long-distance recovery of a banded red-tailed hawk

With a lot of help from:



Edgar Allen Poe, 1809-1849



Charles Dickens, 1812-1870

A “Tail” of Two Airports

Once upon a midnight dreary, as Ricky pondered weak and weary,
Over many a quaint and curious volume of forgotten lore*,

While he nodded, nearly napping, suddenly he heard a tapping,
as if someone gently rapping, rapping at his cranium door!

He rubbed his eyes; the data were irrational,
a banded red-tailed hawk, bestruck at Honolulu International!

“’Tis some aberration,” he muttered, “tapping at my cranium door—only this and nothing more.”

***Bird Banding Laboratory Database**

A “Tail” of Two Airports

Why was this band recovery such “an aberration tapping at Ricky’s cranium door”?

First, red-tailed hawks are not in the Hawaiian Islands!

Furthermore……..
14 Sep 2012. This HY red-tailed hawk was captured and banded at Portland International Airport (PDX); then relocated and released 60 miles away at Ankeny National Wildlife Refuge, Oregon.

09 Apr 2013. The relocated red-tailed hawk had returned to PDX and was observed at airport.

17 Apr 2013 (8 days later). This bird is found 2,700 miles away via the Pacific Ocean on a runway at HNL.

A “Tail” of Two Airports

Could this bird have flown to Honolulu where it was struck?

Quoth the Raven “Nevermore”!

Conclusion: After discussions with PDX and BBL personnel, we concluded that this red-tail was:

- struck at PDX during take-off by one of the daily flights to HNL,
- carried across the Pacific in the landing gear compartment, and
- dislodged as a frozen carcass when the aircraft touched down.

Entries in the NWSD, BBLD, and BBSD were revised accordingly.

A “Tail” of Two Airports

Epilogue: This incident demonstrates:

- **Another example of relocated red-tailed hawks struck at airport.**
- **Diligence needed to minimize the entry of erroneous records.**
- **Means to introduce invasive plant seeds/parasites/diseases.**

Quoth the Raven, “Nevermore”!

A “Tail” of Two Airports

"Not knowing how he lost himself, or how he recovered himself, he may never feel certain of not losing himself again."

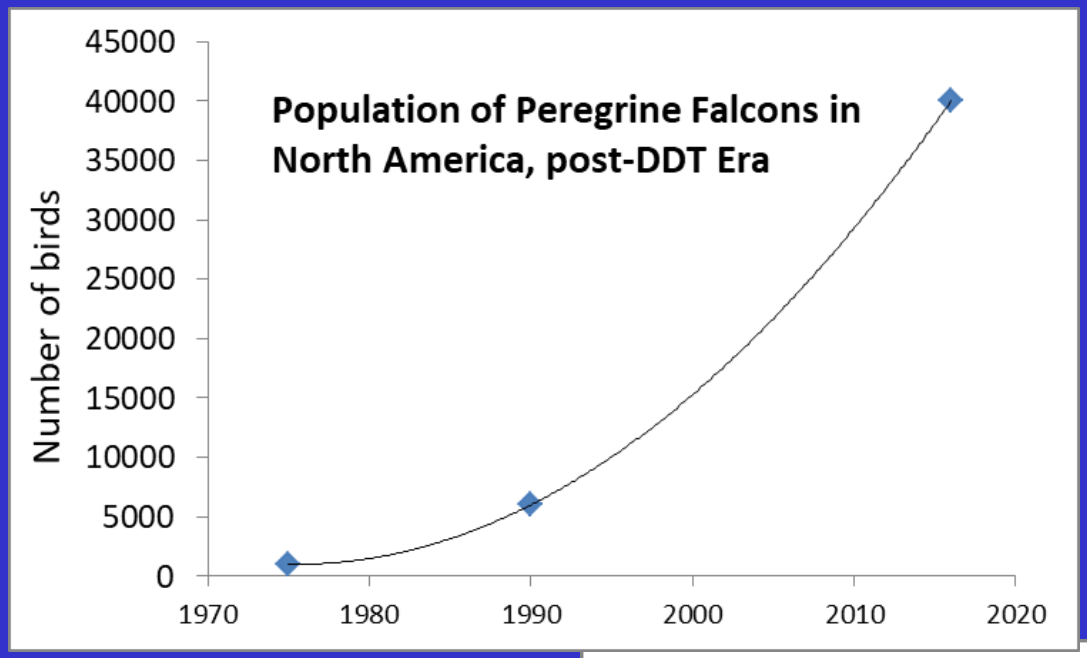
— Charles Dickens, A Tale of Two Cities

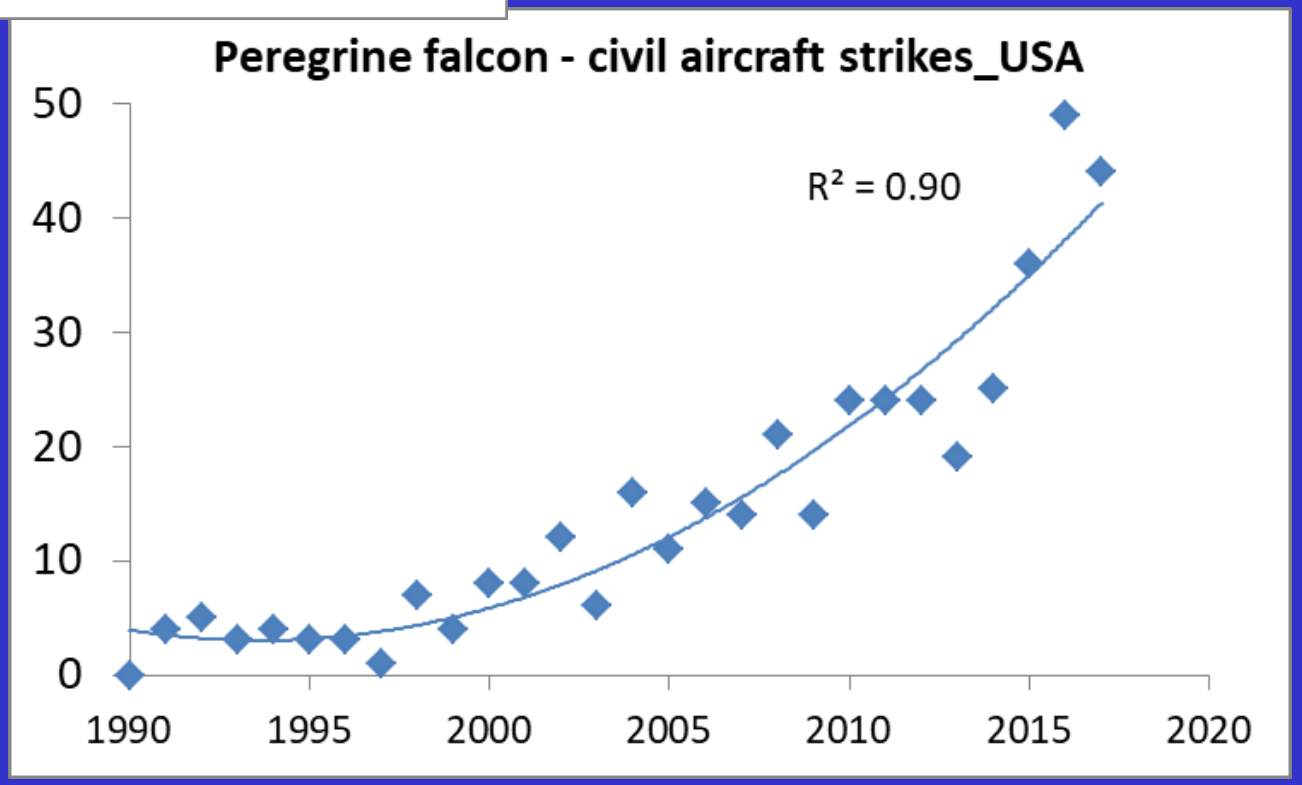
BBSD: Banded birds struck by aircraft in USA, 1990-2018

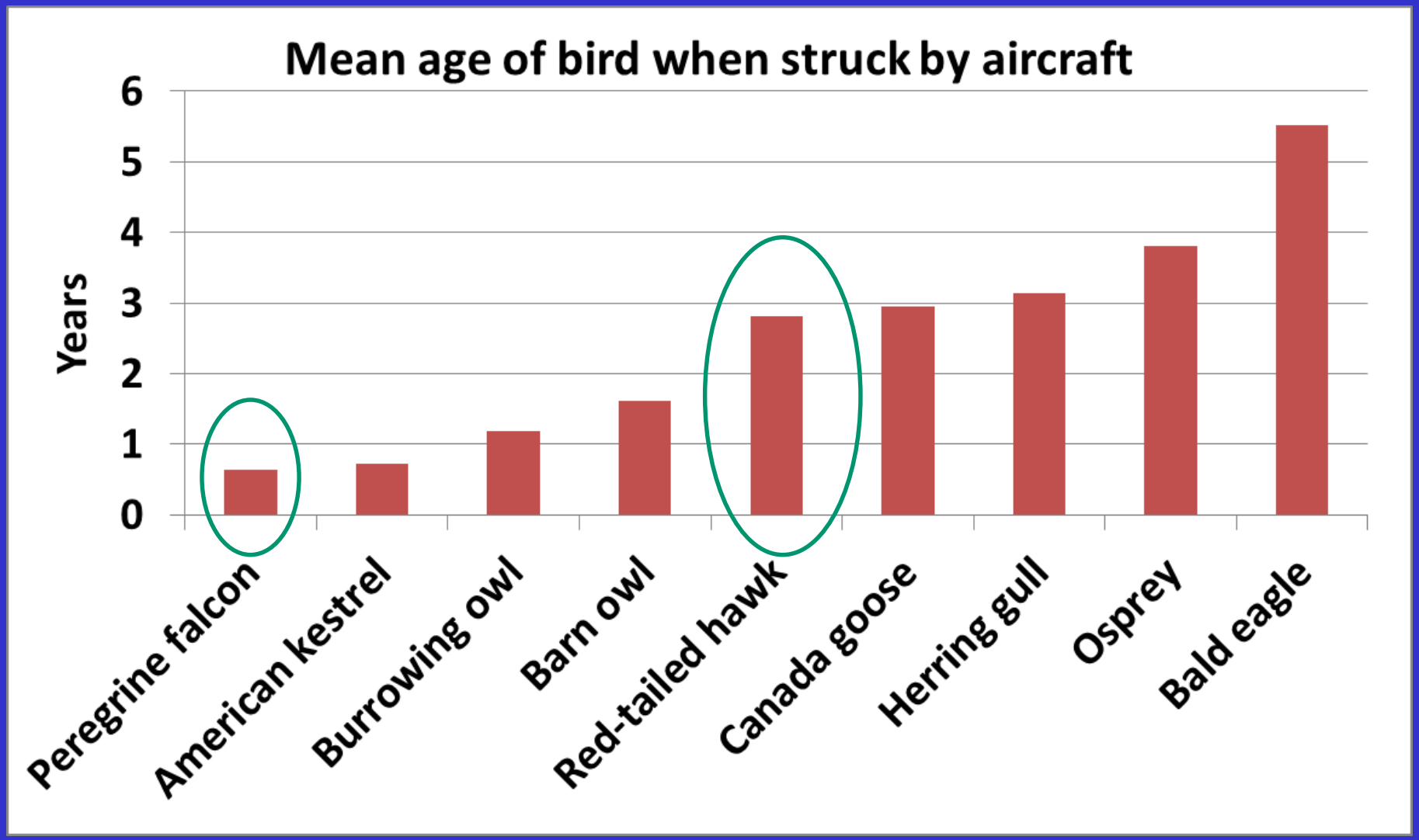
Rank	Species	Relocated from airport	Released at capture site	Total
1	Peregrine falcon	3	128	131
2	Red-tailed hawk	59	22	81
3	American kestrel	22	36	58
4	Canada goose		37	37
5	Barn owl	6	25	31
6	Osprey		21	21
7	Snowy owl	6	5	11
8	Mallard		8	8
9	Burrowing owl		7	7
10	Herring gull		6	6
11	Bald eagle		5	5
12	Swainson's hawk	4	1	5
13-41	29 species	2	47	49
	Grand total	102	348	450

75% <15 miles from airport

Canada geese (N = 37)

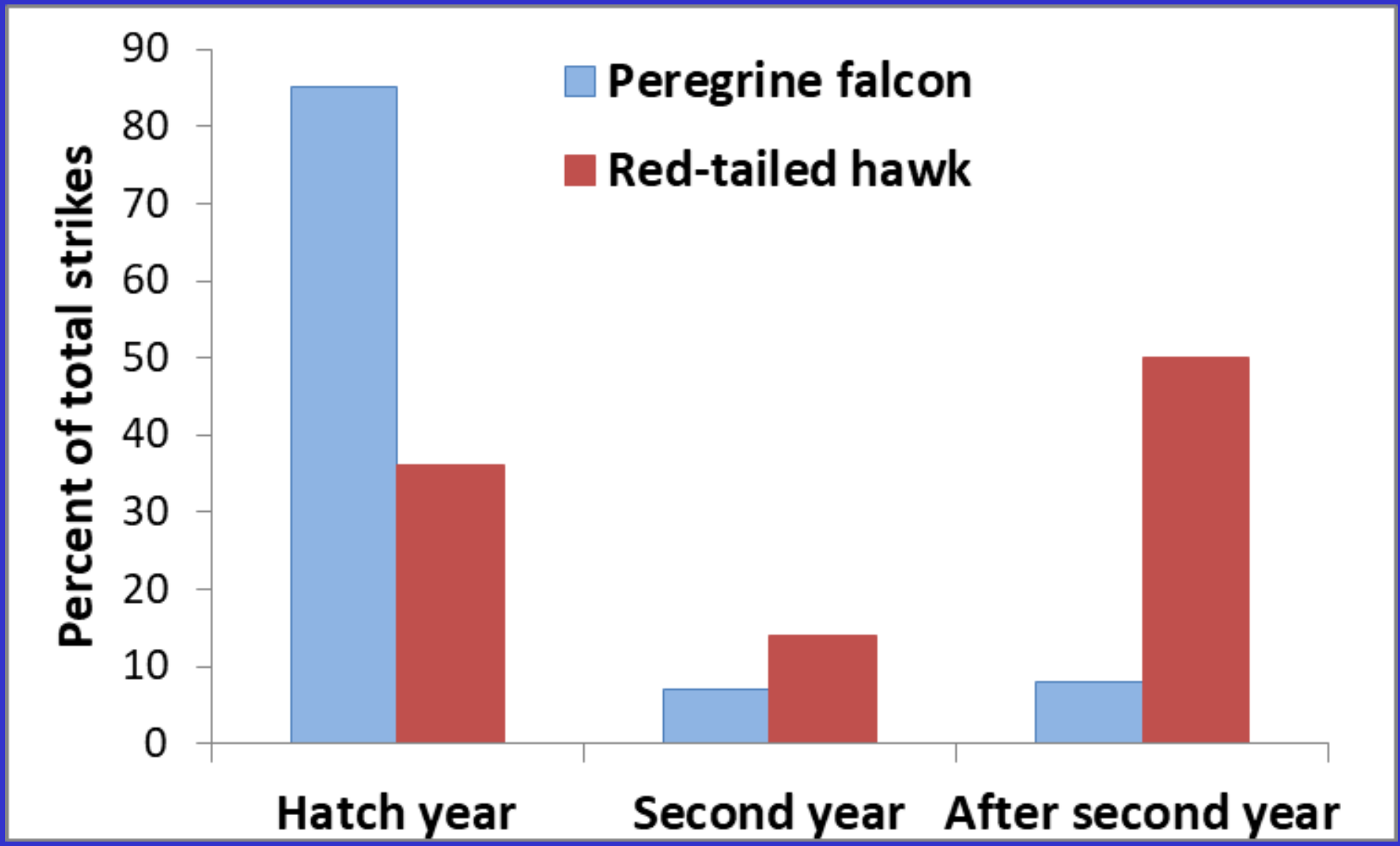

Population of Peregrine Falcons in North America, post-DDT Era
Number of birds
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
1970
1980
1990
2000
2010
2020


Peregrine falcon - civil aircraft strikes_USA
R² = 0.90
50
40
30
20
10
0
1990
1995
2000
2005
2010
2015
2020



Banded in hatching year

Birds banded in hatch year

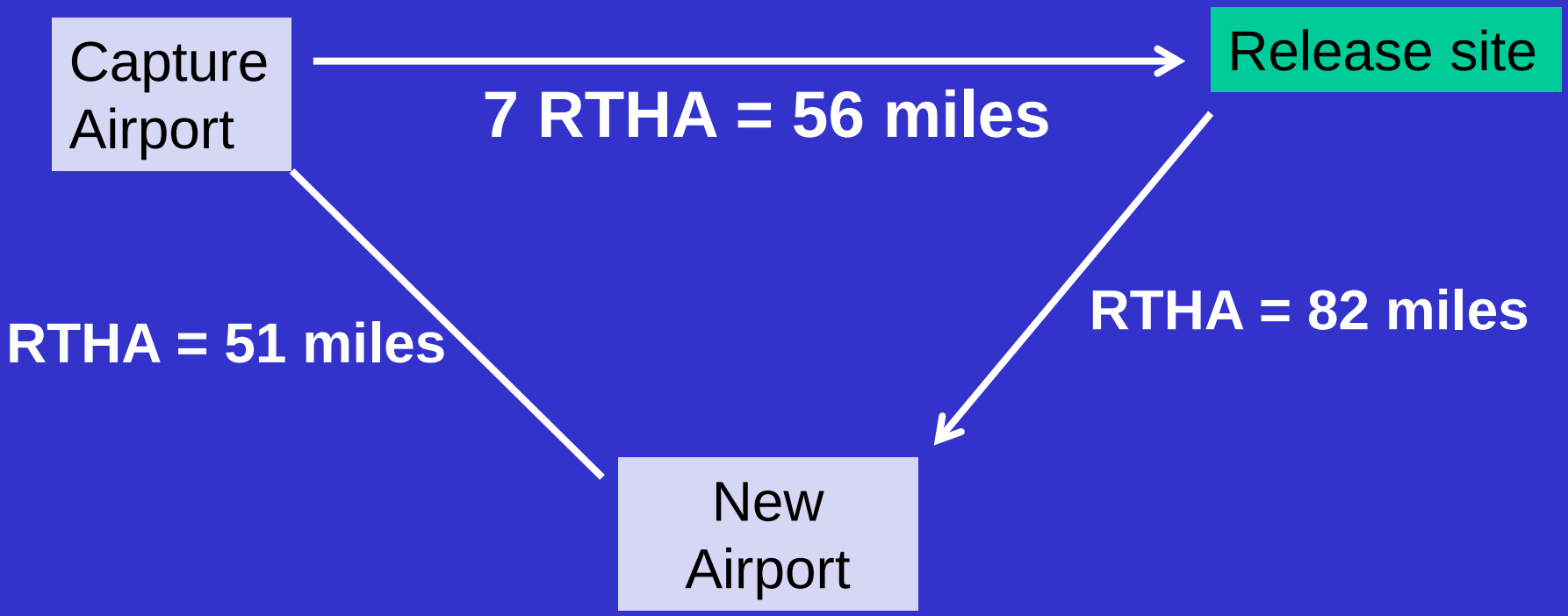


Relocated banded birds struck by aircraft in USA, 1990-2018

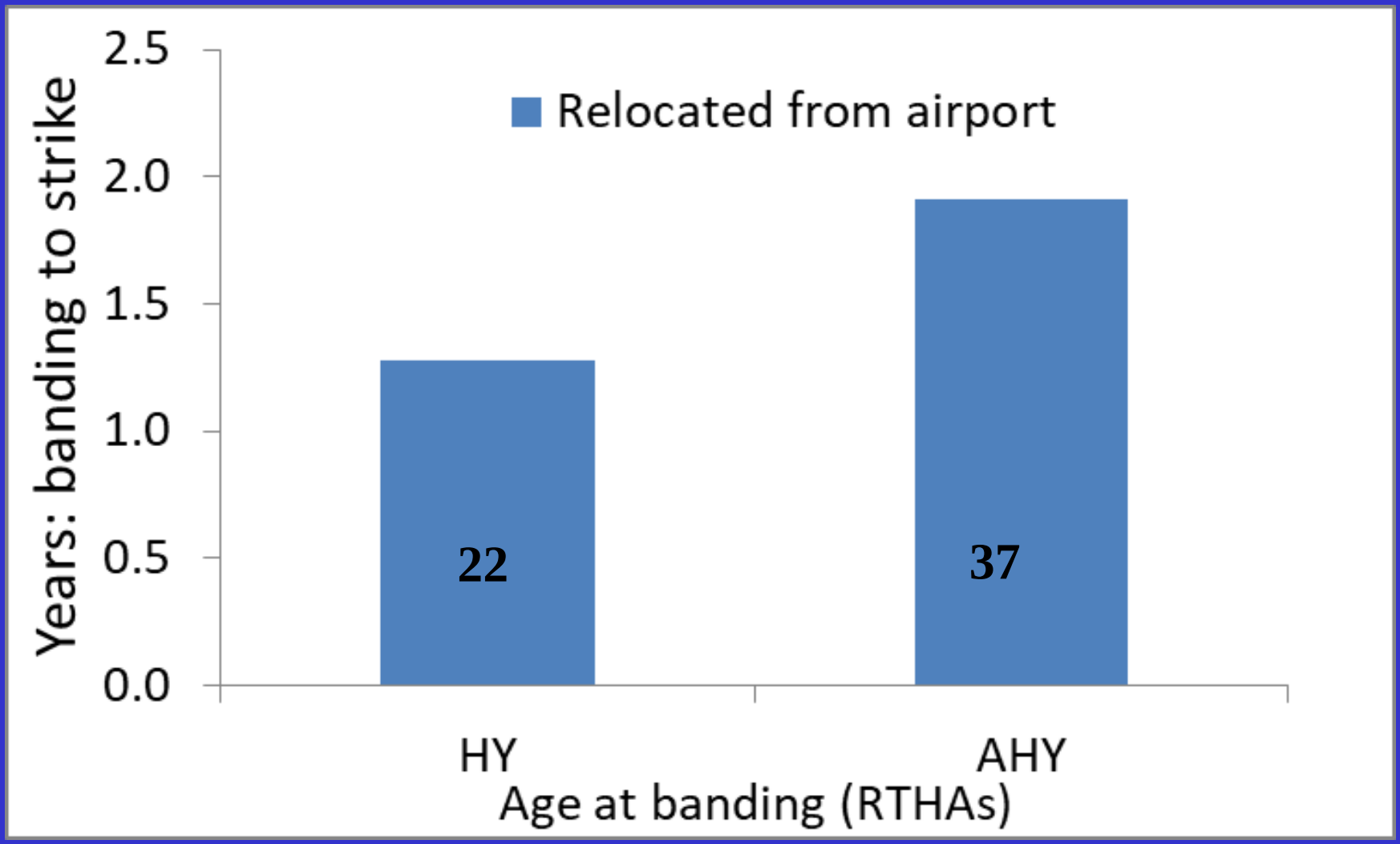
	Relocated from airport and then struck at:		
Species	Same airport	Different airport	Total
Red-tailed hawk	52	7	59
American kestrel	15	7	22
Barn owl	6		6
Snowy owl	2	4	6
Swainson's hawk	4		4
Peregrine falcon	2	1	3
Ferruginous hawk	1		1
Great horned owl		1	1
Total	82	19	101

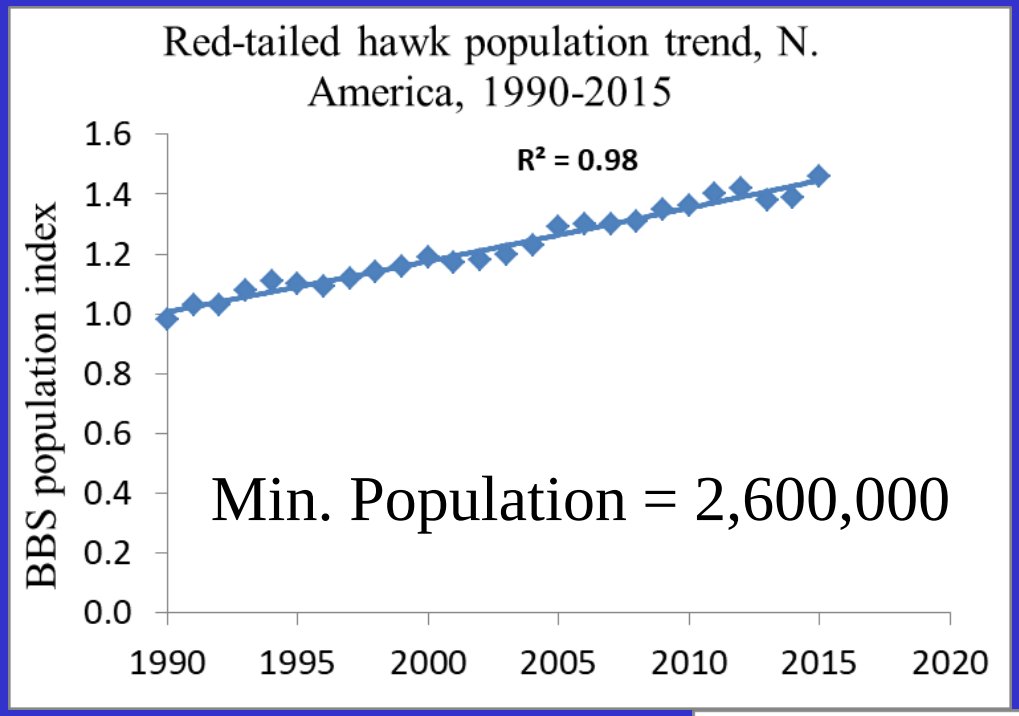
Mean distance for relocated RTHAs struck at capture airport

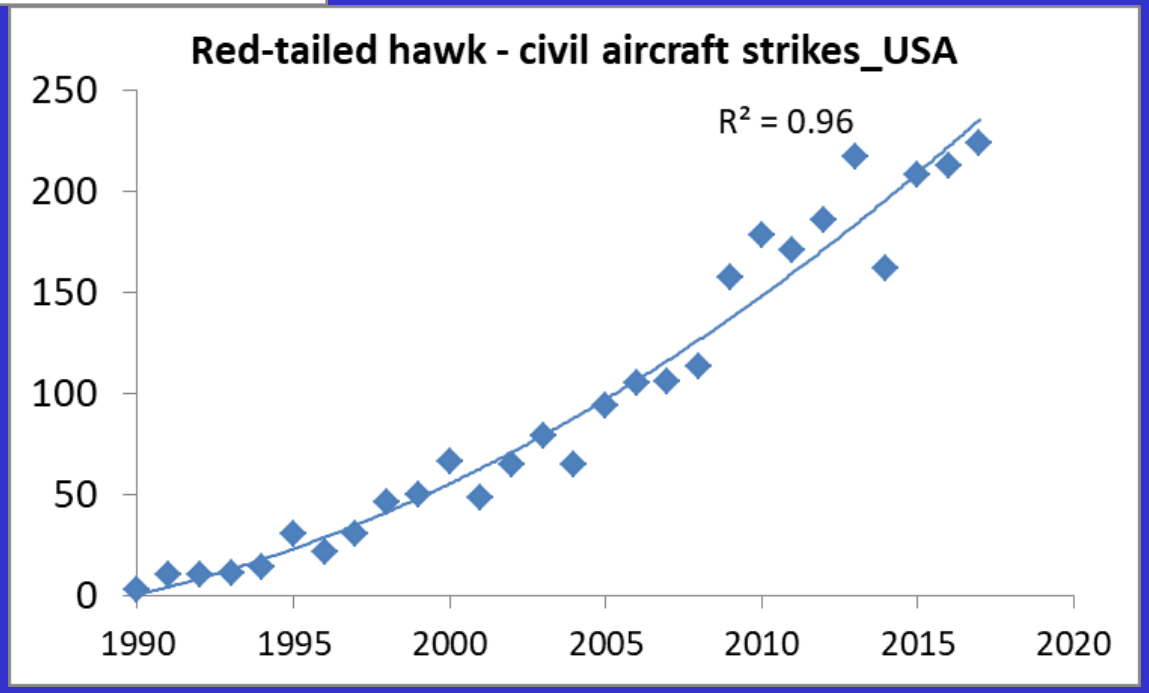
Mean distances for relocated RTHAs struck at new airport

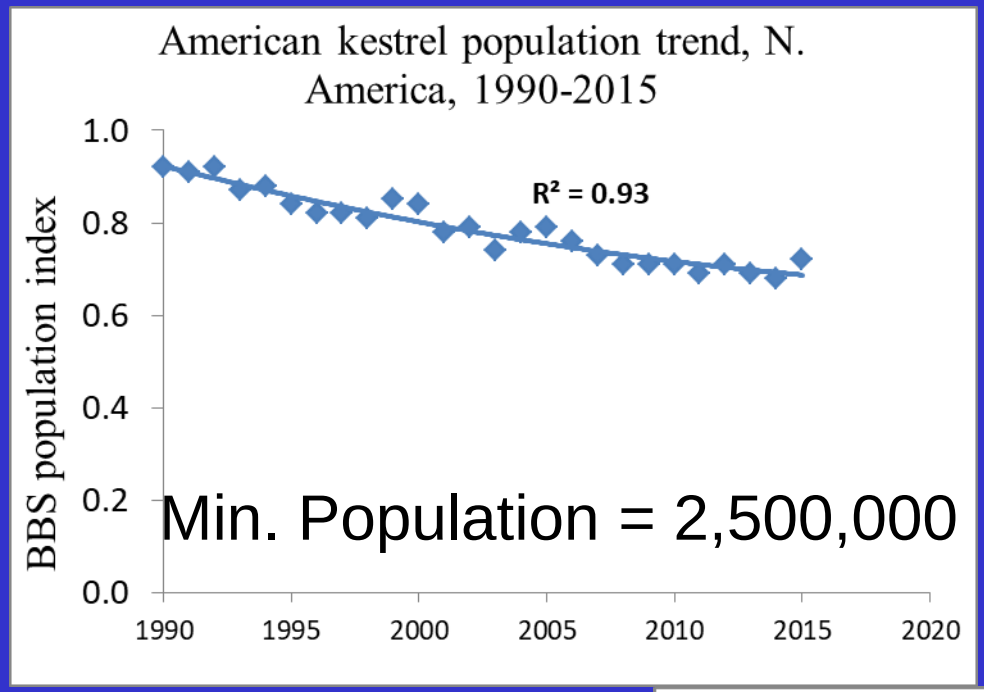


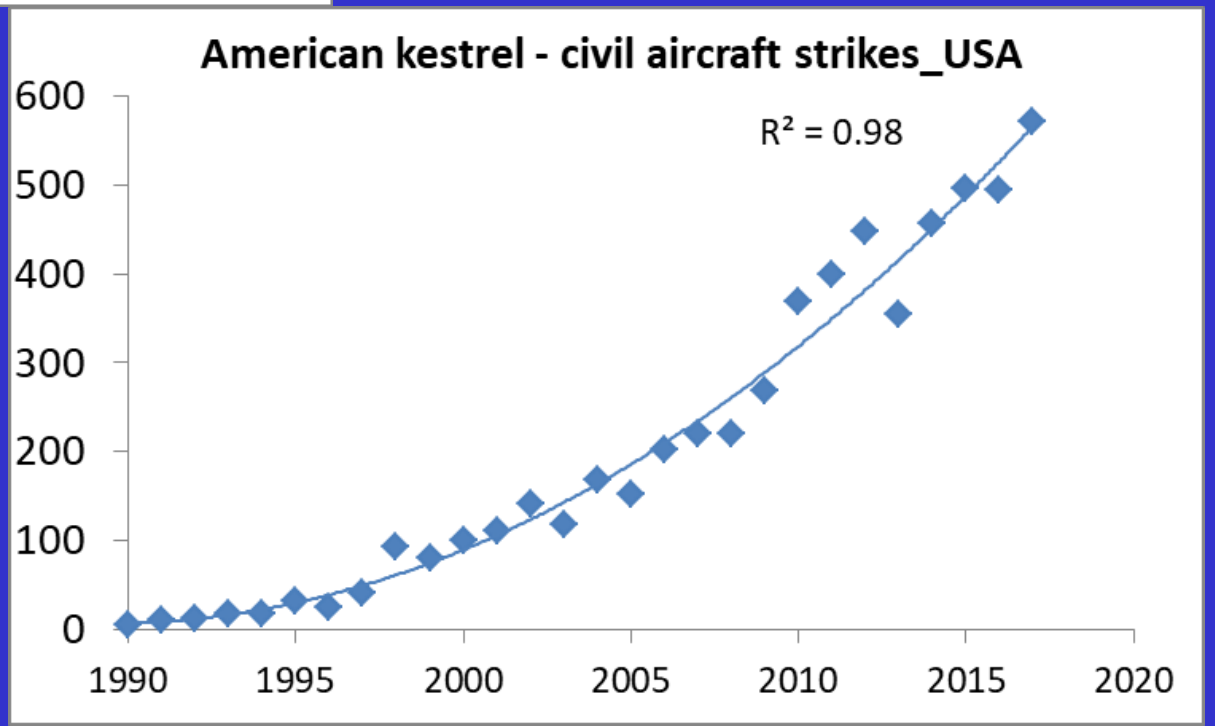
Time (years) from banding to bird strike for red-tailed hawks

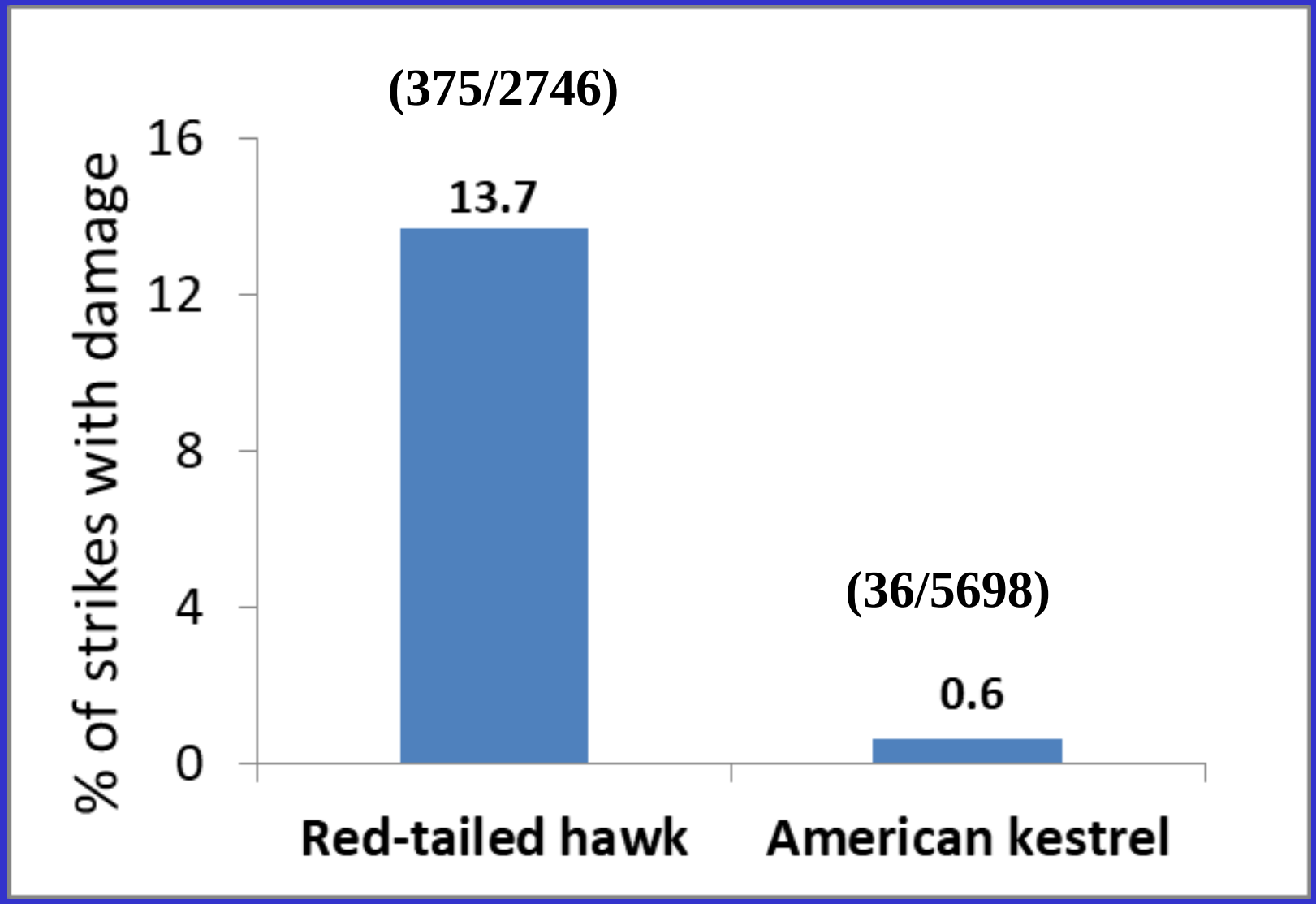



Red-tailed hawk population trend, N. America, 1990-2015
R² = 0.98
BBS population index
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1990
1995
2000
2005
2010
2015
2020
Min. Population = 2,600,000


Red-tailed hawk - civil aircraft strikes_USA
R² = 0.96
250
200
150
100
50
0
1990
1995
2000
2005
2010
2015
2020


American kestrel population trend, N. America, 1990-2015
BBS population index
1.0
0.8
0.6
0.4
0.2
0.0
R² = 0.93
Min. Population = 2,500,000
1990
1995
2000
2005
2010
2015
2020


American kestrel - civil aircraft strikes_USA
600
500
400
300
200
100
0
R² = 0.98
1990
1995
2000
2005
2010
2015
2020


(375/2746)
16
12
8
4
0
% of strikes with damage
13.7
(36/5698)
0.6
Red-tailed hawk
American kestrel

Conclusions (Part 1)

- **PEFAs are particularly vulnerable to bird strikes in their first summer/fall.**
- **For CAGOs, band recovery data support reduction in resident geese populations near airports.**

Conclusions (Part 2): Relocation issues:

- **Documented 101 cases of raptors relocated from airport struck at same (82) or different (19) airport.**
- **For RTHAs & AMKEs, no difference in interval of time between relocation and strike for HY and AHY birds.**
- **Are relocation programs reducing strikes?**

  RTHAs: Given the 1) increasing population, 2) increasing number of strikes, and 3) high hazard, do we need to focus more on habitat management at airports and less on relocation?

  AMKEs: Declining population but increasing number of strikes. Given the low risk that AMKEs pose to civil aircraft, is trap and relocation a good policy? Do we need to focus more on habitat management at airports and less on relocation?

- **I commend efforts to refine relocations to reduce return rates.**

Goal of NWSD and BBSD:
Provide a scientific foundation for policies and management actions to mitigate risk.

Safer Skies for all who fly ….

Birds *and* People!