Managing wildlife hazards at North American airports: The challenge posed by population increases of large-bird species

Richard A. Dolbeer, PhD

U.S. Department of Agriculture, Wildlife Services, Sandusky, Ohio USA

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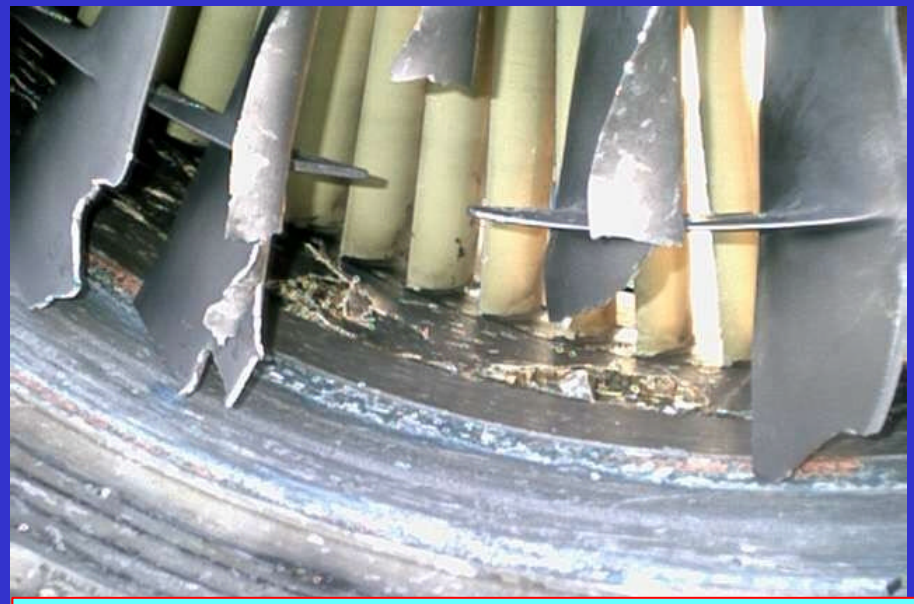
- U.S. Air Force
- Air Line Pilots Association
- Transport Canada

Bird strikes are an increasing safety and economic concern, annually costing commercial air carriers > $1.2 billion and U.S. military $???.



Canada goose strike with A-300, USA (Ohio) , July 2001, $3.5 million

Why?:

1. **Increasing populations of large-bird species.**
2. **Faster quieter turbofan-powered aircraft.**
3. **Inadequate airworthiness standards for airframes and engines, relative to large- and flocking-bird species.**

Population trends of 14 Largest Bird Species in N. America, 1980-2002

(Species ranked 1-14, mean body mass >3.6 kg or 8 lbs)

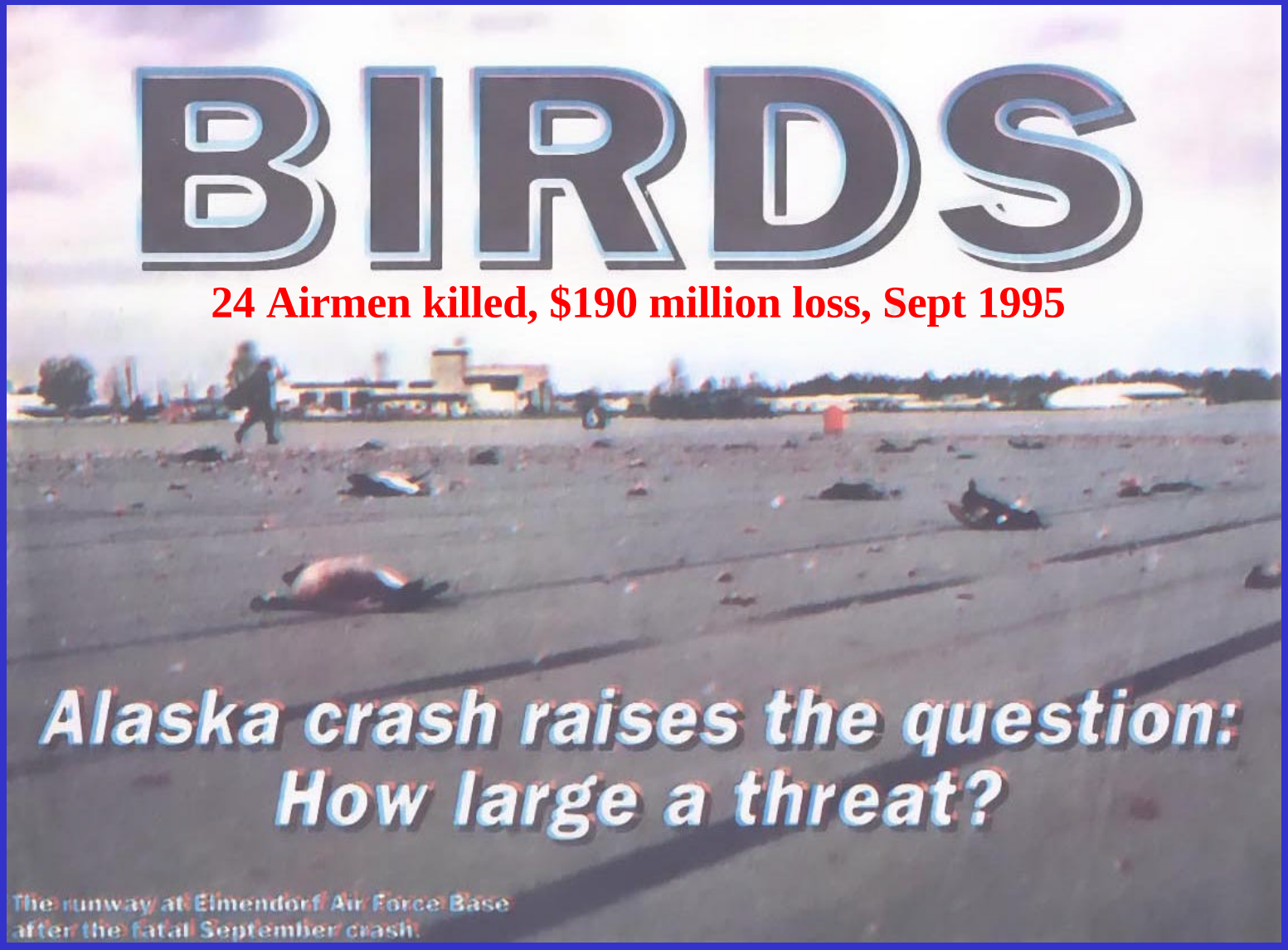
Rank	Species	Mass (kg)	Population trend
1	Mute swan	11.8	Increase
2	Trumpeter swan	11.4	Increase
3	California condor	10.1	Increase
4	Wild turkey	7.4	Increase
5	Tundra swan	7.1	Increase
6	Am. w. pelican	7.0	Increase
7	Whooping crane	5.8	Increase
8	Sandhill crane	5.8	Increase
9	Yellow-billed loon	5.5	Unknown
10	Bald eagle	5.4	Increase
11	Golden eagle	4.9	Increase
12	Canada goose	4.2	Increase
13	Common loon	4.1	Increase
14	Brown pelican	3.7	Increase

39% of reported strikes with >3.6-kg birds involved multiple birds,

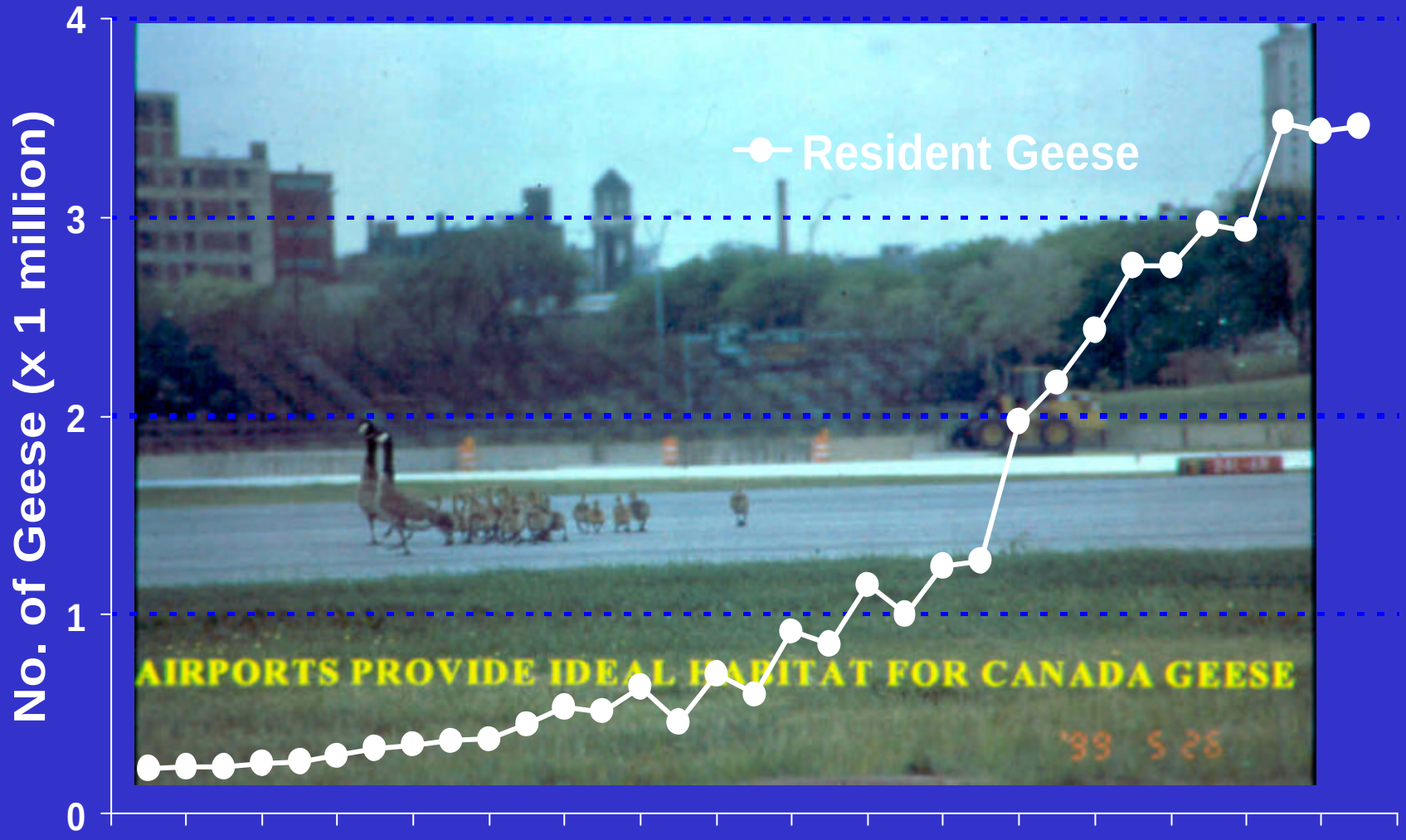
(n = 1,205 strikes, USA civil aircraft, 1990-2002)

Striking multiple birds increases the probability of multiple engine ingestions which……..

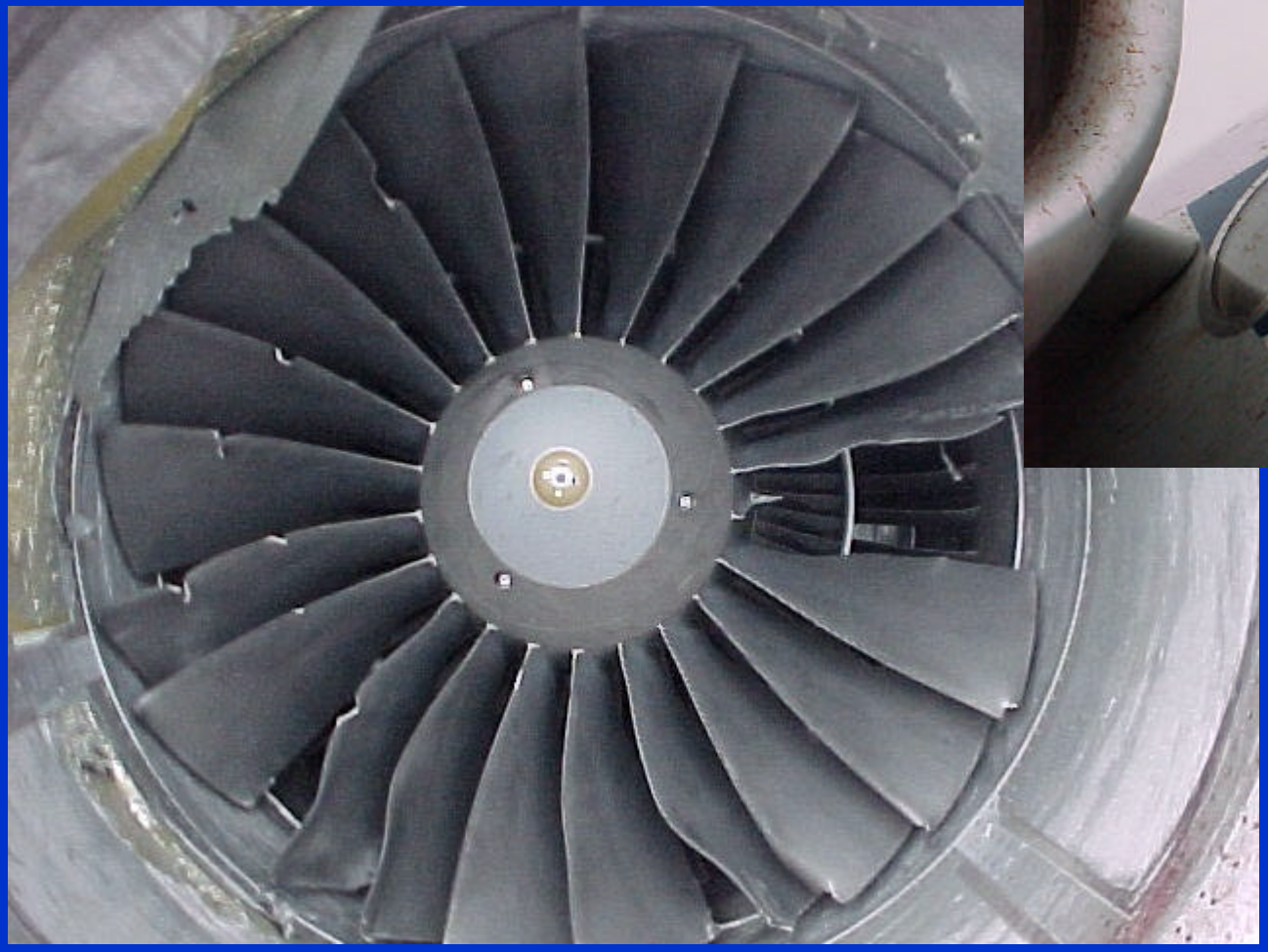
…….can result in an aviation disaster!



RESIDENT (NON-MIGRATORY) CANADA GOOSE POPULATION IN NORTH AMERICA INCREASED FROM 1 MILLION IN 1990 TO 3.5 MILLION IN 2002.

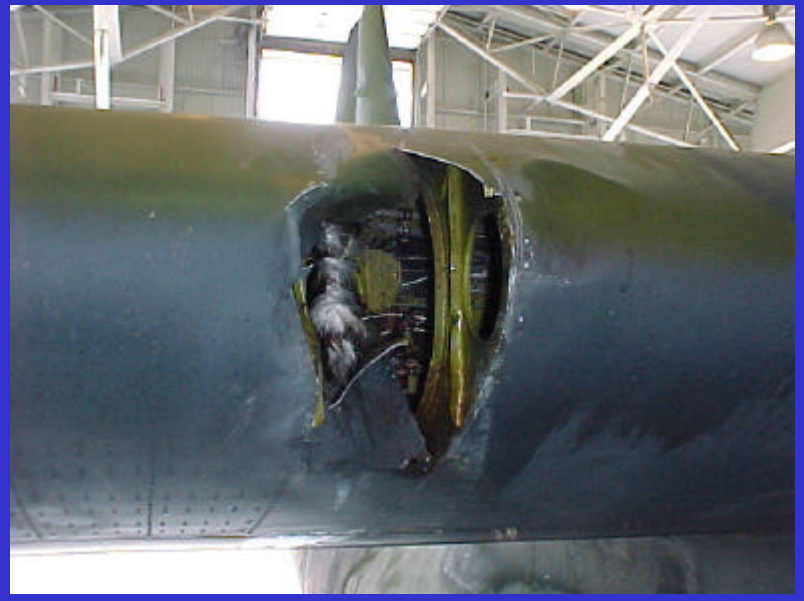


(Source U.S. Fish and Wildlife Service)

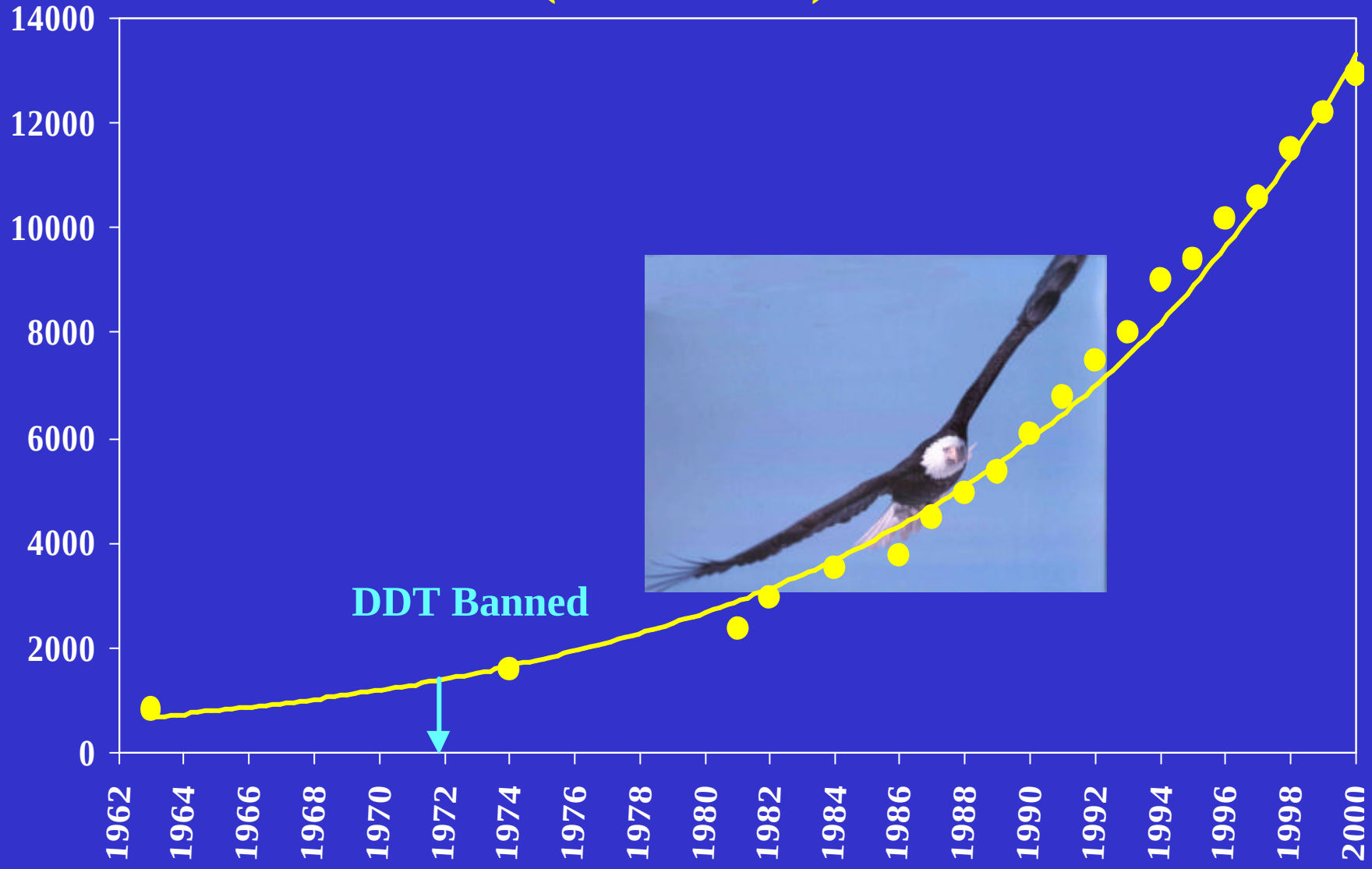


<u>Uncontained engine failure</u> caused by Canada goose during departure of Fokker 100 from East Coast Airport, USA, September 2003

Bald Eagle (5.5 kg) through leading edge of wing on C-130, Sep 2000

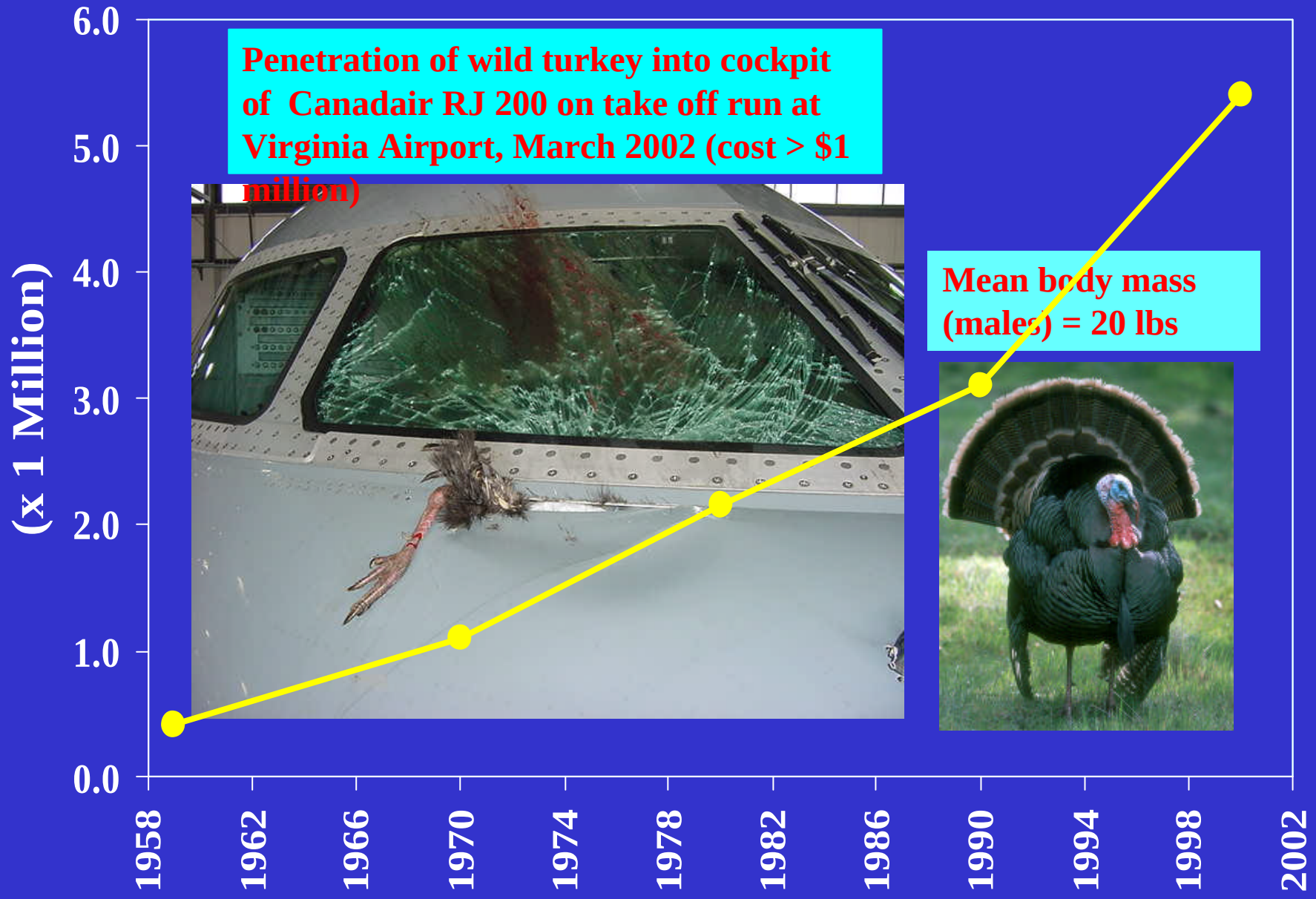


Nesting Bald Eagle Population in Contiguous USA (1963-2000)



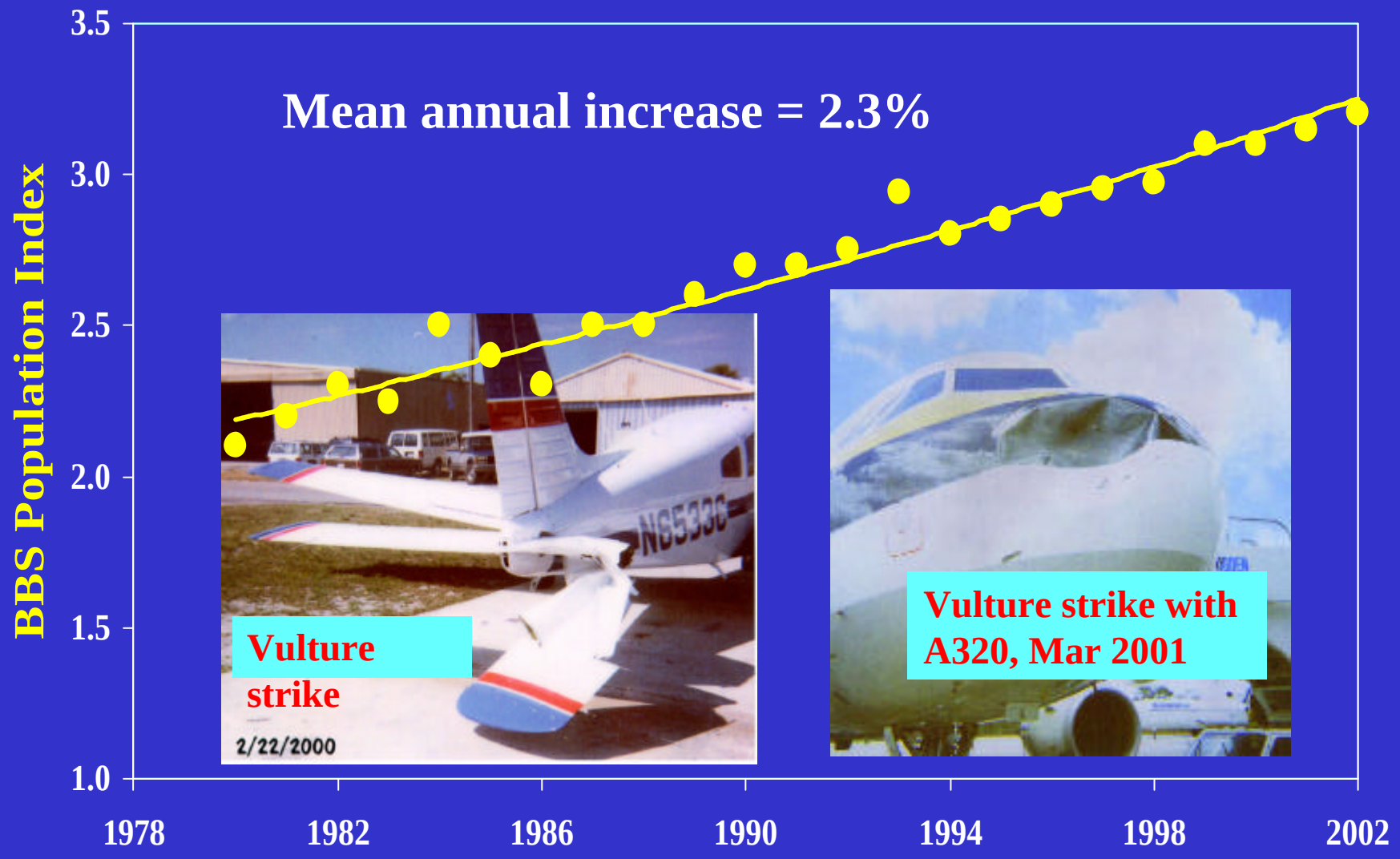
Engine destroyed on KC-135 after ingestion of Wild Turkey during takeoff from New England Airport, USA, July 2003

Wild turkey population in USA (1959-2000)



USMC Harrier collision with Turkey Vulture at 300 feet AGL, South Carolina, Oct 2003

Turkey vulture population increase in N. America, 1980-2002



Herring gull ingestion causes <u>uncontained engine failure</u> on MD-11 during aborted takeoff run at west coast airport in USA, 2001

1996: Military Bird Strike (European Starlings) with 34 Fatalities

Date: 15 July 1996
Aircraft: Lockheed C-130
Location: Eindhoven, Netherlands
Phase of flight: Approach
Effect on flight: Crashed short of runway
Damage: Aircraft destroyed: 34 fatalities
Wildlife Species: European Starlings

2003: Fatal Crash at Airport in Italy caused by Rock Doves

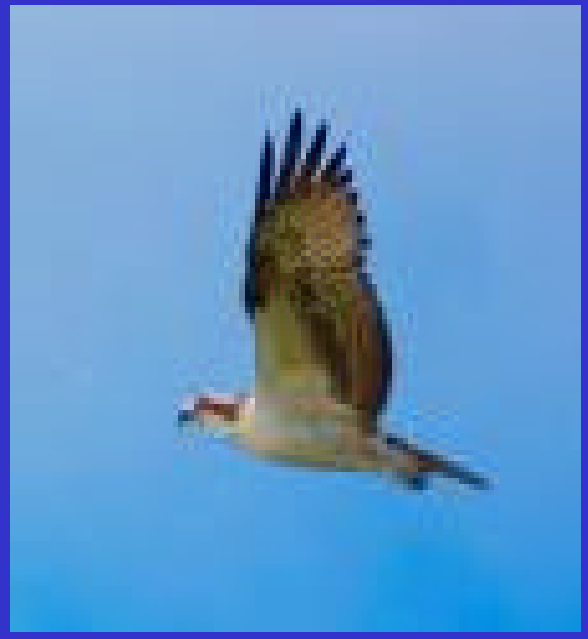
Monday, June 2, 2003

Bird collision deadly as plane hits flock; pilots killed

MILAN, Italy –(AP) A small jet plane which ran into a flock of birds at takeoff crashed into a warehouse yesterday……

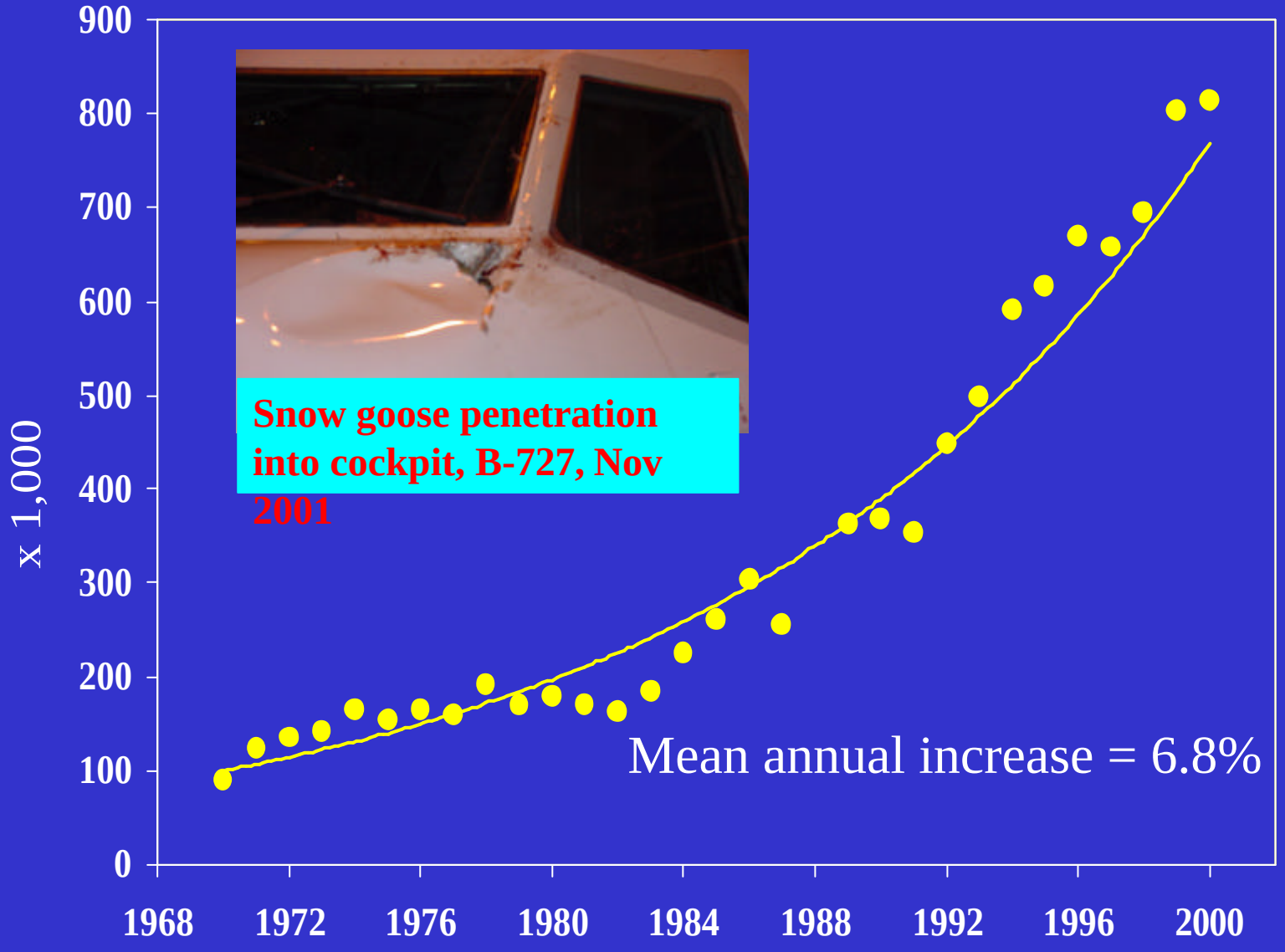
Il capannone dove è precipitato l'aereo

Breeding Population of Ospreys has Increased over 10-fold in USA, 1966-2002



Greater Snow Goose Population (1970-2000)

(Winters from New Jersey to North Carolina)



Conclusions

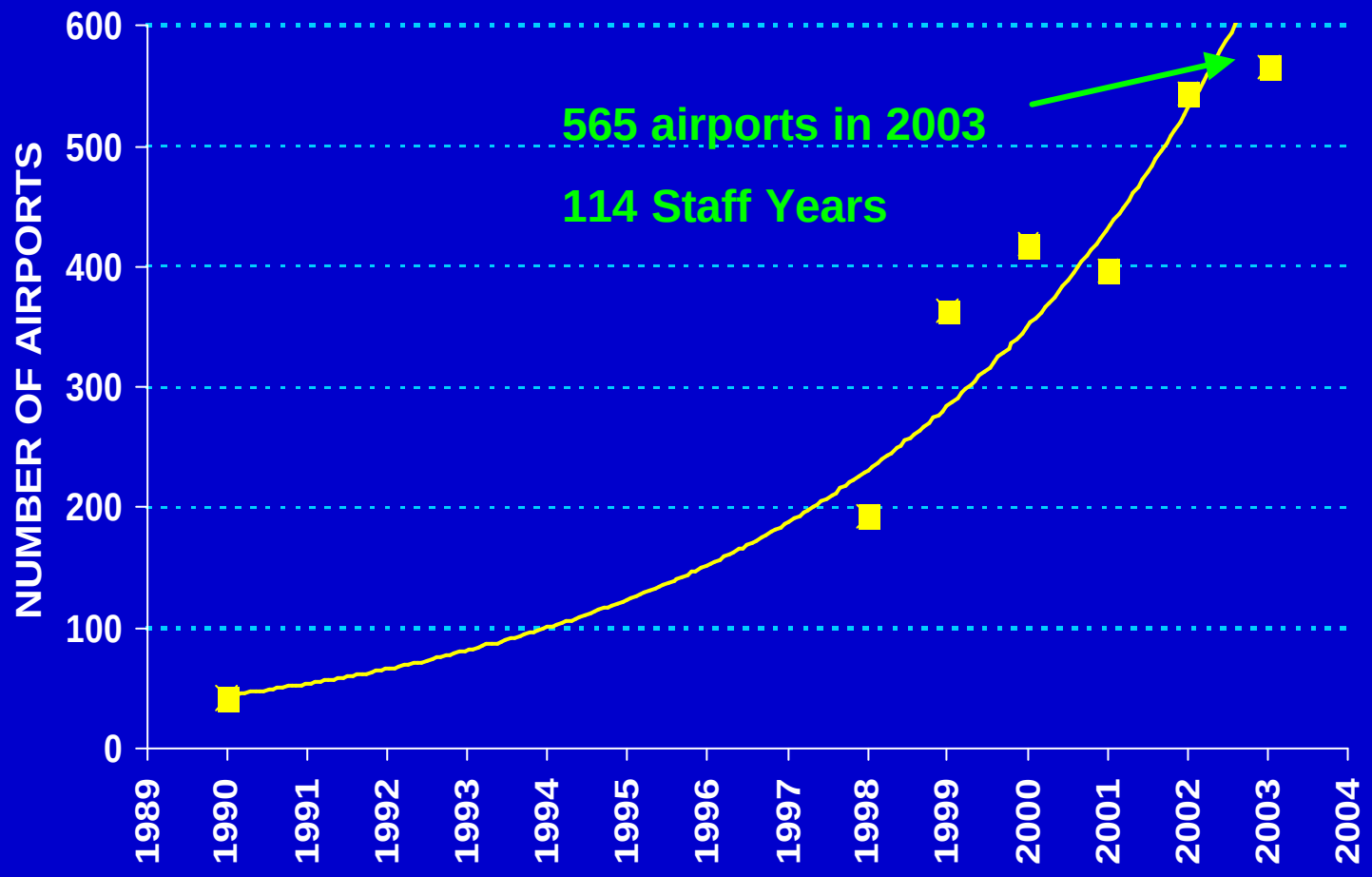
1. We have done outstanding job of wildlife conservation for large, flocking bird species in N. America over past 30 years.
2. Aircraft and engines are not designed to withstand impacts by large (>1.8 kg) birds, or multiple strikes by small birds.

Solutions

1. ~~Reevaluate airworthiness standards.~~

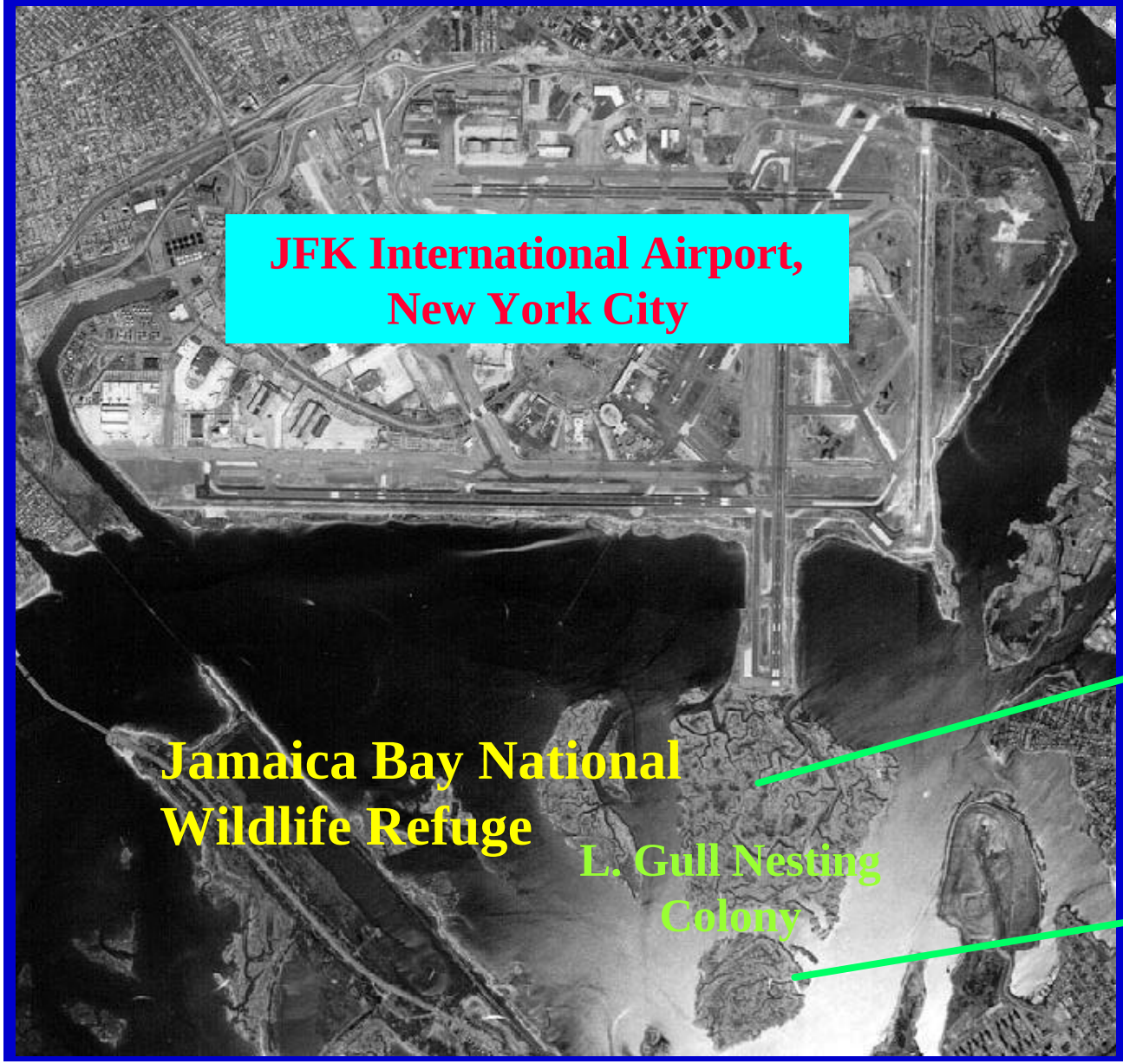
2. **Establish zero tolerance for hazardous bird species at airports.**

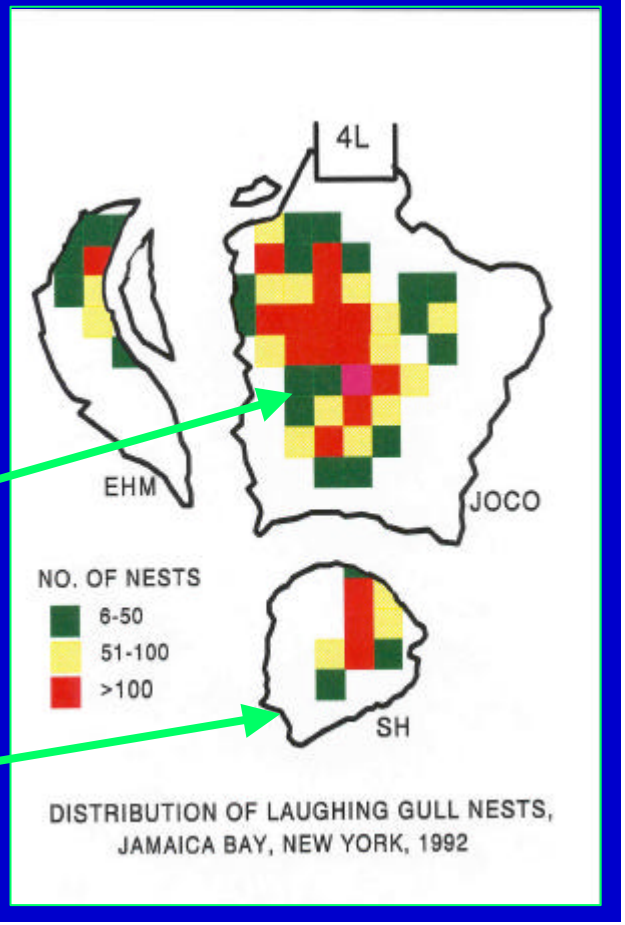
Airports requesting assistance from USDA WS biologists increased from 42 to 565, 1990-2003



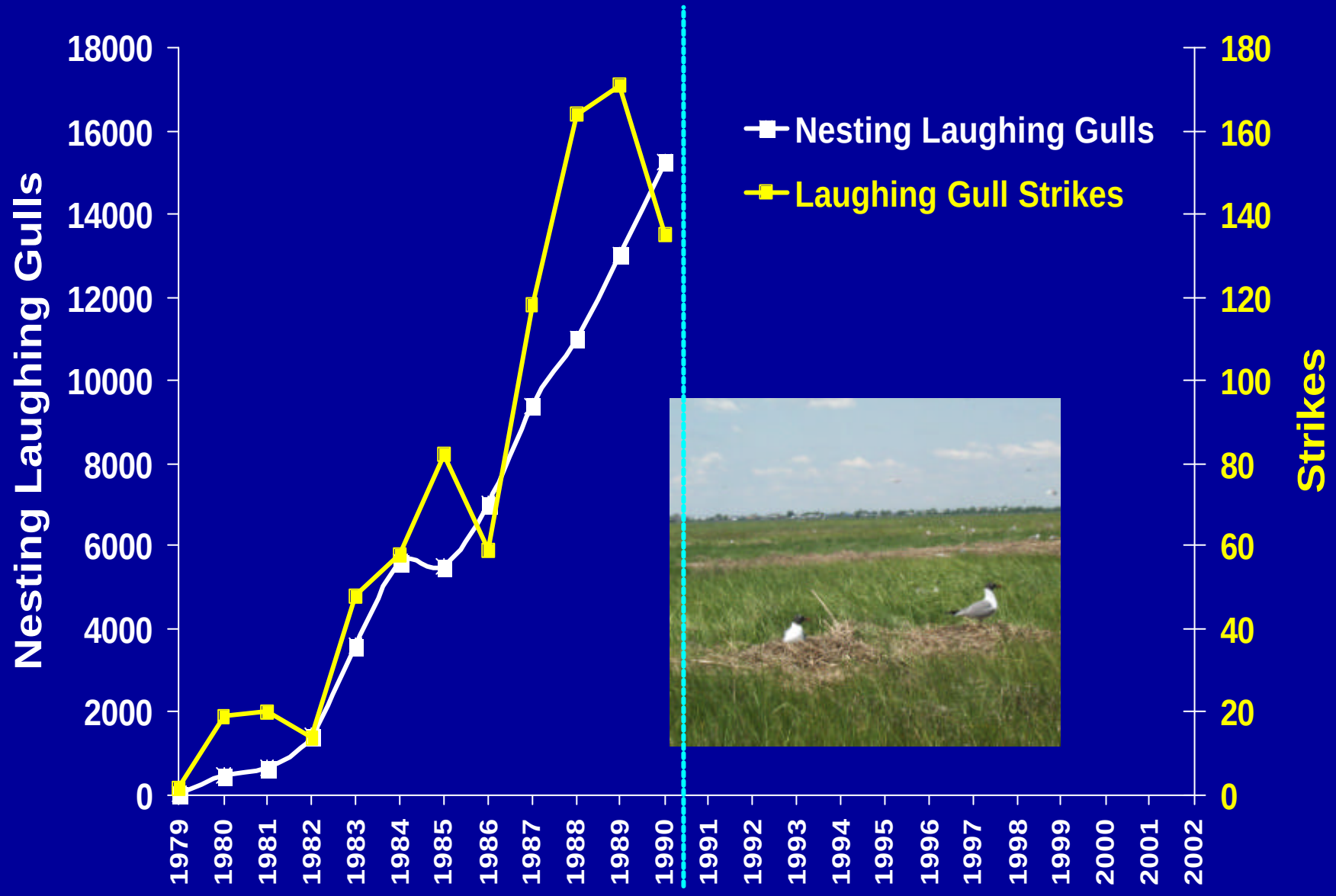
Shooting Gulls has reduced strikes by >88%: Case study at John F. Kennedy International Airport

The Mother of All Incompatible Land Uses!

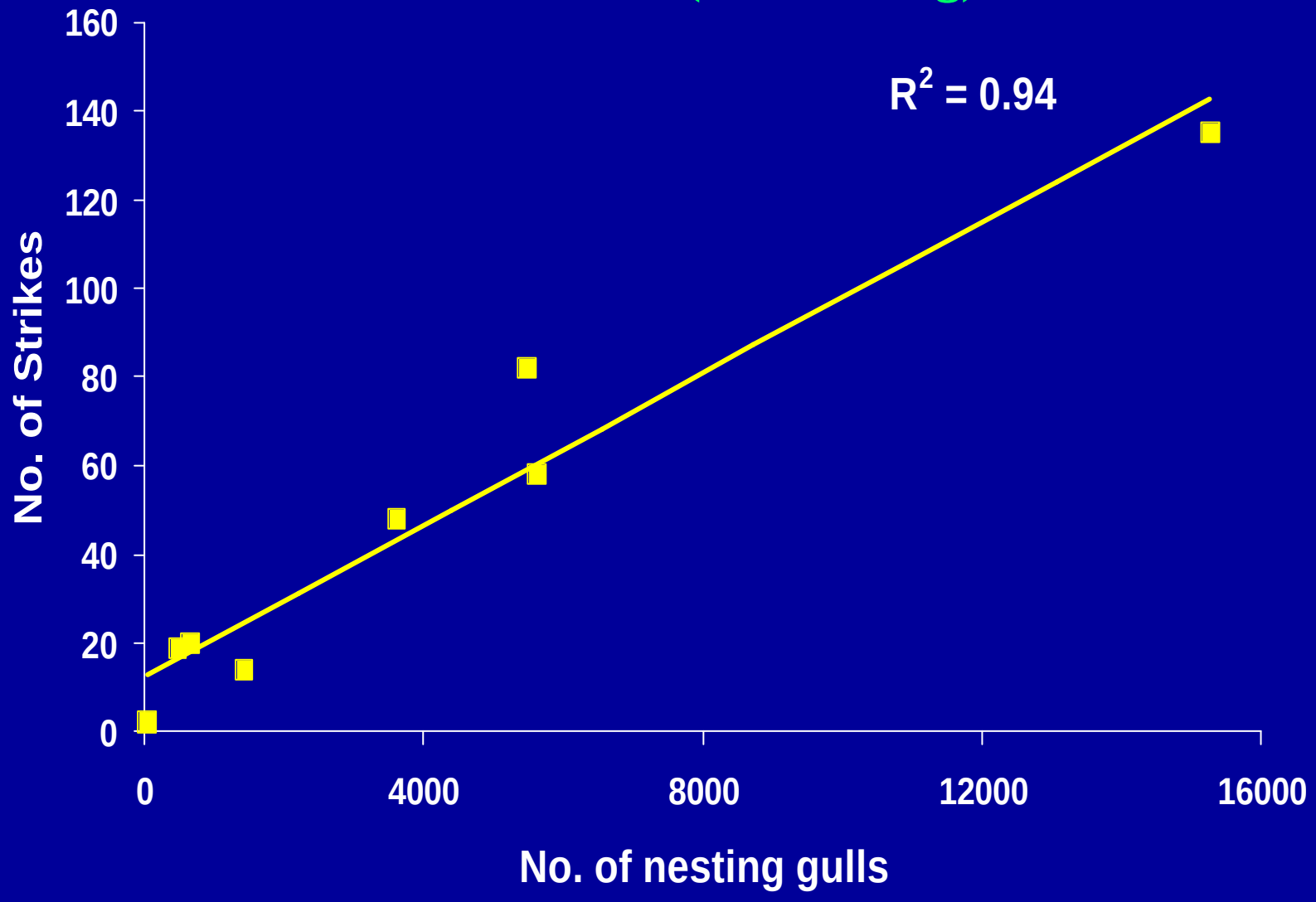




Laughing Gull strikes in relation to growth of Nesting Colony adjacent to JFK International Airport, 1979-1990



Relationship between size of Laughing Gull Nesting Colony adjacent to JFK Airport and number of strikes, 1979-1990 (no shooting)



Laughing Gulls at JFK International Airport,
New York City, 1991
Concorde on approach to JFK Airport
Gull nesting colony on NPS land (JBWR)

In 1991, USDA initiated an experimental program to shoot gulls attempting to fly over the airport from the protected marsh areas in Jamaica Bay

Shooting was conducted by professional USDA Biologists from May-August, 1991-2003

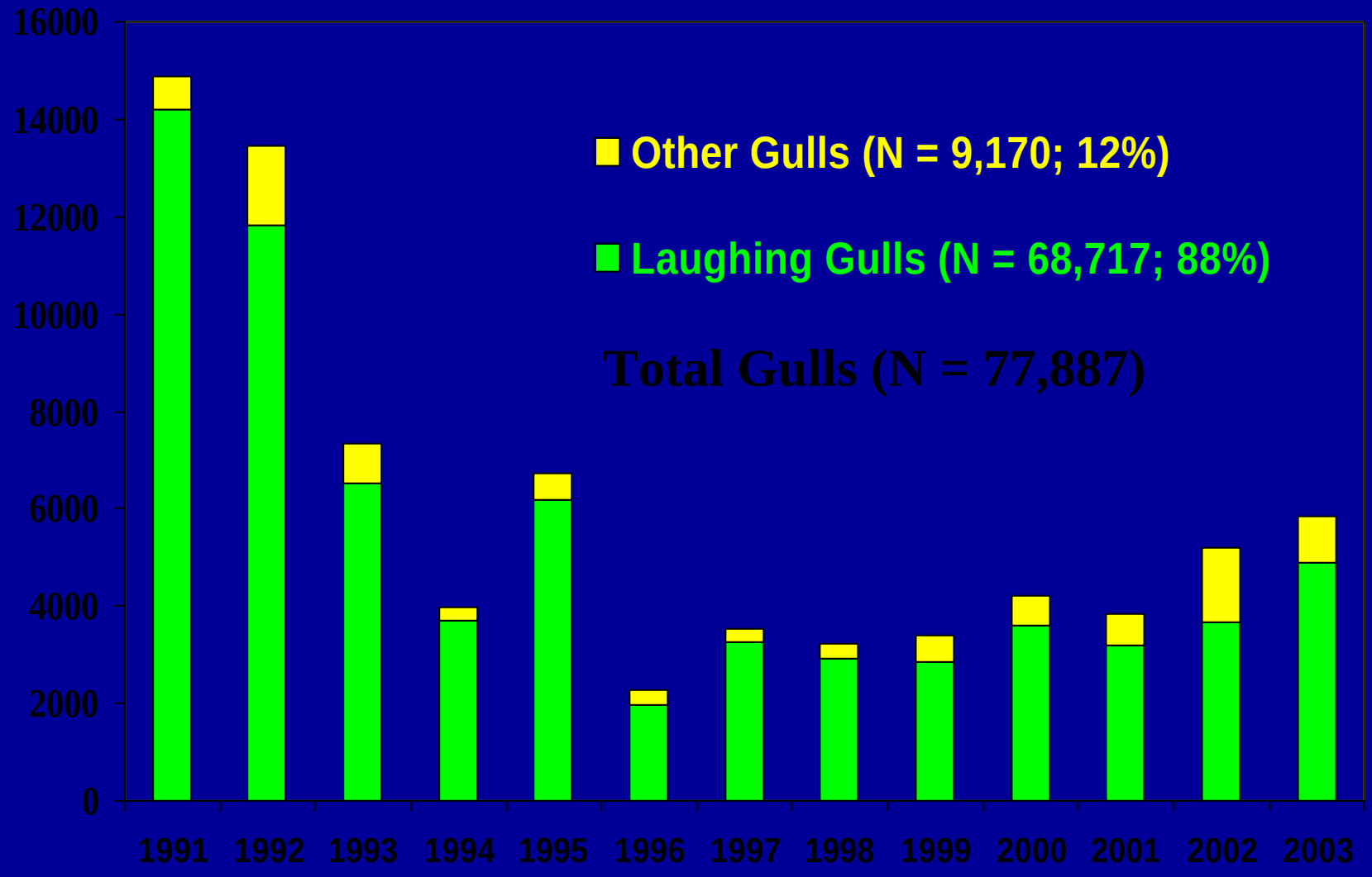
Hypotheses (objectives) of shooting program were that shooting would:

1. **Reduce the population of gulls in Jamaica Bay, and**
2. **Train surviving gulls to avoid the airport,**

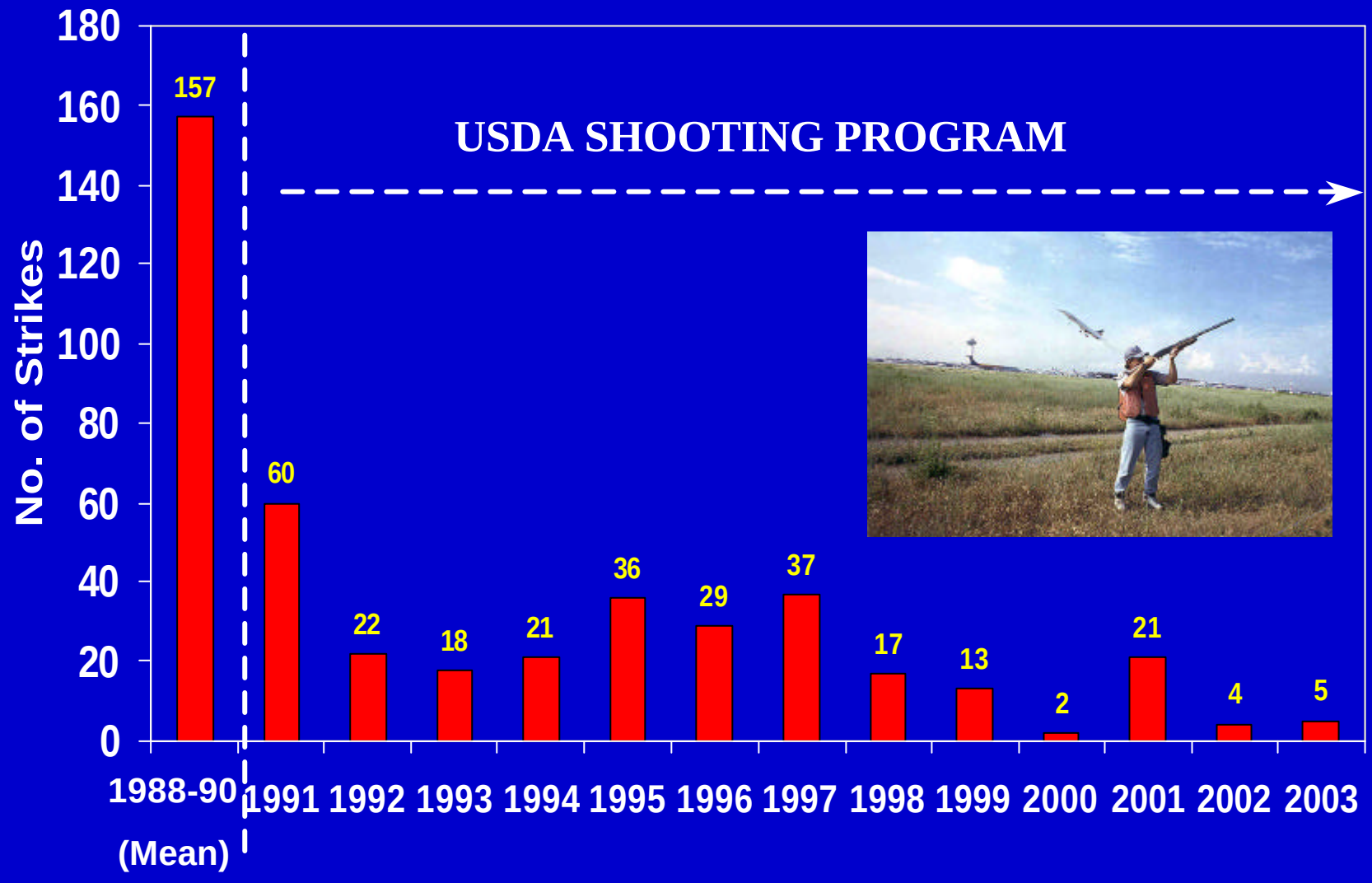
Which would result in:

1. **Fewer gulls flying over airport, and**
2. **A reduction in the number of gull strikes with aircraft.**

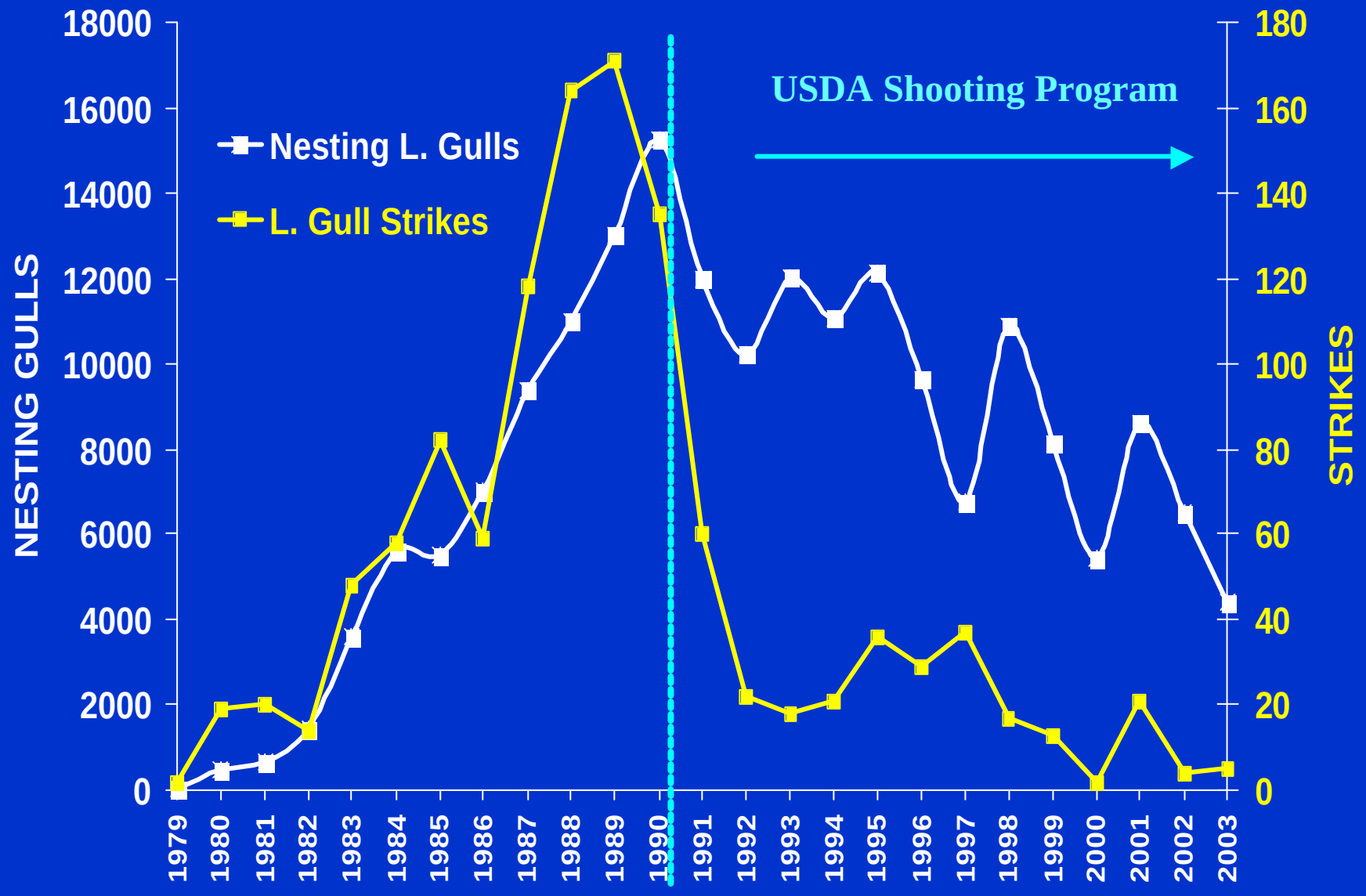
Over 77,000 Gulls were Shot at JFK International Airport, New York, May-Aug 1991-2003



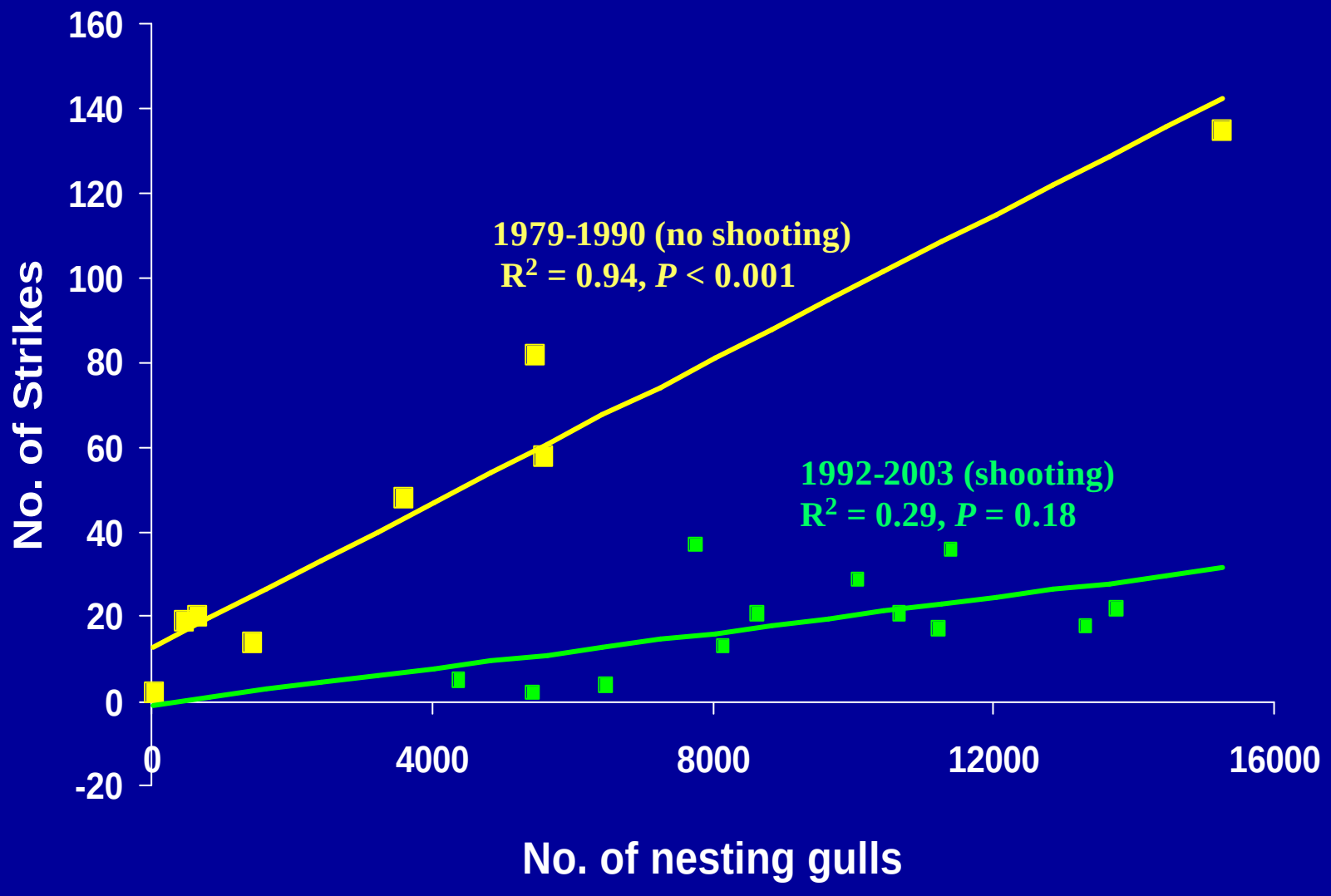
Number of Aircraft Striking Laughing Gulls, JFK International Airport, NY, 1988-2003



Laughing Gull strikes have declined proportionately more than the nesting colony has declined, 1991-2003, JFK International Airport



Relationship between size of Laughing Gull Nesting Colony and number of strikes

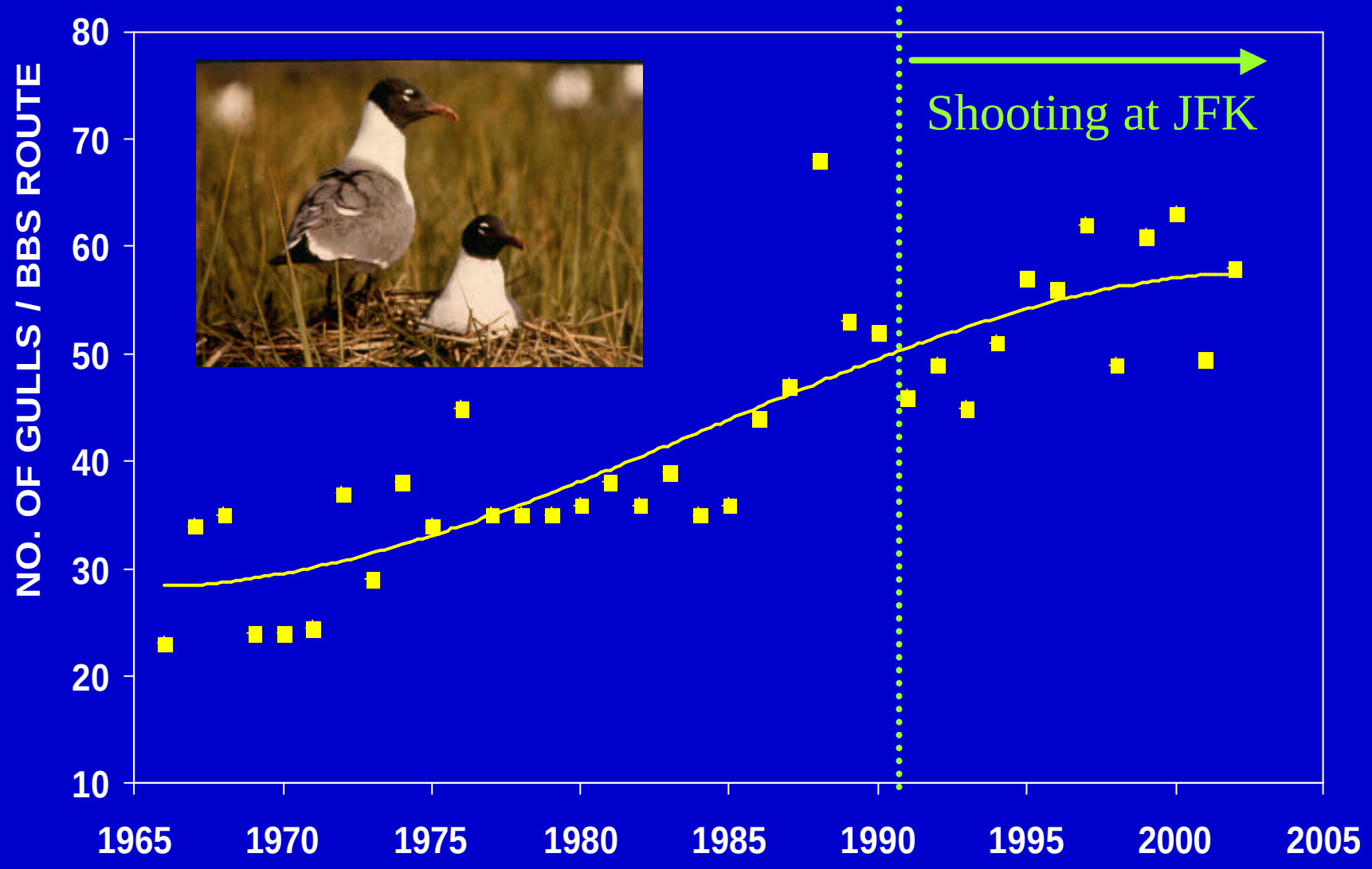


Regional Laughing Gull Nest Population, New Jersey to Maine has <u>increased</u> 27% since shooting began:

1989-1991 = 68,426 nests

2001-2002 = 87,235 nests

Laughing Gull Population Index, Virginia-Maine, 1966-2002, North American Breeding Bird Survey



Dolbeer's Four Cardinal Rules for Lethal Control

Accurately document the numbers taken by species;

Document the impact that the removal has on local and regional populations;

Document that the animals taken are indeed the ones causing the damage and that their removal reduces the conflict;

Inflict minimal "suffering" on the removed animals.

NEW YORK POST

METRO EDITION

THURSDAY, MAY 21, 1992

Shotgun-toting feds killing sea gulls at JFK Airport

BYE, BYE BIRDIE!

A federal agent yesterday blasts away at sea gulls flying near JFK Airport.

MACY'S SHUTS 8 STORES

LEONA'S STILL QUEEN

TOUGH TRIP FOR DINKINS

The Metro Section

The New York Times

MONDAY, SEPTEMBER 15, 1997

Photographs by Marilynn K. Yee/The New York Times

Thomas Cullen deploying Morefar, a peregrine falcon on her first mission to frighten birds from Kennedy Airport jets.

When Birds of Man and Nature Meet

Falcons Keep Geese and Gulls From Colliding With Jets

By ANDREW C. REVKIN

As a Boeing 747 thundered to a landing at Kennedy International Airport, two silver Chevy Blazers raced down a road paralleling the runway, patrolling for intruders.

the engines of airliners.

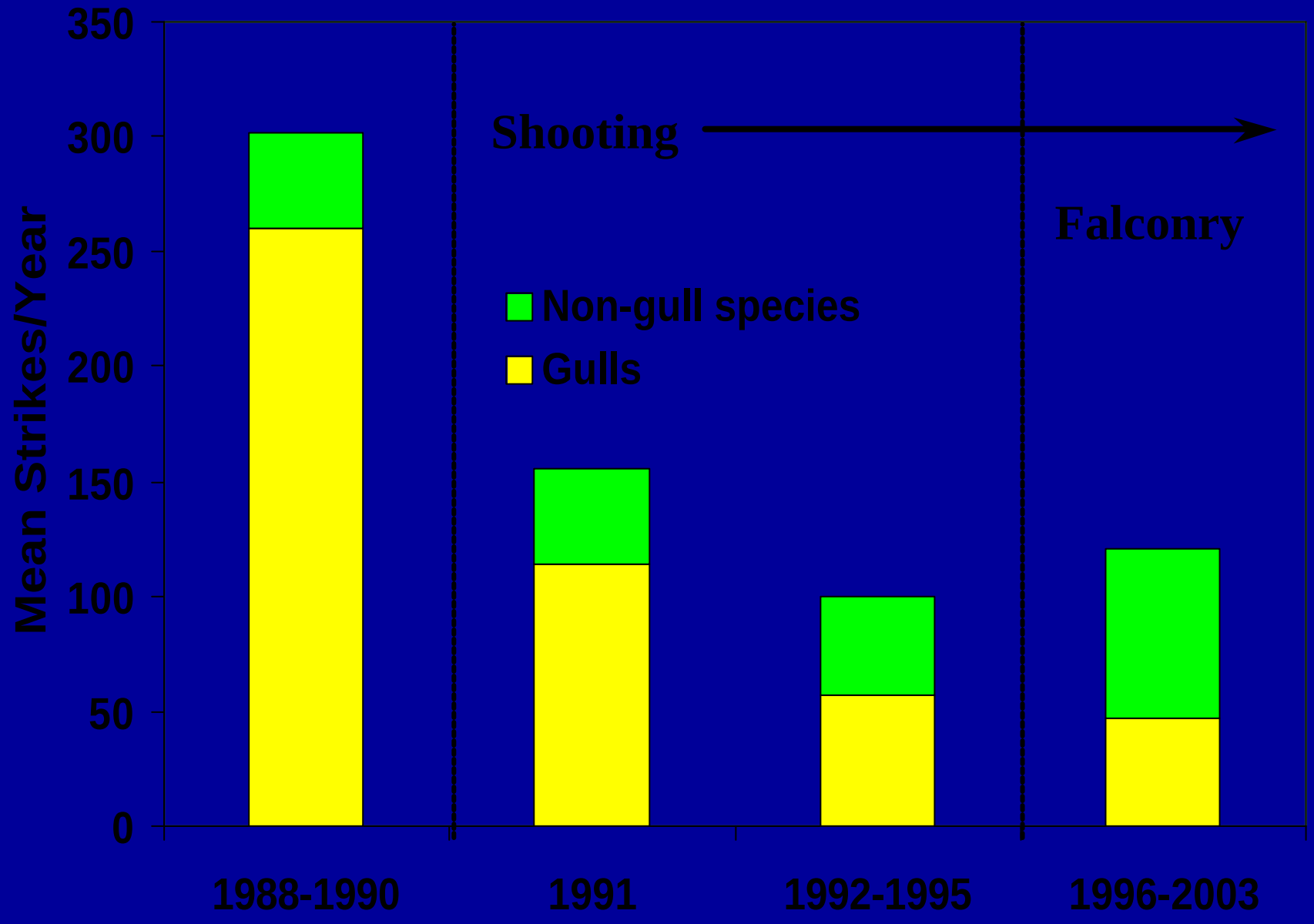
The birds of prey, trained for hunting ducks and small game, are used to frighten, not kill, with flung pigeon breasts — bought from a Queens poultry supplier — acting as a lure. "Just the sight of an

tional Park Service scientists.

In 1989, an international panel of biologists recommended relocating the gull colony. But the Park Service — saying its mission is to nurture, not repel, birds — has insisted on conducting more research

In 1996, JFK implemented a falconry program to compliment the shooting program as part of an integrated approach to reducing bird strikes at the airport.

Falconry has not influenced the Mean Bird Strikes/Year Involving Non-Gull and Gull Species at JFKIA, New York, 1988-2003



Good News-Bad News Conclusions

(Shooting Program at JFK, 1991-2003)

Good news: Shooting dramatically reduced strikes by gulls, 1991-2003, by a combination of reducing the local population and training gulls to avoid the airport. The regional population of gulls was not impacted.

Bad news: Shooting 77,000 gulls generated some negative publicity for JFK.

Good news: Falconry generated much positive publicity for JFK, 1996-2003.

Bad news: Falconry has been an important part of the integrated management program, but analysis of strike data has not indicated that falconry reduced strikes by gulls or other birds.

Overall Conclusions

1. We have done an outstanding job of wildlife conservation for most flocking bird species in North America over past 30 years.
2. Aircraft and engines are not designed to withstand impacts by large birds or flocks of birds.
3. Therefore, airports must professionally implement wildlife hazard management plans.
4. Lethal control directed at overabundant populations is necessary in an integrated management program to reduce bird strikes.
5. Lethal control must be conducted in a science-based manner under federal/state permits by trained personnel (Dolbeer's rules).
6. USDA Wildlife Services provided assistance at 565 airports in USA in 2003, including 165 in which lethal control was carried out.

Our Goal:

Safer Skies for all who fly ….

Birds *and* People!

Thank You!

BIRD STRIKE COMMITTEE USA

BIRD STRIKE COMMITTEE CANADA

13-16 SEPTEMBER 2004, 6th JOINT MEETING

HOSTED BY

Baltimore-Washington International Airport

***FIELD TRIP & FIELD DEMONSTRATIONS**

***TRAINING SESSIONS & EXHIBITORS**

***TECHNICAL SESSIONS**

***ROUND-TABLE DISCUSSIONS**

***USA-CANADA WATER VOLLEYBALL TOURNAMENT**

INFORMATION AND REGISTRATION AT
WWW.BIRDSTRIKE.ORG