



We are
Airports

Wildlife Hazards vs Risks

Compliance, Safety, Due Diligence and Action Thresholds

WILDLIFE HAZARD MANAGEMENT WORKSHOP

Nairobi KENYA
5-9 February 2024

John R Weller and Amy L Anderson
BSC USA past-Chair and current Chairperson
FAA National Wildlife Biologist



FAA
Office of Airports

1. ASSESS

Wildlife Hazard
Assessment, Site Visit,
Continual Monitoring

2. PLAN

Wildlife Hazard Mgt Plan
(e.g., Responsibilities,
Habitat / Wildlife Mitigation
& Monitoring,
Communication, Training,
Resources, etc.)

3. MITIGATE

Proactive (modify and
exclude) and Reactive
(Harass / disperse &
nonlethal / lethal removal)

4. EVALUATE

Data Collection, Data
Analysis, Trends, Gaps,
Metrics, KPI's, Wildlife
Hazard Working Groups,
"Compliance vs
Excellence"

5. MODIFY

Prioritization of
Resources, Funding &
Personnel

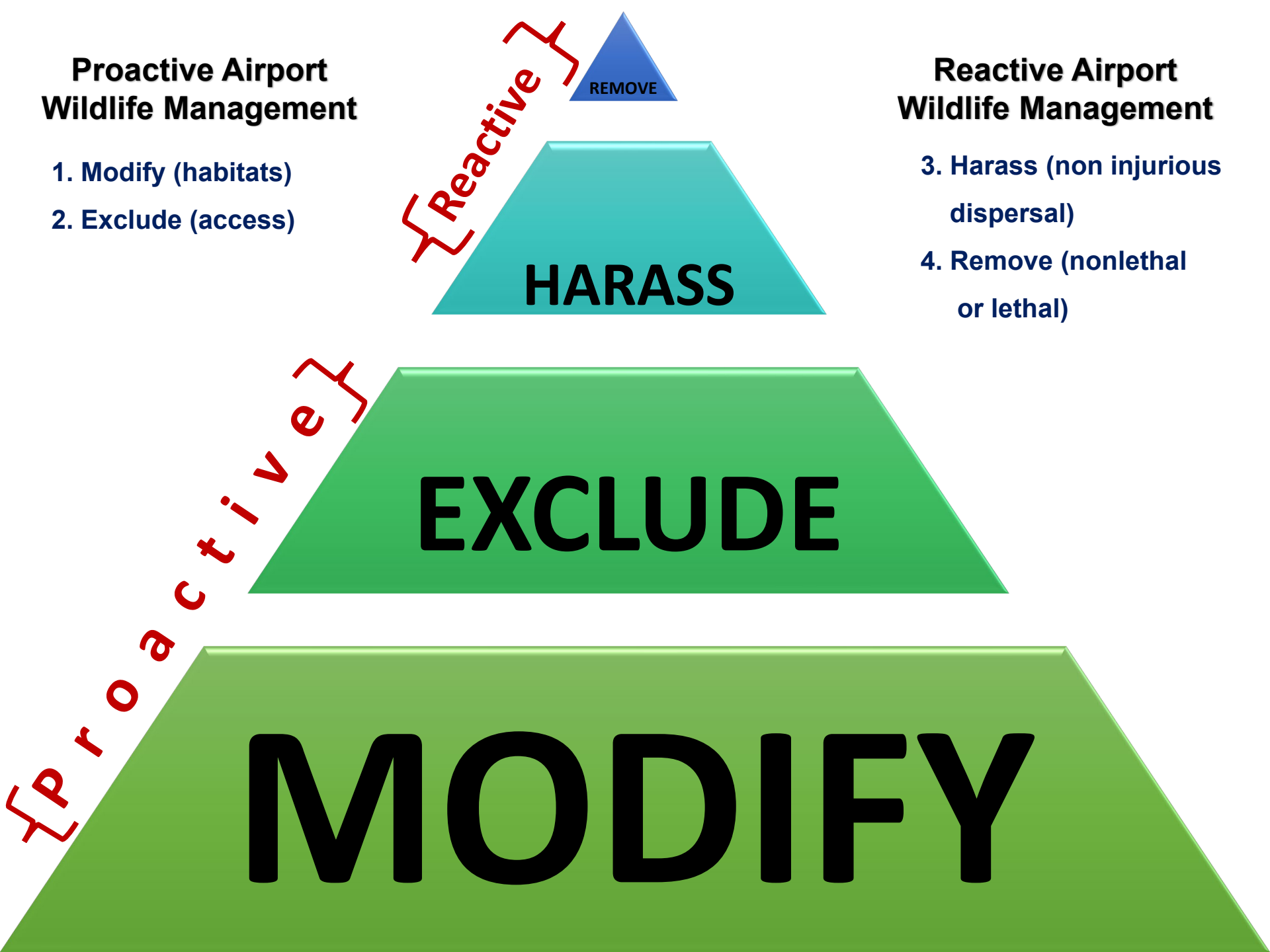
**Wildlife
Hazards
to
Aviation**

Proactive Airport Wildlife Management

1. Modify (habitats)
2. Exclude (access)

Reactive Airport Wildlife Management

3. Harass (non injurious dispersal)
4. Remove (nonlethal or lethal)



{Reactive}

REMOVE

HARASS

EXCLUDE

MODIFY

{Proactive}

HAZARD

VS

RISK

A **HAZARD** is something that has the potential to harm you

RISK is the likelihood of a hazard causing harm



RISK MANAGEMENT




Hazard vs Risk

- Wildlife Hazard = Severity ranking of the animal
- Wildlife Risk = Severity x Probability

Hazard level = high hazard species
Risk level = low

Hazard level = high hazard species
Risk level = high





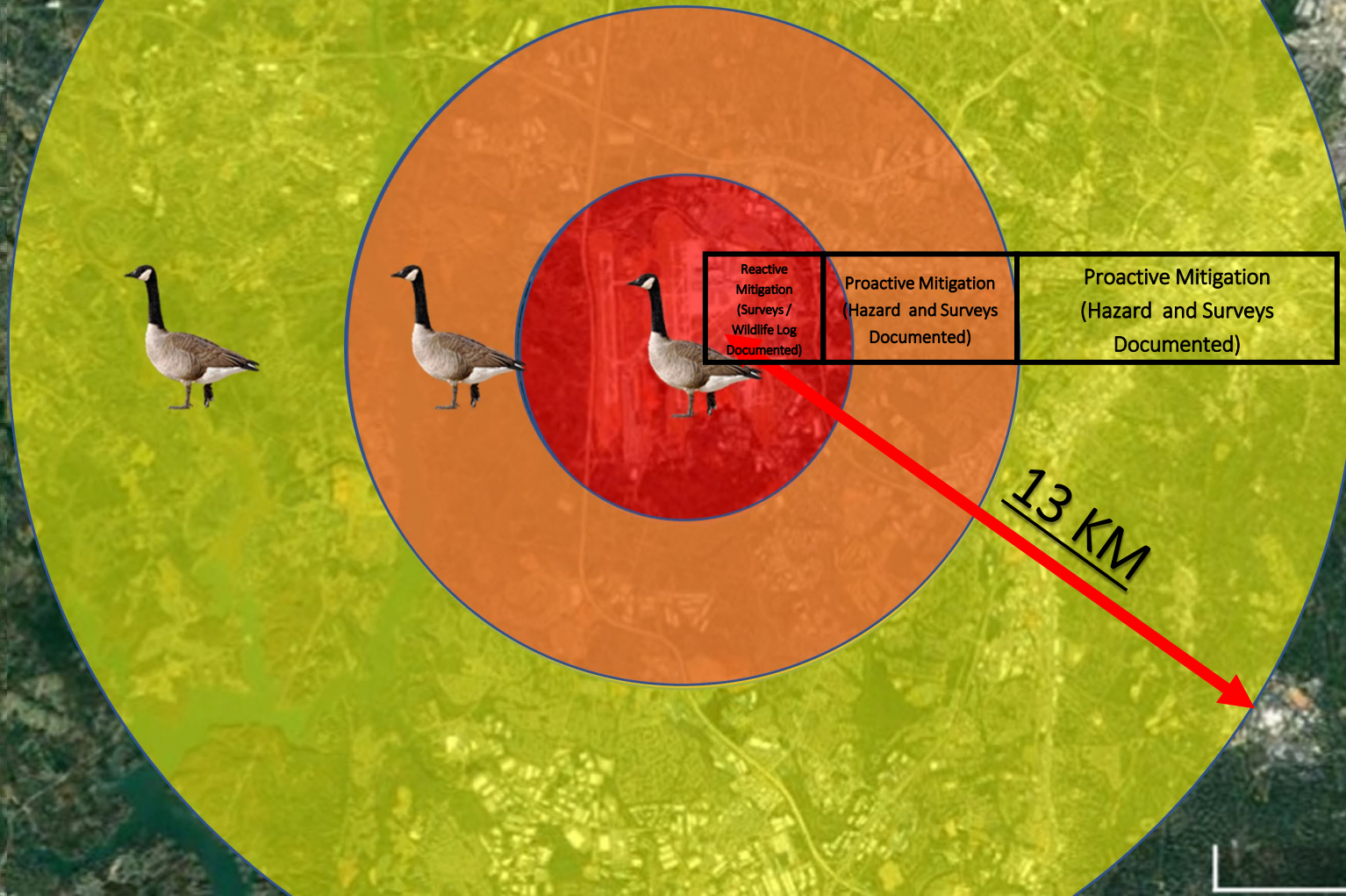
There are no fences for birds
When is a risk unacceptable?
Is it explained in your Plan?

Orlando International Airport

Orlando International Airport (MCO)_

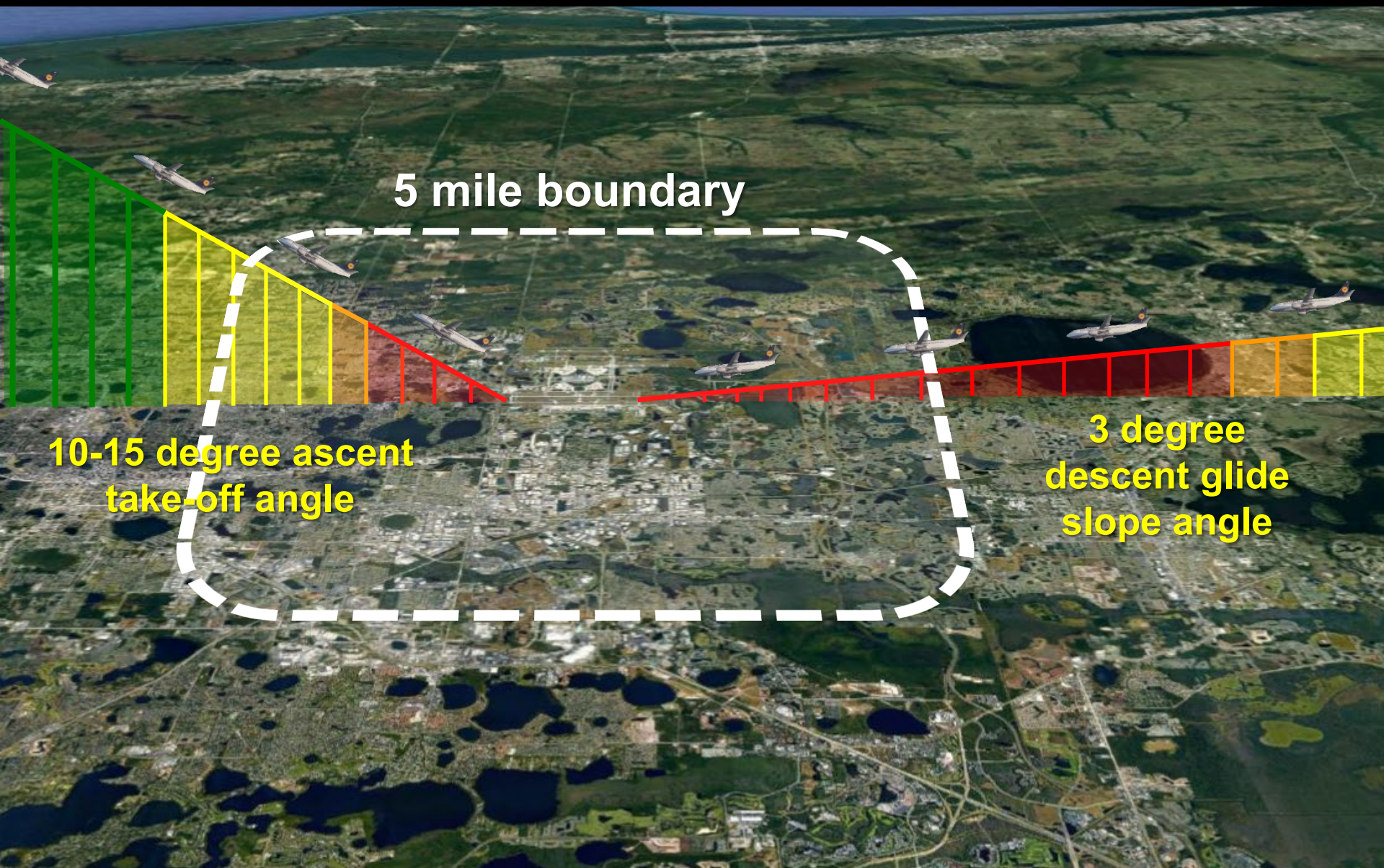
RISK ACTION THRESHOLDS

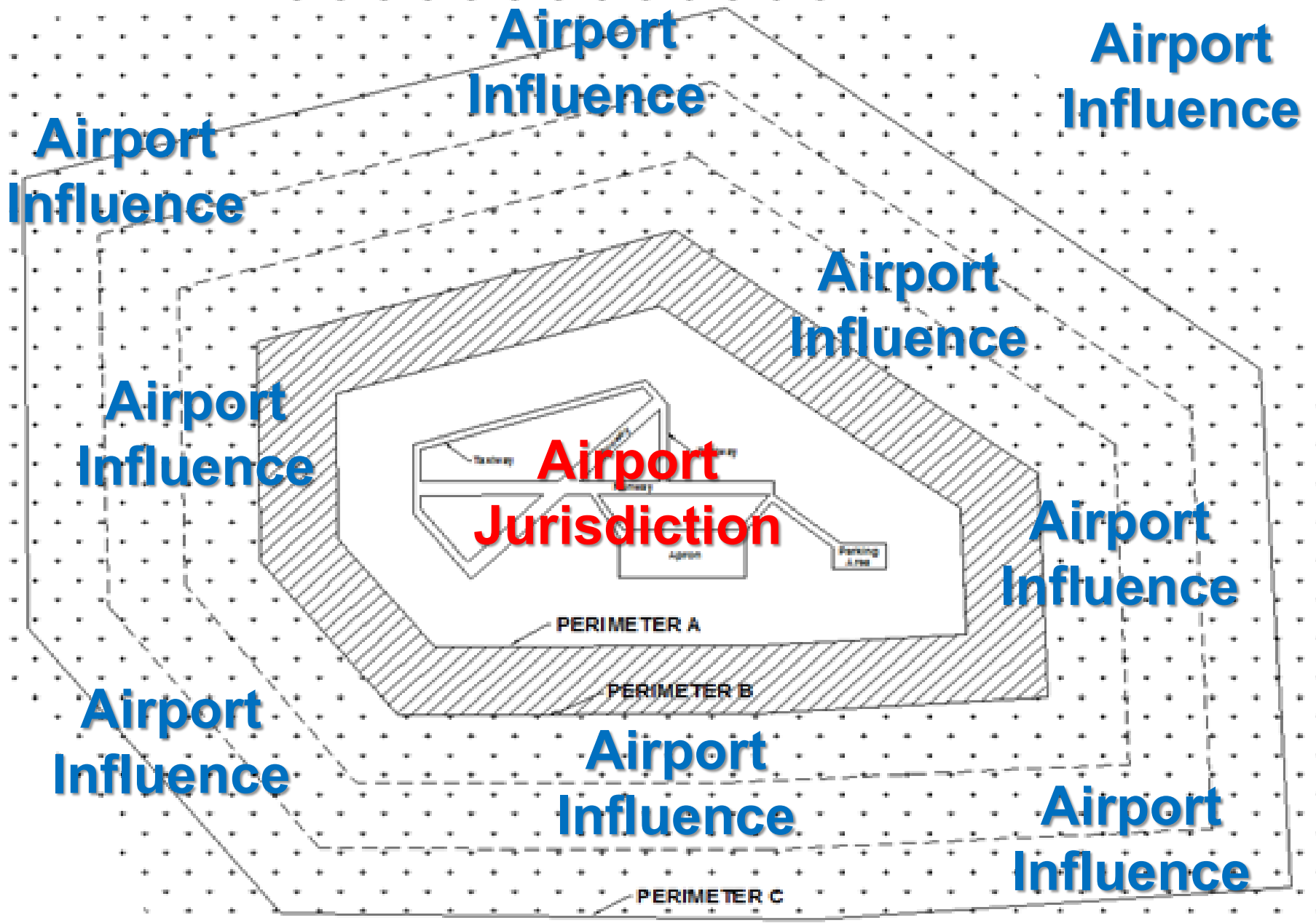
Dependent on: Species – Numbers – Location
– Time of Day – Season - Attractant



Separation Distances

Factors include: Aircraft Flight Characteristics & Strike Data





Airport Influence

Airport Influence

Airport Influence

Airport Influence

Airport Influence

Airport Influence

Airport Influence

Airport Influence

Airport Influence

Airport Jurisdiction

PERIMETER A

PERIMETER B

PERIMETER C

Taxiway

Runway

Apron

Parking Area

Wildlife

$\leq 3,500$ ft AGL = 92% of strikes

Aircraft

$\leq 1,500$ ft AGL = 82% of strikes
*(these strikes are within the 5 mile separation distance)

Strikes

≤ 500 ft AGL = 71% of strikes

Ground Level = 41% of strikes



ACTION THRESHOLD

What is the tipping point between acceptable/ unacceptable?

1. European starlings on airfield 50 vs 500 vs 5,000
2. Deer outside perimeter fence vs inside perimeter fence under cover (e.g., woods) vs on airfield
3. Canada geese on airfield vs off airfield
4. Vulture(s) soaring 500 feet AGL vs 2,000 feet AGL vs different ends of a runway
5. Rock pigeons / doves in airfield grass vs perched on airfield signs vs perched on perimeter fence

ACTION THRESHOLD

What is the tipping point between acceptable/ unacceptable?

Zero-tolerance Species in Zero-tolerance Location (Scenario Requiring Action)

1. Biomass + Strike Probability = Action

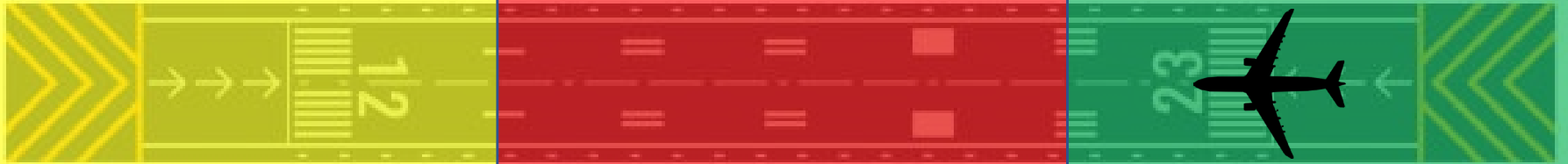
which means...

- a. Wildlife species and/or numbers (biomass) unacceptable
- b. Probability of strike is unacceptable

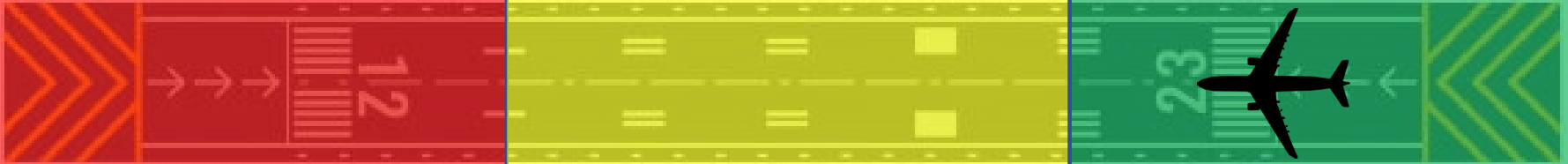
***Timing of Action depends on Probability of strike

Behavior – Location – Animal Mobility – Operations or Phase of Flight

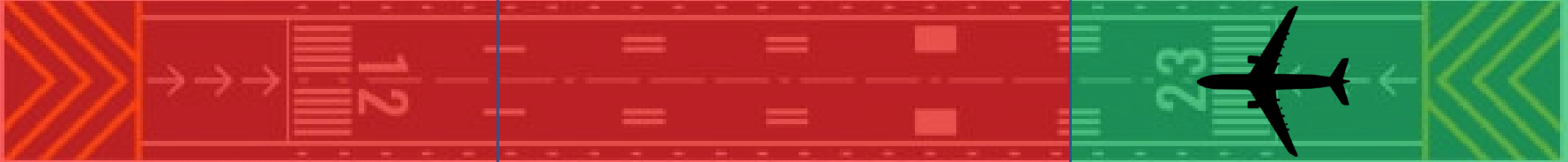
Threshold Response - BIRD



Threshold Response - BIRD



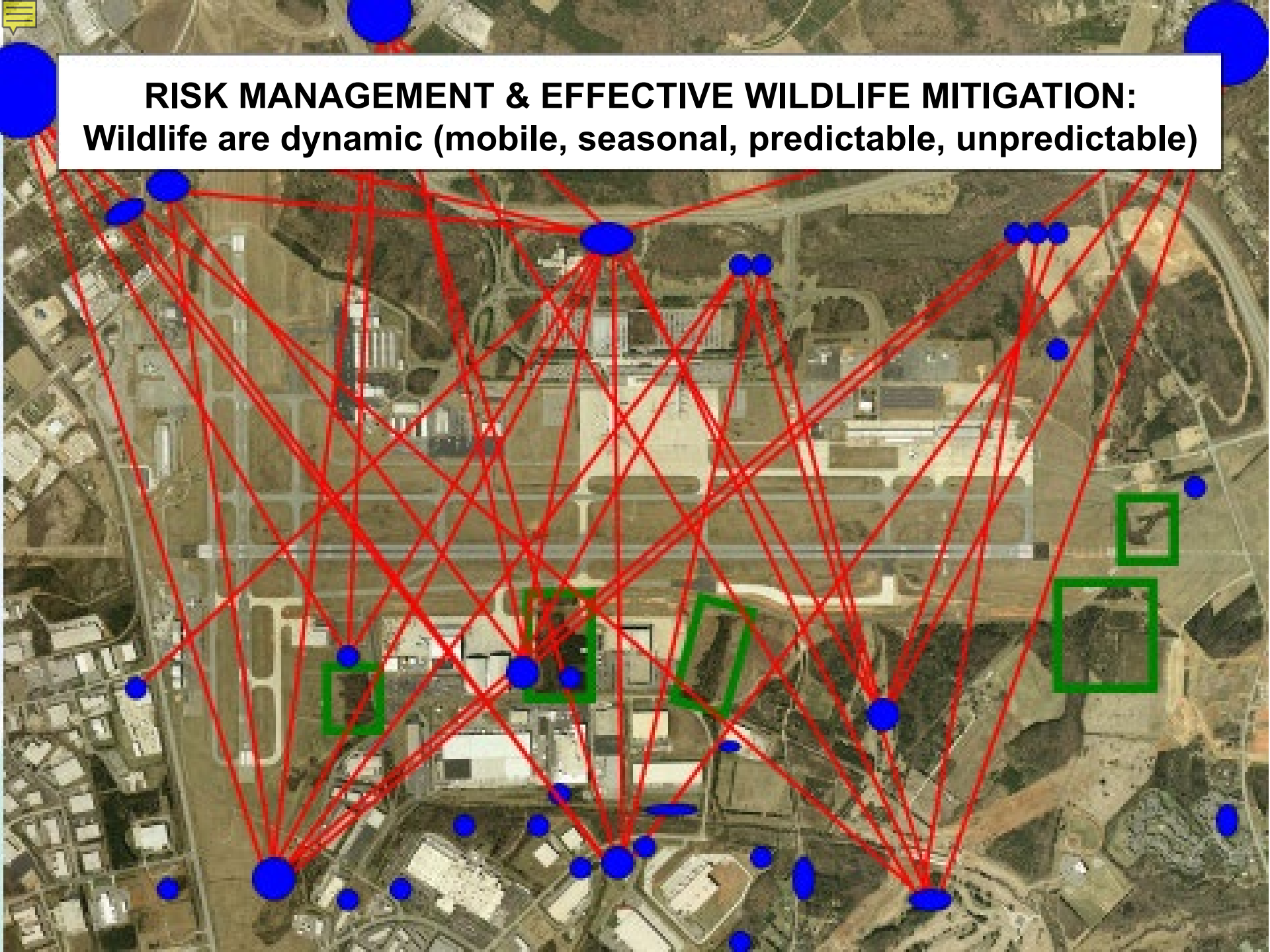
Threshold Response - BIRD



Threshold Response – High Risk MAMMAL



**RISK MANAGEMENT & EFFECTIVE WILDLIFE MITIGATION:
Wildlife are dynamic (mobile, seasonal, predictable, unpredictable)**





C C1 →

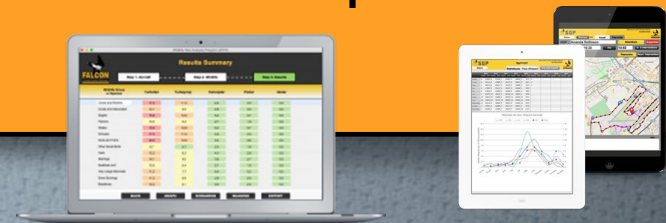


A 16



QUANTIFYING RISK TOOLS

- Quantitative methods based on diverse variables such as: Species – Numbers – Location – Behavior - Time of Day – Season - Attractant - Aircraft type - Aircraft operation numbers
- ACRP Report 145 details WHM and SMS, describes the development of the Wildlife Hazard Management Risk Assessment Tool (WHaMRAT),
- Falcon Environmental created Wildlife Risk Analysis Program (WRAP) to allow an airport bird hazard risk-assessment process
- USDA / Wildlife Services is developing separate Risk Assessment Tool that will link wildlife hazard risk scores to metrics and performance indicators similar to above listed items.



Risk assessment matrix

Severity →

	Negligible	Minor	Moderate	Significant	Severe
Very Likely	Low Med	Medium	Med Hi	High	High
Likely	Low	Low Med	Medium	Med Hi	High
Possible	Low	Low Med	Medium	Med Hi	Med Hi
Unlikely	Low	Low Med	Low Med	Medium	Med Hi
Very Unlikely	Low	Low	Low Med	Medium	Medium

↑
Likelihood

Risk Matrix Example

Likelihood X Severity = Risk Level

Wildlife Hazard Management Risk Assessment Tool (WHaMRAT)

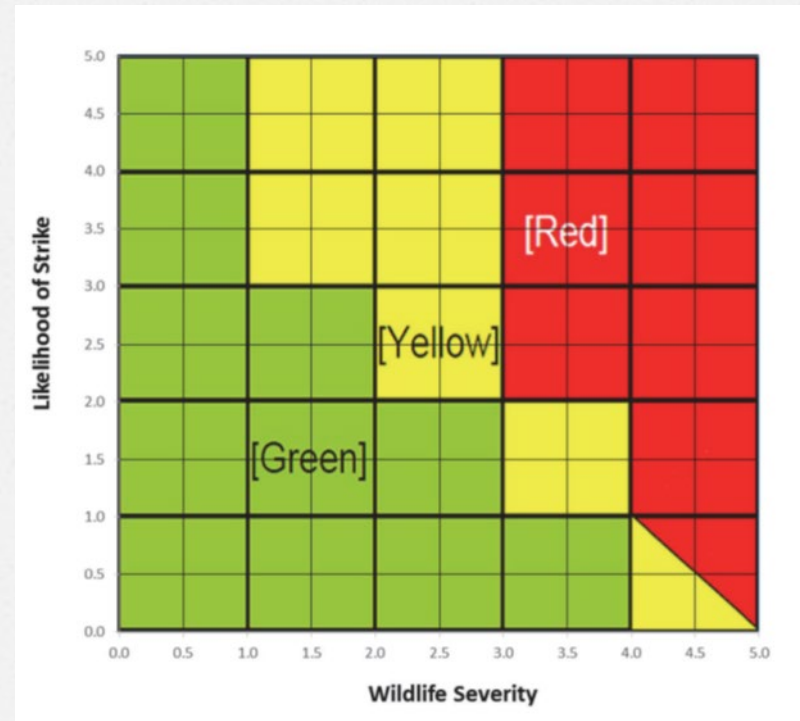
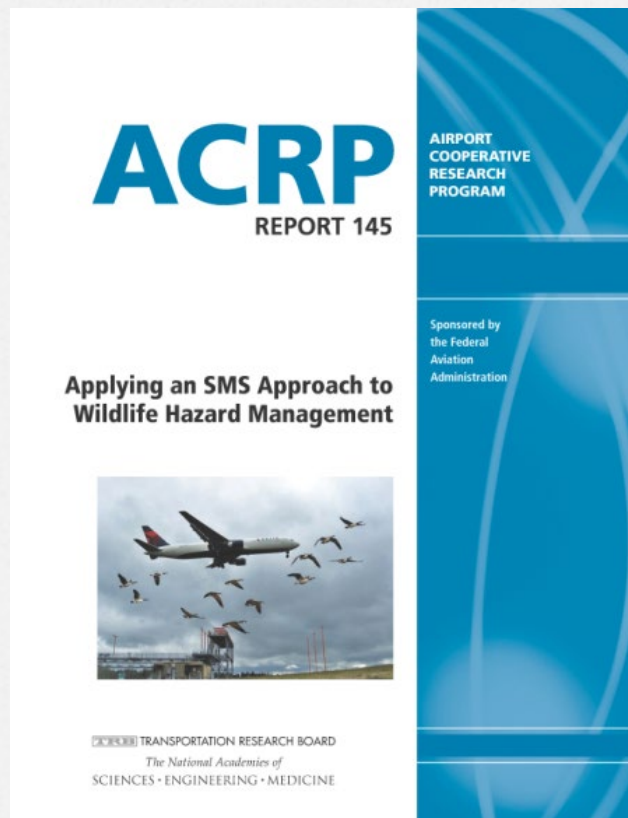


Figure 4: The EZ-Version WHaMRAT Wildlife Data Worksheet

Table 2. The EZ-Version WHaMRAT avian guilds and severity scores.

Weights expressed in grams (g)

Guilds	Severity
Waterbirds	2
Seabirds	2
Pelicans/Cormorants	4
Waders	2
If flocks ≥ 5	5
Waterfowl	3
If flocks < 5	4
If flocks ≥ 5	5
Raptors/Vultures/Owls	2
Upland Game Birds	2
If Turkeys	5
Cranes	5
Shorebirds	1
If flocks < 15	4
If flocks ≥ 15	5
Gulls/Terns	2
If flocks < 10	4
If flocks ≥ 10	5
Pigeons/Doves	1
If flocks < 20	4
If flocks ≥ 20	5
Parrots	1
Aerial Foragers	1
Woodland Birds	1
Corvids	2
If flocks < 10	4
If flocks ≥ 10	5
Grassland Birds	1
Blackbirds/Starlings	1
If flocks < 100	4
If flocks ≥ 100	5
Miscellaneous	1
Criteria for Score	Severity
Less than 300g	1
300–999g	2
1000–1999g	3
2000–3999g	4
Greater than 4000g	5

Source: BASH Inc.

Wildlife Hazard Management Risk Assessment Tool (WHaMRAT)

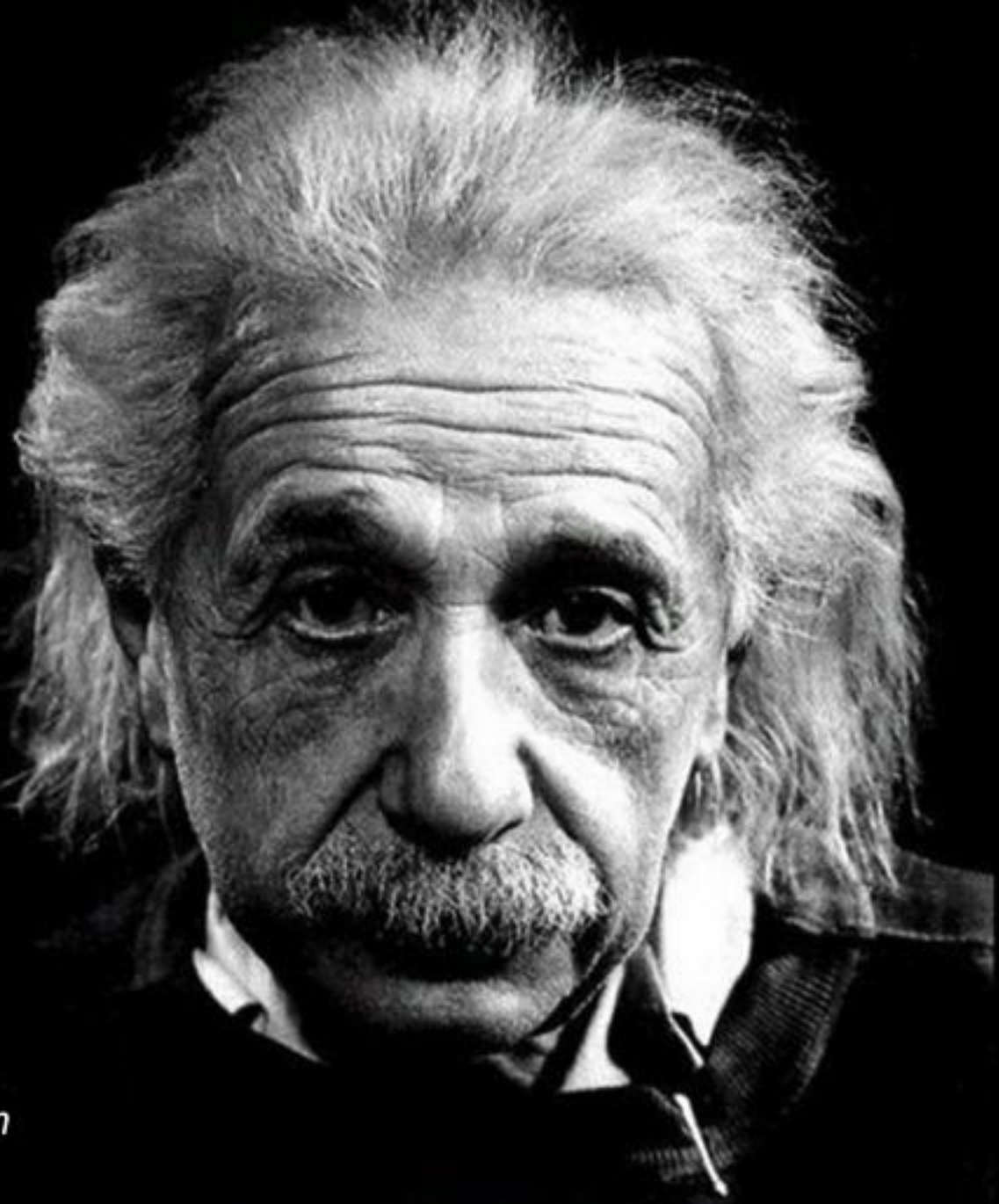
WORLDWIDE CHALLENGES

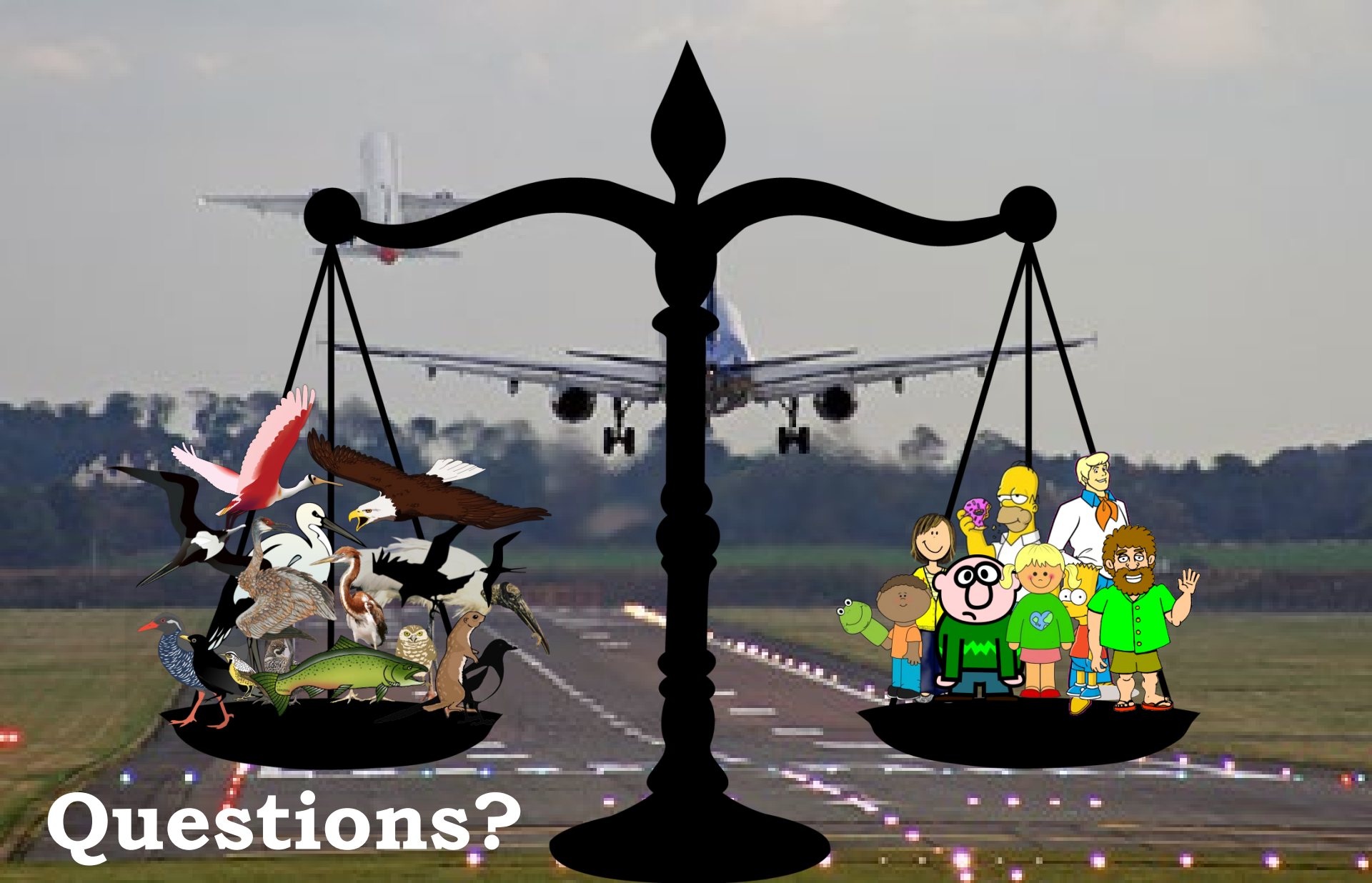
WILDLIFE / AVIATION

1. Lacking standardized regulations / BMPs worldwide
2. Enforcement of regulations
3. Priorities
4. Standardized definitions
5. Language
6. Funding
7. Data collection and Data sharing
8. Resources (Feather ID Labs, BSCs)
9. Personnel (numbers, expertise / experience, etc...)

"If I had an hour to solve a problem and my life depended on the solution, I would spend the first 55 minutes determining the proper question to ask, for once I know the proper question, I could solve the problem in less than 5 minutes."

- *Albert Einstein*





Questions?