9-2011

Native vegetation conservation vs. induced grass covered surfaces as a control measure for risk fauna

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Native vegetation conservation *vs.* induced grass covered surfaces as a control measure for risk fauna

12 ASA airports case study in Mexico

2011 Bird Strike North America Conference

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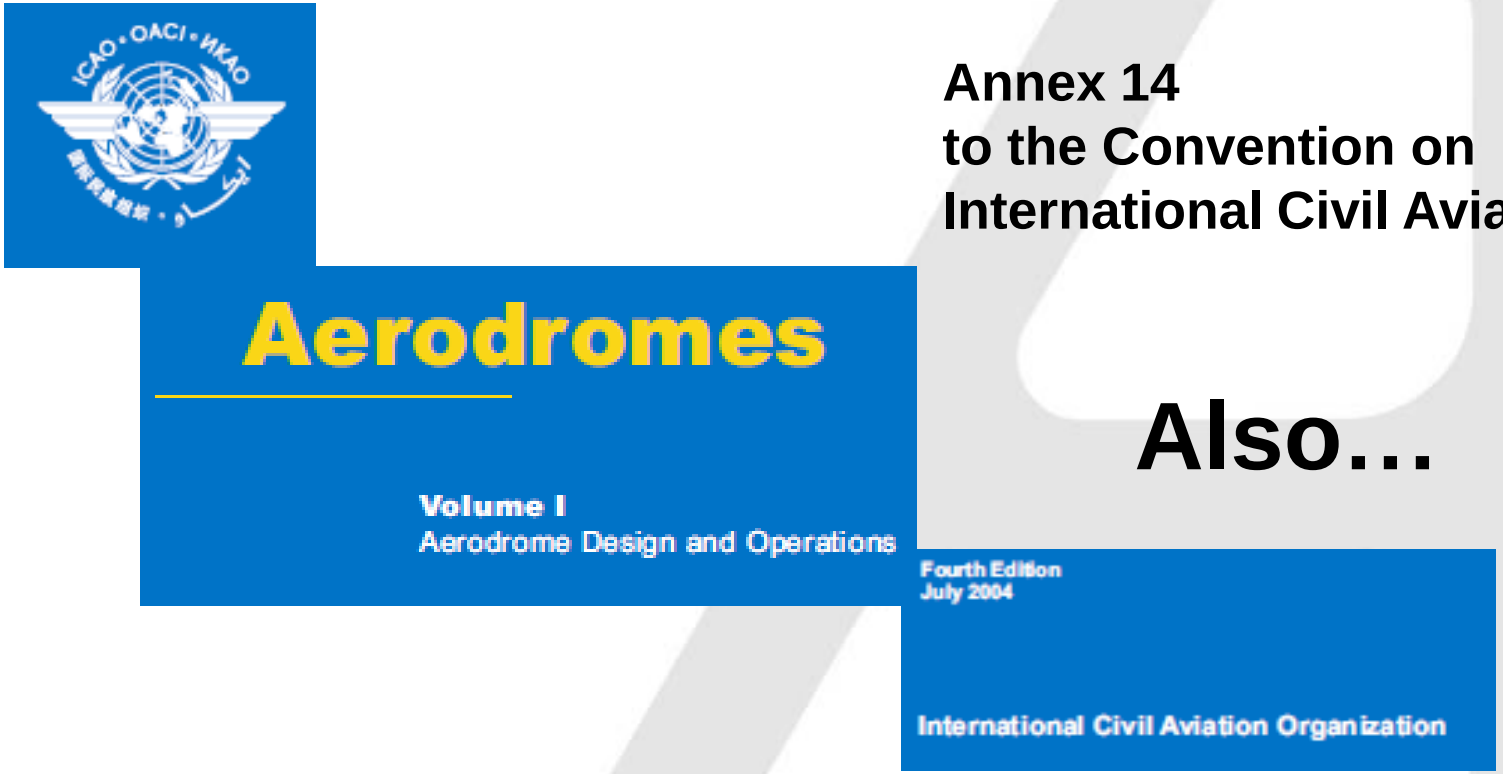
INTRODUCTION

Airports are due to maintain aerodrome conditions free of vegetation for visibility and safety, according to international regulations

Annex 14
to the Convention on
International Civil Aviation



Also…

INTRODUCTION

Wildlife Hazard Management at Airports: A Manual for Airport Personnel

Edward C. Cleary Richard A. Dolbeer

9.2.B HABITAT MODIFICATION AND EXCLUSION

Habitat modification means changing the environment to make it less attractive or inaccessible to the problem wildlife. All wildlife require food, cover, and water to survive. Any action that reduces, eliminates, or excludes one or more of these elements will result in a proportional reduction in the wildlife population at the airport.

The management of an airport's airside ground cover to minimize bird activity is a controversial subject in North America. The general recommendation, based on studies in England in the 1960s and 1970s, has been to maintain a monoculture of grass at a height of 6-10 inches (Transport Canada) or 7-14 inches (U.S. Air Force).

Tall grass, by interfering with visibility and ground movements, is thought to discourage many species of birds from loafing and feeding. However, the limited studies conducted in North America have not provided a consensus of opinion on the utility of tall-grass management for airports.

INTRODUCTION

What have we seen in our tropical/semiarid environments on 12 ASA airports?

Cardinals

Parrots

Whrens

Tucan

Peccary

Black-throated magpie jay

Several native species prefer canopy/vegetation protected conditions than open spaces

INTRODUCTION

Whereas induced grass

Favors the entry of generalist , opportunistic and/or exotic species:

Increases risk because of their size and gregarious habits.

Domestic pigeon

Collared dove

Great-tailed-Grackle

Dogs

Cats

Jackrabbit

Cara cara

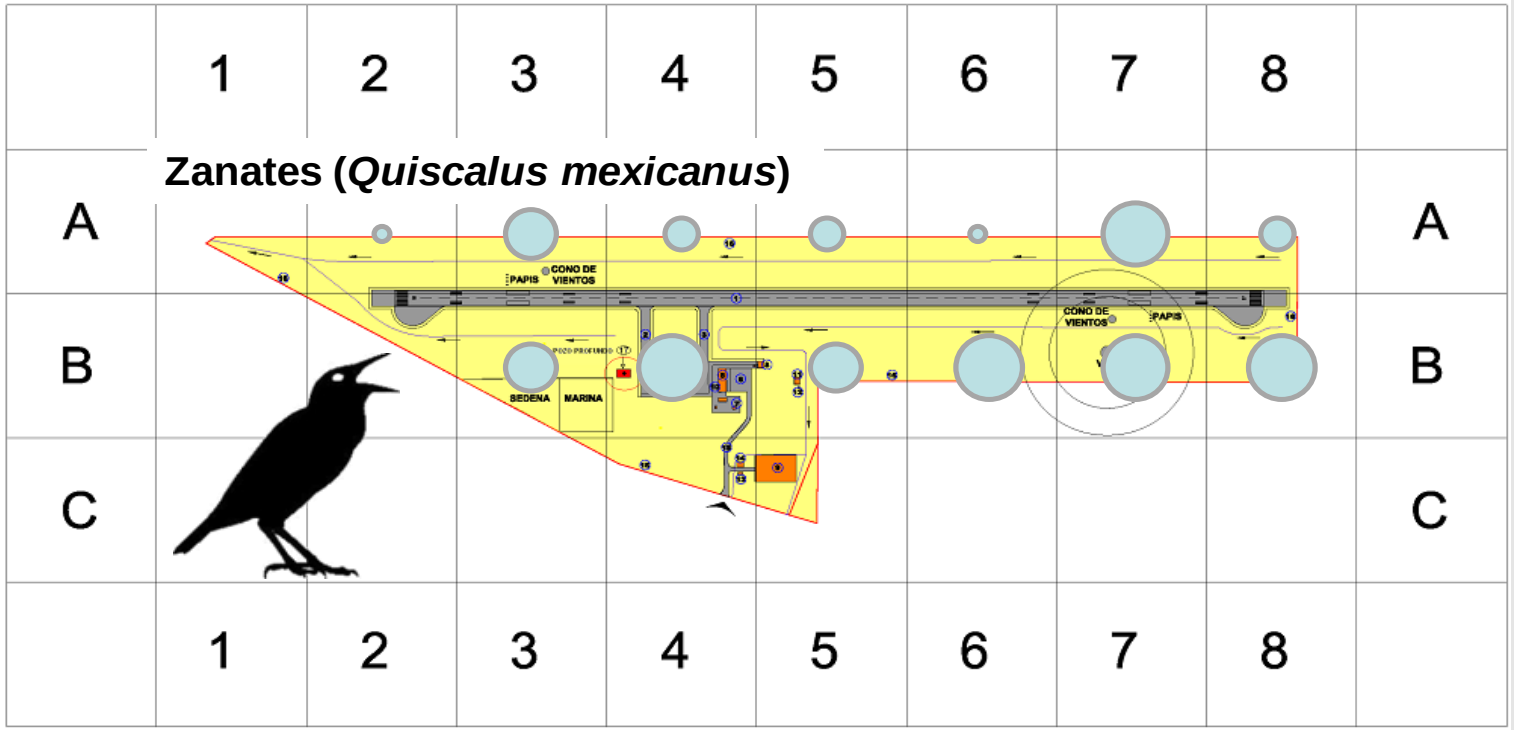
Cattle egret

NATIVE AND EXOTIC SPECIES

Airport	Native low risk species	Exotic, generalistic and high risk species
CEN Matorral xerófilo	Lince (Lynx rufus) Juancito (Spermophilus sp) Zorrillo (Mephitis sp.)	Perro (Canis familiaris) Gato (Felis catus) Zanate (Quiscalus mexicanus)
PXM Trópico seco	Zorra gris (Urocyon cinereoargenteus) Jaguarundi (Herpailurus yagoaroundi)	Perro (Canis familiaris) Zanate (Quiscalus mexicanus)
PAZ Trópico húme		
MAM Matorral espin		
CVM Matorral espir		
CTM Trópico húmedo	Zorra gris (Urocyon cinereoargenteus) Zereque (Dasyprocta sp) Tepezcuintle (Cuniculus paca) Coatí (Nasua narica) Mapache(Procyon lotor) Cuatro ojillos (Philander opossum) Tlacuache (Didelphis sp) Urracas (Cyanocorax yucatanensis) Lagartijas (Diversos géneros) Serpientes (Diversos géneros)	Zanate (Quiscalus mexicanus)
UPN Bosque de pino y	Tlacuache (Didelphis sp)	Perro (Canis familiaris) Gato (Felis catus) Zanate (Quiscalus mexicanus) Paloma doméstica (Columba livia)
TPQ		
GYM Matorral xerófilo	Zorra gris (Urocyon cinereoargenteus) Zorrillo (Mephitis sp)	Perro (Canis familiaris) Paloma doméstica (Columba livia)
LTO Matorral xerófilo	Lince (Lynx rufus) Zorrillo (Mephitis sp)	Perro (Canis familiaris)

INTRODUCTION

Example: Great-tailed Grackle



≥16 ≤28

≥8<16

≥5<8

≥1<5

Great –tailed Gracke abundances

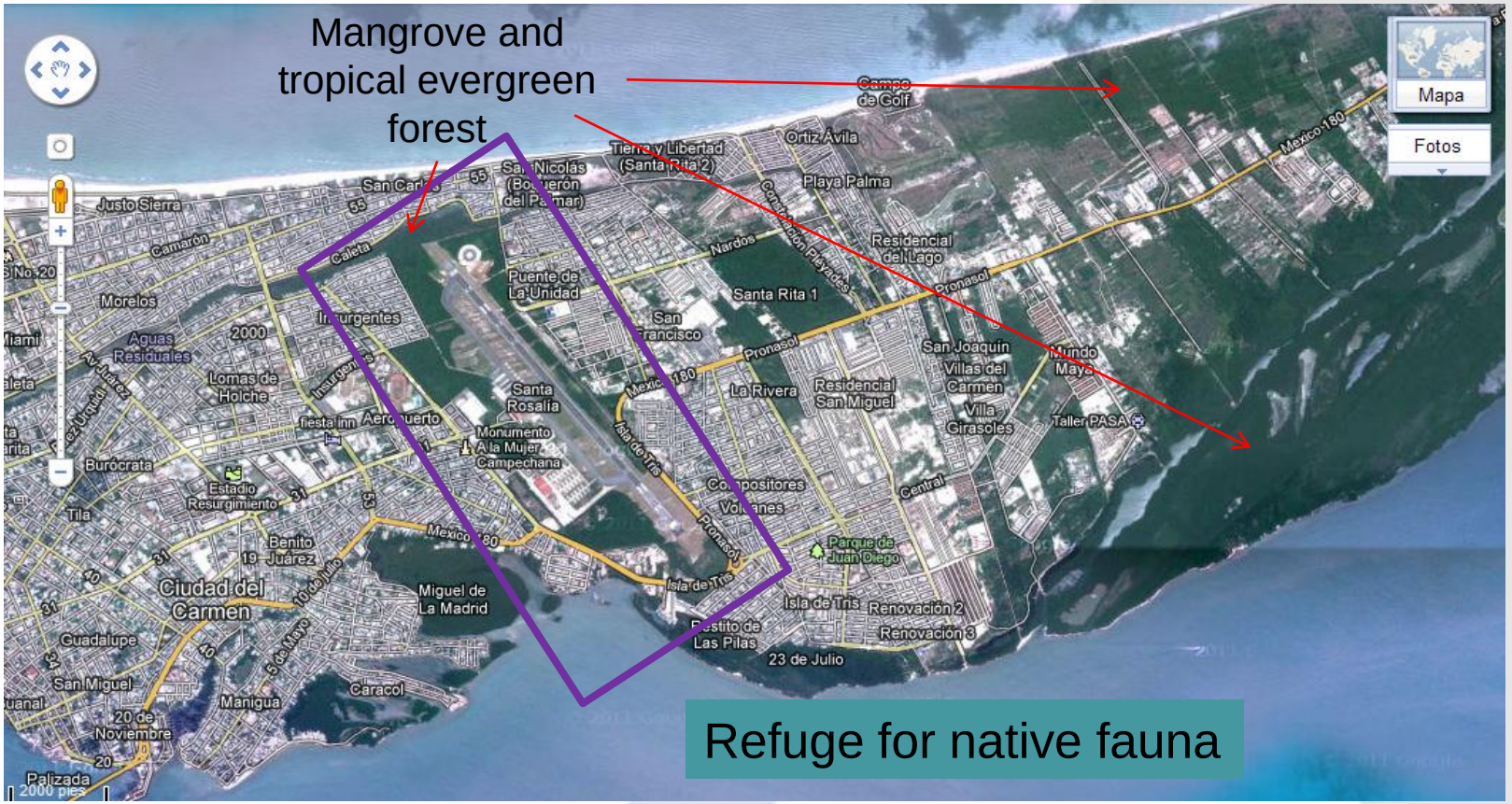
INTERROGATIVE ?

For Mexican tropical evergreen and semiarid airports.

Is a grass monoculture an appropriate measure to reduce risk fauna activity ?

SITUATION

Many airports in Mexico represent high diversity islands within an urban/agricultural ocean.



Niche occupation by native species inside airport boundaries

(how an organism makes a living)

SITUATION: Niche occupation

Tropical landscape holds tropical fauna:

Satisfies all their needs for food, water, shelter, housing and reproduction

Animals don’t go about searching for them elswhere

SITUATION: Niche occupation

Semi-arid landscape holds semi-arid fauna:

Satisfies all their needs for food, water, shelter, housing and reproduction

Animals get exposed to environment/predators if they go about searching for them in more open areas

RESULTING SITUATION

Native fauna remains within native vegetation

Opportunistic gregarious species take advantage with airport clearings and grass monoculture establishment

RISK IMPLICATIONS?

Grupo Selome

HYPOTHESIS

Native vegetation areas hold less high risk species, compared to modified landscapes with induced grass monoculture.

OBJECTIVE

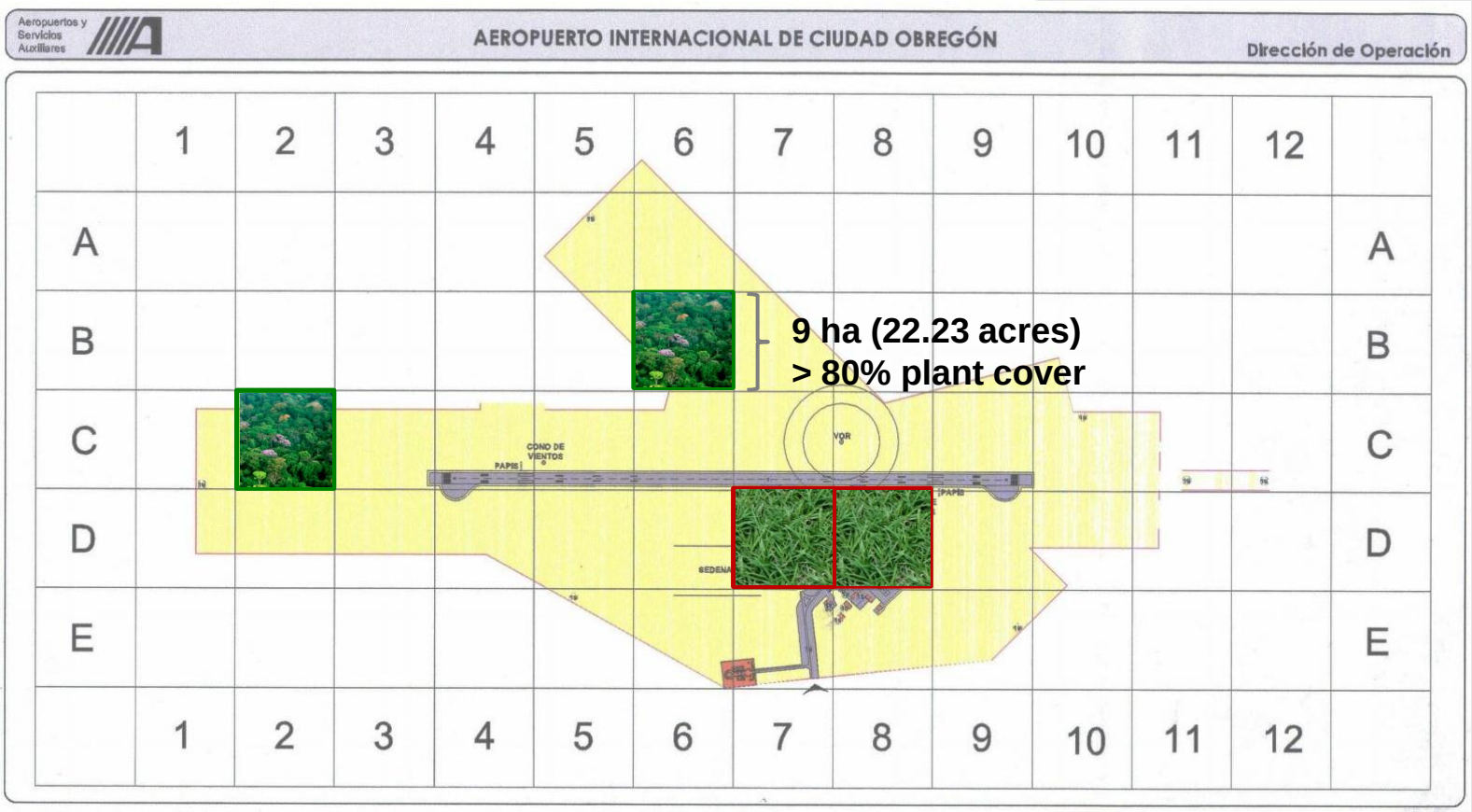
To compare risk fauna species abundances in native vegetation and grass monoculture areas within different airports in Mexico.

STUDY SITE

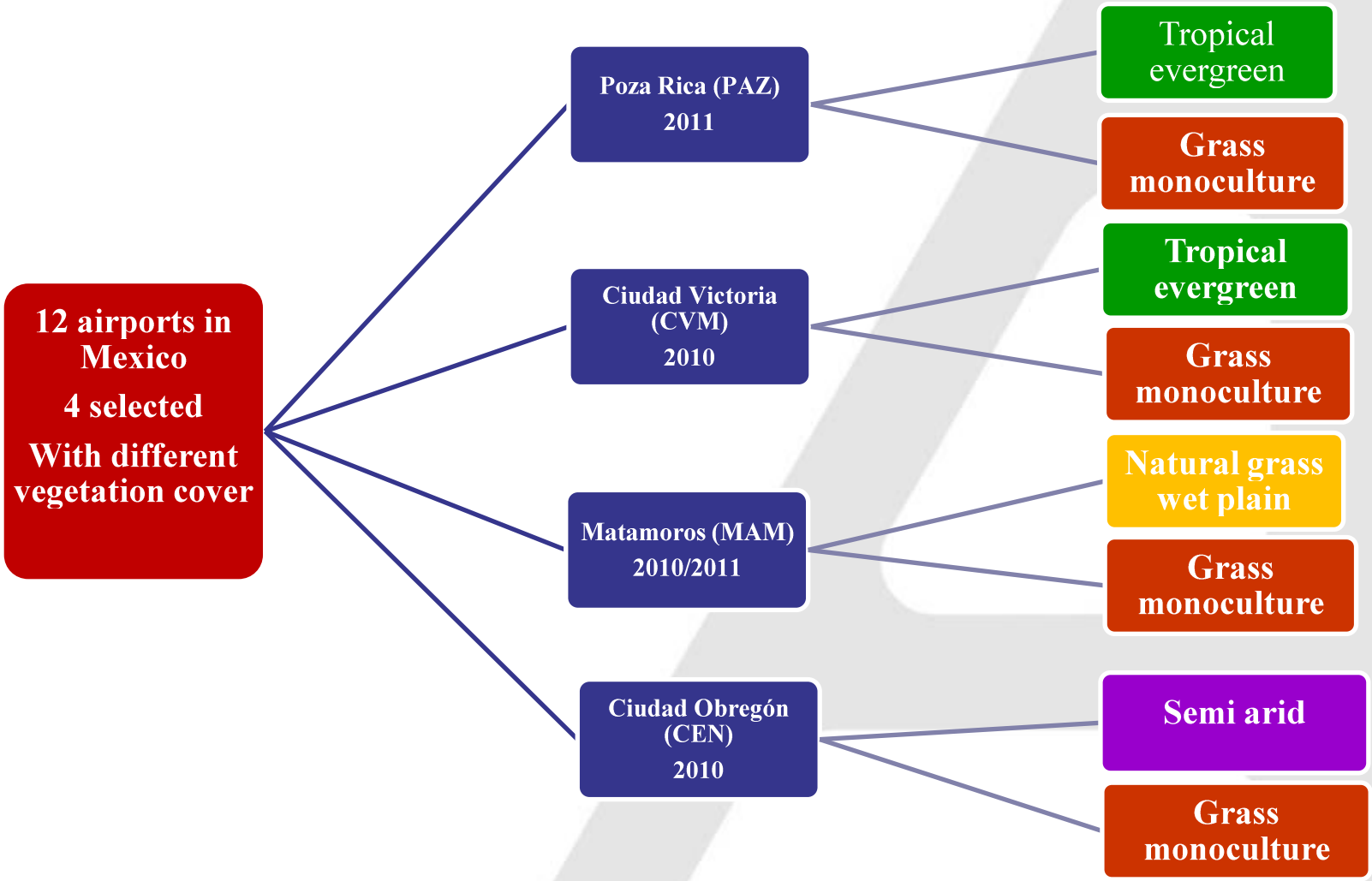
12 ASA airports under different native vegetation cover

SAMPLING

At each airport… 2 plots of each vegetation type



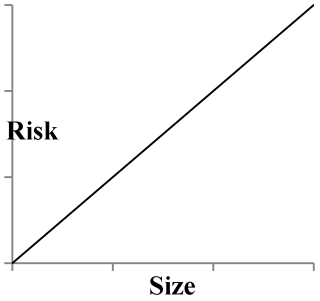
SAMPLING


12 airports in Mexico
4 selected
With different vegetation cover
Poza Rica (PAZ) 2011
Ciudad Victoria (CVM) 2010
Matamoros (MAM) 2010/2011
Ciudad Obregón (CEN) 2010
Tropical evergreen
Grass monoculture
Tropical evergreen
Grass monoculture
Natural grass wet plain
Grass monoculture
Semi arid
Grass monoculture

HAZARDOUS FAUNA CRITERIA

Composed risk index

Size



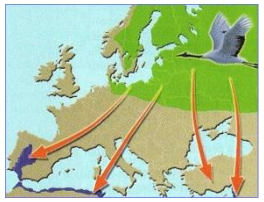
Behavior

Abundance

High risk

Low risk

Frequency/movement



Migratory species

Resident species

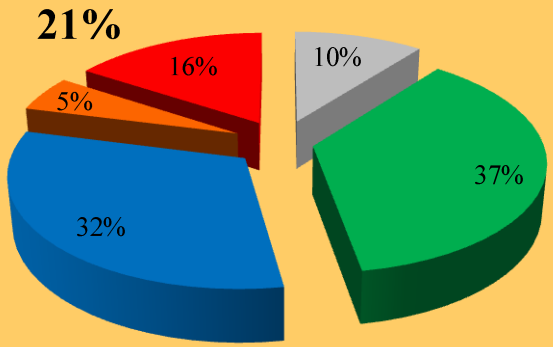
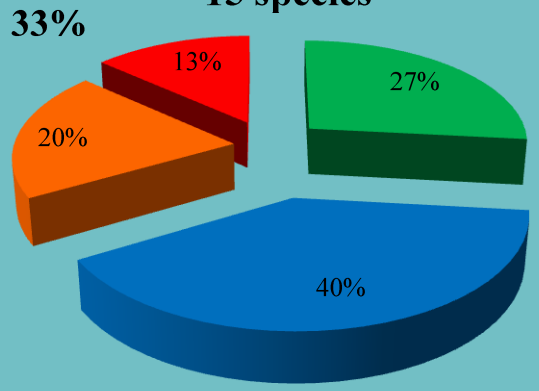
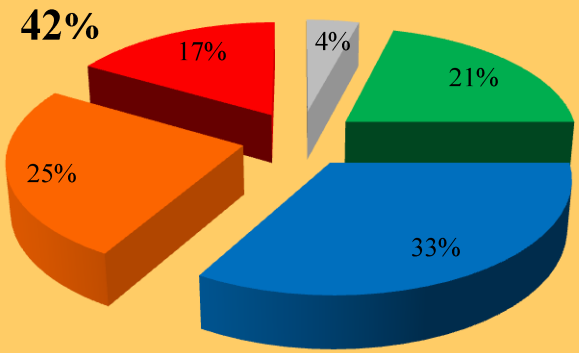
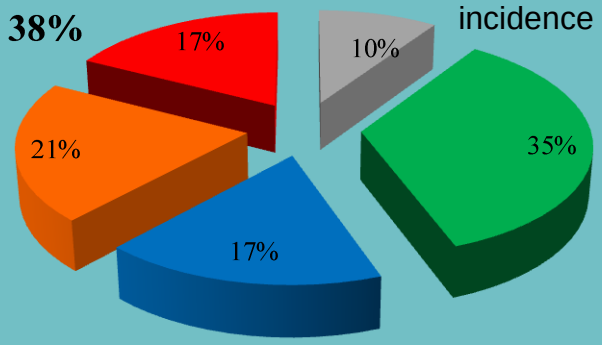
Statistics (reported incidents)

HAZARD SPECIES CLASSIFICATION

Category	Value	Definition
Very High	4	Species gathering 4 -5 hazard criteria
High	3	Large and abundant resident species. Activities near runway. Three risk factors are considered.
Medium	2	Medium gregarious species that use airport movement areas. Represent an indirect risk they attract predators
Low	1	Small size, lone habits, and do not use airport movement areas. They attract predators
Not determined	0	Not registered species. Airport workers report its presence, but we do not have enough information for establishing a risk category.

PRELIMINARY RESULTS

Risk Species Abundaces:

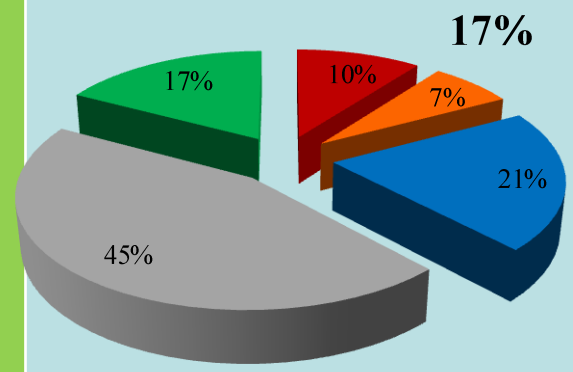
	PAZ: Poza Rica	CVM: Cd Victoria
Native vegetation Tropical evergreen	19 species 	15 species 
Grass Monoculture	24 species 	63 species Higher species incidence 

Very High	4
High	3
Medium	2
Low	1
Not det.	0

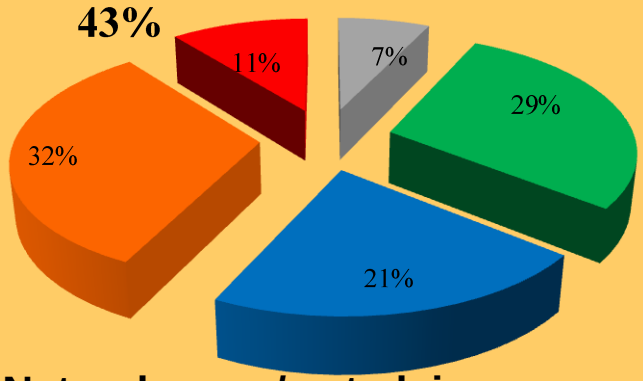
Grupo Selome
Valor ambiental compartido

PRELIMINARY RESULTS

	CEN: Nuevo Laredo	MAM: Matamoros
Native vegetation	29 species	28 species
Grass Monoculture	25 species	63 species

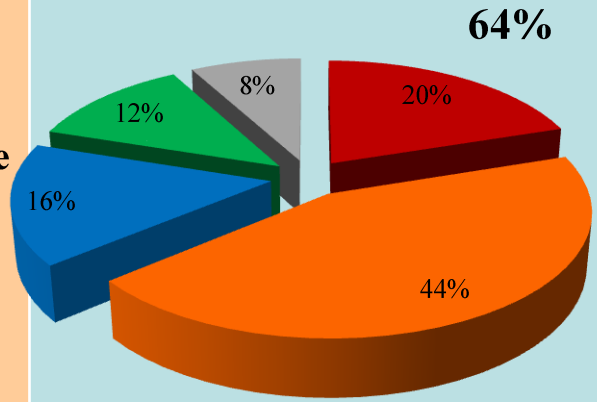


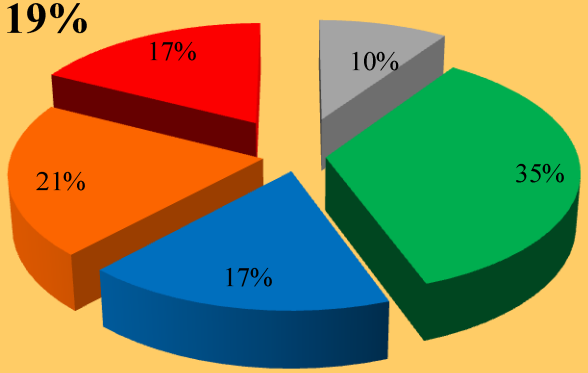
Semi arid



Natural grass/wet plain

Higher species incidences





Very High	4
High	3
Medium	2
Low	1
Not det.	0

Grupo Selome
Valor ambiental compartido

MAM: Matamoros airport

Natural grass/wet plain

PRELIMINARY RESULTS

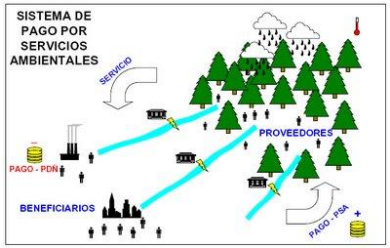
Airport	Native vegetation		Grass monoculture	
	Very high risk	High risk	Very high risk	High risk
MAM	3	9	11	13
CVM	2	3	4	3
CEN	3	2	5	11
PAZ	3	1	4	6
	11	15	24	33
TOTAL		26		57

OTHER ADVANTAGES

Conservation of native vegetation:

- Additional benefits:

Reduces maintenance costs



Environmental services

Prevents soil erosion

Noise isolation

Dust isolation

Suppors local biodiversity

Improves landscape configuration

Maintenance of monotypic, uniform stands of tall grass is difficult and expensive on many airports because of varying soil conditions and the need for fertilizer and herbicide applications. Arid regions in the western USA cannot maintain tall grass without irrigation.

CONCLUSIONS

Preliminary results suggest:

• Substitution of a large portion of the natural vegetation within airport boundaries (under tropical evergreen and arid conditions) by induced grass monoculture seems to open niche possibilities for opportunistic species, which imply higher risk than natives due to their gregarious daring behavior, size and mobility.

•Induced pastures produce spikes and soil fauna that constitute abundant food sources for rodents, insects and birds, that attract predators of higher risk levels than the former. Therefore we think they should be restrained to the minimal surface required by airport safety requirements.

•Keeping native vegetation as much as possible helps to preserve biodiversity, soil, protects endemic and endangered species, avoids the entry of exotic and generalist species and doesn t need maintenance (less $). (*The management of airside vegetation to minimize rodents, insects, and seeds might be complex, requiring insecticide, herbicide, and rodenticide applications; changes in vegetation cover; and adjustments in mowing schedules..-Cleary Richard A. Dolbeer, 2005*)

WHAT'S NEXT?

Once we have at least one year of risk fauna monitoring at all ASA airports, we plan to analyze data grouped by type of native vegetation so that we can test our hypothesis in a more robust way.

If our suspicions are confirmed by such analysis, we would like to do some trial plots for different types of creeping vegetation/grasses and other materials to look for alternative solutions.

THANK YOU!