

TRIAL WITH GRASSES AT BARCELONA AIRPORT CONCLUSIONS FOR SAFETY

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- Advisor consultant company to the Barcelona-El Prat Airport



- Scientific advice from the university

With the collaboration of:

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Introduction

- Fauna hazard management starts with **preventive actions**.
- In Barcelona we have identified 44 species involved in bird strikes (2009-2013).
- 90% of bird strikes are generated by 13 species.
- Some of them go to airfield to **feed on vegetation or insects**.
- Causing disturbances in flight operation and some damaging strikes.



Swift (40 g)
32% of strikes



Kestrel (170 g)



Swallow (20 g)



Mallard (890 g)

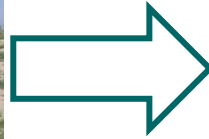
Objectives for grass management at Barcelona-Airport

To reach a habitat:

- Homogeneous across all the airfield.
- With a low diversity of plant species.
- Dense and tall.



Past/present: airfield after works



Future?

Preparing the trial

In 2011 we gathered some information about the use of grasses inoculated with endophyte fungi.



AgResearch New Zealand

In cooperation with the Polytechnic University of Catalonia, we selected different varieties of grasses, **resistant to Mediterranean climate**:

- Grasses with endophyte fungi: *Festuca arundinacea*, *Lolium perenne*, *Poa pratensis* and *Cynodon dactylon*.
- Sterile grasses (no seed production): *Paspalum vaginatum*.

Implementation of the trial

Trial carried out in **three plots**, in 2012 autumn:

- Plot 1: control.
- Plot 2: endophytic grasses.
- Plot 3: sterile grasses.

Grasses with endophyte fungi sowed in an additional plot of 2200 m².

No reseeding or other interventions done.



Monitoring of birds and invertebrate abundance

55 bird counts between March 2013 and January 2014.

- Two days per month, three times per day, 15 minutes per count.
- One ornithologist from a distance of 100 m.

Three invertebrate surveys and vegetation measurements: June, August and October 2013.

- Use of pentagonal sleeves for vegetation shake.
- Each sample taken in a 30 m transect, 4 m wide.



Invertebrates abundance evaluation

- Samples maintained in 60° alcohol.
- Classified into orders of Insects and Gastropod (snails)
- Dried 48h in oven at 60 °C
- Every sample weighted in a precision balance



Results on vegetation establishment

Control plot reached the highest coverage and height of vegetation. Also high biodiversity.

There were intrusion of vegetation from outside the plots, specially in Plot 2 (endophytic grasses).

	Plot 1 (control)	Plot 2 (endophytic grasses)	Plot 3 (sterile grasses)
Mean height	46,0 cm	8,7 cm	13,9 cm
Mean coverage (%)	>90 %	80-90 %	70-80 %



Plot 1: control



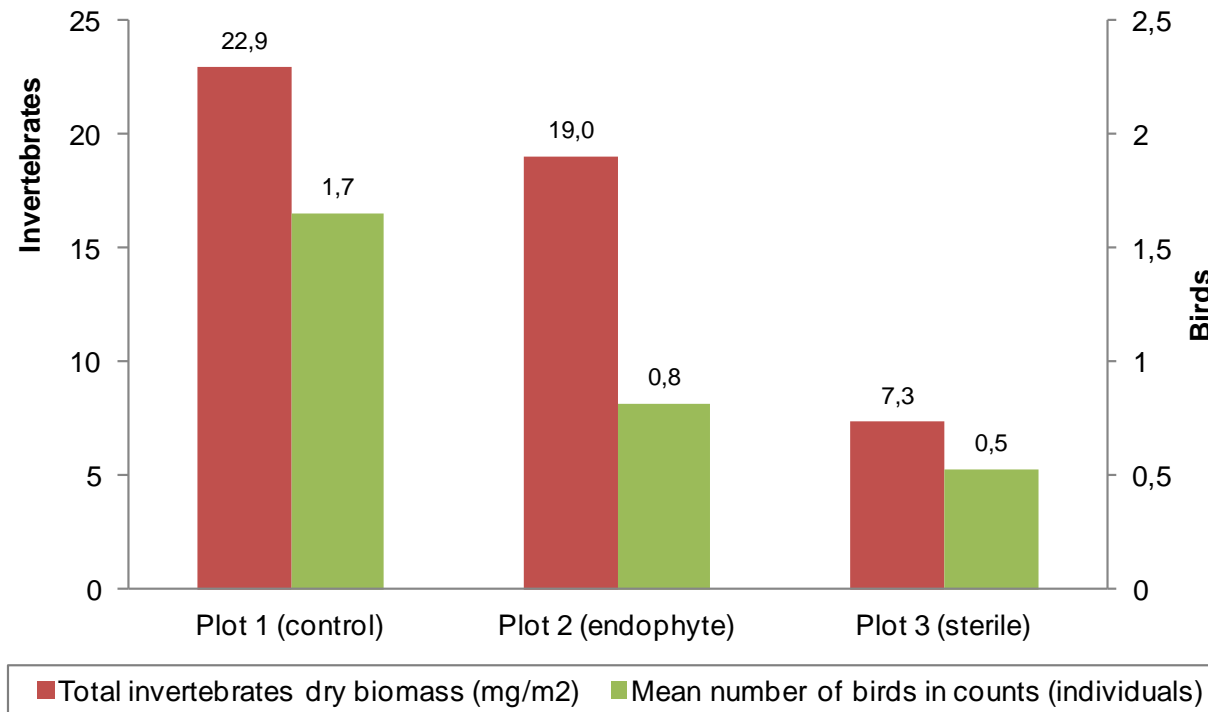
Plot 2: Endophytic grasses



Plot 3: Sterile grasses

Results on animal abundance

Highest abundances of invertebrate biomass and birds were found in the Control plot. Highly variable among samples.



Statistics showed significant differences in birds between Plots 1 and 3.

93% of invertebrate biomass was due to snails.

Discussion and conclusions

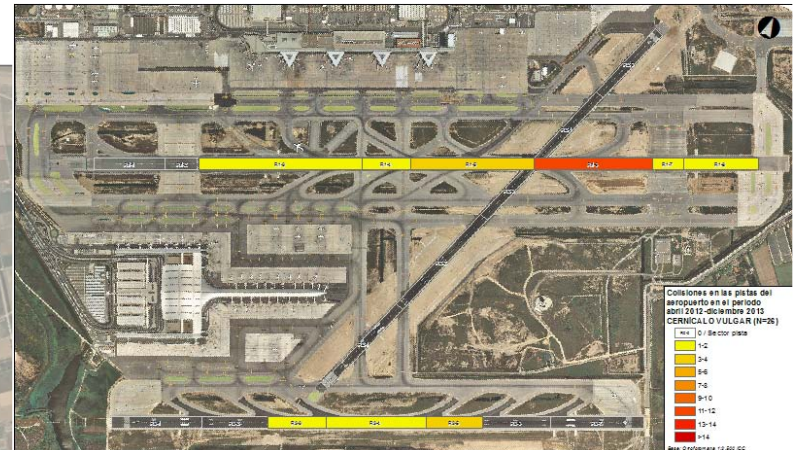
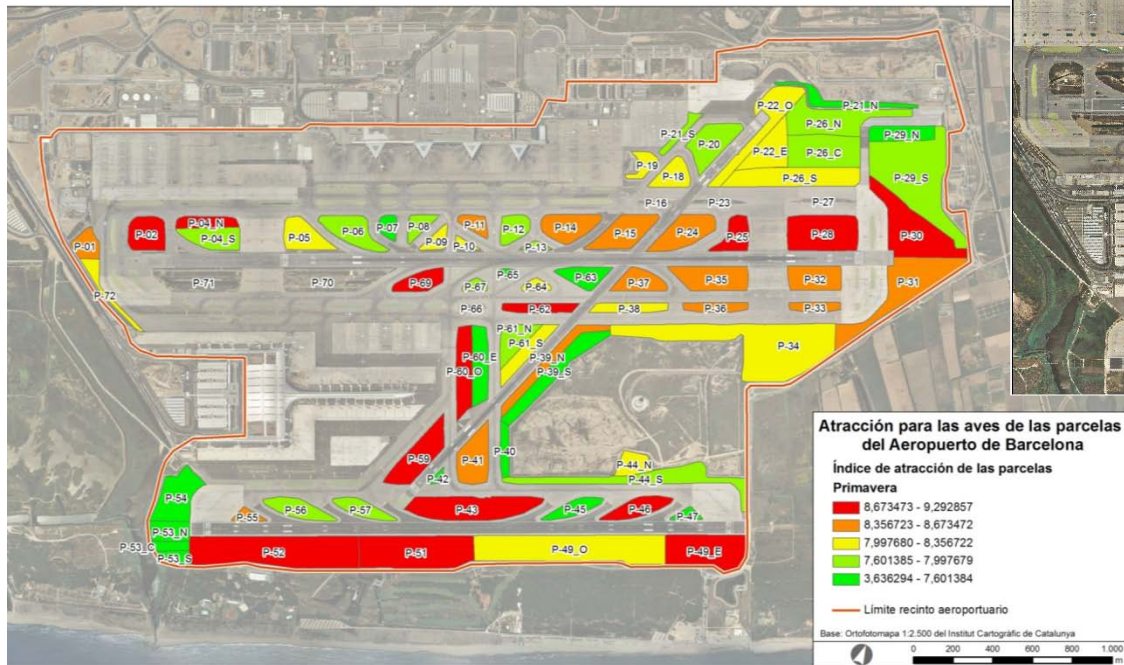
- Birds' counts are more robust vs invertebrate surveys for statistical purposes, cheaper and easier to carry on.
- Grass management at airfield must include sowing. Cutting the autochthonous vegetation is not enough.
- Grass maintenance after sowing is important to reduce vegetation intrusion and to ensure a good establishment.
- In our trial, lower bird and invertebrate abundance was found in sterile grass.
- Nevertheless, grass with endophyte fungi grows slowly and reach a higher percentage of coverage. This permits a better management to reach the desired habitat more cost efficiently.



The next step

- Expand endophytic grasses to the rest of the airfield.
- This is highly expensive. Some areas have been sowed during 2014.
- An inventory was done to determine the most attractive vegetation to birds. Along with the location of bird strikes allows us to set the priorities.

Level of attraction (red highest; green lowest)



Kestrel strikes

Thank you very much

We all are waiting for your contributions

