The role of grass species in reducing vertebrate visits to airfields

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Introduction

- conflicts have been reported from the beginning of aviation
- Orville Wright 1905
- Paris-Madrid air race 1911

Eugene Gilbert in Bleriot XI attacked by eagle over Pyrenees in 1911 depicted in this painting (Wikimedia Commons).

Introduction

- de Havilland Comet 1952 was the first commercial jetliner

~start of larger scale bird problems!

Wikimedia Commons

Introduction

- bird and other wildlife strikes are costly
- worldwide, 1200 million US dollars/year
- 65,139 bird strikes for 2011–14
- 177,269 wildlife strike reports on civil aircraft between 1990 and 2015

Inside of a jet engine after a bird strike / Wikimedia Commons

Introduction

- larger animals obviously most dangerous to aircrafts
- but also smaller, if in large numbers

US Airways Flight 1549 in the Hudson River, New York, USA on 15 January 2009 ©Greg L

Countermeasures

- lethal methods
- non-lethal methods
  - exclusion (fences: mammals)
  - visual repellents (falcons, dogs, lasers)
  - auditory repellents
  - tactile repellents (spikes)
  - chemical repellents
  - relocation
  - **habitat manipulation**

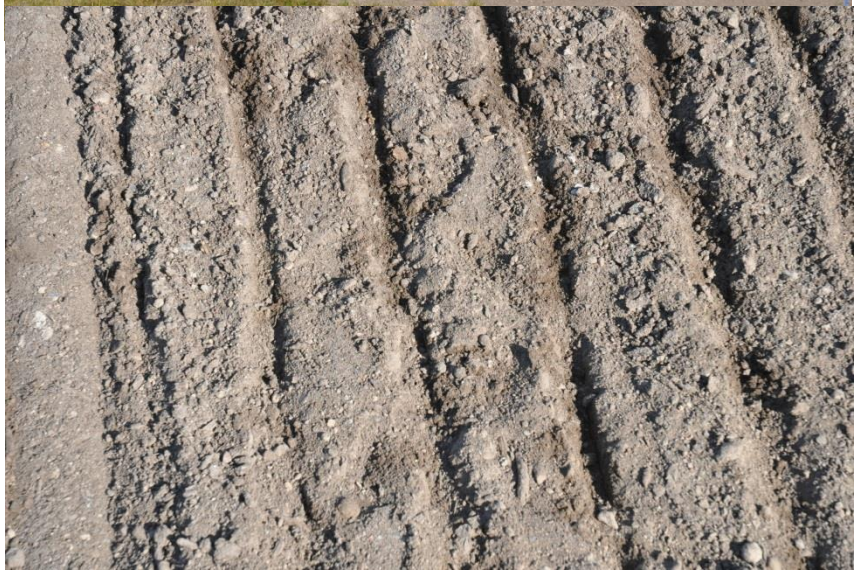
An Airbus A330 of China Eastern behind a flock of birds at London Heathrow

Habitat manipulation

- turfgrass is preferred food source for geese etc.
- how to decrease the appeal of turfgrass?
- using endophyte-infected grasses that taste bad
- using less palatable grass species

Experiment at Helsinki-Vantaa airport

- June 2017
  - Tall fescue (*Festuca arundinacea*)
  - Meadow fescue (*Festuca pratensis*)
  - ”standard hay seeds”
- 3 stripes in each 25x25plot
- 5 plots



Study plots at Helsinki-Vantaa airport

Monitoring methods

Vertebrate monitoring

- pellet counts
- camera traps
- visual observations

+ insect samples

Methods

Plant measurements

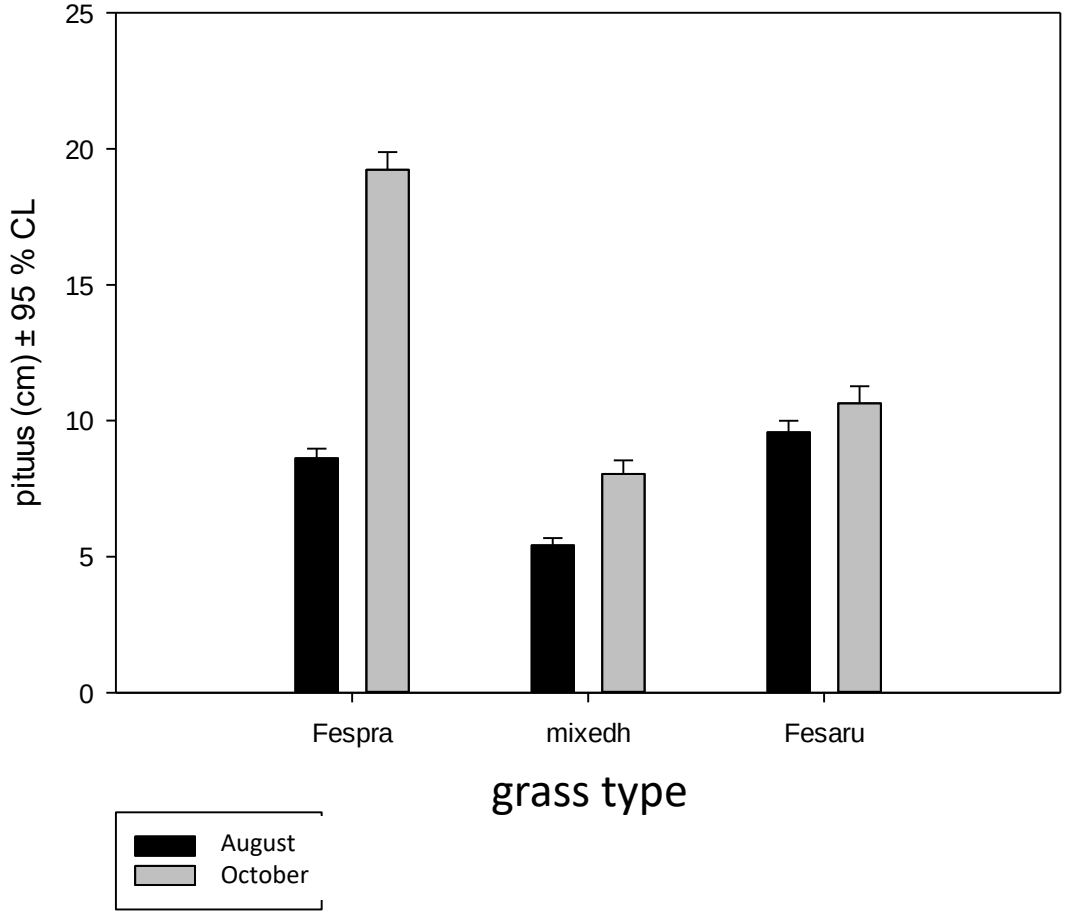
- height
- germination frequency cover
  - 10x10cm 2017

    (100x100cm 2018)

Results

- plant performance
  - growth 2017

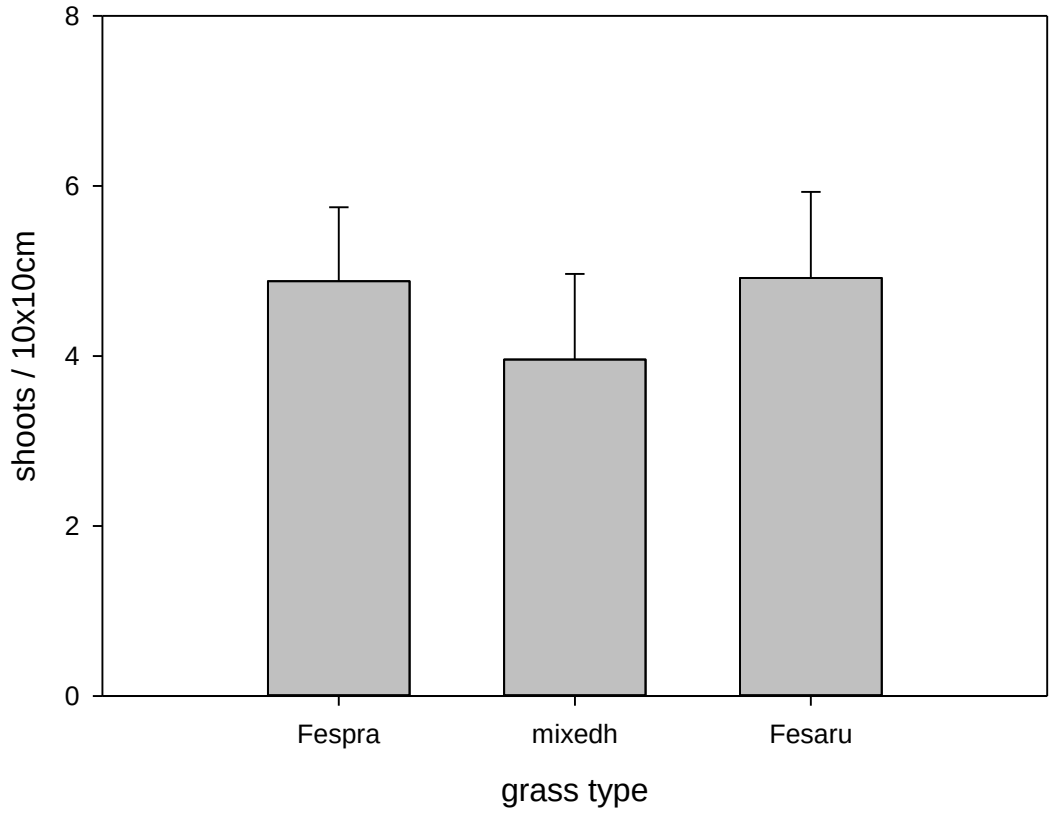
  = shoot height



Fespra= Meadow fescue, mixedh= standard grass mixture, Fesaru = Tall fescue

Results

- germination of seeds



Fespra= Meadow fescue, mixedh= standard grass mixture, Fesaru = Tall fescue

Results

- Pellet counts
- not feasible

Visual observations – similar conclusion

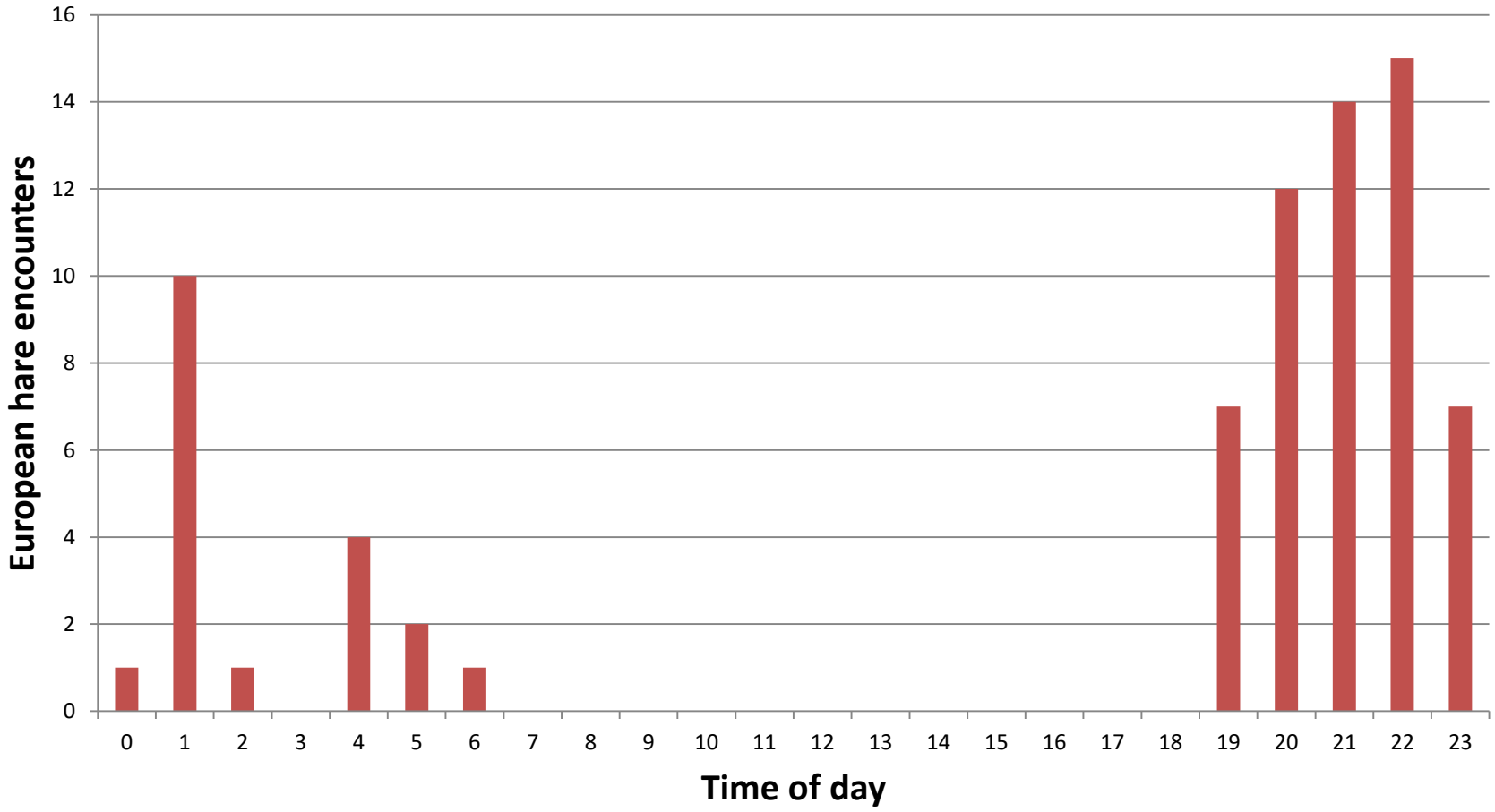
Camera traps

- c. 300 pictures
- European hare in most of these
- also some foxes, raccoon dogs and rabbits

Animal encounters in camera traps

Species	B	C	D	E	∑
European hare (*Lepus europaeus*)	15	23	15	21	74
European rabbit (*Oryctolagus cuniculus*)			12		12
Animal (Mammalia)	1	3	1	4	9
Raccoon dog (*Nyctereutes procyonoides*)	1				6
unidentified hare / rabbit (Lagomorpha)			4	1	5
Fox (*Vulpes vulpes*)		3		1	4
Northern Wheatear (*Oenanthe oenanthe*)	1		2		3
Bird (Aves)	1				1
Animal encounters	18	29	34	27	114
no visible reason	23	6	19	7	55
∑	42	40	53	34	169

Activity pattern of the European hare



Conclusions

- Tall fescue and meadow fescue grow better than the standard seed mixture
- Camera trapping is an efficient monitoring method of animals

Season 2018

- Automatic cameras to all plots and stripes (=15)
- measuring the vegetation cover (and height)
- measuring the area of eaten grass
- 1x1m vegetation plots
- insect monitoring

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