

# Lasers, Drones and Speakers: Field Testing of Bird Control Tools

Marie-Line Fiola, Pierre Molina, Maxime Allard, Sarah Gagnon, Franck Chambon, Lynzey Ruscitti

**FALCON**

ENVIRONNEMENT | ENVIRONMENTAL

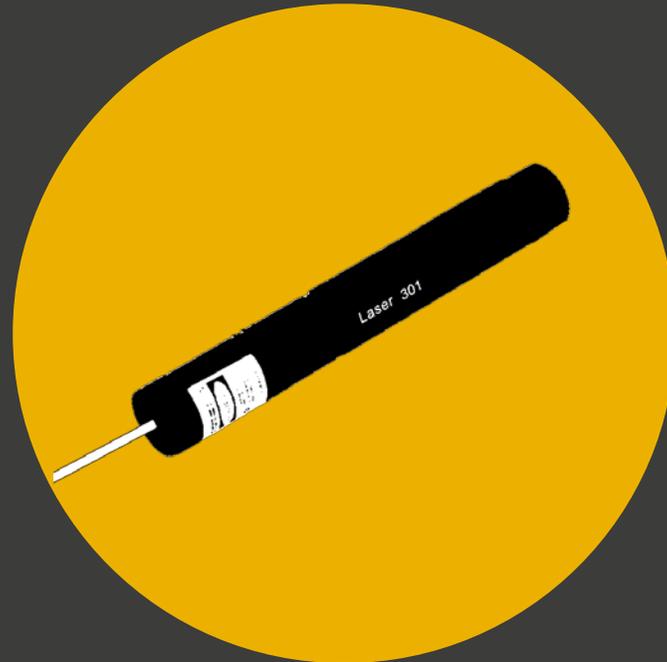
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**BIRD STRIKE**  
CONFERENCE



# THE TOOLS



# THE TOOLS



# WILDLIFE CONTROL PROCEDURES MANUAL

TRANSPORT CANADA  
SAFETY AND SECURITY  
AERODROMES STANDARDS BRANCH

“ an effective but temporary scaring technique involves the use of a variety of noises including **sirens, car horns, human voices, amplified recordings**, and pyrotechnics (firearms, cannons). Natural bird sounds include the **alarm** and **distress calls** of problem species, as well as the calls of their **predators...** ”



TP 11500 E



Canada

## THE THEORY



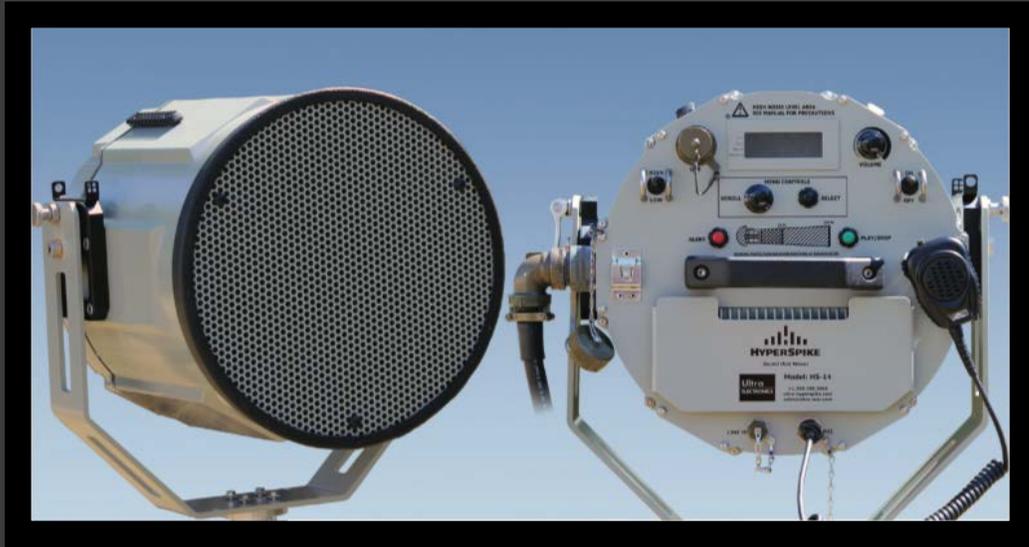
### Birds response can be influence by

- The environment (Type of habitat)
- Time of the year
- Group size / Behavior of the flock members
- Frequency of predation risk
- Etc...

What does the TP11500 says about audio deterrents ?



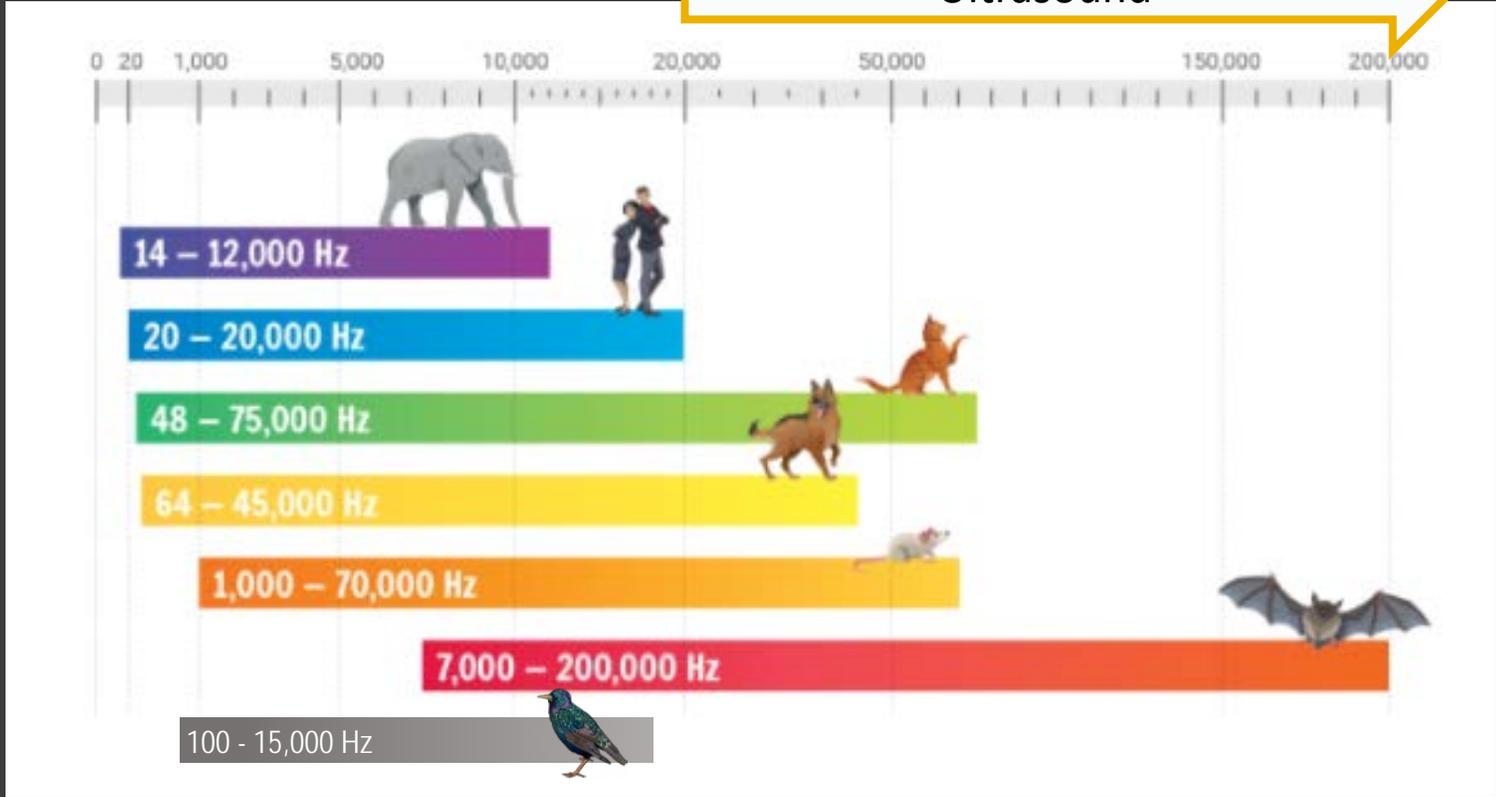
# HyperSpike HS-14



- ▶ Very powerful, military grade speaker (151 dB)
- ▶ Best sound quality



# Ultrasound



Distress Calls



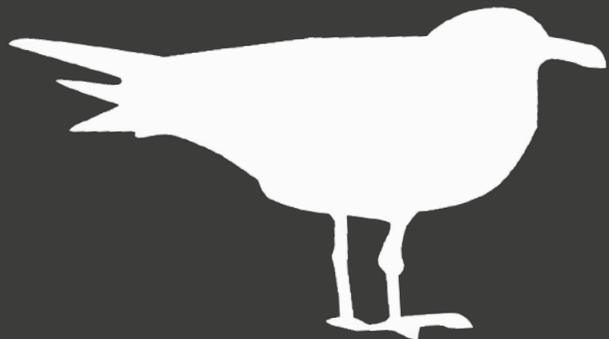
Predators



Siren



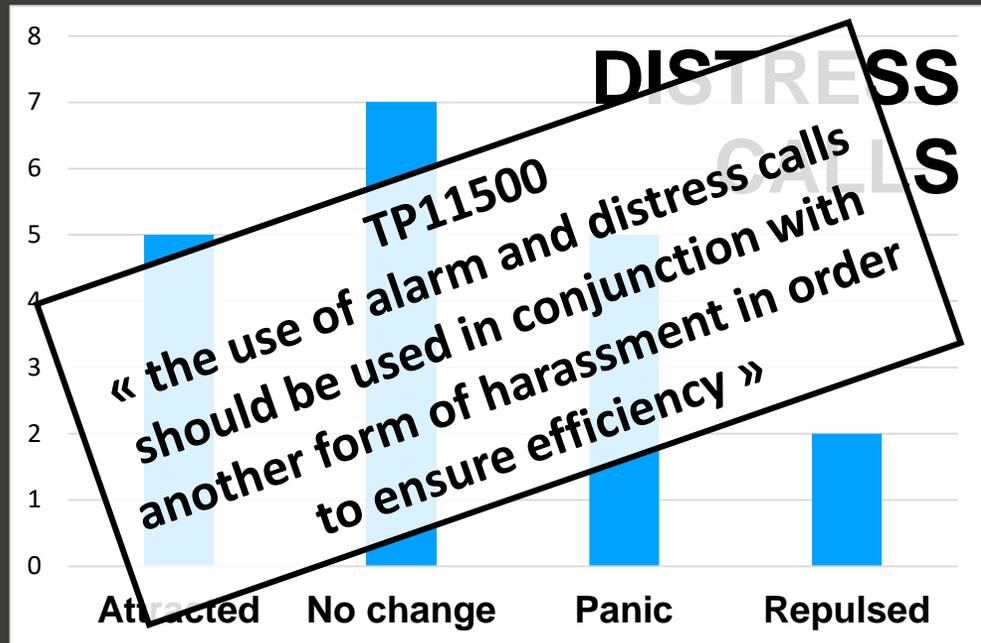
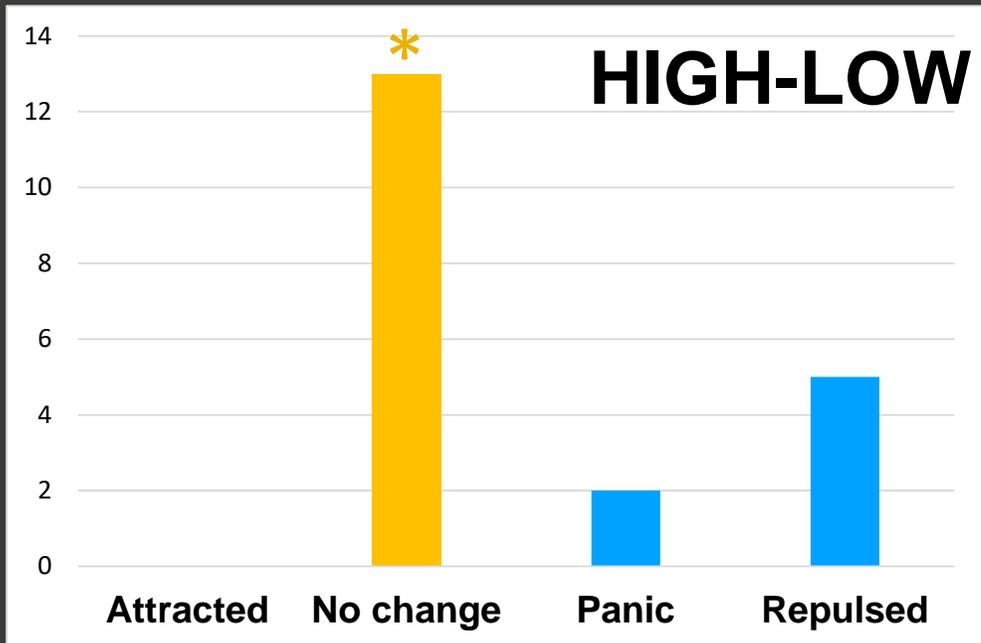
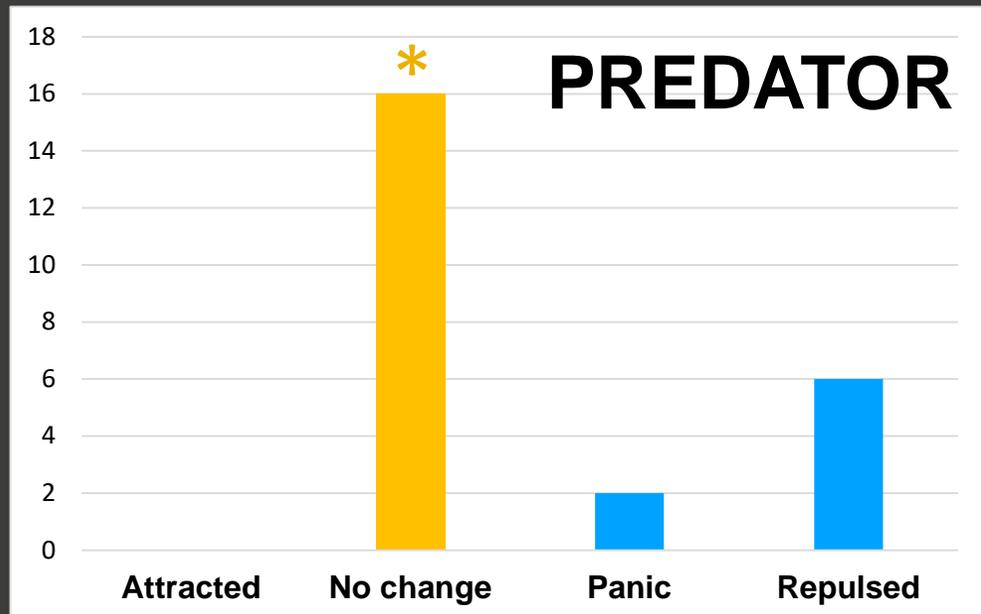
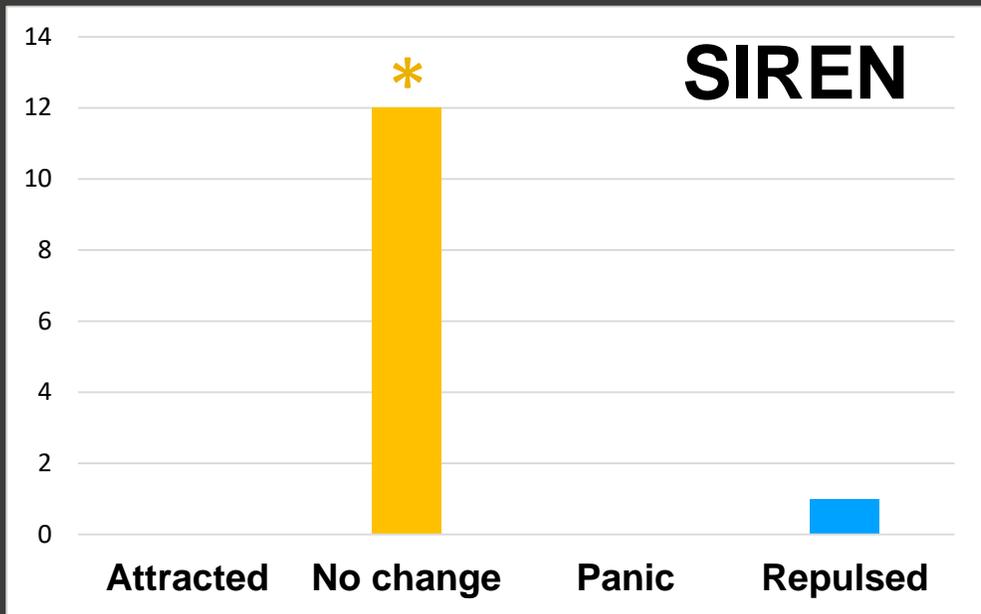
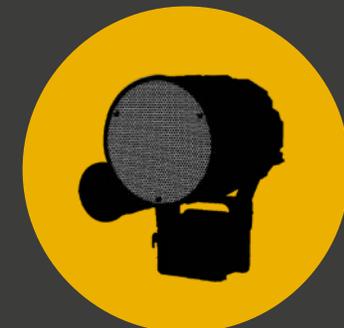
High-Low Frequencies



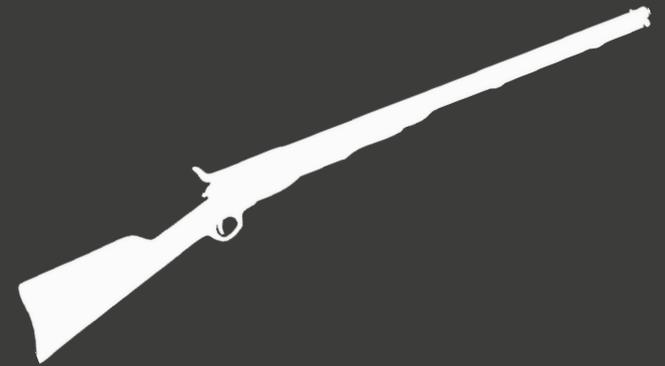
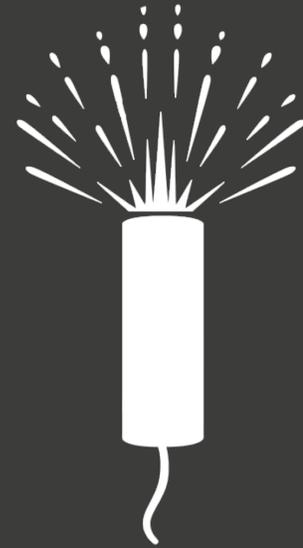
- ▶ No change
- ▶ Attracted
- ▶ Panic
- ▶ Repulsed

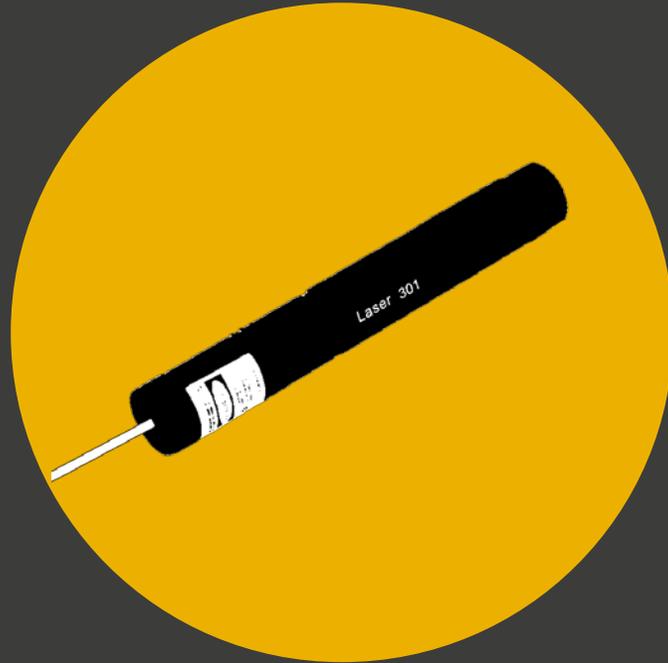
Each sound : 1 min per hour

Nb interventions



# IN SUMMARY









Green spot is associated with predatory behaviour



Class 3A Permits





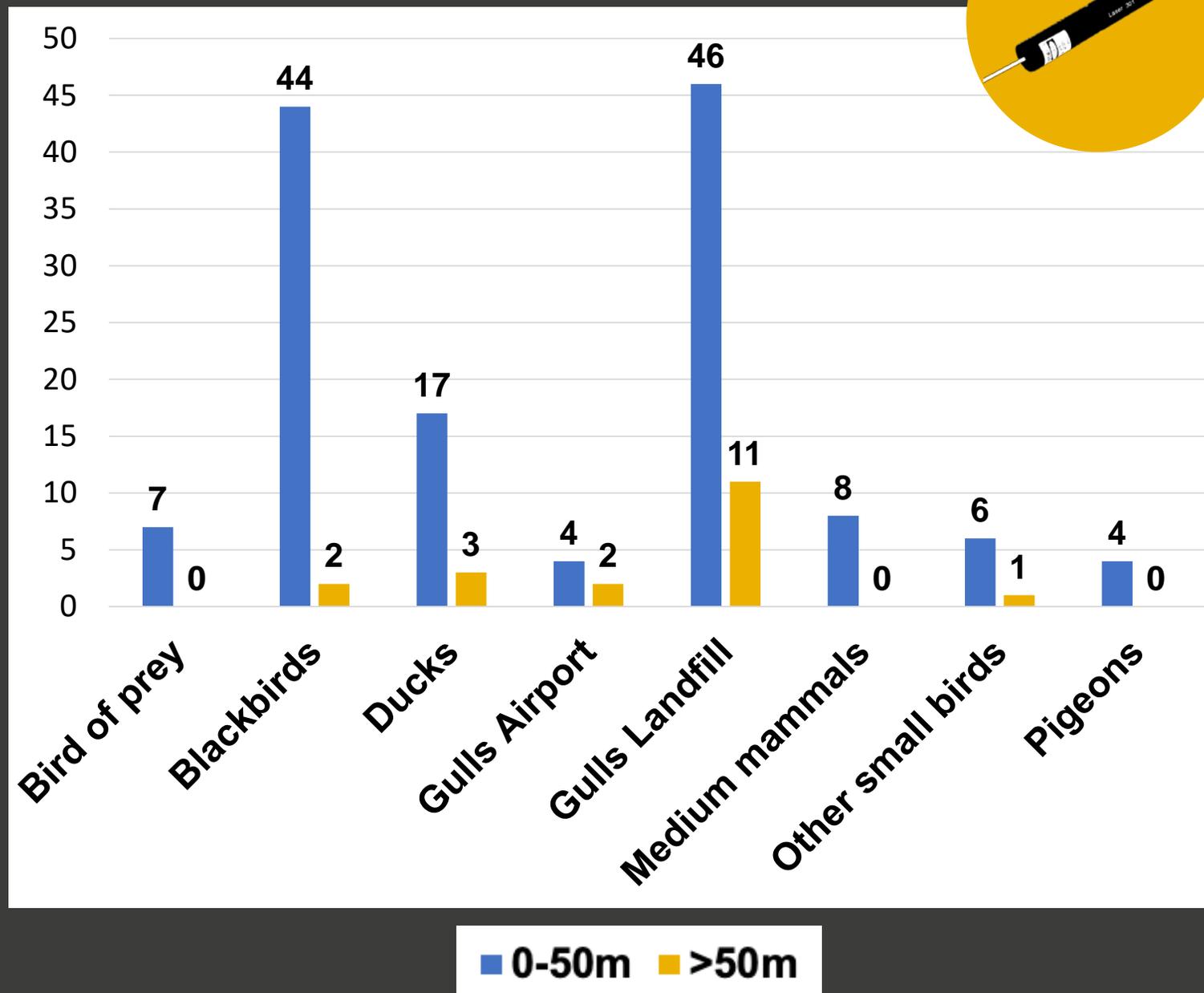
- Time of the day
- Species
- Number of birds
- Location
- Moving Distance :
  - < 50 m or
  - > 50 m

Range 20-500 m (65-1,600ft)



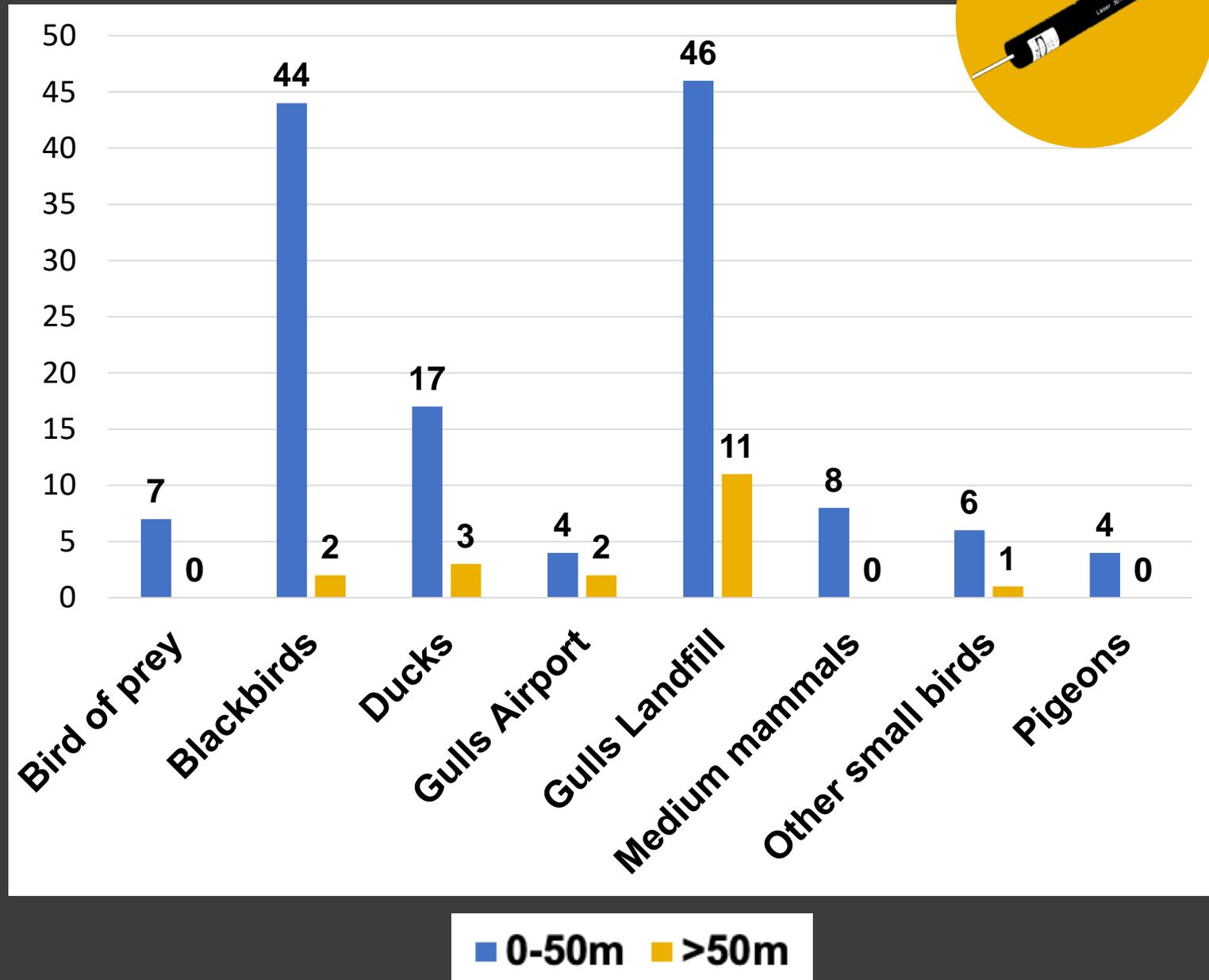


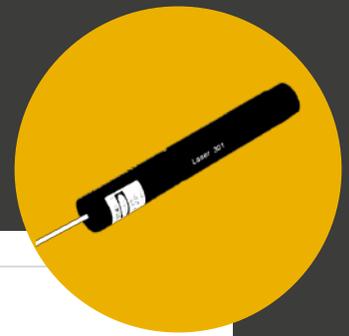
Nb interventions



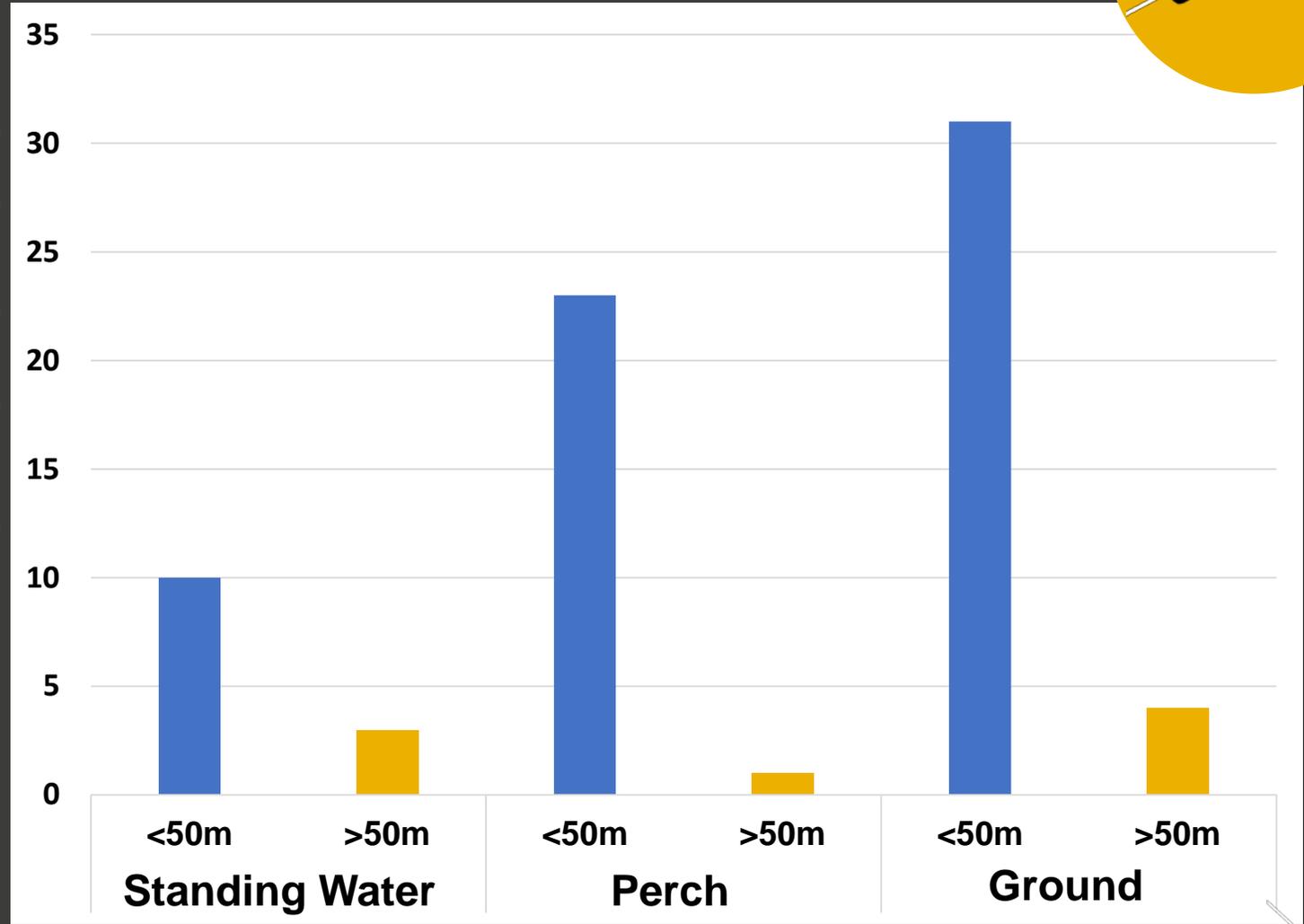


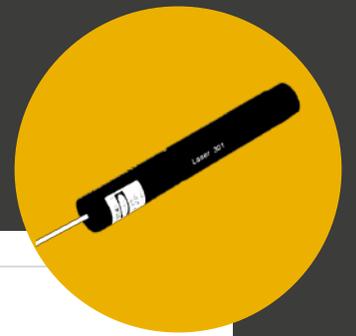
Nb interventions



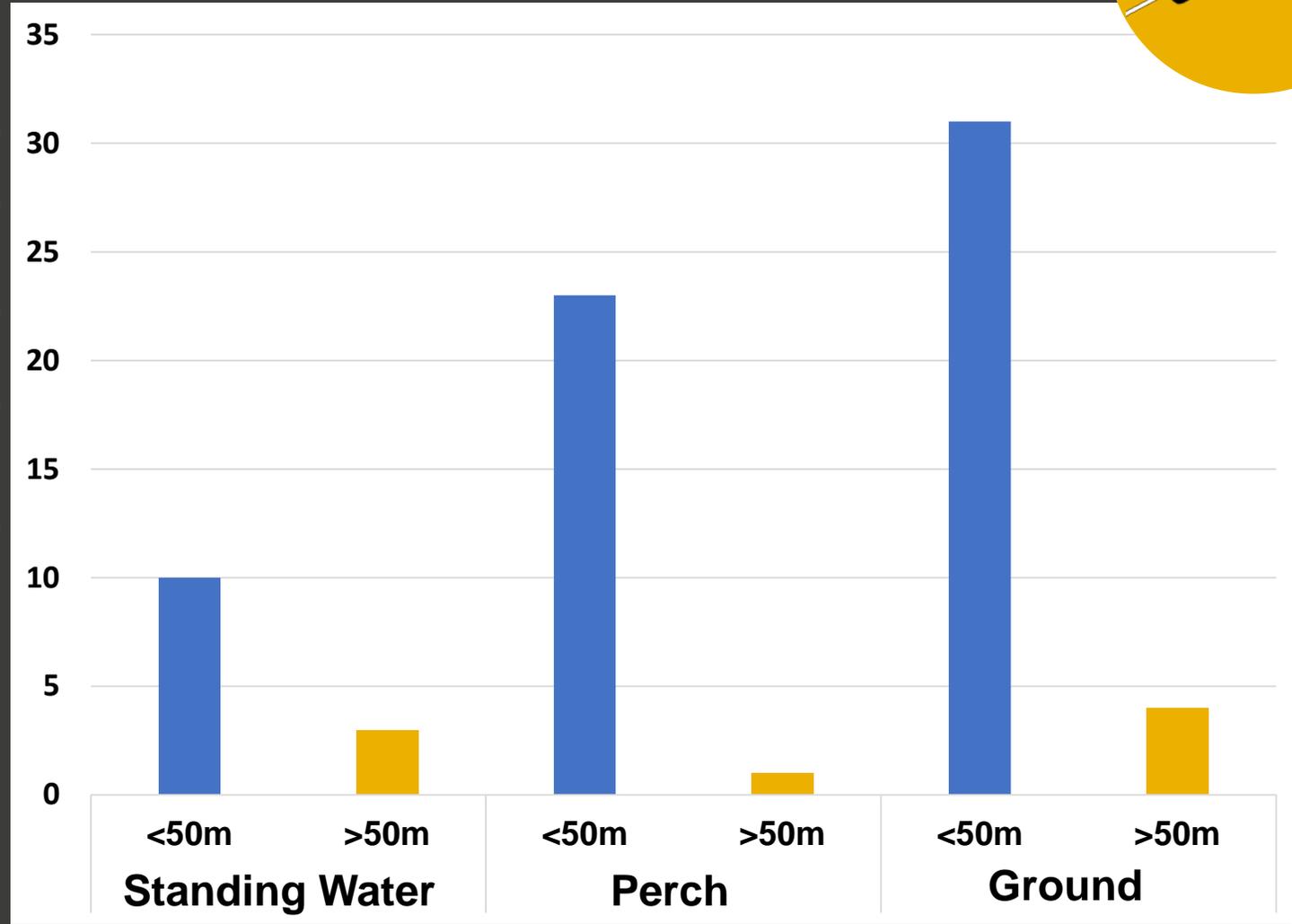


Nb interventions

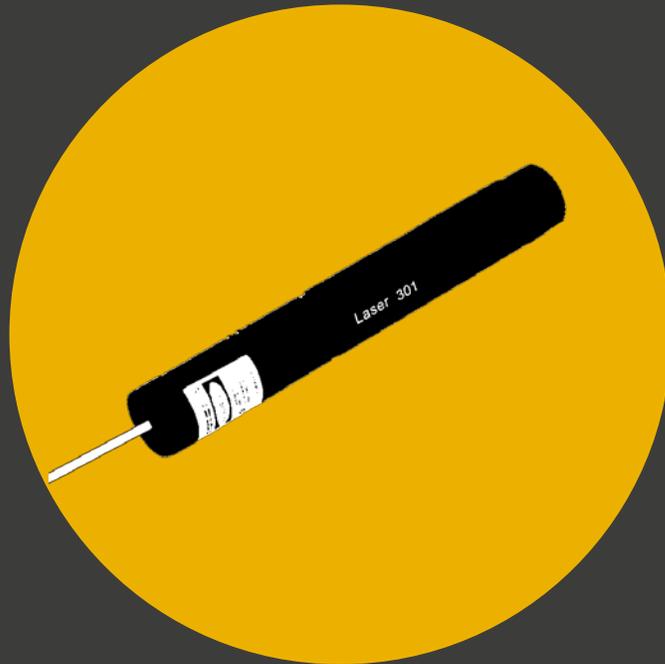
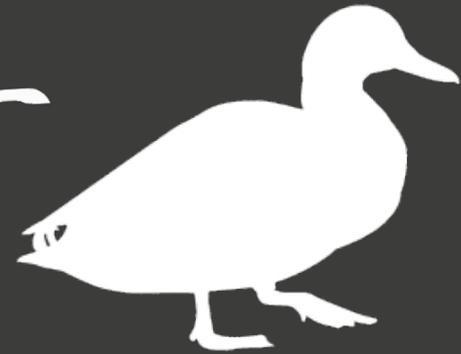




Nb interventions



# IN SUMMARY









# RoFalcon



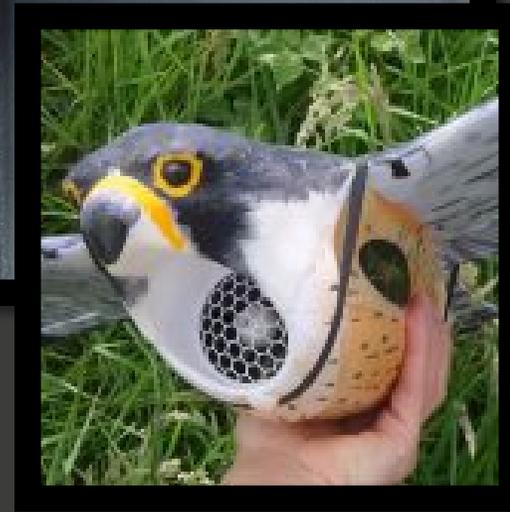


# RoFalcon





# RoFalcon





# The use of falconry is effective to deter gulls from a landfill site



*Animals* **2015**, *5*, 214-225; doi:10.3390/ani5020214

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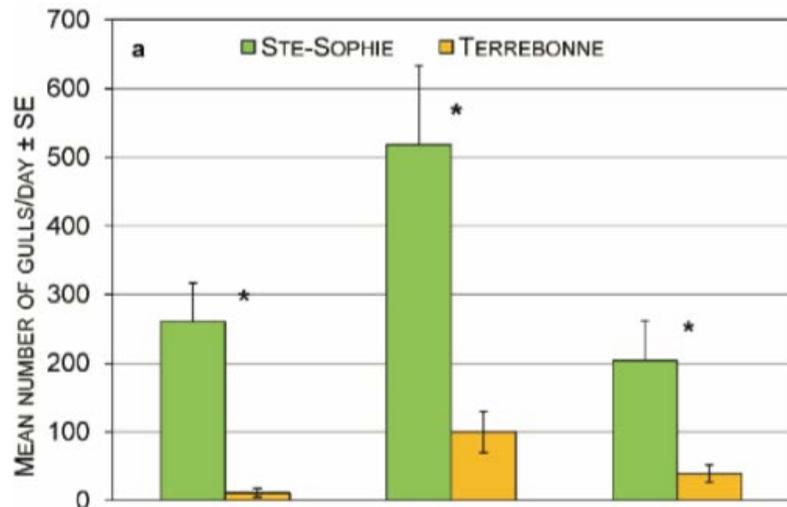
Article

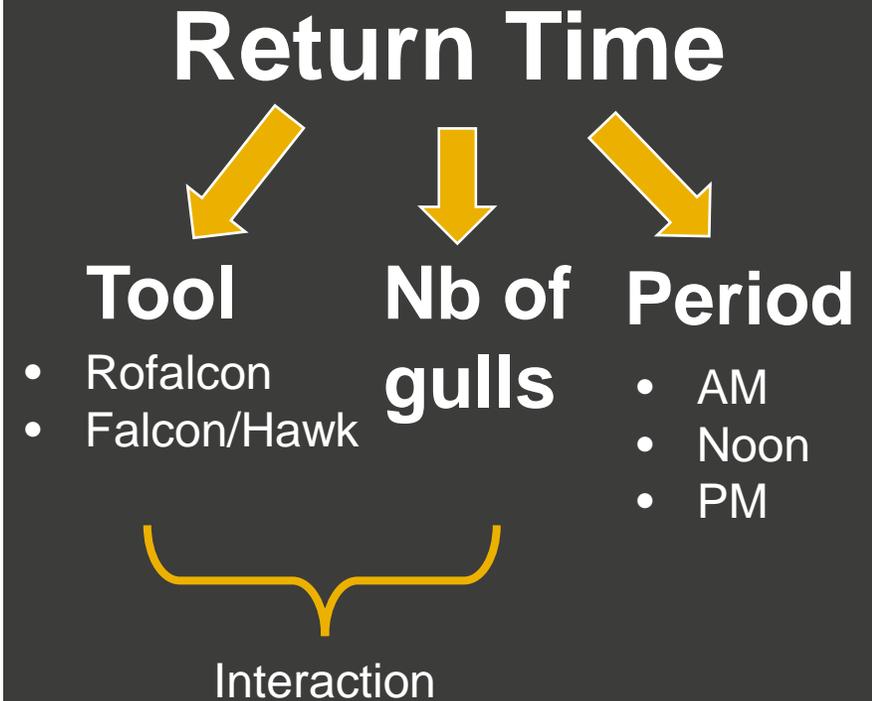
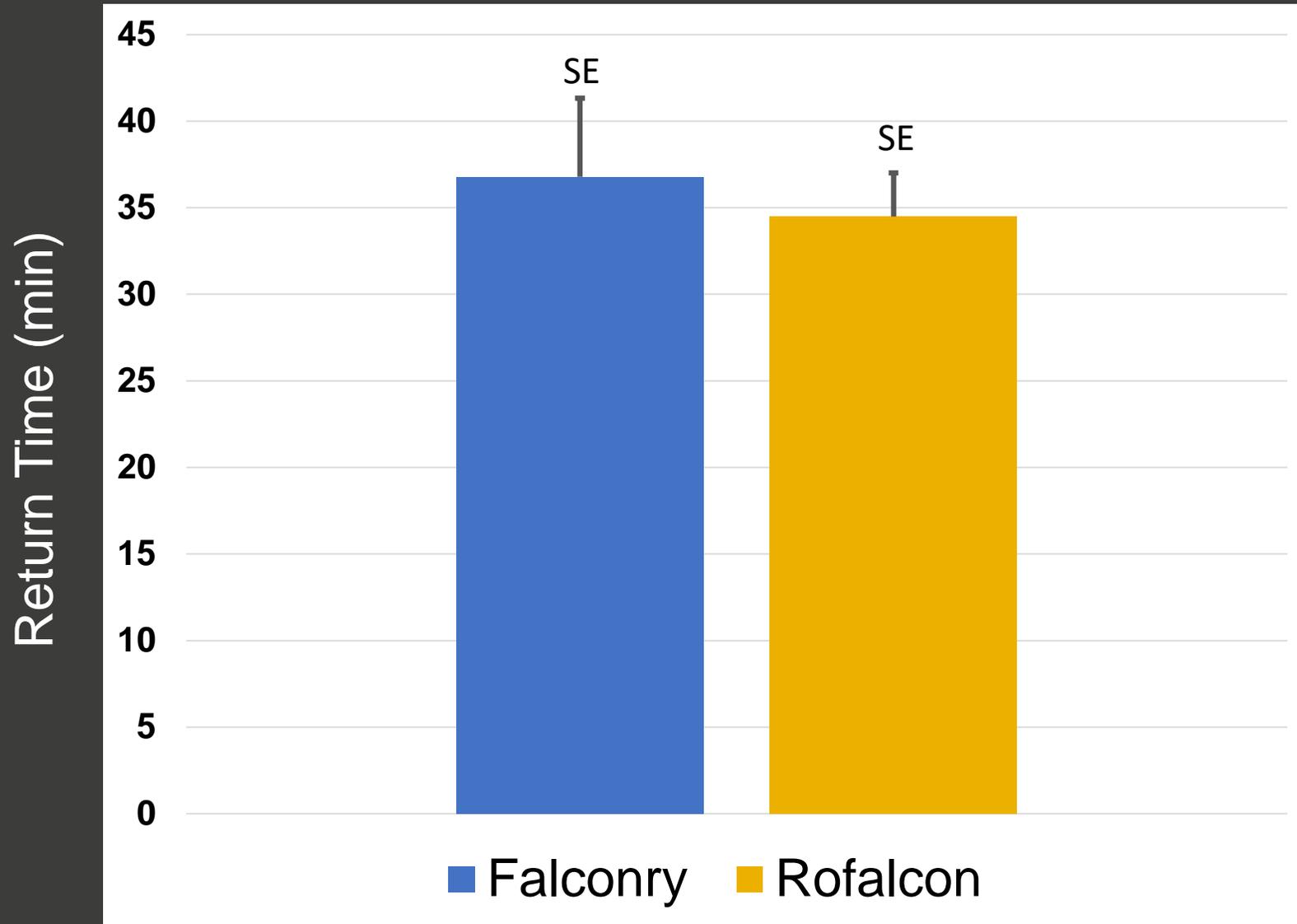
## The Efficiency of an Integrated Program Using Falconry to Deter Gulls from Landfills

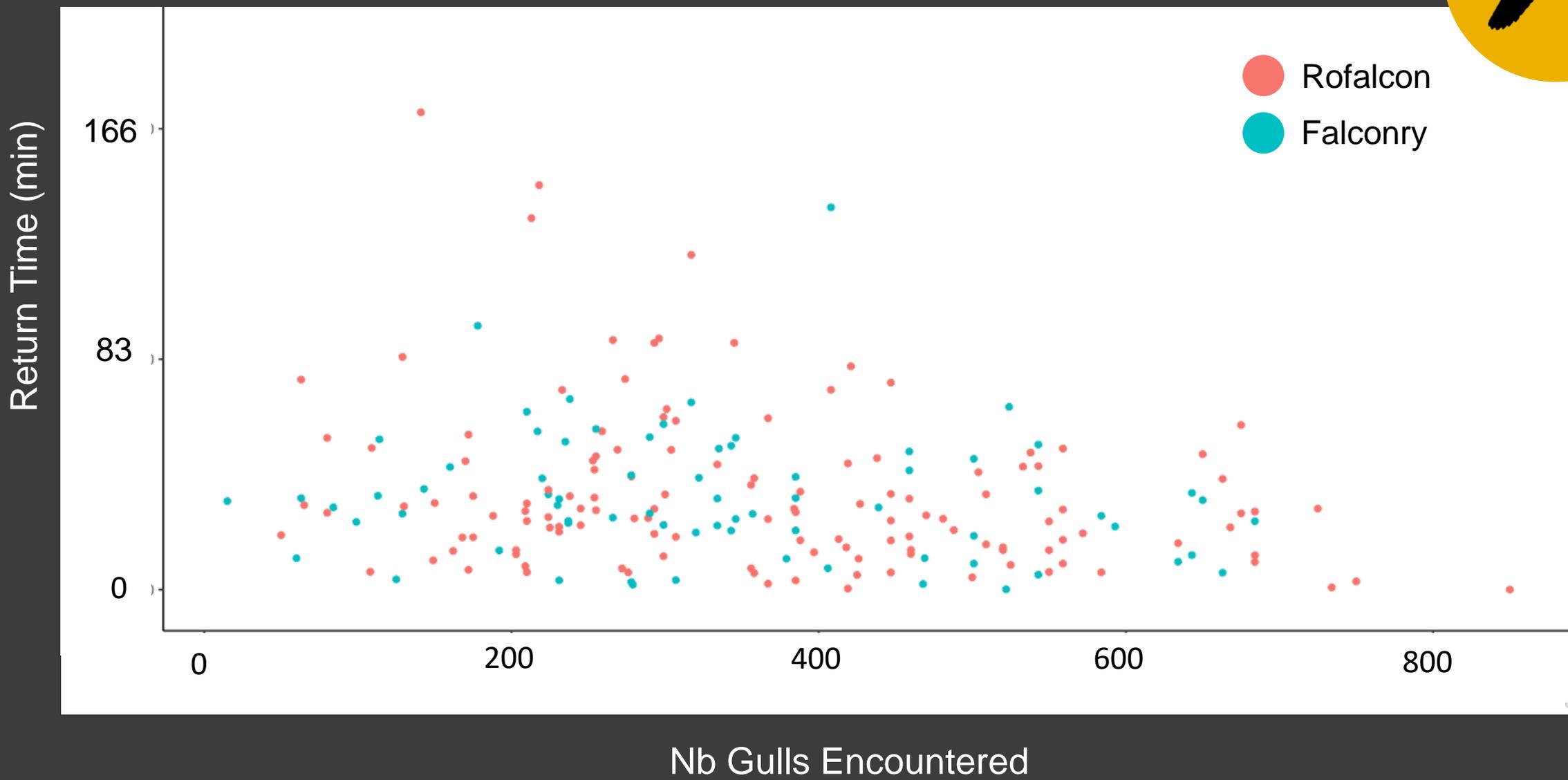
Ericka Thiériot <sup>1,†</sup>, Martin Patenaude-Monette <sup>1</sup>, Pierre Molina <sup>2</sup> and Jean-François Giroux <sup>1,\*</sup>



VS





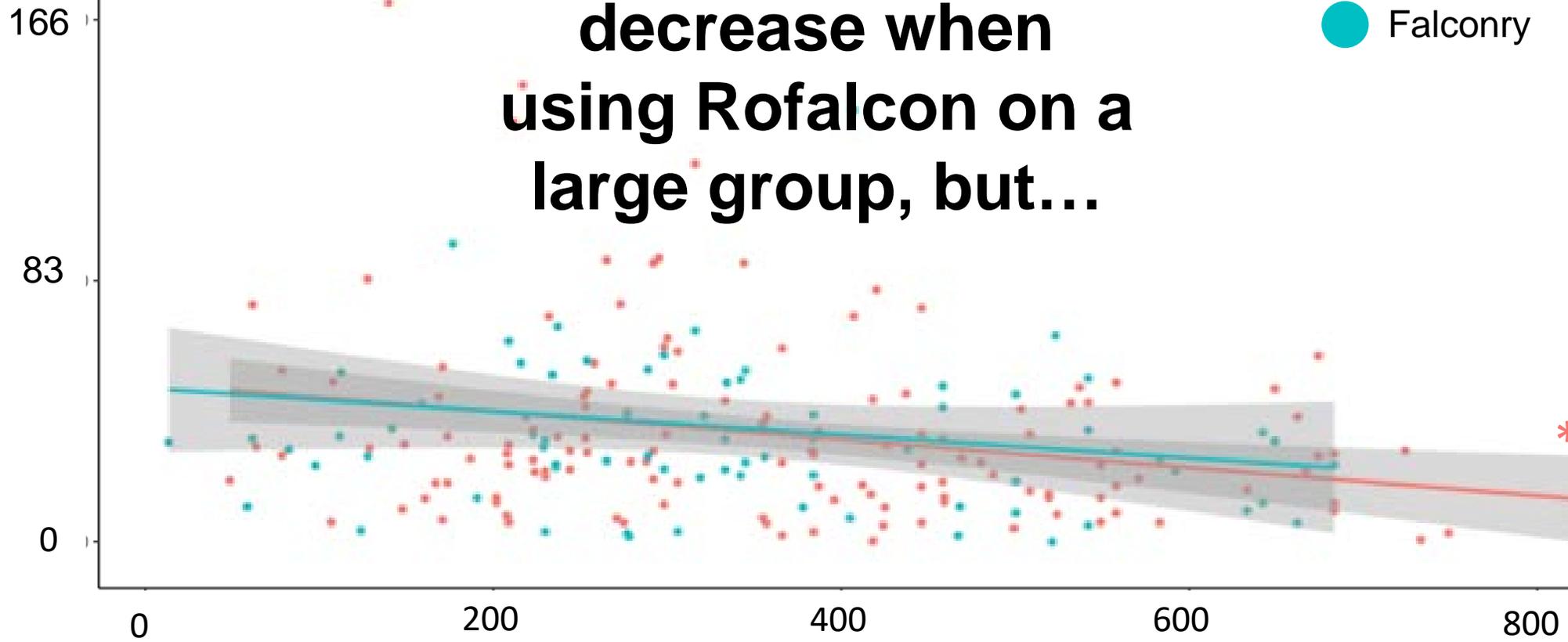




Return Time (min)

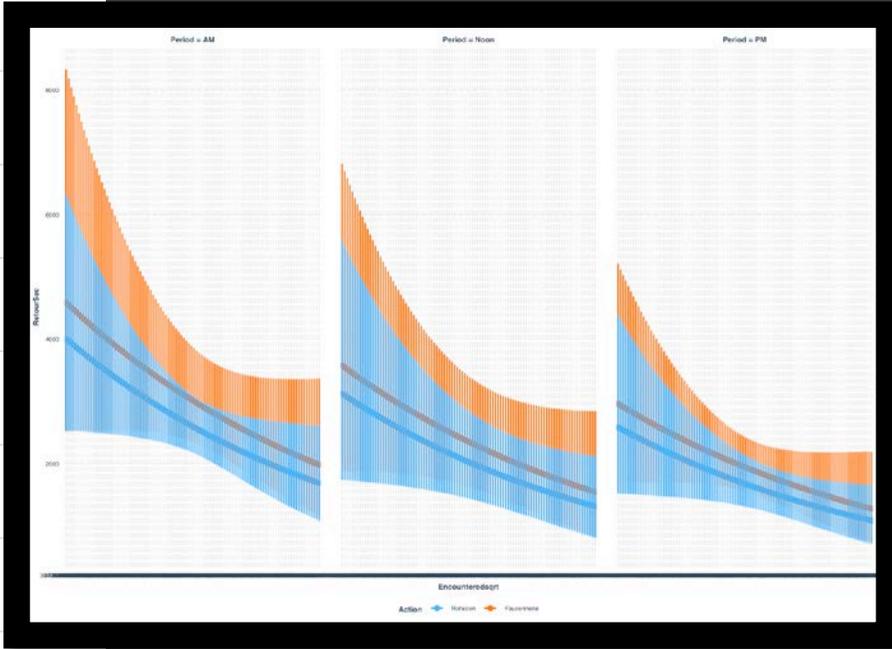
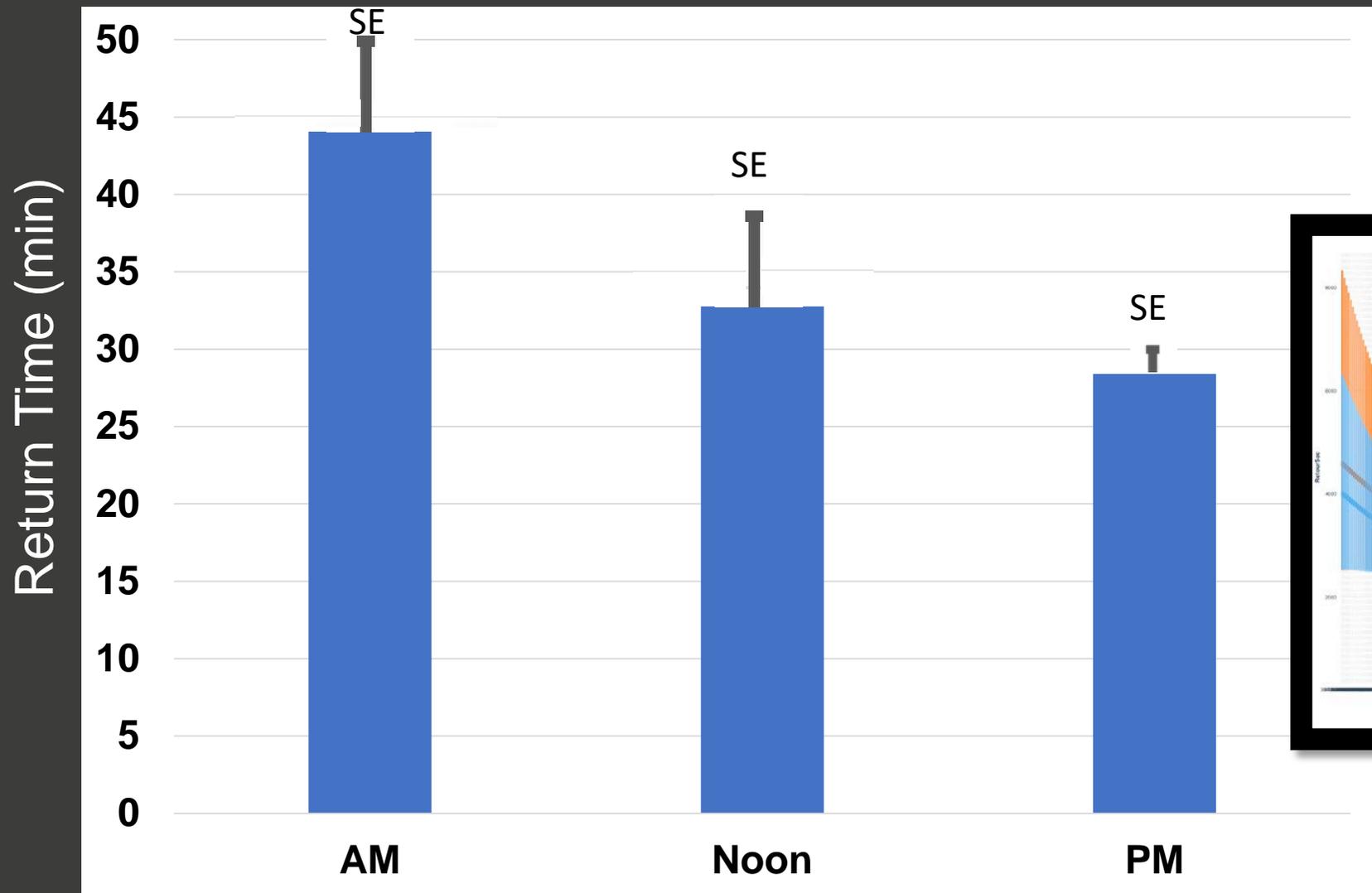
# Return time decrease when using Rofalcon on a large group, but...

- Rofalcon
- Falconry



Nb Gulls Encountered





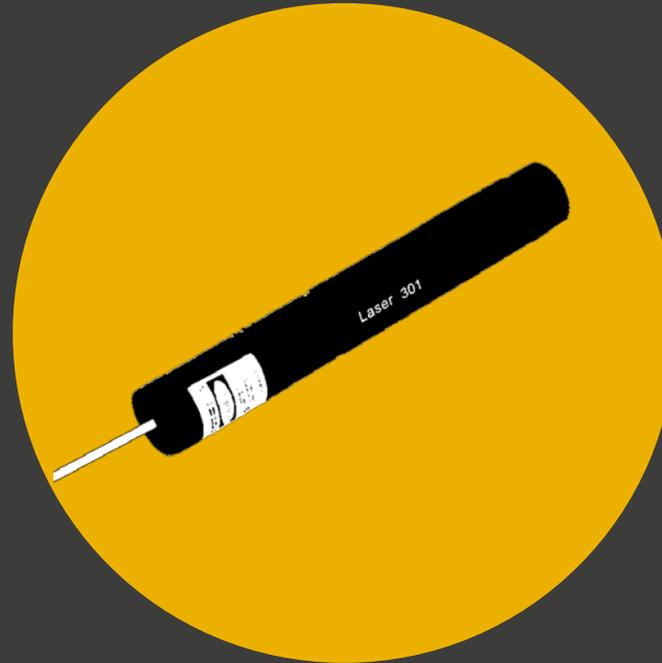
# TAKE HOME MESSAGE



# TAKE HOME MESSAGE



**Use distress calls,  
with other tools**



**Keep it in the  
vehicle, just in  
case**



**Interesting  
alternative to  
falconry**

# THANKS TO OUR PARTNERS



Aéroports  
de **Montréal**



COMPLEXE ENVIRO  
CONNEXIONS

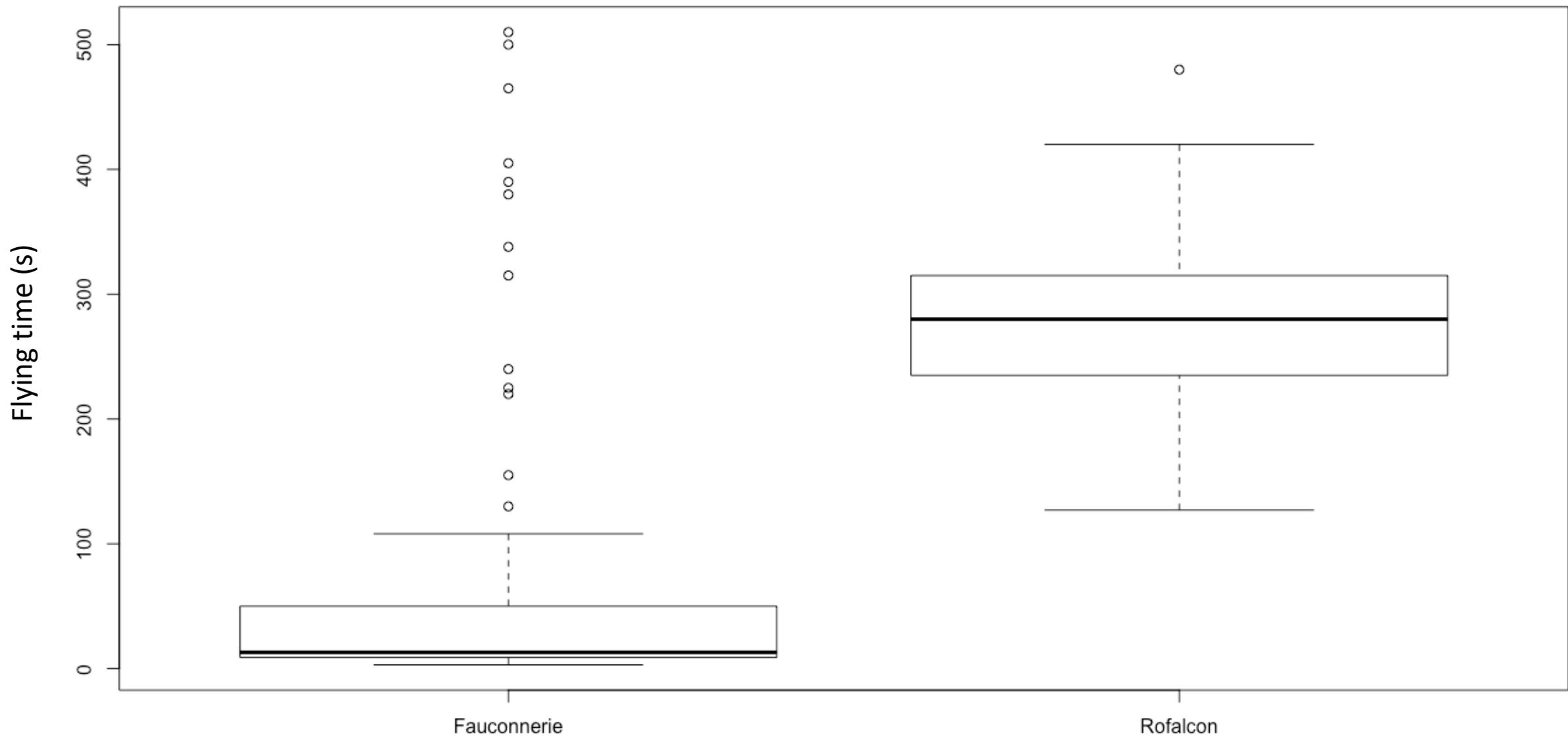


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# ROFALCON SPECS

- Material body fin and wing : EPP
- Material head : PU
- Material of the plastic parts : Nylon
- Wingspan : 930 mm
- Length : 580 mm
- All up weight : 640 g +20 g for the sensors
- Surface area including tail : 0.275 m<sup>2</sup>
- Wingloading : 0.2327 g/m<sup>2</sup> + 0.0073 g/m<sup>2</sup> for the sensors
- Flight time : 5 minutes full throttle, 10 minutes half throttle
- Max range : 1.4 km
- Frequency : 2,4mhz
- Max LOS : 300 meter
- Max climb rate : 4.2 m/s
- Sink rate : 1.36 m/s
- Maximum ground speed : 91.5 km/hr
- Minimum ground/cruise speed : 36 km/hr
- Power to weight ratio : 1:0.625
- Maximum level of acceleration : 0-80 km/hr 7.1 sec





## Distress Calls

### **Advantages**

- Habituation to distress or alarm calls may be relatively slow if they are used sparingly and in conjunction with other complementary deterrent methods.
- This technique can be used day or night.

### **Disadvantages**

- Many species of birds do not emit distress or alarm calls.
- Distress and alarm calls have not been recorded for many species. Recordings of these calls would need to be obtained in order to be available for timely use.
- Most distress/alarm calls are at least partially species specific. Broadcasting the call of one species may not disperse other birds.
- Weather conditions may affect transmission of sound.
- Playback of distress or alarm calls is not likely to be useful unless the timing of the playbacks is controlled by an on-site operator. Thus, the method is labour-intensive

```
> modele<-glm(RetourSec~Action*Encounteredsqrt+Period,data=drone,family = "quasipoisson")
> summary(modele)
```

Call:

```
glm(formula = RetourSec ~ Action * Encounteredsqrt + Period,
     family = "quasipoisson", data = drone)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-69.126	-27.428	-7.331	12.445	178.612

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )	
(Intercept)	8.558924	0.375388	22.800	<2e-16	***
ActionRofalcon	-0.131614	0.478175	-0.275	0.7834	
Encounteredsqrt	-0.033175	0.020279	-1.636	0.1034	
PeriodNoon	-0.248272	0.185639	-1.337	0.1826	
PeriodPM	-0.437322	0.134100	-3.261	0.0013	**
ActionRofalcon:Encounteredsqrt	-0.001001	0.026344	-0.038	0.9697	

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for quasipoisson family taken to be 1475.094)

Null deviance: 280299 on 205 degrees of freedom  
Residual deviance: 248501 on 200 degrees of freedom  
AIC: NA

Number of Fisher Scoring iterations: 5

## Federal Permit: Notice of Proposal to Conduct Outdoor Laser Operation(s)

To fill the form, you need:

- Localization
- Description of Operations
- On-Site Information
- Description of Control Measures
- All the Configurations of the Laser
  - Beam Characteristics and Calculations
  - Beam Directions
  - Distances, such as the Nominal Ocular Hazard Distance

All this has to be sent to Transport Canada that will analyze the proposition and authorize (or not) the use of the laser according to the Aeronautics Act – Interim Order Respecting Battery-powered Hand-held Lasers.

The behaviour is changing everything...

#### Restrictions au Canada

- Certificat de pilote de drone avancé
- COAS pour voler dans un espace aérien contrôlé
- Autorisation de l'aéroport et de NavCan (soit vol unique ou pendant une période) : dire l'altitude maximum et le rayon d'action
- Immatriculation du drone



Comportement du drone qui fait la difference

RC model aircraft require skilled operators (Littauer 1990a). For that and other reasons, they have not been widely adopted in dispersing birds at airports (BSCE 1988).

Model aircraft cannot be used in heavy winds, rain or snow.

C'est un drone conçu à la base pour l'entraînement des oiseaux de proie, On a fait modifier quelques composants pour assurer une meilleure fiabilité (cerveau digital plus précis et plus longtemps) et une meilleure réception (double antenne)

1 vol dure 5-6 min. Une batterie par vol (LiPo 4S), en hiver le vol est de 3 min (télécommande fait le décompte des minutes de vol pour toi)

Moteur = turbine donc pas de risque de blessure avec une hélice.

Control : Sur l'aile, il y a deux ailerons activés par le cerveau, c'est ce qui donne la direction et la profondeur.

Très facile à piloter, 15 vols sont suffisants pour être autonome.

Dans un contexte de gestion de la faune, 1 seul rofalcon est suffisant, mais besoin de plusieurs pièces de rechange en cas de bris

Le comportement des oiseaux varie selon la période : par exemple les juvéniles ne comprennent pas, il faut attendre l'effet de groupe pour qu'ils décollent

Comparaison maison :

Faucon au leurre – rofalcon qui vol : 10 min avant retour

Faucon en chasse - rofalcon qui stoop : 30 min avant retour

Cout Rofalcon : environ 1500\$ selon les options

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Tous les drones à voilure tournante ont un NFZ (no flying zone) : Rofalcon n'a pas cela car il ne peut pas arrêter sec (voilure fixe)

Pas un argument de protection car pour voler sur un aéroport, il faut demander au constructeur (DJI) de débloquer les NFZ car sinon on ne peut pas décoller (à l'aéroport ou à proximité). Bulle pour l'aéroport et une bulle autour des pistes d'environ 600m de chaque côté.

