Age dependent breeding performances of captive-bred female North African Houbara bustard released in the wild

Léo Bacon, Yves Hingrat, & Alexandre Robert
• Age effects $\rightarrow$ demography
  – Youth $\rightarrow$ Adult $\rightarrow$ Senescent individuals
Age dependent breeding performances

• **Age effects** → demography
  – Youth → Adult → Senescent individuals

• Translocation
  – Life history preserved?
  – Improving long-term viability assessment (Robert et al. 2015)

North-African Houbara bustard (*Chlamydotis undulata undulata*)
Causes of decline:

- Unregulated hunting
- Illegal trade
- Habitat degradation, overexploitation
Age dependent breeding performances in the wild?
Study area and methods to locate nests
- Clutch size
- Egg volume (Hoyt 1979)
- Nest initiation date (Combreau et al. 2002)
- Daily nest survival rate (Shaffer 2004)
- Daily brood survival rate
Released female identification at the nest
## Released female identification at the nest

Nest survey: 2002-2016, N nests = 1094, N females = 781

<table>
<thead>
<tr>
<th>ID tool</th>
<th>N nests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmitters</td>
<td>404</td>
</tr>
<tr>
<td>RFID</td>
<td>690</td>
</tr>
</tbody>
</table>
Nest survey: 2002-2016, N nests = 1094, N females = 781

Released female identification at the nest
- Clutch size
- Egg volume
- Nest initiation date
- Daily nest survival
- Daily brood survival

Age + Age²
Age * Winter Precipitation
Age * Winter Temperature

Multi mixed model inference
Model averaging (Best Models → ΔAICc < 2)

Generalized additive mixed models (GAMM)
• Nest initiation date (GAMM predictions)
Results

- Daily brood survival rate (GAMM predictions)
• Clutch size (GAMM predictions)
• Egg volume (GAMM predictions)
CAPTIVITY (Chantepie et al. 2015, Preston et al. 2015)
Results

- Condition dependent clutch size (GAMM predictions)
• Age effects
  – Increase of breeding performances
    • Individual process: Breeding experience, Breeding investment
    • Population process: Selection of good quality individuals
• Age effects
  – Increase of breeding performances
  – Senescent trend → females ageing in the wild
    • Individual life history preserved
• Age effects
  – Increase of breeding performances
  – Senescent trend $\rightarrow$ females ageing in the wild
  – Condition dependent breeding performances
What’s next?

- Trend in **wild-born** individuals?
- Population dynamic/viability
Léo Bacon
bacon.leo@gmail.com
• Daily nest survival rate