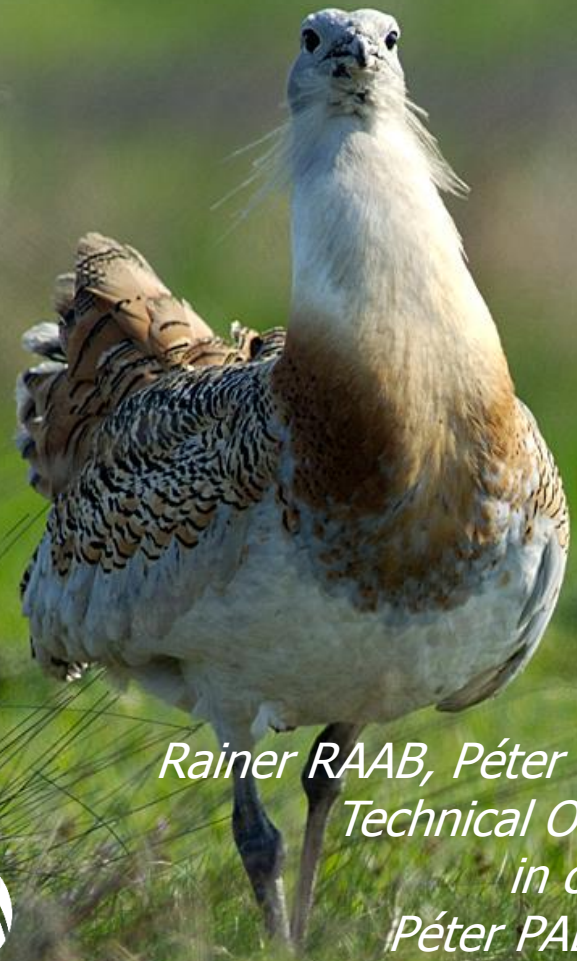
Great Bustard MoU and LIFE Project Meeting
Illmitz, Austria, March 9, 2017



Comparision of Great Bustard (satellite) telemetry tagging technics from practice, and evaluation of the optimal method for the ongoing LIFE project

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LIFE GREAT BUSTARD

Importance of telemetry

Study objective	Radio-tracking	advantages
Natal and breeding dispersal	essential	no alternative method to track all birds and establish true dispersal rates
Mortality	essential	only way to establish true mortality rates
Migratory and seasonal movements	required	allows continuous tracking; satellite telemetry necessary for long-distance migration
Home range and space use	required	enables easy location and continuous tracking
Longevity	required	facilitates tracking until battery depletion
Viability modelling	required	allows estimation of demographic parameters
Census	useful	facilitates location of birds or flocks by tracking marked individuals

Source: Alonso, 2008

Constraints of tagging

Difficulties of capturing and marking Great Bustards

Tagged individuals might show:

- higher mortalities
- behaviour alterations
- worse condition

The costs of tagging must be compensated by the benefits

Influence must be low, to avoid false and misleading results

In contrary the sample size should exceed a 3% limit

LIFE Project Action

Actions and means involved: … „In **AT and HU altogether 24 adult female GBs** will be equipped with **GPS-based satellite transmitters** to follow their movements and gather new information on habitat preference, metapopulation dynamics and use of peripheral habitats.”

LIFE Project Action

The aim of this action is to identify those areas in Austria and the neighbouring countries that are recently not considered as Great Bustard habitats. The action also aims to investigate **Great Bustard metapopulation dynamics**, i.e. movements of individuals between core habitats as well as the actual use and importance of peripheral Great Bustard habitats that have only sporadic occurrence data. The results of the surveys have clear connections to Agri-environmental measures aiming Great Bustard protection.

LIFE Project Action

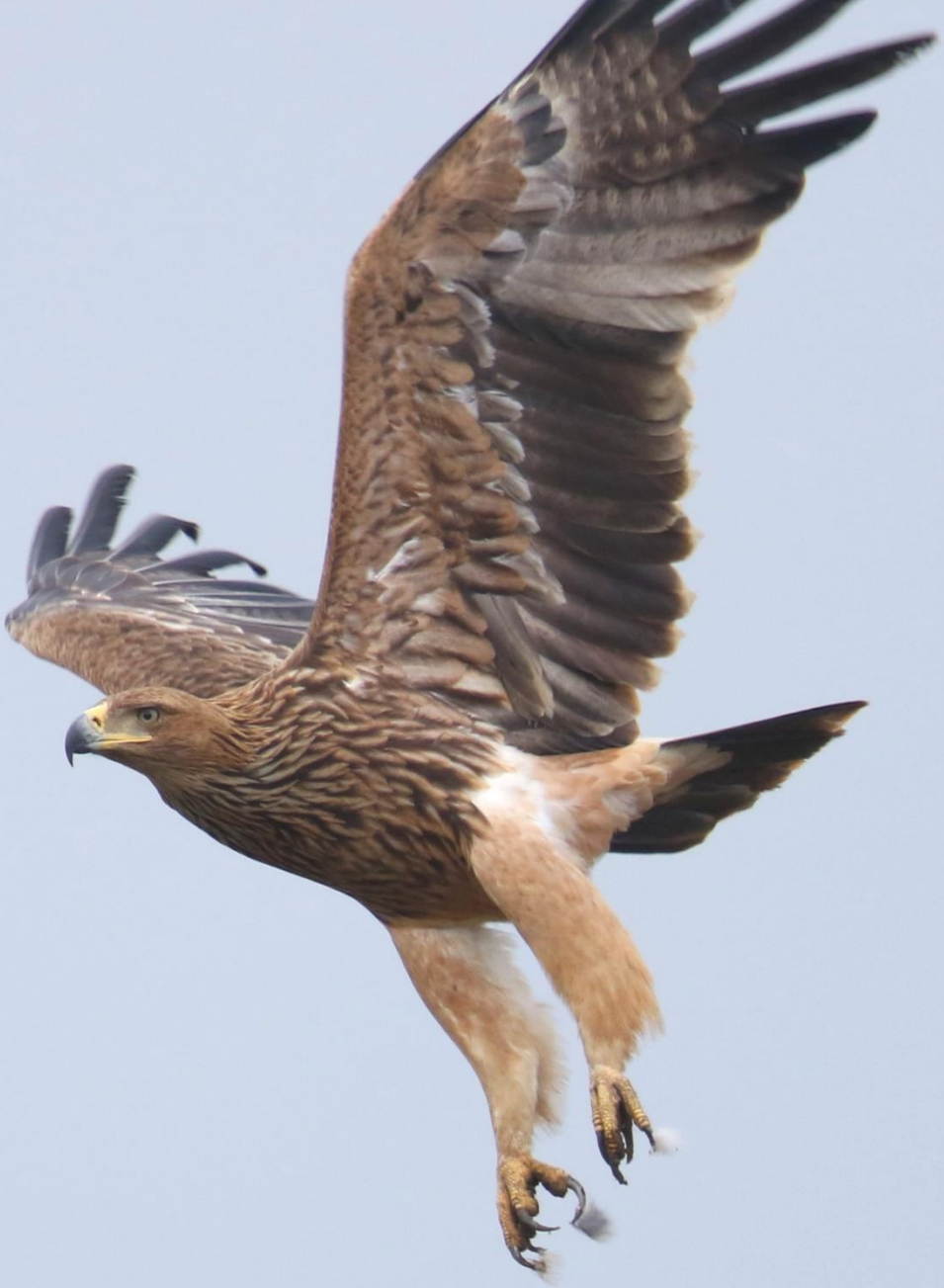
The first individuals will be marked in the Project-Sub-Area AT3 PPH, and later in the other project-sub-areas in AT. The exact **system of the transmitter** will be selected in the **winter of 2016/2017**. The collected data on locations will be analysed by **GIS** in combination with the datas of the population and of the **habitat monitoring**. The movement of the marked individuals will be followable for public via **Live Tracking App**. We will use the **Animal Tracker-app** from the LIFE-project used for the Northern Bold Ibis.

LIFE Project Action

We plan to catch **females at breeding places**, when it is unlikely that the female can hatch the eggs successfully due to external reasons, e.g. the environment of the breeding place altered dramatically due to agricultural work during the incubation. We will **catch the bird at night** on the previously located nest with a net, being gently pulled by cars or people onto the bird. **The transmitter will immediately be fastened on the bird and the bird will be released as soon as possible**.

Red Kite
(Milvus milvus)

Photo: R. Katzinger



Imperial Eagle
(Aquila heliaca)

Photo: R. Katzinger

GB telemetry studies in practice

- Spain (E): proyactoavutarda.org, VHF telemetry (+ patagial/dorsal tags), hundreds of individuals - migration, dispersion, home range, demographic parameters, etc.

- Germany (D): grosstrappe.de, VHF telemetry (+ tags/rings),1992: 19 individuals, 1993: 11 individuals, 1999-2007: 150 individuals - juvenile dispersion, juvenile survival, improving release program

- Russia (RUS): satellite telemetry, 1999: 3 individuals, 2000: 3 individuals - migration

GB telemetry studies in practice

- Mongolia (MGL): asiangreatbustard.org, satellite telemetry, 2007-2011: 14 individuals - migration, habitat use
- Great Britain (GB): greatbustardgroup.org, satellite, radio telemetry (+ tags) - juvenile dispersion, juvenile survival, improving release program
- Hungary (H): satellite telemetry, 1 individual - pilot project (migration, habitat use)

Saker Falcon

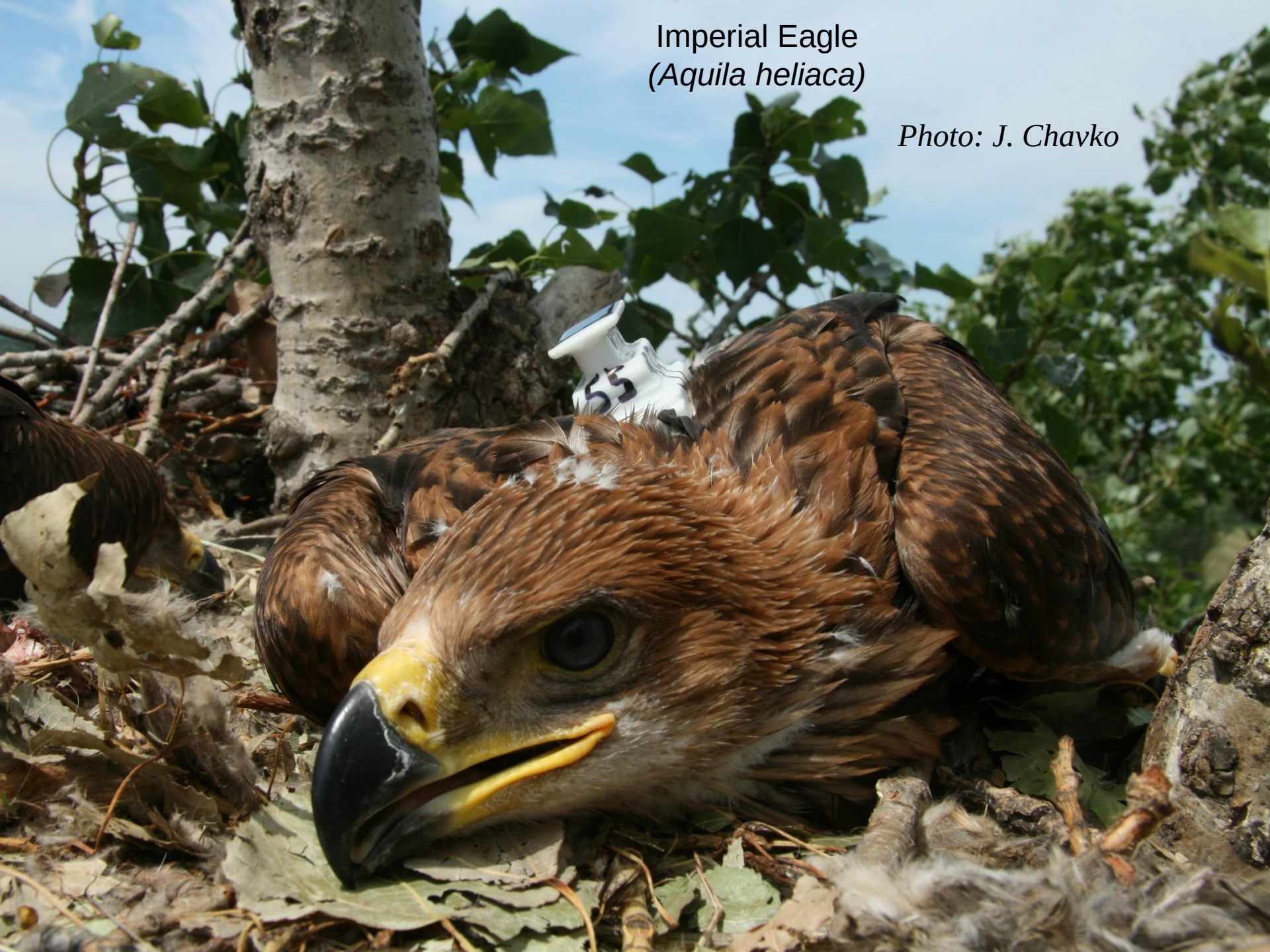
(Falco cherrug)

Photo: R. Katzinger

Capturing Juveniles

- Common practice in Spain
- Juveniles with limited flying ability
- After some chasing, the juveniles usually lay down

- Natural juvenile mortality is high, quick loss of tagged birds
- Stress tolerance of juveniles is high
- The body is still growing



Imperial Eagle
(Aquila heliaca)

Photo: J. Chavko

Imperial Eagle
(Aquila heliaca)

Photo: R. Katzinger

Rocket Net

- Common practice in Spain
- Most effective method to catch adults

- Requires intensive preperation (selection of suitable location and preperation)
- Tremendous Teamwork necessary
- Stress for all involved

„Individual“ Net

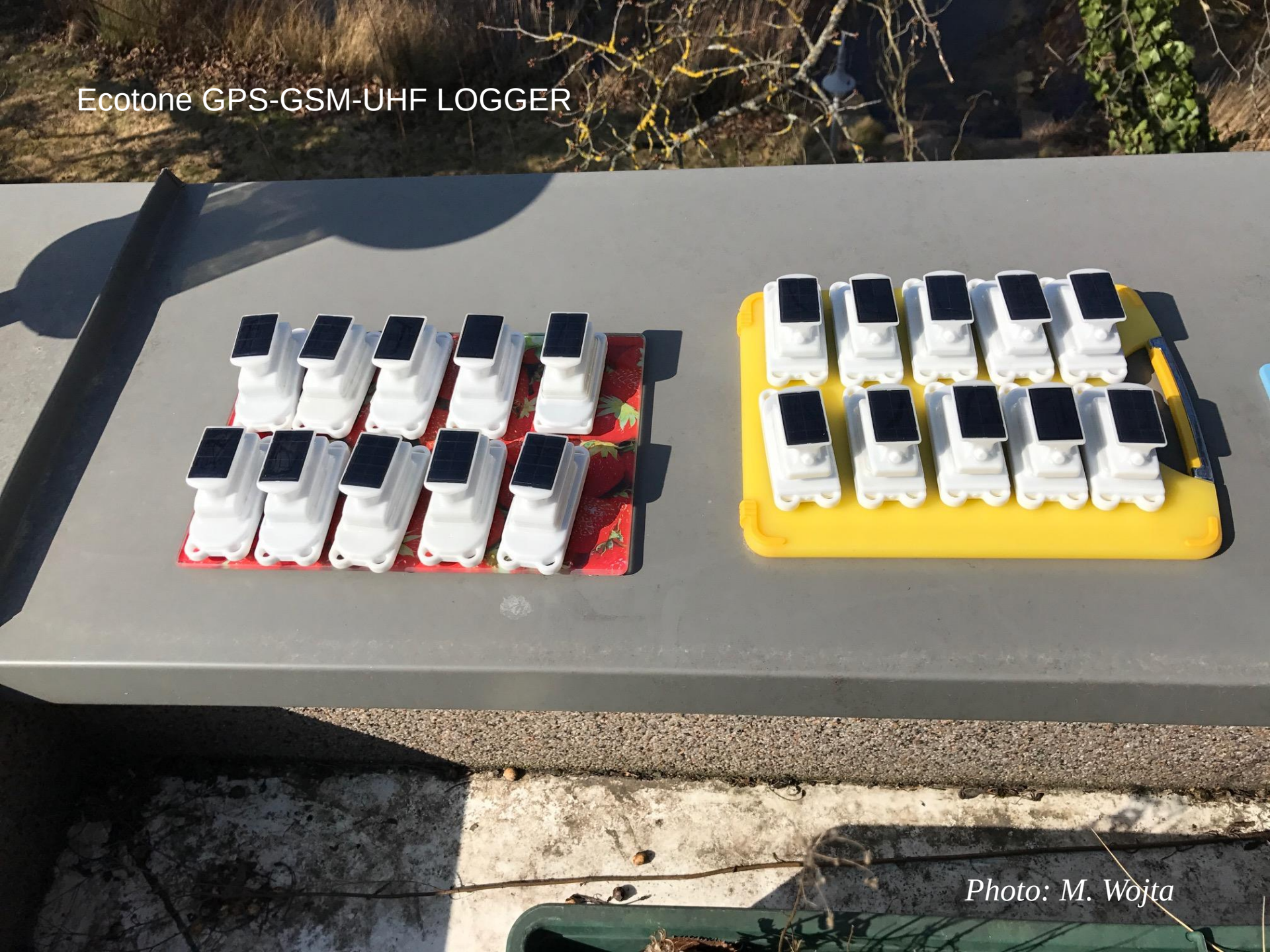
- Manually moved net (RUS, MGL, H)
  - At night (RUS, MGL, H)
  - From moving vehicle (RUS, H)
  - With spotlight (MGL)
  - Roosting individuals (MGL) or breeding females (RUS, H)

- Remote controlled or automatic net (RUS)
  - During the day
  - Only breeding female

- Nest abandonment (additional „cost“ or unpredictable)
- Artifically incubated eggs – cooperation with release station

Failed trials in Spain

- Great Bustards should be „shepherded“ into the net
- Oral tranquilizer


Ecotone GPS-GSM-UHF LOGGER
Photo: M. Wojta

Telemetry tagging 1: Patagial tag, wing band

Patagial tag:
D:1992: 19, 1993: 11 individuals
E: 1991: 7 Indviduals
Fixed on plastic patagial tag
Limited weight – short battery lifespan
High number of loss of tags
Not recommended

Telemetry tagging 1: Patagial tag, wing band

Wing band:
E: 1991: 10 individuals
flexible plastic wing band around the humerus
fixed by staples
limited weight – short battery lifespan
some tags were lost soon, because of the fixing technic
not recommended

Telemetry tagging 2: poncho or necklaces

E, D, GB
only on females
plastic sheet or plastic band

limited weight – short battery lifespan
transmitter loss within a few years
suitable for short term study

Telemetry tagging 3: tail mounted transmitter

common practice in D, used in GB

limited weight – short battery lifespan
tail feathers are moulted yearly
the maximum carrying period is 1 year, usually less

Telemetry tagging 4: backpack transmitter and the harness

E, H, RUS, MGL, GB

- suitable for both sexes and in all age classes
- position of the transmitter is the closest to the body center
- bigger transmitter – longer lifespan
- good possibility for solar panel
- rigid (Teflon is popular), elastic harness (recommended for bustards), combination (silicone-teflon), plastic, overbraided rubber tubing, metal wires covered with these

	Males		Females	
	Measured at 70 days	Percentage of adult value	Measured at 70 days	Percentage of adult value
Weight	3,157	32.1	2,003	46.0

Juvenile weight in comparison to adult weight. Source: Alonso et al. 2009

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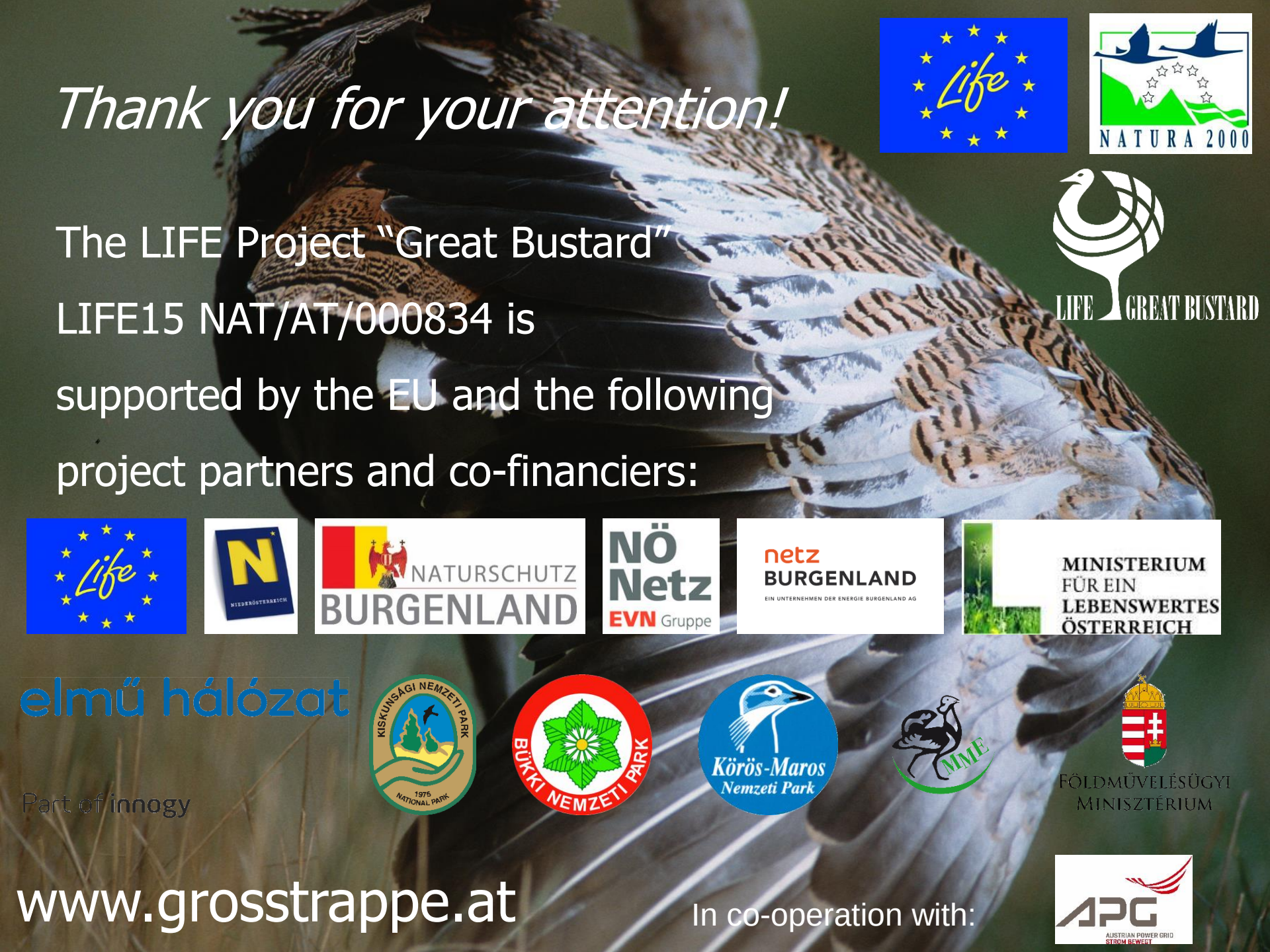

Thank you for your attention!

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www.grosstrappe.at

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