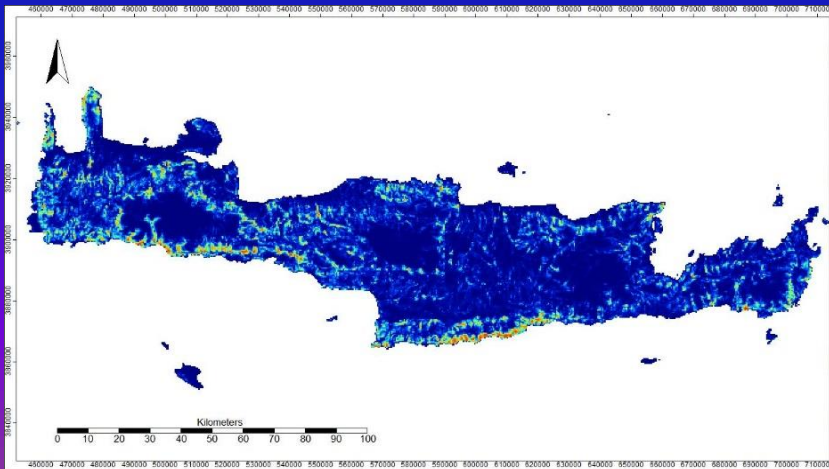
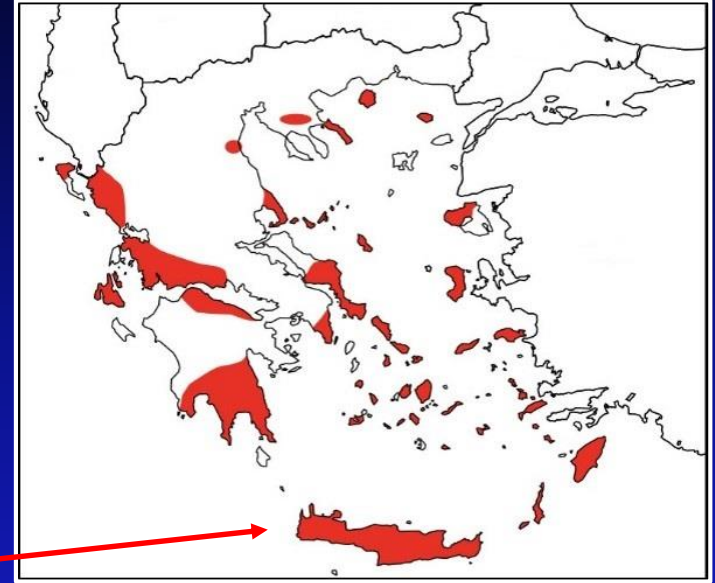


## Dispersal movements & hot spot areas of juvenile Bonelli's eagles (*Aquila fasciata*) on the island of Crete (Greece)

Xirouchakis S., Damianakis K., Kardamaki A., Anagnostopoulou, A.  
& E. Georgopoulou

Natural History Museum of Crete,  
School of Science & Engineering,  
University of Crete,  
University Campus (Knossos),  
Heraklion 71409, Crete, Greece

# Study area



- ✓ Crete surface: 8261 Km<sup>2</sup>
- ✓ No. eagle territories (1990-2020): 35
- ✓ Breeding distribution: 1900 Km<sup>2</sup> (23%)
- ✓ No. active territories (2020): 20-22 (max 25)
- ✓ Territory size: 60-90 Km<sup>2</sup>

## Aims

- ❖ To fill the current knowledge gaps on juvenile post-fledging dispersal
- ❖ To delineate the “settlement areas” of non-breeding birds
- ❖ To pinpoint hot-spot areas which act as regional population sinks
- ❖ To improve the species productivity in the breeding territories
- ❖ To identify and eliminate mortality factors

## Methods

1. Monitor Bonelli's eagle breeding territories
2. Locate a sample size of accessible nest sites
3. Radio-tag eaglets before fledging
4. Collection & analysis of telemetry data

- ✓ No. monitored territories (2018-2023): 15
- ✓ No. accessible nest sites: 12



# Material & Methods - Fieldwork

Fieldwork November-May (2018-2023)



Incubation: 40 d





## Material & Methods - Fieldwork



- Tagging: 80% fledging age (x 65 d max)
- 45-50 days old
- Tag attachment: Silicon string + Teflon ribbon tube
- Harness type: Pelvis & Backpack
- GPS/GSM tags: Ornitela OT-30 (LT)
- Radio-fix time step: 15 min (dawn to dusk)
- 2019-2023: 30 fledglings tagged (1-10 inds/yr)
- Post-fledging movements: 17 inds





## Material & Methods – Data analysis

- ❑ *Fledging date*: 1st day with full satellite coverage & consecutive GPS fixes
- ❑ *Dispersal date*: Consecutive long flights (> 10 km) overstay away from the natal territory

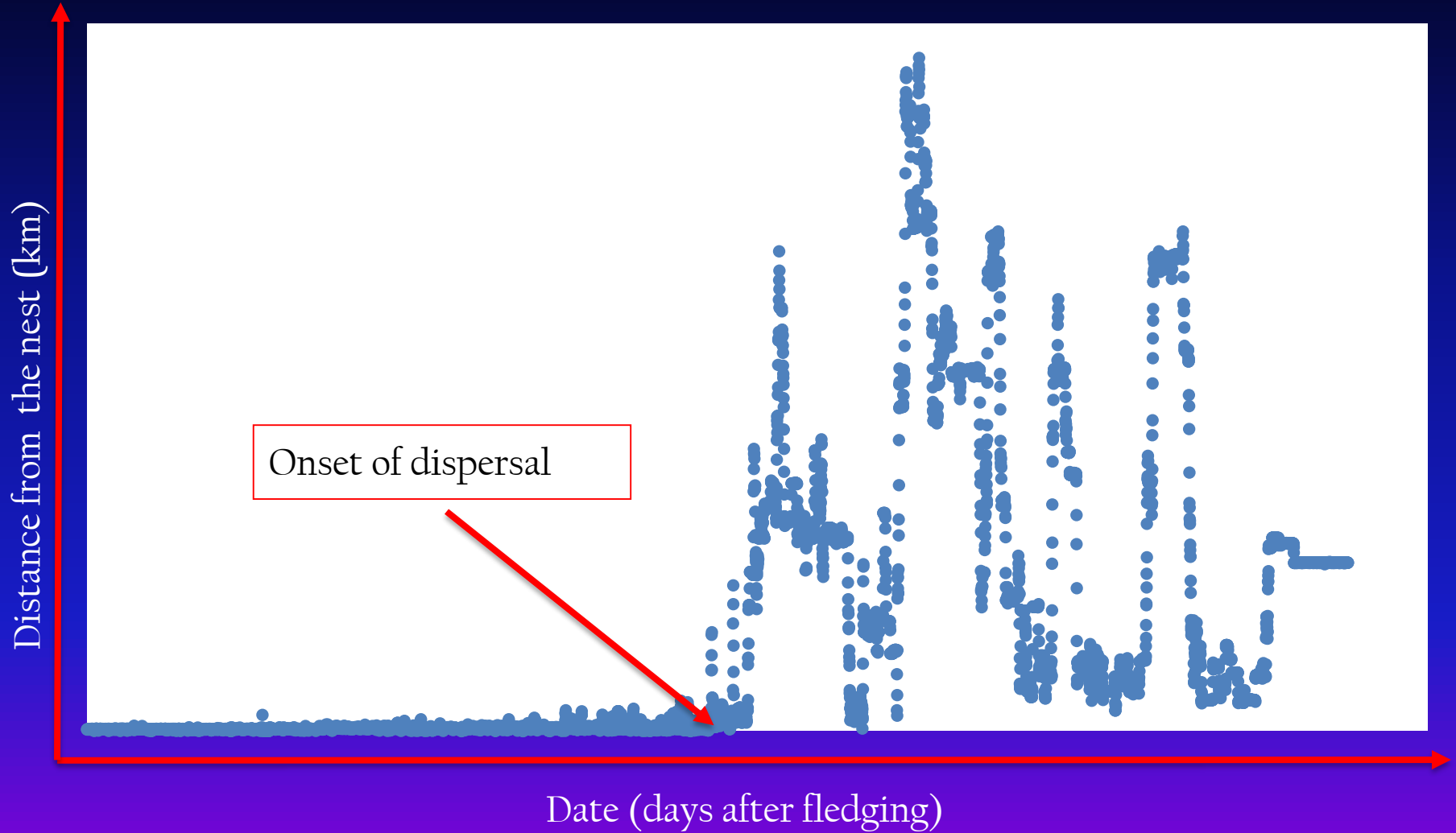
### R libraries

- adehabitatHR – Home range, Core areas
- track2KBA – Hotspot areas
- dBBMM/MOVE – Unequal movement variance & autocorrelation



- Home range (50%)
- Core areas (25%)
- Dispersal distance

## Material & Methods – Data analysis



## Results

Year	Mean fledging date	Range	N
2019	8 June	30 May – 20 June	3
2020	6 Jul		1
2021	20 May	9 May – 6 Jun	9
2022	21 may	2 May – 14 Jun	10
2023	22 May	27 Apr – 12 Jun	6
2019-2023	<b>24 May</b>	<b>27 Apr – 6 Jul</b>	29

Year	Mean dispersal date	Range	N
2019	27 Aug	9 Jul – 24 Sep	3
2020	16 Sep		1
2021	8 Aug	18 Jun – 22 Sep	9
2022	30 Aug	23 Jul – 24 Sep	5

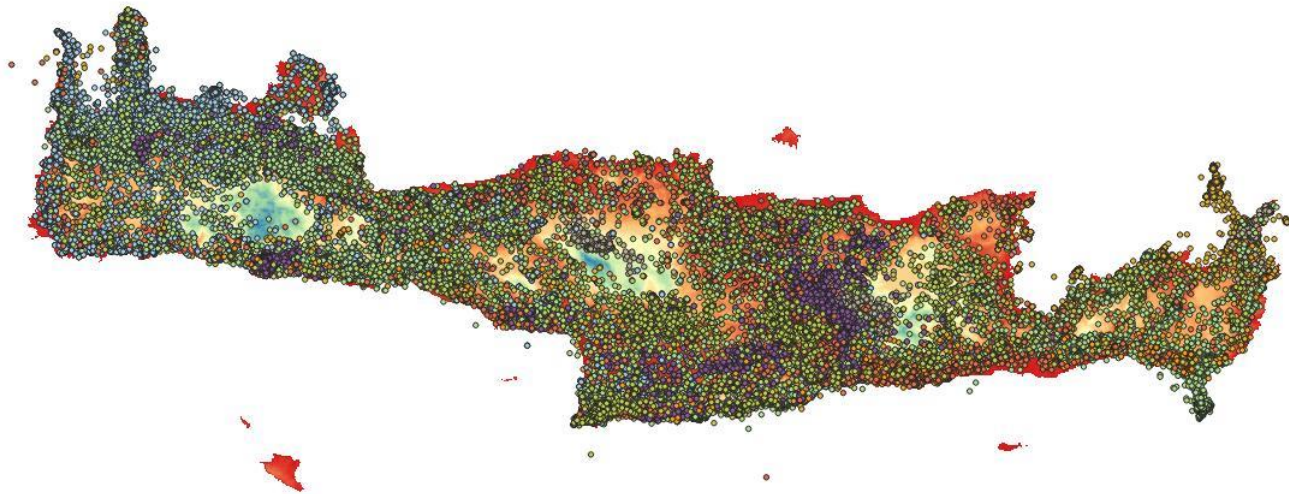


## Dispersal area

17 individuals

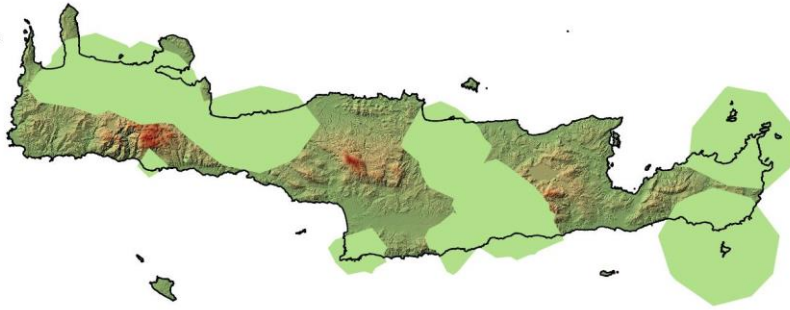
543.000 radiolocations

3350 eagle-days

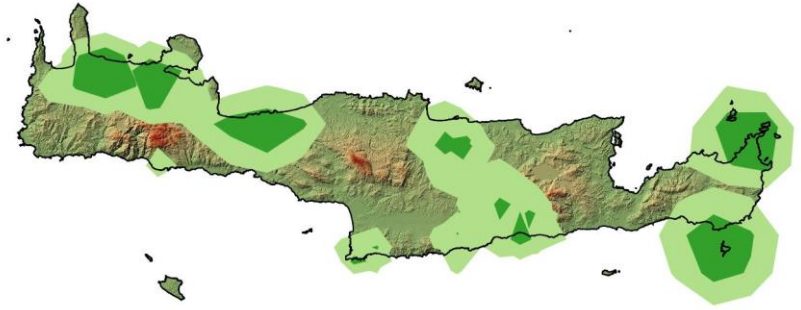


# Settlement & Hot-spot areas

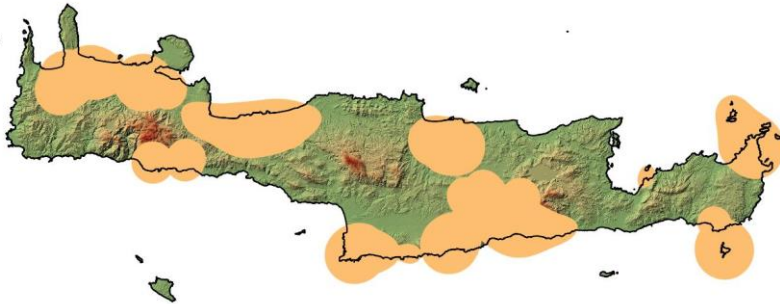
KDE50%= 685,5 Km<sup>2</sup> (range= 28,7-1738)



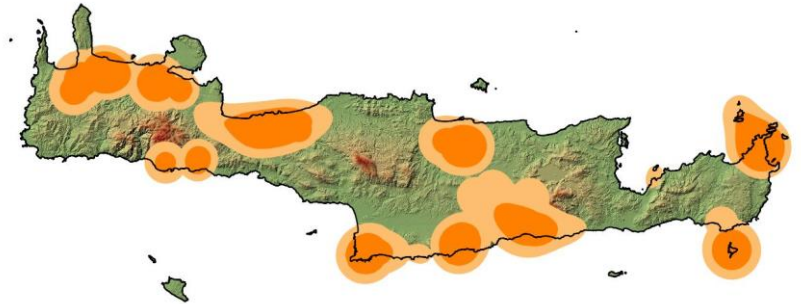
KDE25%= 119,6 Km<sup>2</sup> (range= 0,36- 349)



KBA50% = 558,5 Km<sup>2</sup> (range= 151- 1108)



KBA25%= 189,6 Km<sup>2</sup> (range= 61- 389)



❖ Mean max distance per trip= 70 km (0.5-233)

❖ Mean daily distance= 5.6 km



- ✓ *Strong site fidelity on Crete*
- ✓ *Settlement areas include:*
  - (1) *Abandoned or active territories*
  - (2) *satellite islets around Crete*
  - (3) *Rural areas (mainly olive grooves)*
  - (4) *Water reservoirs & waste dumps*





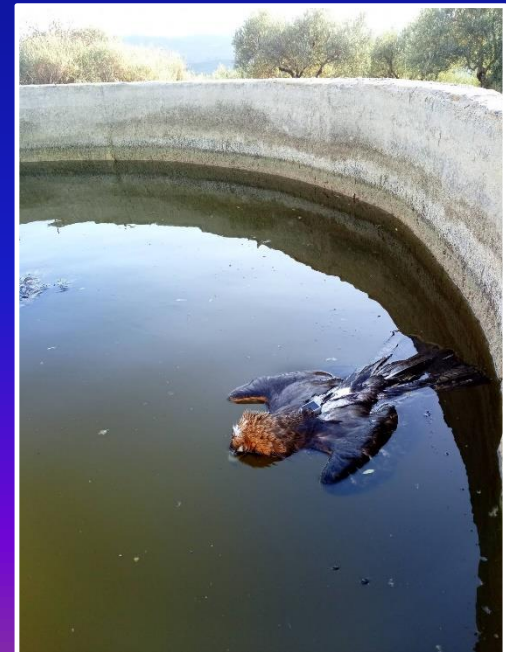
A. fasciata territories



Satellite islets

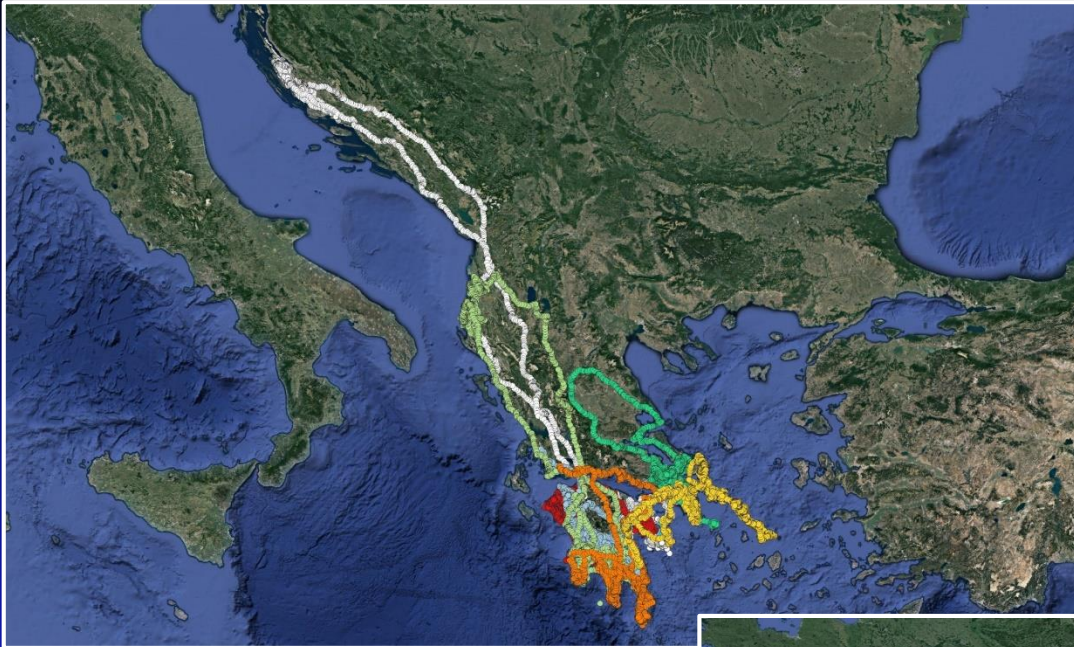


Rural areas





Mainland



Aegean





Natural  
History  
Museum  
of Crete

UNIVERSITY OF CRETE



LIFE  
Bonelli

eastMed

Thank you  
for your attention



LIFE17 NAT/GR/000514

Conservation and Management of the Bonelli's eagle population in east Mediterranean