The status of the European Roller in FRANCE

Timothée Schwartz
Groupe de Travail Rollier / A Rocha France

Breeding population status

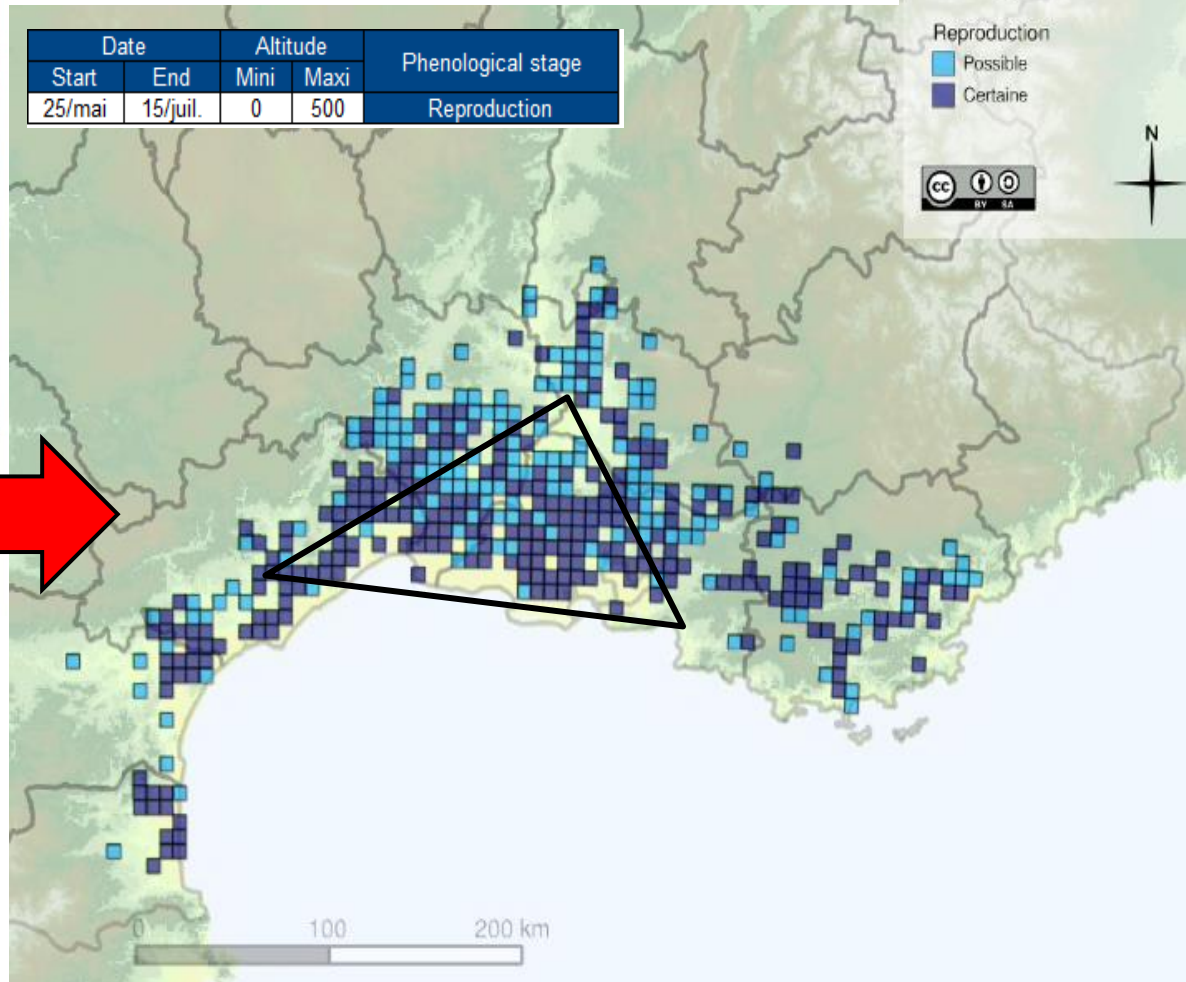Map of breeding population in France (GTR 2011)

Date		Altitude		Phenological stage
Start	End	Mini	Maxi	
25/mai	15/juil.	0	500	Reproduction

Légende

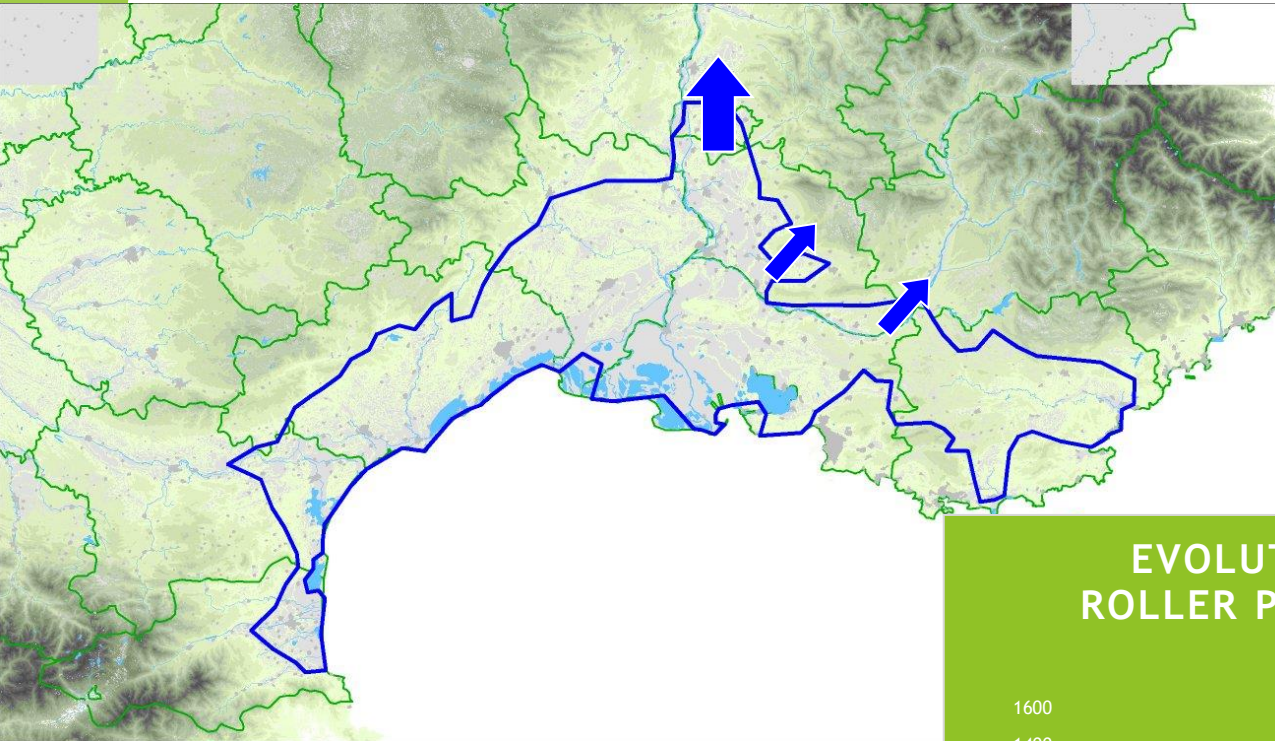Reproduction
- Possible
- Certaine

- ▶ Notes for previous slide

- ▶ The french population is located in the mediterranean region, in the lowland areas and river valleys. Rollers do not breed over 500m of altitude.

- ▶ Most of the breeding population is located within a triangle made by the cities of Marseille, Montpellier and Avignon.

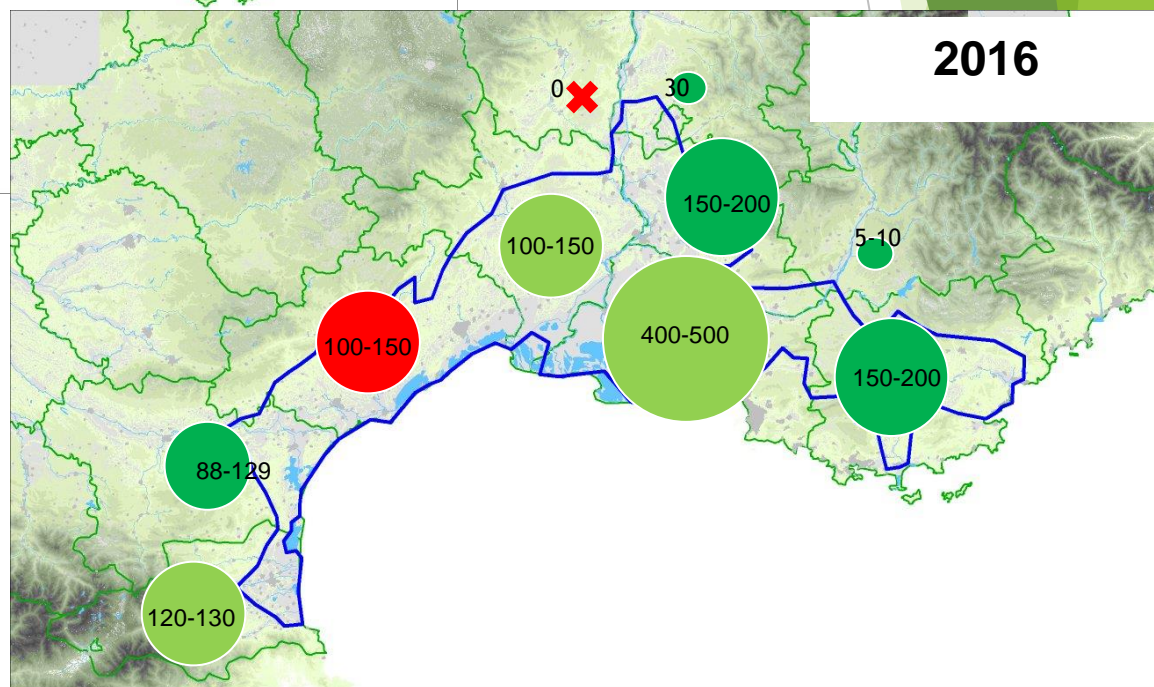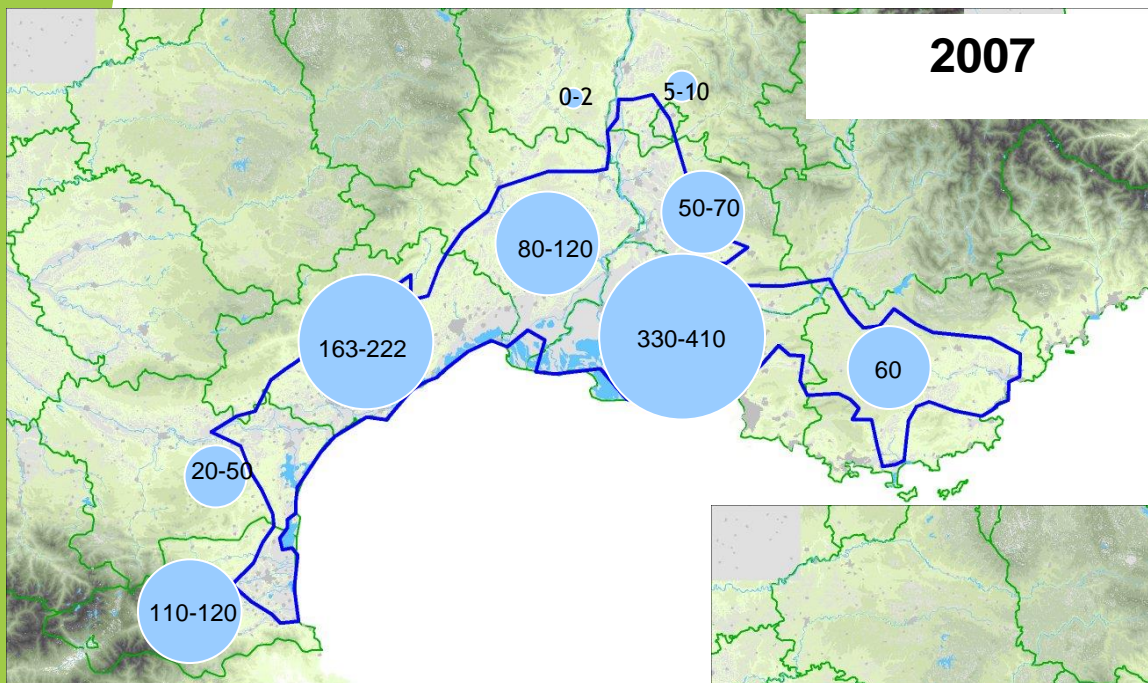# Spatial and numerical expansion

Estimations :

- 1986 : 450-540 pairs
- 1998 : 520-620 pairs
- 2008 : 800-1000 pairs
- 2016 : 1143-1499 pairs

EVOLUTION OF THE FRENCH ROLLER POPULATION FROM 1986 TO 2016

Breeding pairs

495 — 570 — 900 — 1321

- ▶ Notes for the previous slide

- ▶ According to bibliography and previous reports, data, experts knwoledge and publications, the french population has been increasing during the past 40 years.

- ▶ It is one of the only population is Europe with such a positive dynamic.

- ▶ We tried to update the french population in 2016, based on local expert knowledges in all the mediterranean districts. This is the same method that was used for the precedent census of 800 to 1000 pairs in 2008. We reach an interval of 1143 to 1499 known breeding pairs in France, which an increase of 50% since 2008.

- ▶ We have not documented local population density increase during the past 8 years but spatial expansion is very well documented especially towards the North along the Rhône river valley, along the Durance river in the East and in the hills of Provence.

2007

0-2   5-10
50-70
80-120
163-222   330-410   60
20-50
110-120

2016

0 ✕   30
150-200
100-150   5-10
100-150   400-500   150-200
88-129
120-130

Comparison 2007 – 2016:
Increase of the number of known breeding pairs in most regions, mostly to the North in the Rhône valley

▶ Notes for previous slide

▶ When we look at the different districts we can see that the number of breeding pairs has been increasing in every district except the departement of Hérault, around the city of Montpellier, which is the one with the highest rate of urbanization and infrastructure projects. Most of the population increase is located in the districts with acertained spatial expansion.

Discussion of spatial expansion

Number of localities with observations of rollers during breeding season
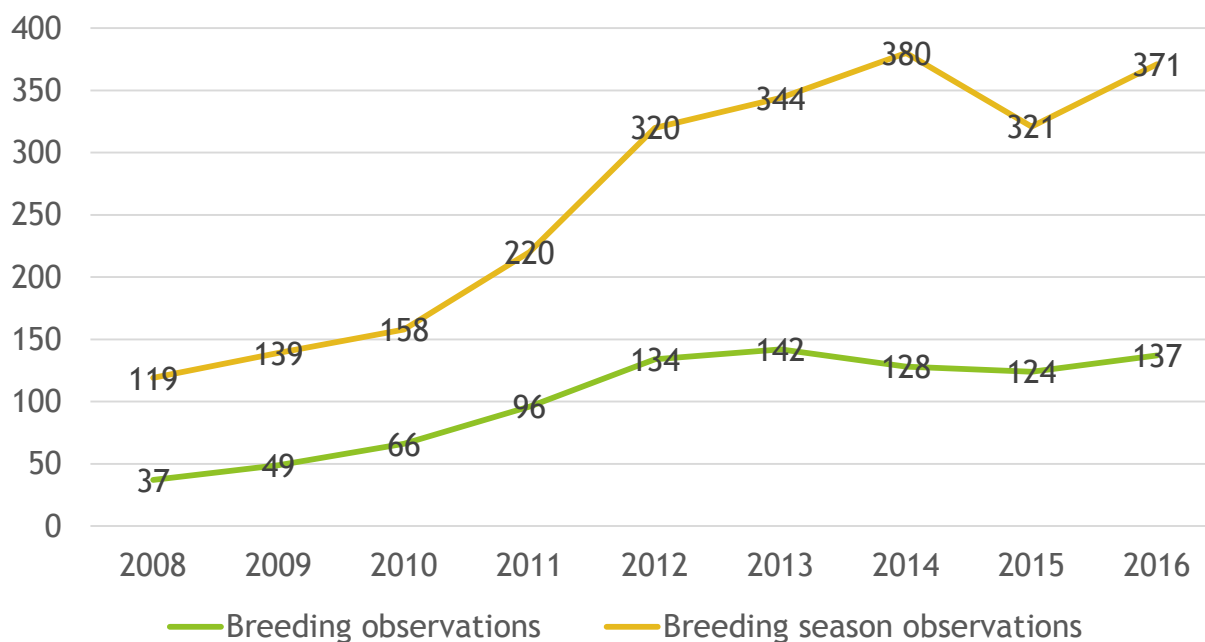
- **More localities from 2008 to 2012**
- **Stability since 2012 !**
- **So more rollers ?**

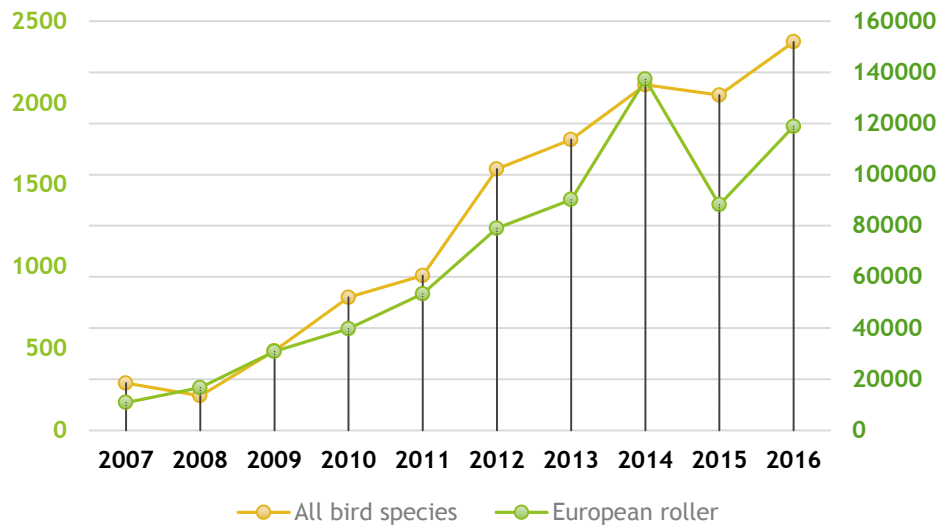*Data from Meridionalis and LPO PACA*

- ▶ Notes for previous slide

- ▶ However these numbers are only based on expert knowledge and not on factual data. So we tried to look at the different bird databases that are commonly used by birders in South of France. From these datasets, we can see that rollers have been sighted in an increasing number of different localities between 2008 and 2012 during breeding season: the figure is the same when we look at either every roller observation during breeding season, or only at the observations with breeding evidence.

- ▶ Thus we can think that the population has probably stopped to expeand or only very little since 2012.

- ▶ However we know that open online databases have been developed only recently and that the number of birders computing their data has also evolved recently, so we wondered wether these figures are reflecting a real roller expansion dynamic or only observation pressure dynamic.
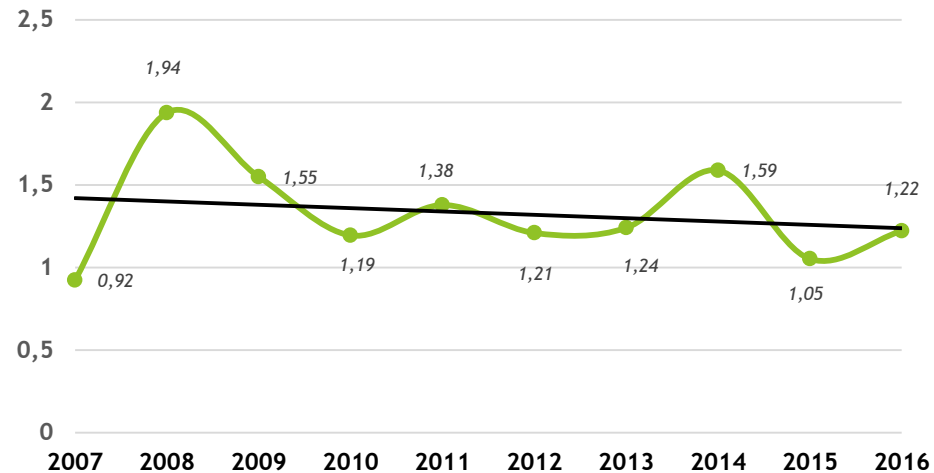
Discussion of numerical expansion

Number of sightings during roller breeding season

—○— All bird species   —○— European roller

% of roller sightings

0,92   1,94   1,55   1,19   1,38   1,21   1,24   1,59   1,05   1,22

Data from Meridionalis and LPO PACA

- More sightings = More rollers ?
- Or more sightings = more observators and more computed data !
  - => So more rollers ?
  - => We do not know !

We definitively know more pairs but we do not know if they are actually more than before...

- % of roller obs among all obs shows stability or slight decrease !
- Conclusion : population size **1143-1499** (M) with **moderate increase** (M)
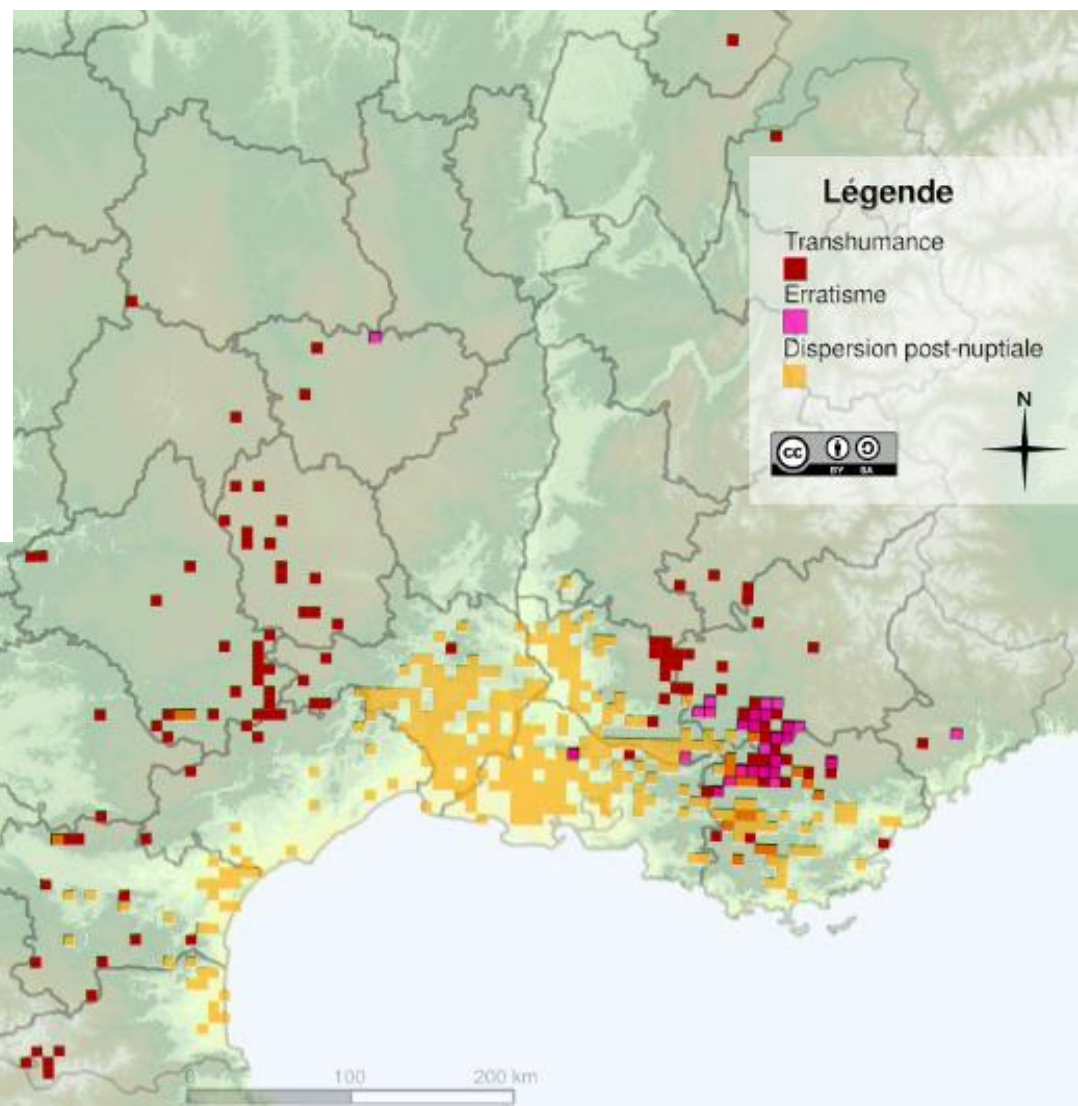
- ▶ Notes for previous slide

- ▶ When we compare the number of computed observations of rollers with the number of computed observations of every bird species in France, we can see that they follow the same curve for the past 10 years. Hence, the percentage of roller observations within all observations during roller's breeding season has been at best stable or even slightly decreasing.

- ▶ So, actually we do not knwo if we have more rollers in France since 2008 or if we only know more of them because of increased observation pressure!

- ▶ Spatial expansion is certain, and the figure of 1143 to 1499 pairs sounds realistic or even maybe slightly underestimated, but it is really possible that we had the same number of pairs already 8 years ago. This is why we need to be cautious with any conclusions about roller positive dynamic in France.

- ▶ We conclude of a moderate increase of the population since the last ISAP with medium quality data.

Août-septembre 2014

Duquet, 2014

Afflux postnuptial

Zone de nidification

Rollier d'Europe *Coracias garrulus*

Map of erratism, transhumance and post nuptial dispersion in France (GTR 2011)

Légende

Transhumance

Erratisme

Dispersion post-nuptiale

N

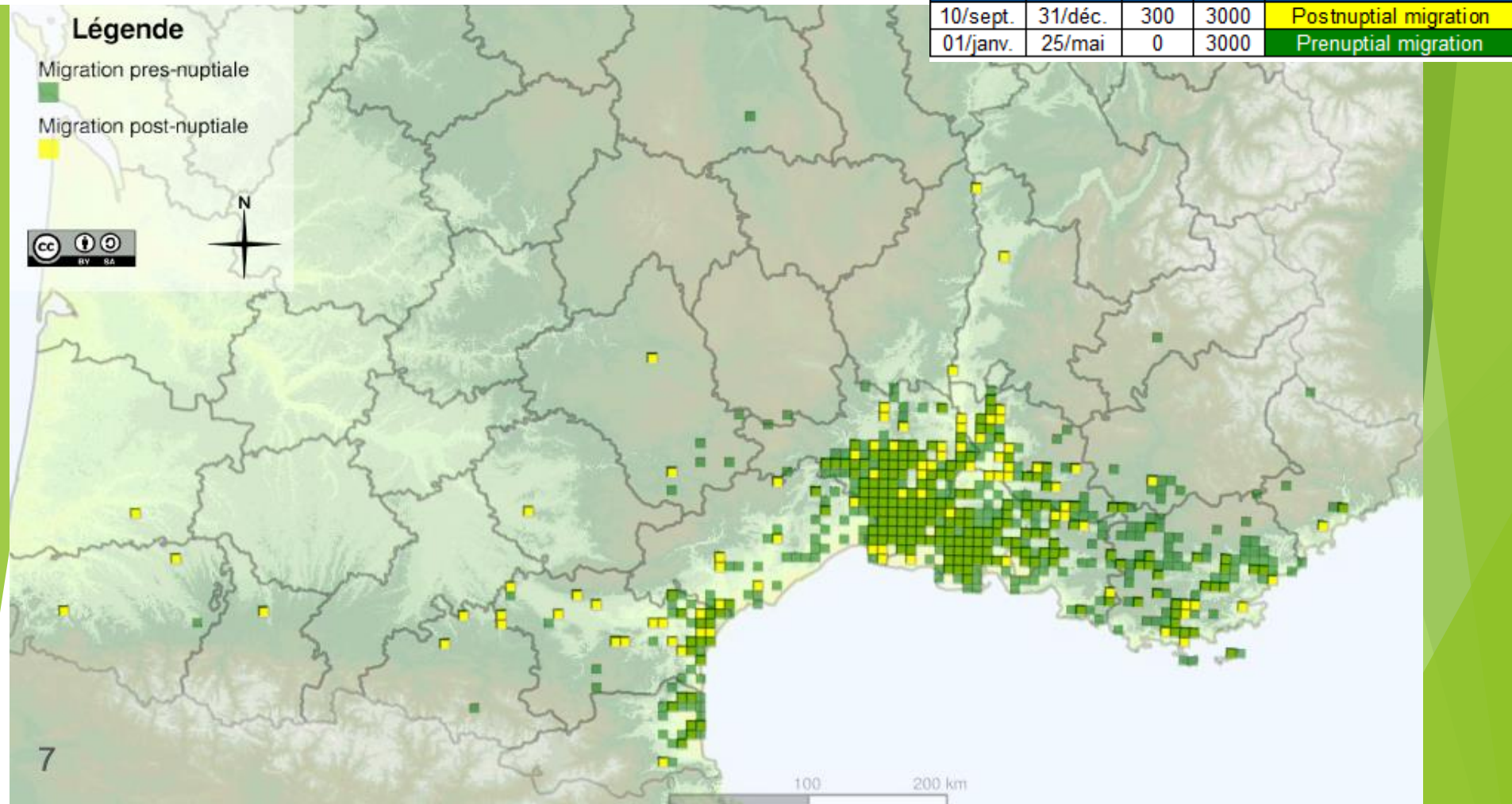| Date		Altitude		Phenological stage
Start	End	Mini	Maxi	
25/mai	15/juil.	500	3000	Erratism
15/août	31/déc.	0	300	Postnuptial Dispersion
15/juil.	15/août	0	500	Postnuptial Dispersion
15/août	10/sept.	300	500	Transhumance
15/juil.	10/sept.	500	3000	Transhumance

100   200 km

- Notes for previous slide

- Just a quick look at post nuptial dispersion data

- We found evidence of young rollers dispersing very far from breeding range, especially in 2014 when many rollers were spotted in different departements for the first time in France.

- We also have large groups of rollers that move up in the mountains in august and septembre, much higher in altitude, to forage in meadows rich with grasshopers at this time of year (just like lesser kestrels do)

Map of migration observations in France (GTR 2011)

Date		Altitude		Phenological stage
Start	End	Mini	Maxi	
10/sept.	31/déc.	300	3000	Postnuptial migration
01/janv.	25/mai	0	3000	Prenuptial migration

Légende

Migration pres-nuptiale

Migration post-nuptiale

7

▶ Notes for previous slide

▶ As for migration data, most rollers in migration are spotted within the breeding range but some are spotted in mountain areas, sometimes at over 2000m of alititude
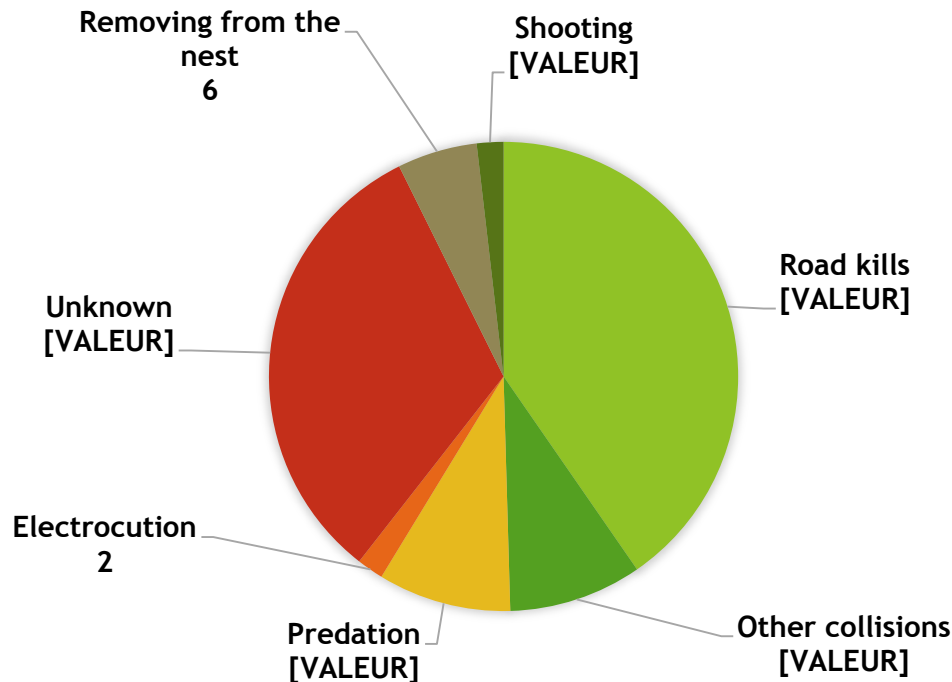
Main threats in France

MORTALITY CAUSES FOR THE EUROPEAN ROLLER IN FRANCE BETWEEN 2008 AND 2016

Removing from the nest
6

Shooting
[VALEUR]

Road kills
[VALEUR]

Unknown
[VALEUR]

Electrocution
2

Predation
[VALEUR]

Other collisions
[VALEUR]

n = 109

Author : Timothée Schwartz
Groupe de Travail Rollier

Data collected from :
- CRSFS PACA (LPO PACA)
- CRSFS 34 (LPO 34)
- Goupil Connexion HFS (30-34)
- Parc Ornithologique de Pont de Gau
- www.faune-paca.org
- www.faune-lr.org
- www.faune-drome.org
- MNHN / CRBPO

- Notes for previous slide

- Threats

- We looked at all the data of mortality we could gather since 2008 especially among the faune rescue centers in South of France

- 50% of the death causes recorded are collisions, mostly due to traffic

- Predation from natural predators and active removing from the nest of chicks are also important

- Electrocution and shooting seem rare

- But we need to bear in mind that road kills are the most detectable mortality cases

Critical threats

2.1.8 Disappearing of non productive pieces of land

2.1.9 Urbanization of the countryside

2.2.3 Logging of used / suitable trees

2.2.4 Clearing of river banks trees and riparian forests

2.2.10 Loss of solitary trees and hedges with old trees

2.2.10.1 Management of road sides

2.2.10.2 Removal of hedges for expansion of arable land

2.2.10.4 redesign of property limits and landscaping

- ▶ Notes for previous slide

- ▶ Considering the list of threats of the last ISAP, here is the list of the critical ones

- ▶ The biggest concern is the loss of breeding and foraging habitats, especially due to urbanization and intensive agric practices, management of riverbanks for flooding security

High threats

1.1.4 Secondary poisoning by insecticides

2.1.1 Land abandonment

2.1.10 Conversion of permanent grasslands to other land use

2.2.1 Replacing native soft woods with hard woods or introduced trees

2.3.2.2 Insecticides use

2.3.3 Use of herbicides

- Notes for previous slide

- High threats in France are mostly the problem of intensive pesticides use in agriculture

- Land abandonment and plantations of introduced or hard wood tree species are also of major concern

Medium threats

1.1.2 Road kills

1.2.1 Habitat degradation and loss in S Europe

1.3.1 Natural predation

2.1.2 Afforestation of pastures

2.1.4 Cultivation of fallow lands

2.1.5 Irrigation schemes

2.1.7 Intensification of grassland management

2.2.5 Loss of old buildings

2.2.5.1 renovation

2.2.8.2 No trees to replace old ones

2.2.12 Competition with other species for nest sites

2.3.1 Availability of perches for hunting

- ▶ Notes for previous slide

- ▶ We have many medium threats, among them you can find road kills, as we saw this is the main mortality cause we have recorded (it used to be at a low level in the last ISAP)

- ▶ We can find also competition with other species which is a problem with the jackdaw or the red necked parakeet

- ▶ Natural predation is also increasing as pine martin is spreading towards South of France

Long term threats with no solutions

Urbanization (2.1.9)

Plane tree *Platanus sp.* canker (2.2.10)

Use of pesticides (1.1.4 / 2.3.2.2 / 2.3.3)

Riverbanks management (2.2.4)

- ▶ Notes for previous slide

- ▶ We have major long term threats which are difficult to tackle

- ▶ Urbanization is the first one because south of France is very attractive

- ▶ We have a major problem with a desease of the plane tree, as some roller populations nest almost only in this tree species for example along the Canal du Midi

- ▶ Pesticides is a problem as France is one of the biggest user in Europe and this is not decreasing

New threats

▶ Large infrastructure projects in South of France (new roads and railways, large activity or logistic plants) = H

▶ Large renewable energy installations such as

- Windmills = H

- Solar panels = M

- Notes for previous slide

- Our new threats are mostly the new large infrastructures that are built or going to be started in south of France such as motor ways, rail ways, large logisitic plants, which always impact roller breeding territories

- Also the multiplication of windmill and solar panels plants is reducing foraging habitats and causes mortality

Threats that have been solved or gotten better

2.1.3 Increase of monoculture: M -> L

2.1.4 Cultivation of fallow land: C -> M

2.3.1 Availability of perches for hunting: H -> M

- ▶ Some good news anyway

- ▶ Monoculture is rather decreasing in South of France as organic farming and cattle rearing is increasing

- ▶ Lack of fallow lands are not a major problem because many agriculture lands are getting abandonned, this also brings a lot of natural perches for rollers

Changes in policies and legislations in France

➢ Development of biodiversity offset policy : any impact on protected species has to be avoided, reduced and compensated (obligation of compensation is new)

➢ More constraints for projects in Natura 2000 sites

% of population protected

➢ Probably 50-60% of breeding pairs are in "protected" areas (Natura 2000 or natural parks mostly) but very few in legally protected sites (national reserves, national parks, <10%)

- ▶ Notes for previous slide

- ▶ As for policy and legislation, we have had a new biodiversity law in 2016. This law strengthens the biodiversity offset policy, any new infrastructure project has to avoid any impact on biodiversity or compensate. Obligation of compensation is new

- ▶ Also on Natura 2000 lands there are more regulations on projects, so these areas are better protected

What is the main goal in your country regarding the roller population?

- ▶ Stability or increase of the population

- ▶ Reliable / unbiased census of the population at a national level for long term monitoring

SZALAKÓTA
védelmi program
www.rollerproject.eu

life

NATURA 2000

MME

▶ Notes for previous slide

▶ We do not have an official goal for the roller population in France, but everyone agrees that we need to keep our population stable or increasing, and very important, to perform a reliable census of the population on a national level in order to be able to do long term monitoring

Recent conservation activities in France

▶ National review of roller data in France before 2012 (GTR 2013)

▶ Census of local populations (Alpilles, Roussillon, Costières de Nîmes, Gorges du Gardon)

▶ LIFE+ Alpilles www.life-alpilles.com

- 72 nestboxes for roller set up and monitored

- 5km of hedges planted

- 200m of riparian forest planted

- 200 ha of closed habitats reopened and grazed

▶ Maintenance and monitoring of nestboxes

- in Vallée des Baux, Provence (A Rocha France)

- In Roussillon (GOR / UEA / A Rocha France)

Recent conservation activities in France

- ▶ PhD thesis of Tom Finch (UEA)

- ▶ 3 scientific papers on migration (Finch et al. 2015 & 2016, Emmeneger et al. 2013)

- ▶ 2 scientific papers on video camera monitoring in a nestbox (Guillaumot 2016 & 2017)

- ▶ Study on roller nestsite selection in Provence (Bouvier et al. 2014)

- ▶ Research project of Timothée Schwartz on the roller (EPHE)

  - Lead of national colour ringing scheme (since 2014)

  - National census protocol (Schwartz 2016)

  - PhD starting in February 2017

Please list any new scientific findings that could affect the conservation of the species.

▶ Tom Finch's PhD outcomes

▶ Preliminary results on comparison of natural and artificial breeding sites (oncoming Timothée Schwartz'PhD)

▶ Notes from previous slide

▶ As for new scientific findings, we will quickly look at some results of Tom Finch's PhD and preliminary results of my own PhD thesis
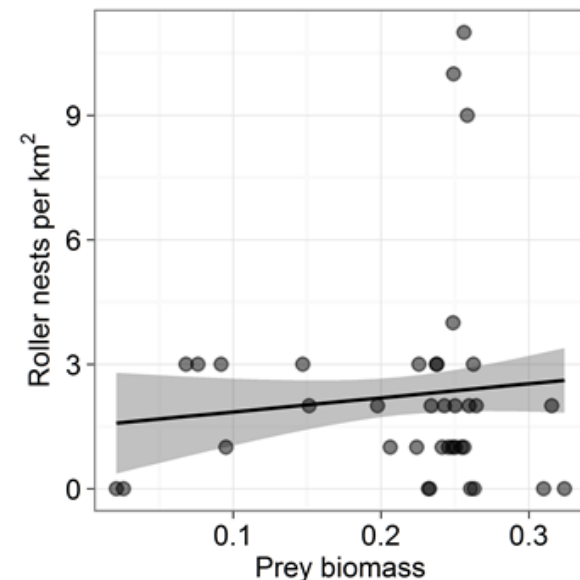
Insect abundance and breeding ecology
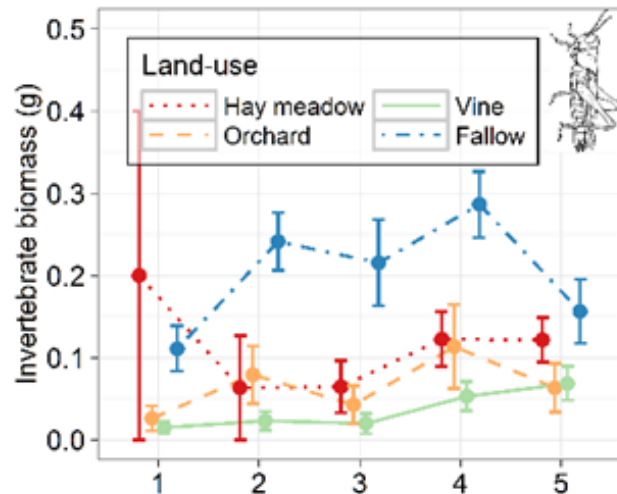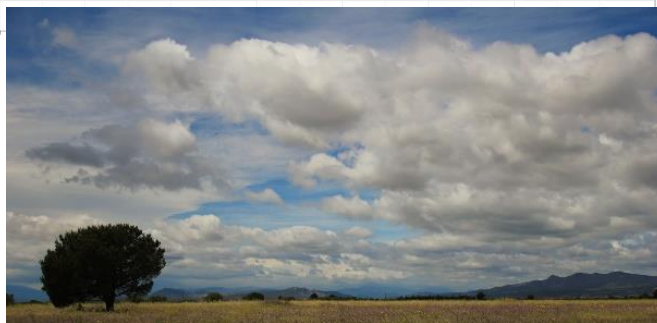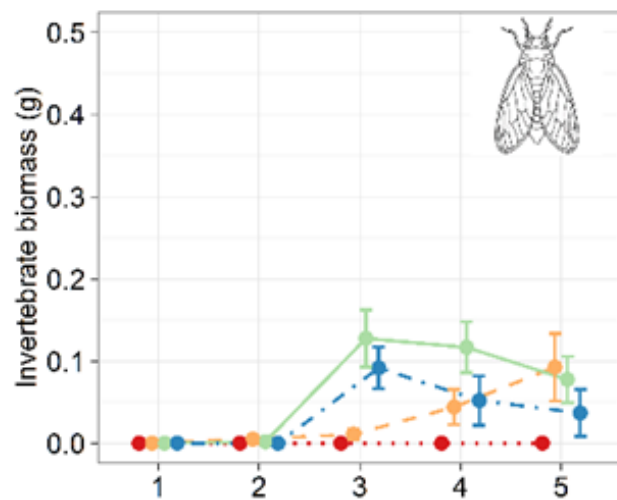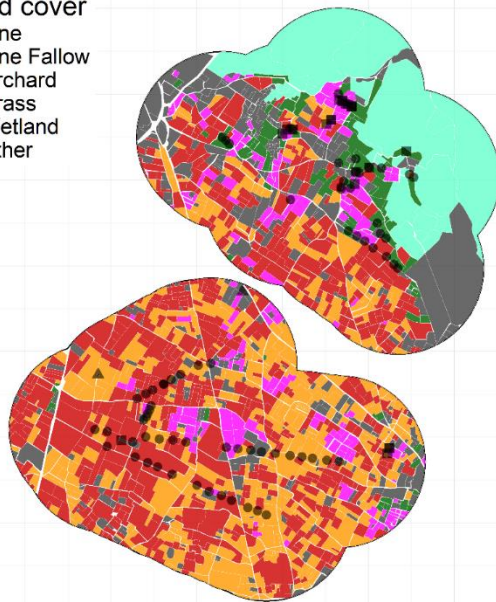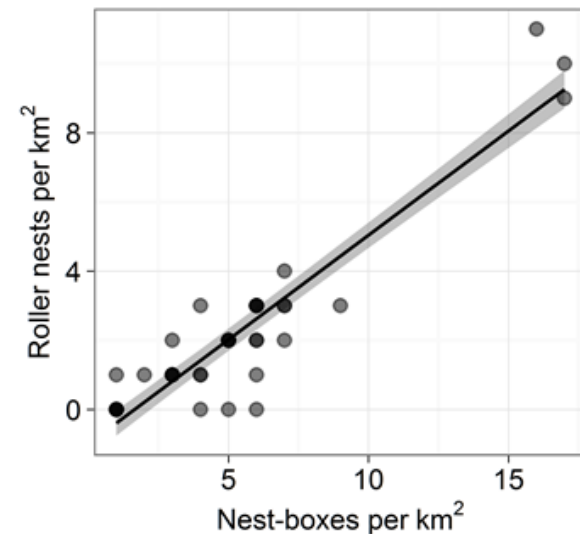
► Notes for previous slide

1. Tom conducted Insect transects in habitats surounding Roussillon Population in South of France : show clear spatial and temporal patterns and allow us to predict prey abundance across time and space (so can predict the quality of a breeding territory in terms of prey abundance, based on surrounding land use)

3. Across the site, Roller density correlates very strongly with nestbox density, but not with prey abundance : this shows existing nest site limitation ! So we could increase the local population size by increasing the number of nestboxes.

Home range

France
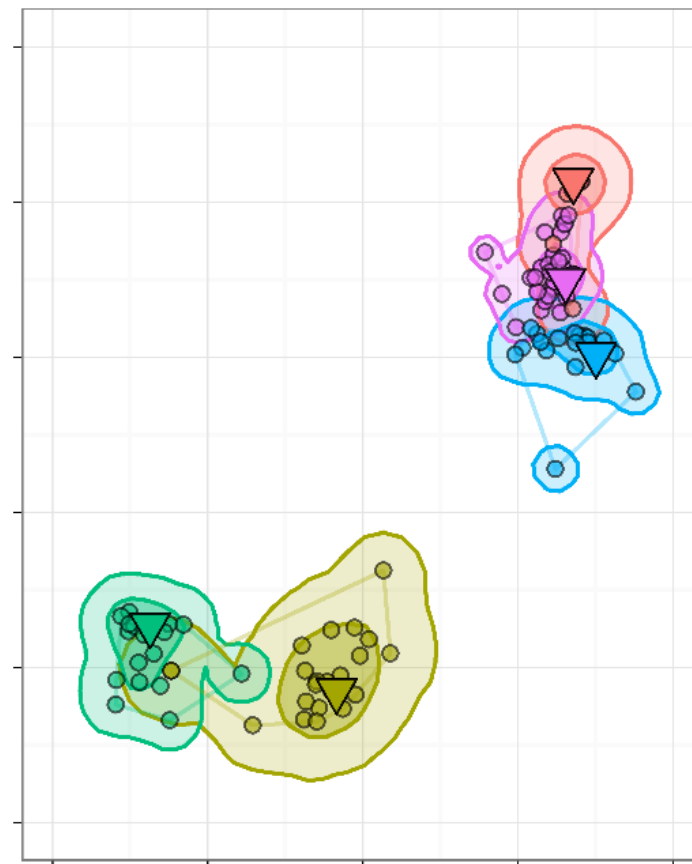
$n = 5$

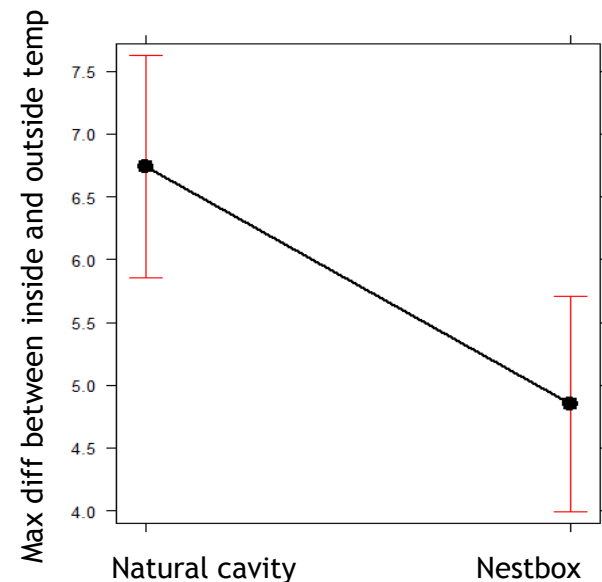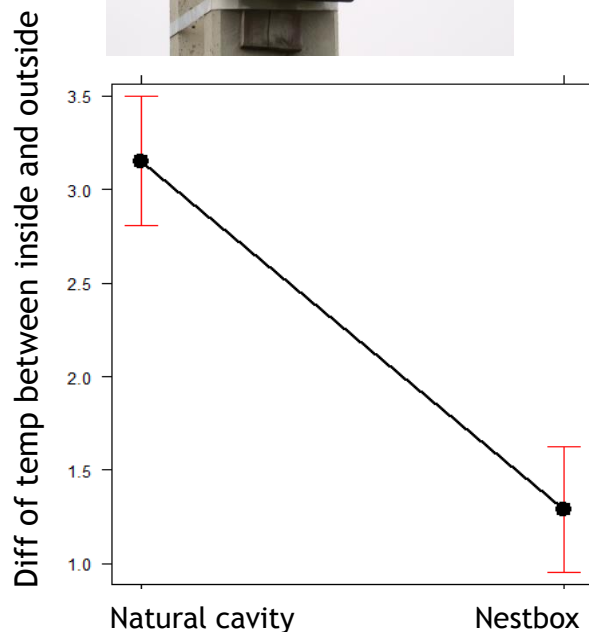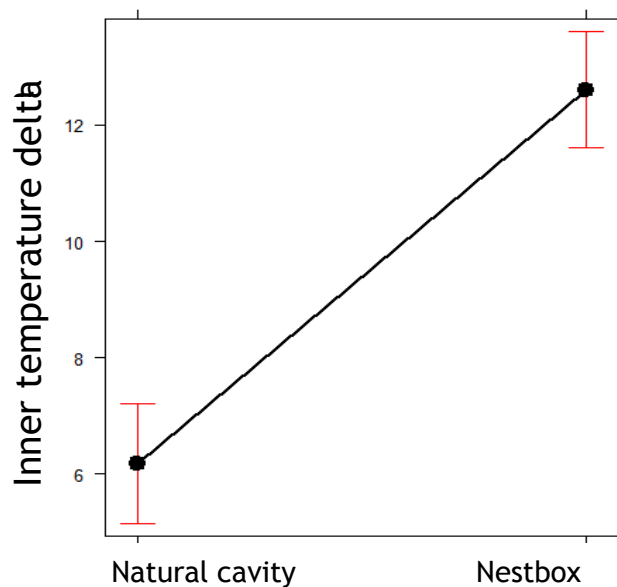50% of fixes within 250m, 95% within 750m

▶ Notes for previous slide

▶ 2. Tom did radio tracking on a small sample of birds, less than expected (5) in order to characterize home range. We can say that Rollers generally forage <1km from the nest in Roussillon, which is rather small, probably because they have lot's of food

Comparison of natural and artificial breeding sites

- Notes for previous slide

- On my side I compared microclimatic conditions between natural and artificial nests. I recorded temperature inside and outside 30 artificial nest boxes and 30 natural cavities in trees (which are mostly green woodpecker cavities) half of them occupied and half not occupied by rollers

- I found that temperature in cavities is

- More stable (smaller interval between max and min temp)

- Cavities have a better buffer effect (inside temperature is less related to outside temp)

- This preliminary results show that temperature variations in nest boxes are stronger than in natural cavities, and thus artificial nest boxes might create stronger constraints on fitness and could lead to create ecological traps

Monitoring methods

▶ National census protocol developed in 2015 (Schwartz 2016)

▶ Only implemented on small sites so far (lack of funding for national survey)

▶ Methodology:

- Random selection of 1km² squares within known breeding range

- Habitat description of selected squares

- Looking for nest sites with breeding proofs (feeding / chicks calling…) : we count breeding sites and not rollers

- Point transects repeated 3 times between 15/06 and 15/07

▶ Analysis:

- Royle N-mixture models (Royle 2004)

- Calculates detection probability of breeding sites

- Calculates density of breeding sites with confidence interval for selected squares

- Enables unbiaised extrapolation on all breeding range

▶ Notes for previous slide

▶ Monitoring methods

▶ You understood we have not had the chance to launch a national census of the population yet

▶ However we developed a census protocol that is available and reliable, we tested it successfuly on a few sites

▶ The method consists in doing a random sampling of 1 square kilometer plots on which we do point transects to look for roller nest sites. We repeat this 3 times between the 15th of June and the 15th of July.

▶ The analysis is based on N-mixture models and enables to separate the detection from the presence probability and thus calculates a density. As this is unbiaised we can extrapolate on the rest of the squares that have not been chosen.

Goals and actions from the last ISAP (2008) that are now considered complete.

▶ 1.2.4 Design and promote best practice agro-environmental measures targeting Roller

▶ 1.3.1 Raise awarness about the value and conservation status of the Roller among key stakeholders

▶ 2.1.4 Promote /improve environmental impact assessment of irrigation schemes

▶ 2.2.6 Install nestboxes including in areas whith healthy populations but with likely shortage of nest sites

▶ 2.3.1 Promote international cooperation for the study of roller movements and the threats along flyways

Goals and actions from the last ISAP (2008) that are partially complete.

- ▶ 1.1.1 Develop national species action plans

- ▶ 1.1.2 Legally protect

- ▶ 1.1.3 Develop site management plans

- ▶ 1.2.1 Develop monitoring schemes and implement annual monitoring on roller populations and breeding success

- ▶ 1.2.5 Design and promote best practice forestry measures targeting roller

- ▶ 1.2.6 Develop best practice guide for nest box placement, design and maintenance

- ▶ 2.1.6 Protect and restore non-productive features

- ▶ 2.1.7 Identify and ban insecticides and herbicides with adverse effects on rollers

- ▶ 2.1.10 Ensure that roller priority areas are taken into account during urban development mapping

- ▶ 2.2.1 Ensure that old cavity trees are not cut by forestry operations

- ▶ 2.2.4 Promote planting of native softwood and the elimination of introduced tree species in roller priority areas

- ▶ 2.2.7 Provide alternative nest sites near old buildings with nests to avoid nest-site destruction

- ▶ 2.3.2 Promote bird friendly electric pylon design

Acknowledgements

Thank you.