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**To cite this version:**

Sourdril, Anne and Wencelius, Jean and Andrieu, Émilie and Barbaro, Luc and Barnaud, Cécile and Deconchat, Marc : *Bringing together local ecological knowledge, anthropology & landscape ecology to understand the impacts of socio-ecological changes on rural communities in South-western France*. (2017)  
In: 23. International conference Society for Human Ecology: Navigating complexity, human-environmental solutions for a challenging future, 7 July 2017 - 10 July 2017 (Lisbonne, Portugal).

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# Bringing together local ecological knowledge, anthropology & landscape ecology to understand the impacts of socio-ecological changes on rural communities in South-western France



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SHE Conference – Lisbon – July 7-10, 2017

# The story of bird disappearance from rural France

## A hot topic

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« **The birds disappear from the French countryside at breakneck speed** »  
*This catastrophic decline of one-third in fifteen years is largely due to agricultural practices according to CNRS and Museum researchers.*

From *Le Monde Journal* – 03.20.2018 By Journalist Stephane Foucart

Quote from the paper : « **Spring may be silent this year.** The Museum of Natural History and the National Center for Scientific Research announce Tuesday, March 20, the main results of Breeding Bird Surveys on the French territory and evoke a phenomenon of "massive disappearance", "close to the ecological disaster » . "The birds of the French countryside are disappearing at a vertiginous speed, specify the two institutions in a joint communique. On average, their populations have reduced by a third in fifteen years". »

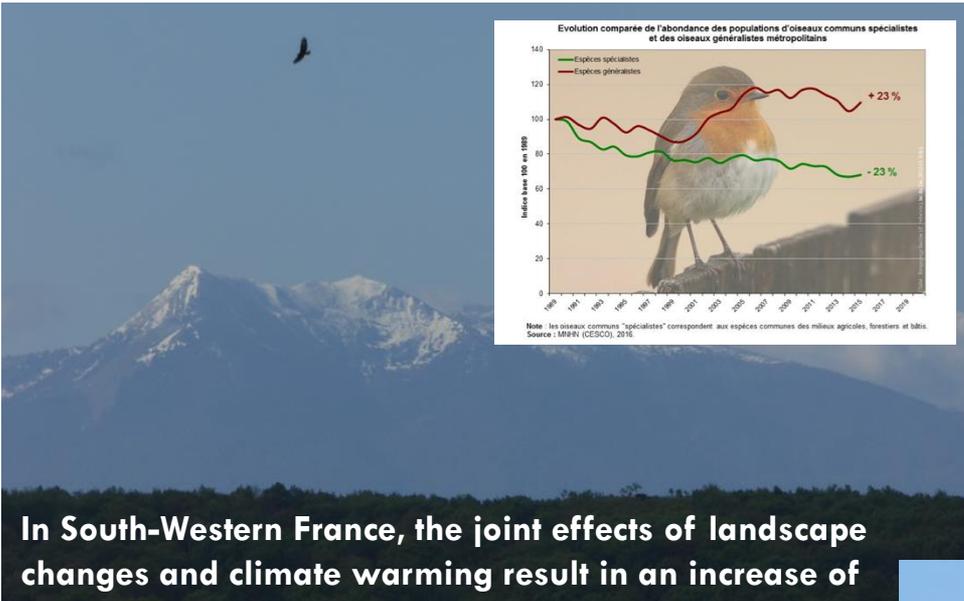


Sur la zone-atelier du CNRS, étudiée sans interruption depuis 1994, la perdrix est désormais virtuellement éteinte.  
McPHOTO / PICTURE ALLIANCE / BLICKWINKEL / MAXPPP

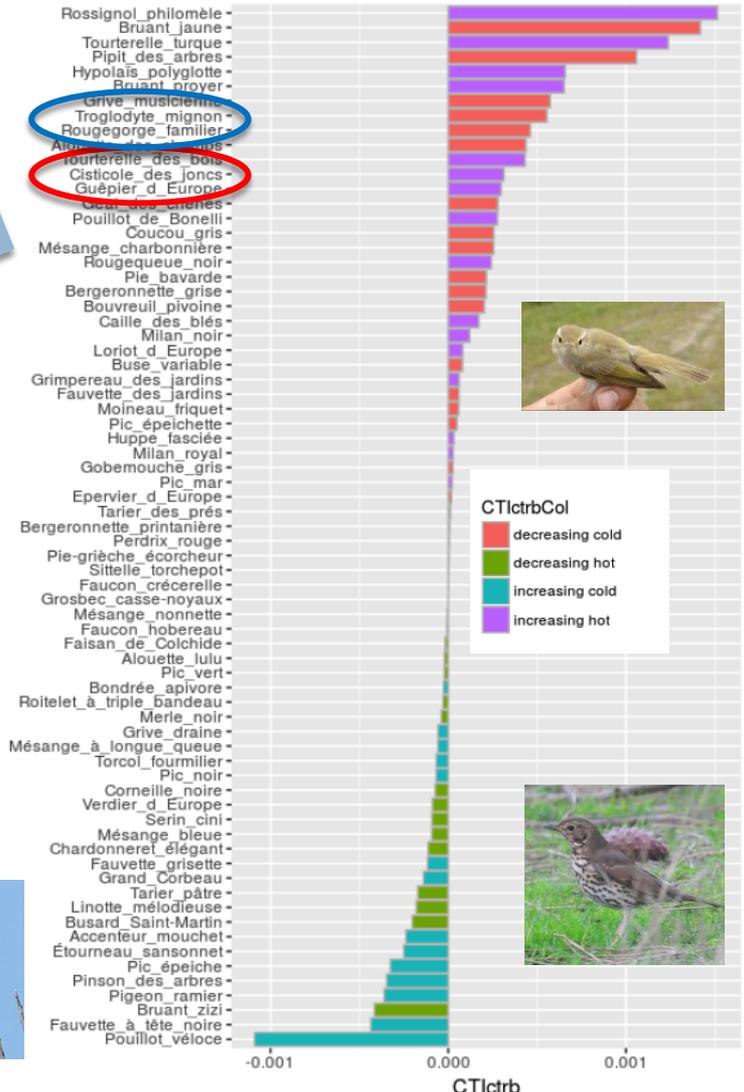
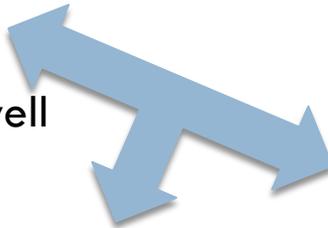
# Looking at birds to understand changes... Birds as indicators for ecologists and scientists

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Birds, especially long-distance migrants, are good indicators of socio-economic, environmental, and climate changes, as well as seasonal variations for ecologists.



In South-Western France, the joint effects of landscape changes and climate warming result in an increase of **warm-dwelling birds**, a decline of **cold-dwelling birds** and new species colonizing such as the black-shouldered kite *Elanus caeruleus* (Gaüzère et al. in prep).



# Looking at birds to make sense of changes...

## What about local stakeholders?

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- **Context:** Rural and periurban areas are affected by global environmental changes that are not always easy to perceive for local communities.
  - **Background :** Researchs on local indicators through ethnosciences document indigenous knowledge on changes and adaptation attempts (Berlin, 1992 ; Veteto & Carlson, 2014 ; Crate & Nuttall, 2009). **Local indicators are linked to traditional knowledge, to empiric experience of the land and depend also on cultural and individual characteristics** (Crate & Nuttall, 2016 ; Orlove *et al.*, 2003).
- ➔ **Research questions (within the framework of ANR Piaf project) :** Are local diagnostics of environmental and socio-economic changes built through bird observations? Is there a difference between local and ecological indicators? How indicators can be used for adaptations at a local scale?

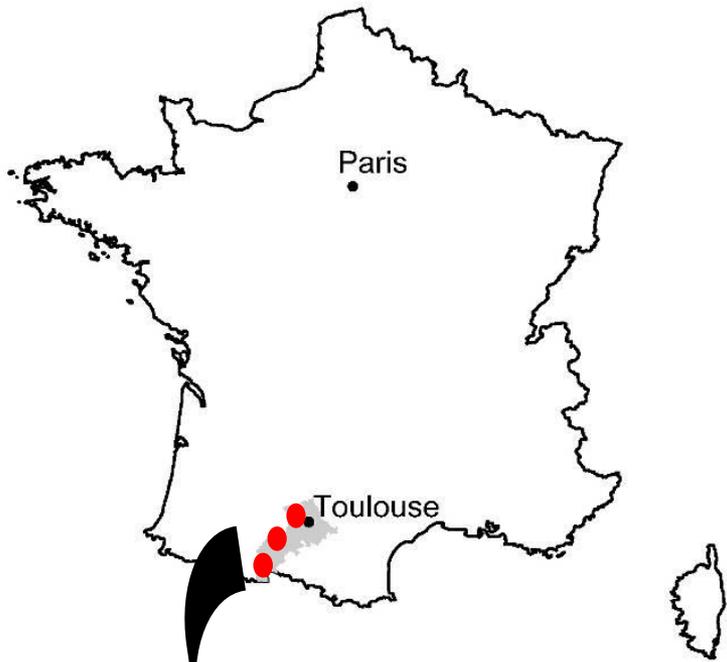


**What is a local indicator, what is an ecological indicator?**

# Birds as indicators in South-Western France?

## From protected to urban areas

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- **South-western France:** LTSER site studied by ecologists and social scientists since 1980's,
- **Urban / Rural / Protected areas:** house-centered system, **mixed-farming** AND sociological changes (**rural exodus, peri-urbanisation & arrival of new comers**),
- **Ethnographic investigations:** semi-directed interviews, freelists, observations...
- **150 interviews:** old timers & new comers (arrived in the 2000's), land users, nature managers ; **60 freelists.**



# Ethnography & freelisting: Between qualitative and quantitative analysis

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- Freelisting is a method of free elicitation to get sense of the local knowledge : informants were asked **to list all the birds species they knew**, then to comment on the changes affecting the birds within (or outside) the list (See Borgatti, 1999, Winkler-Rhoades, 2011),
- The lists were jointly **analyzed** by anthropologists and ecologists using the **underlying statistical significance of the cited bird names** with the FLAME / FLARES softwares (Wencelius *et al.*, in press),
- Local peoples' bird lists to be compared to ecological indicators from scientific surveys, to identify common species, or potential mismatches?
- Interesting method but with some limitations (limited part of the local knowledge accessible to interviewers – to be completed with in-depth interviews and participant observations).

A. F.	Laurianne	G.L.
Pie	Flamant_Rose	Pigeon
Pinson	Mouette	Colombe
Aigle	Pigeon	Perruche
Chouette	Moineau	Perroquet
Buse	Perroquet	Martin_Pêcheur
Mouette	Poule	Goéland
Colibri	Coq	Rouge_Gorge
Perroquet	Rossignol	Pivert
Perruche	Rouge_Gorge	Mésange
Mésange	Héron	Tourterelle
Corbeau	Pélican	Faucon
Pigeon	Corbeau	Pie
Palombe	Pie	Hibou
Coucou	Tourterelle	Colvert
Hirondelle	Pivert	Héron
Grue	Poussin	Buse
Cigogne	Aigle	Colibri
	Buse	Chouette
	Perruche	Aigle

**Example of freelist recording  
in the rural fieldsite**



# Birds as indicators in South-Western France?

## From protected to urban areas: connections to nature

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- Informants with the same cultural background but differences between the studied sites :
  - **Protected area** : traditional agricultural household (breeding mainly), lots of tourism and conservation incentives and people working for protected areas.
  - **Rural Area** : Traditional agricultural household (mixed farming) in the area for multiple generations / New comers mainly retirees from Northern Europe.
  - **Urban area** : Peri-urban population, young commuters working in Toulouse, few farmers and connexion to the land weaker than the 2 other sites.

Will those differences and various connections to the environment have an impact on the knowledge on birds, diagnostics of changes and local indicators within the 3 sites?



**Birds as « indicators »...?**



# Are birds indicators for local stakeholders?

## Differences in the main cited species in the 3 sites?

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PROTECTED	RURAL	URBAN
<i>Gyps fulvus</i> Vautour fauve	<i>Parus</i> ; Aegith Mésanges	<i>Columba livia</i> Pigeon
<i>Aquila chrysaes</i> Aigles	<i>Buteo buteo</i> Buse	<i>Aquila chrysaes</i> Aigles
<i>Gypaetus barbatus</i> Gypaète	<i>Columba palus</i> Palombe	<i>Hirundo</i> ; Ripa Hirondelles
<i>Turdus merula</i> Merle	<i>Passer domesticus</i> Moineaux	<i>Chroicocephalus</i> Mouettes
<i>Passer domesticus</i> Moineau	<i>Columba livia</i> Pigeon	<i>Pica pica</i> Pie
<i>Corvus</i> Corbeaux/cor	<i>Hirundo</i> ; Ripa Hirondelles	<i>Parus</i> ; Aegith Mésanges
<i>Tetrao urogallus</i> Grand Tetra	<i>Carduelis carduelis</i> Chardonnet	<i>Passer domesticus</i> Moineaux
<i>Pica pica</i> Pie	<i>Erithacus rubecula</i> Rouge-Gorge	<i>Streptopelia</i> d Tourterelle
<i>Columba palus</i> Palombes	<i>Perdix perdix</i> Perdrix	<i>Buteo buteo</i> Buse
<i>Hirundo</i> ; Ripa Hirondelles	<i>Pica pica</i> Pie	<i>Erithacus rubecula</i> Rouge-Gorge

The most cited species are relevant with the local compositions of the avifauna.

10 most frequently bird species cited per sites

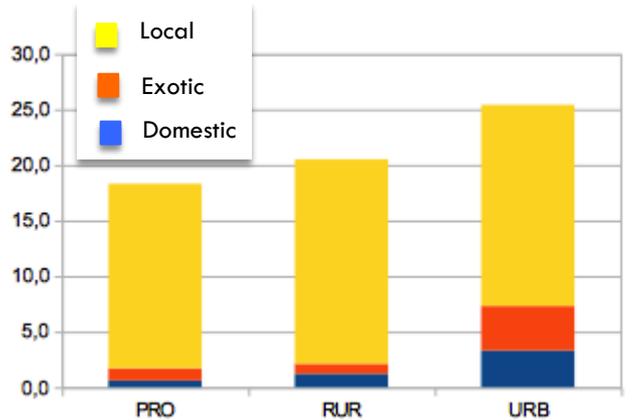


First species cited: in protected areas → Griffon vulture  
 in rural areas → Blue tit  
 in urban areas → Common pigeon

# Are birds indicators for local stakeholders?

## Do the urban informants know less about birds?

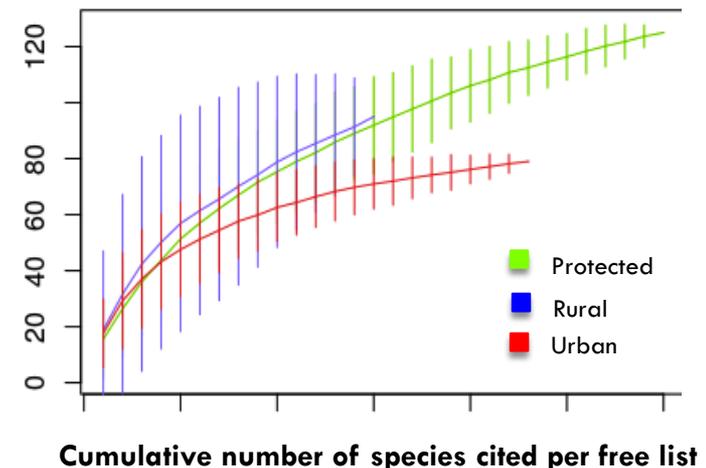
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Number of species cited per informant per site

We hypothesized that urban informants will know less about birds than rural ones, but unexpectedly **each urban informant cited in average more species** (26 for 17 in the protected area) and cited **more exotic and domestic species**: urban people do NOT know less bird species than the others.

However, they tend to cite altogether fewer and more local generalist species, while **in rural and protected areas FLs showed more specificity and diversity**: informants from these areas have a more detailed knowledge on birds than urbans.

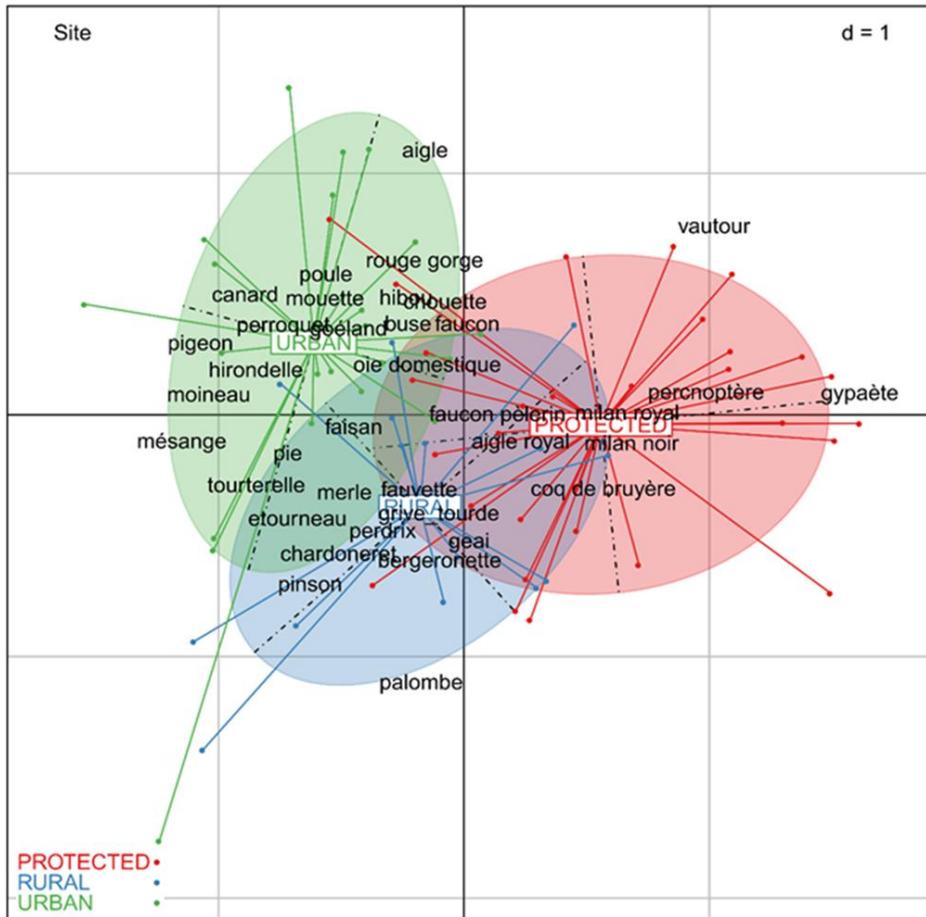


# Are birds indicators for local stakeholders?

## When freelists show site differences in bird perception

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Resp. by Resp proximity – Principal component analysis



68 respondents.  
PCA on a B prime score respondent by item matrix  
using items cited by 5 to 100% of respondents.

### Stakeholders' freelist comparisons based on bird species citations

In urban areas, informants tend to cite a large diversity of birds, including urban-dwelling species (House sparrow, Common pigeon) which population dynamics are linked by them to urbanisation.

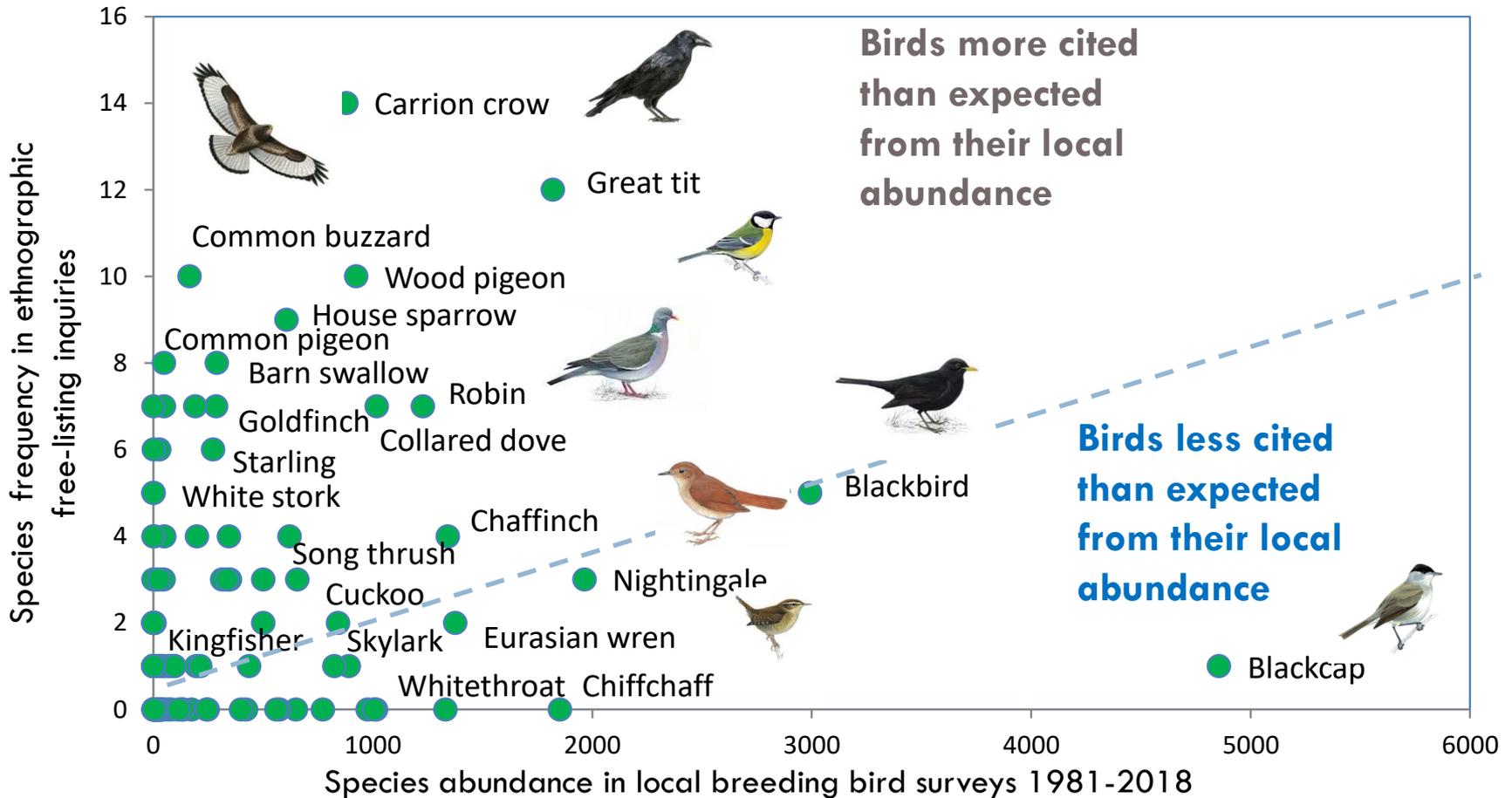
In rural areas, typical farmland and game birds are cited (Grey wagtail, Wood pigeon) some decreasing / increasing as a sign of farmland intensification.

In protected areas, iconic birds of high conservation value are cited (Capercaillie, Bearded vulture) which dynamics are associated to land abandonment.

# Are birds indicators for local stakeholders?

## Are birds cited in proportion of their local abundance?

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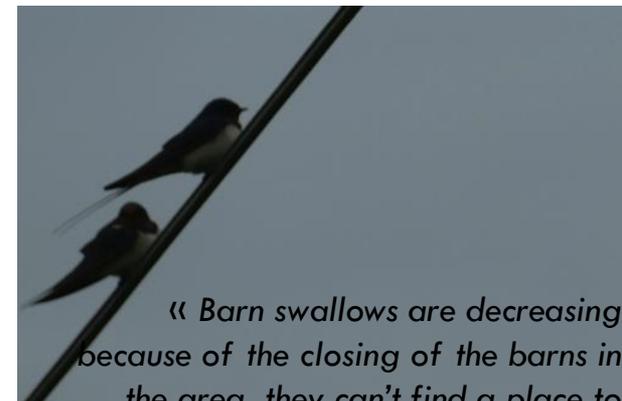
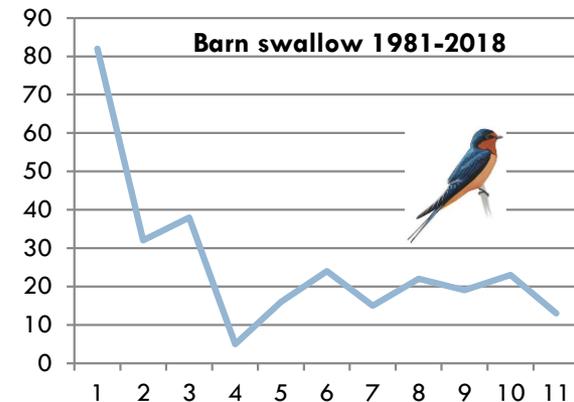
**Overall response is YES but some bird species are far more cited than their actual presence in the local environment due to conspicuousness and comensalism with humans.**

# Are birds indicators for local stakeholders?

## ≠ / = between local & ecological indicators

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- **Some common diagnostics:** for example the decrease of barn swallow is observed by both local people and ecologists, but not linked to the same causes (loss of habitat for the local stakeholders / using of pesticides and global climate change for the ecologists),
- **Some opposite diagnostics:** more robins for local stakeholders when ecologists show a decrease: the difference is mainly due to the habitats where these observations are made.
- **What makes a species an indicator:** abundance, distribution, population dynamics, changes in behavior patterns... but also cultural significance. **Local diagnostic can not be understood without linking the species to their cultural significance**, to sociological as well as environmental changes.



« Barn swallows are decreasing because of the closing of the barns in the area, they can't find a place to build their nest anymore, farms are being abandoned, the farmers who are staying build big closed barns without timber frames. Old farms are disappearing as birds » (Farmer, 52yo, rural area SW France)

# Are birds indicators for local stakeholders?

## People in protected area more willing to conserve?

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- In protected areas people are influenced by local discourses on biodiversity conservation and on the species to protect but not many actions are taken locally...
- ... When unexpectedly, it is in more banal areas (rural areas without apparent conservation issues), that people seem to see the changes and are the most likely to be affected by discourses about the future of their environments and to adapt and act,
- Strong connection to the land such as livelihood based on nature, multiple generations living in the area and oral transmission of knowledge seem to make stakeholders more aware of the occurring changes in a holistic way, of phenological changes and of the necessity to adapt.



Publié le 18/03/2016 à 03:49, Mis à jour le 18/03/2016 à 09:01

Embellissement : 2e journée plantations



En octobre dernier, près de quarante personnes étaient venues participer à la 1re journée consacrée à la taille des végétaux./Photo DDM

« We decided to create this commission with people from the village because we wanted to do something together to take care of the area to make it more beautiful and more safe as well. We are trying to stop using herbicides in the public land, as it is bad for the environment, for the insects, the birds... » (Farmer', rural area, 22 yo)

# Conclusions and perspectives: Refining and comparing the categories

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- **Conclusions and main results:**
  - Birds are good cues of seasonal and meteorological variations but mostly of sociological, land cover and land-use changes: **environmental and sociological changes can not be fully disentangled from local peoples' point of view,**
  - Residents in **protected and rural areas** do not know more species than the urban residents but have a **more detailed knowledge** on bird species ecology due to agricultural connections to the land and its biodiversity.
- **Work in progress** : more analyses to come to compare the sites along gradients of changes, uses and knowledges and within each studied site, between types of informants (native/non-native etc.), between local stakeholders and ecologists or bird life attributes (small/large birds; day/night birds etc.).
- **Perspectives:** the present research takes place within a larger ANR research program: (how) are birds perceived as local indicators in other local communities from other countries from both the South and the North? What about other indicators of changes? And what is an « indicator » in such a context?



**Thank you for your attention!**

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# Are birds indicators for local stakeholders?

## Undesired species as indicators of a mix of changes?

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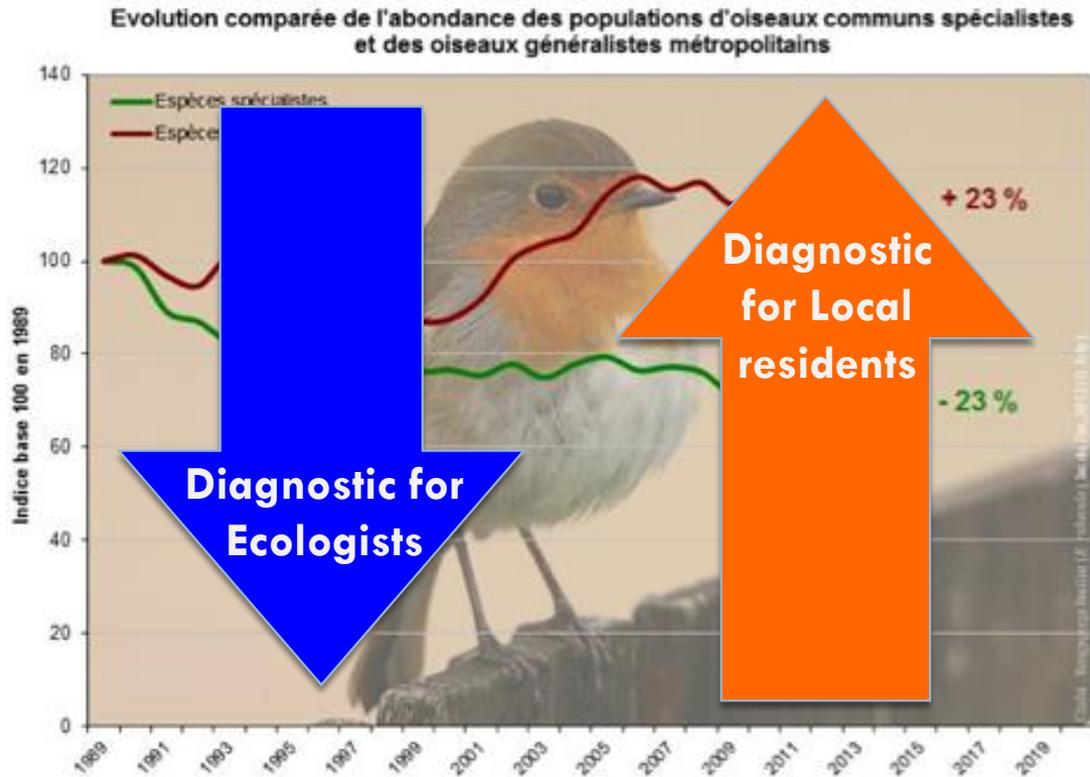
- Local discourses mainly **on undesired species** linked to land-use changes : old species that have lost their traditional uses.
- **Endangered species** linked to land-use changes, lost of their habitats and of some traditional uses that helped maintain the populations.
- **Mentions of migratory birds** as indicators of meteorological variations not directly linked to climate changes. Changes in migratory birds behaviour often linked to other environmental as well as sociological changes (e.g. changes in agriculture) : a matter of scale and of holistic view of the changes.



# Are birds indicators for local stakeholders?

## Mismatches between ecological and local diagnostics?

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Note : les oiseaux communs "spécialistes" correspondent aux espèces communes des milieux agricoles, forestiers et bâtis.  
Source : MNHN (CESCO), 2016.

**Some contrasted general diagnostics between ecologists and local people about avifauna population dynamics in rural area :** ecologists count less birds and see new species when local inhabitants tend to see / hear more birds (except for swallows).

What does these mismatches tell us about diagnostics of changes, variability of knowledge and the possibility to compare, associate or combine different types of diagnostics, for example within conservation attempts?  
**What are the indicators?**  
**Indicators of what changes?**