Listening to birds: How local populations understand environmental changes through everyday sounds and soundscapes?

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LOOKING AT BIRDS TO MAKE SENSE OF CLIMATE CHANGE AND OF OTHER CHANGES TOO…?

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Documenting the perceptions of environmental changes through local indicators

- **Context:** Rural and periurban areas are affected by global environmental changes that are not always easy to perceive for local communities.

- **Background : Researchs have been done on local indicators through ethnosciences** to document indigenous knowledge on changes and adaptation attempts (Berlin, 1992 ; Veteto & Carlson, 2014 ; Crate & Nuttall, 2009).

- **Indicators are** linked to knowledge, empiric experience and historical expertises of the land and **depend on cultural and individual characteristics** (Crate & Nuttall, 2016 ; Orlove *et al.*, 2003).

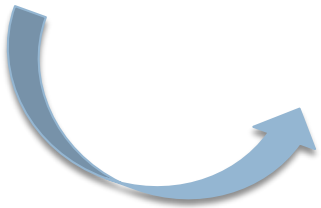
- **Questions in the litterature : Indicators,** but **for who and of what (global) changes** (Dounias, 2007)? How local indicators vary among time, people, sites (Orlove *et al.*, 2010)?

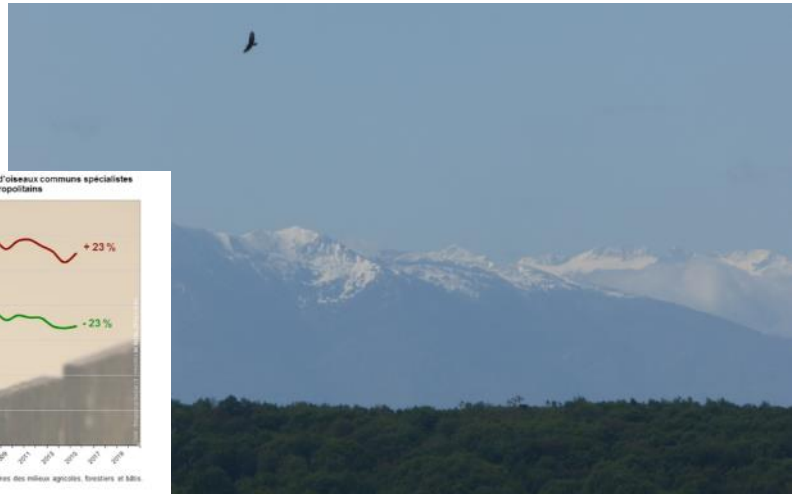


Trees, plants, birds: what is a local « indicator »?

Objectives of the research (within the ANR PIAF)
Looking at birds to make sense of changes ?

(Migratory) Birds known as good indicators of socio-economic, environmental changes, climate change and seasonal variations for naturalists what about local residents?



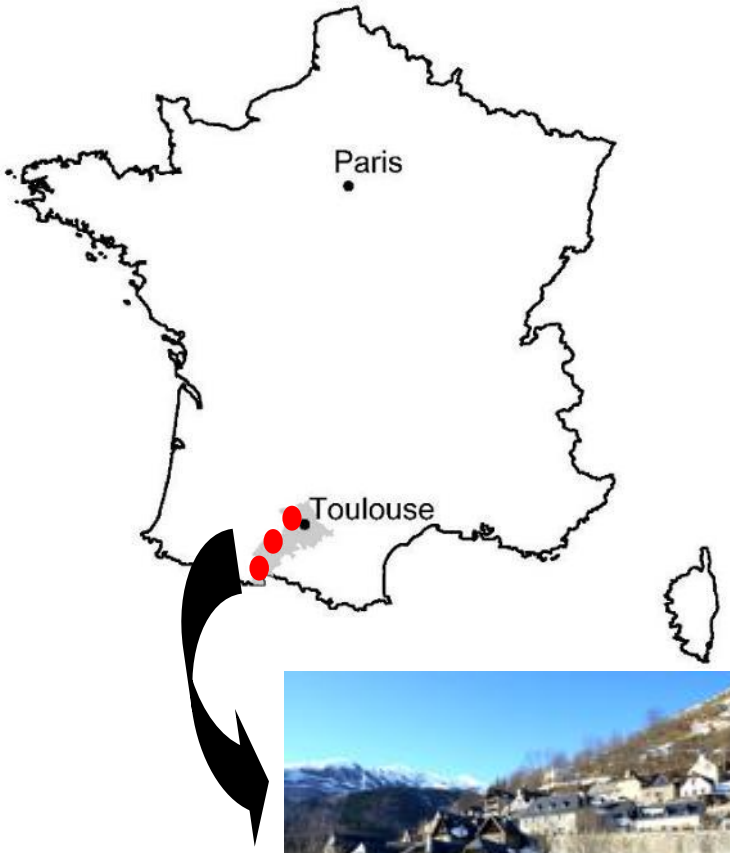


1. Are / What are / How are the **diagnostics of environmental and socio-economic changes built at a local scale through birds observations**? What relevant changes will be shown through those observations for local people (climate change?)?

2. Do the local diagnostics and relevant birds indicators vary depending on the connexion of local societies to the environment and the changes experienced? What does that tell us about ethno-ornithological knowledge at a local scale?

- Work in progress: we are sharing **first results here.**

Birds as indicators in South-Western France?
From protected to urban areas



- **South-western France**: LTSER site known (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). Users, managers ; **60 freelists.**

Freelisting & ethnography:
Between qualitative and quantitative analysis

- Informants in the 3 sites 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 are currently **analyzed for their underlying dimensionality and for the typicality** of the cited birds names for statistical matter and within the FLAME software (Wencelius *et al.*, in press),

- Interviews linked to the list are analyzed and compared to understand **the local knowledge and perceptions of changes of individuals and of the local society.**

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 freelists done in the urban fieldsite (Gazo, 2016)

Main hypothesis to be tested

- ***Hypothesis 1*: Main local indicators should be migratory birds** in all the sites and will show how local residents diagnose climatic and seasonal variations making them more familiar to global environmental issues such as **climate change,**

- ***Hypothesis 2* : Local knowledge about other birds and associated diagnostics will vary among the 3 sites.** Residents from protected and rural area will have a more accurate knowledge on birds species and will be more concerned about biodiversity erosion than urban people that will cite less species.

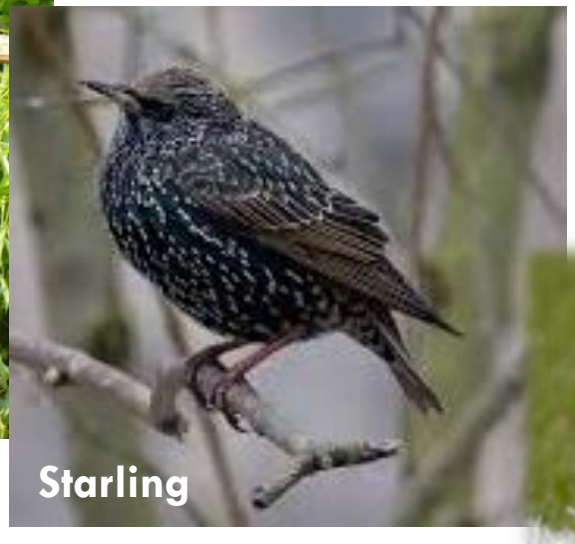
From specific to more generalist cited species and knowledge?

Birds as « indicators »…?

H1 : Local residents focused their discourses: Not on migratory birds but on « undesired » species


Grey heron

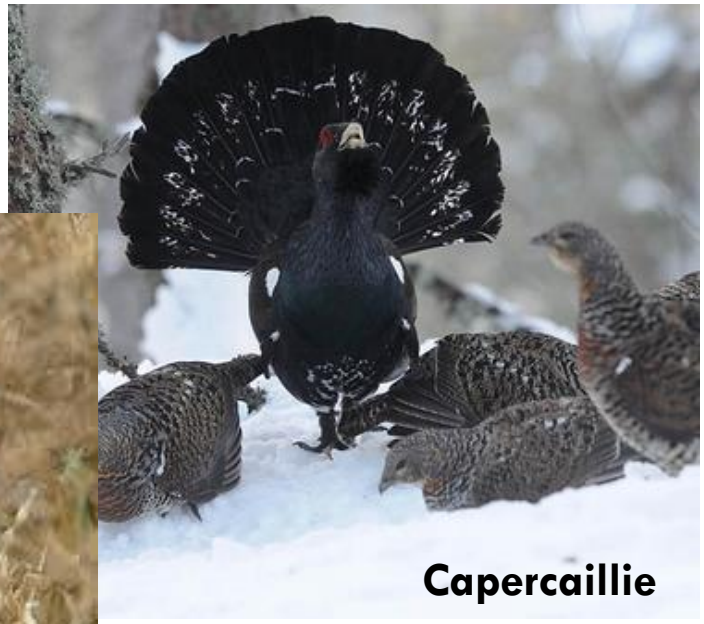
Undesired species linked to land-use changes, could be new species sometimes considered as « invasive » but also old ones that have lost their traditional uses (eurasian magpie).


Starling


Eurasian magpie

H1 : They also talked about :
Endangered local, « patrimonial » & « game » species

Endangered species linked to land-use changes, lost of their habitats and of some traditional uses that helped maintain the populations.



H1 : What about migratory birds?
Signs of CC or rural exodus and seasonal variations?

- Mentions of migratory birds as indicators of seasonal and atmospheric variations that are not directly linked to climate changes. Changes in migratory birds behaviour are often linked to other environmental as well as sociological changes (changes in agricultural practices for example),

Changes in migratory patterns linked to seasonal variations and transformation of crop farming.

Birds indicating the main perceived changes:
Rural exodus & change in agricultural practices

Fieldsite	Consequences of rural exodus	Main Birds Indicators
 Peri-Urban	→ **Urbanisation**	Decrease of passerines, increase of undesired birds
 Rural	→ **Opening of landscape**	Decrease of game species, changes in migratory birds patterns
 Protected	→ **Closing of landscape**	Decrease of patrimonial birds and/or game species

H2 : Comparison among the 3 sites

Talking about birds to talk about sociological changes?

More patrimonial species cited → **More undesired species cited**

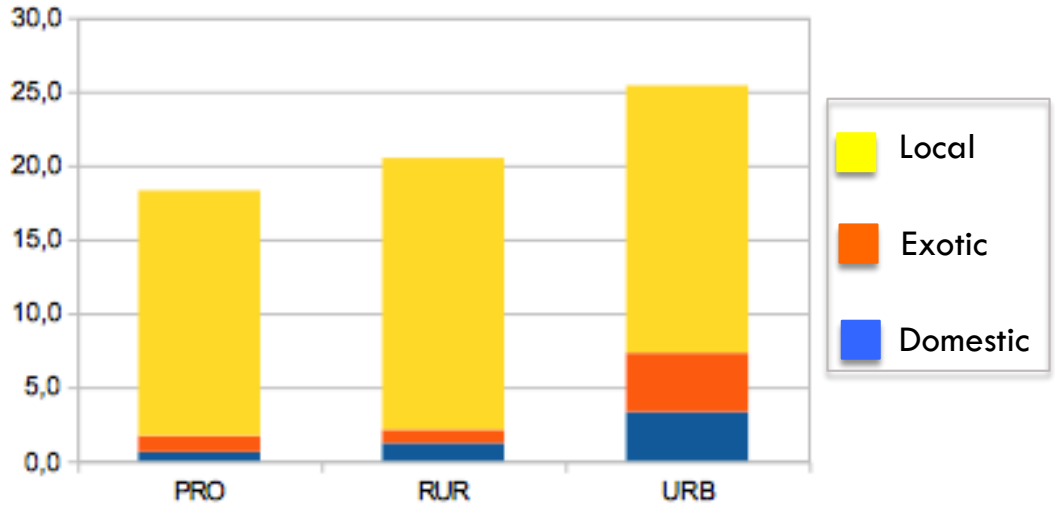
PROTECTED		RURAL		URBAN	
Gyps fulvus	Vautour fauve	Parus ; Aegith	Mésanges	Columba livia	Pigeon
Aquila chrysae	Aigles	Buteo buteo	Buse	Aquila chrysae	Aigles
Gypaetus barb	Gypaète	Columba palu	Palombe	Hirundo ; Ripa	Hirondelles
Turdus merula	Merle	Passer domes	Moineaux	Chroicocephal	Mouettes
Passer domes	Moineau	Columba livia	Pigeon	Pica pica	Pie
Corvus	Corbeaux/corn	Hirundo ; Ripa	Hirondelles	Parus ; Aegith	Mésanges
Tetrao urogallu	Grand Tetra	Carduelis card	Chardonnet	Passer domes	Moineaux
Pica pica	Pie	Erithacus rube	Rouge-Gorge	Streptopelia d	Tourterelle
Columba palu	Palombes	Perdrix perdrix	Perdrix	Buteo buteo	Buse
Hirundo ; Ripa	Hirondelles	Pica pica	Pie	Erithacus rube	Rouge-Gorge

10 most local species cited per sites :
More emblematic species cited in the protected area, no local game species cited in urban area.

H2 : Comparison among the 3 sites

Talking about birds reveals uses and knowledge (1/2)?

More local species cited → **More exotic species cited**



Average number of species cited per informant per site

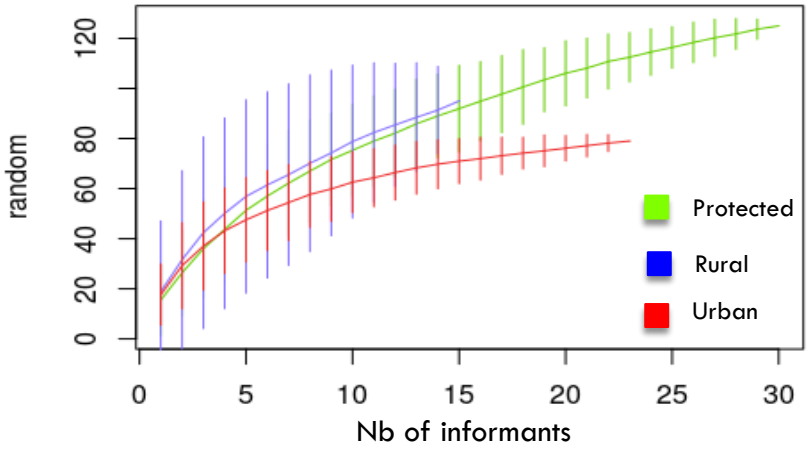
Unexpected : each informant cited in mean more species in the urban area and they cited more exotic and domestic species.

This figure unvalidates the second part of our hypothesis : people in the cities do NOT know less local wild species than the others.

H2 : Comparison among the 3 sites

Talking about birds reveals uses and knowledge (2/2)?

More diverse freelists / more specific species → **More homogeneous freelists / more generalist species**



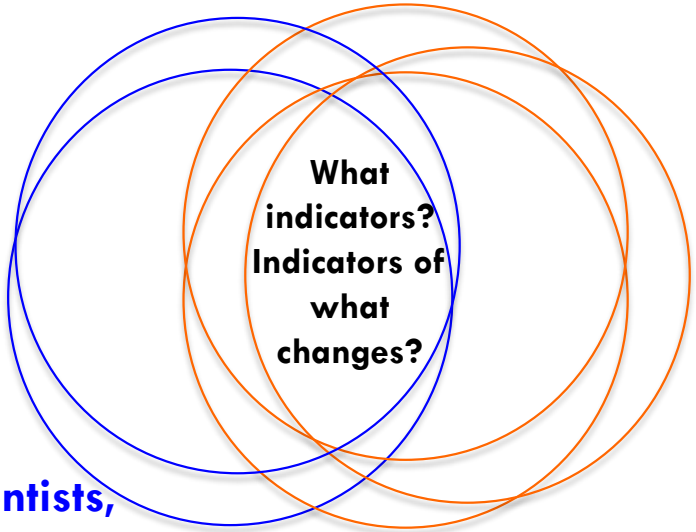
However in urban area, informants cite fewer species and they cite more generalist species : they all cite the same common species, whereas in rural and protected area each FL contains more specificities and diversities : more uses and detailed knowledge on birds species in the protected and rural areas due to agricultural way of life and connexion to the land?

Conclusions and perspectives:
Refining and comparing the categories

- **Conclusions and main results:**
  - Birds: good signs of seasonal and atmospheric variations but mostly of sociological, land cover and land-uses changes: **environmental and sociological changes can not be dissociated,**
  - Residents in **protected and rural area** do not know more species than the urban residents but have a **more detailed knowledge** of the species features due to agricultural connexions to the land and its biodiversity.
- **Work in progess** : more analysis to come to compare the sites within a gradient of changes, uses and knowledge and more analysis to come within each fieldsite, between types of informants (native/non-native etc.), or birds features (small/big birds; day/night birds etc.).
- **Perspectives**: Research done within a larger ANR research program: (how) are birds perceived as local indicators in other local communities from countries from the South and from the North? What about other indicators of changes? And what is an « indicator »?

Perspectives: local vs scientific diagnostics? Indicators for who and of what changes (bis)?

(Migratory) Birds known as indicators of socio-economic, environmental changes, climate change and seasonal variations?



Contrasted diagnostics between local inhabitants who see more birds **and naturalists** who count less birds in South-Western France.

What does that tell us about diagnostics of changes, variability of knowledge and the possibility to compare, associate or combine different types of diagnostics within conservation attempts for example?


Thank you for your attention!
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