



"Regards Croisés" sur l'Influenza aviaire

15-19 / 12 / 2008 • Montpellier • France



Rencontres scientifiques autour de deux projets de recherche: **GRIPAVI (CIRAD, MAEE) & ARDIGRIP (AIRD)**
Scientific meeting around two research projects:

Network of interaction between avian compartments: Avian Influenza in Avian Systems in Zimbabwe

Caron, A.

Supervisor: E. Cameron (MRI, South Africa)

Cosupervisors: de Garine-Wichatitsky, M., Morand, S., Cumming, D., Monicat, F.

UPR AGIRs - CIRAD

Mammal Research Institute – Uni. Of Pretoria





"Regards Croisés" sur l'Influenza aviaire

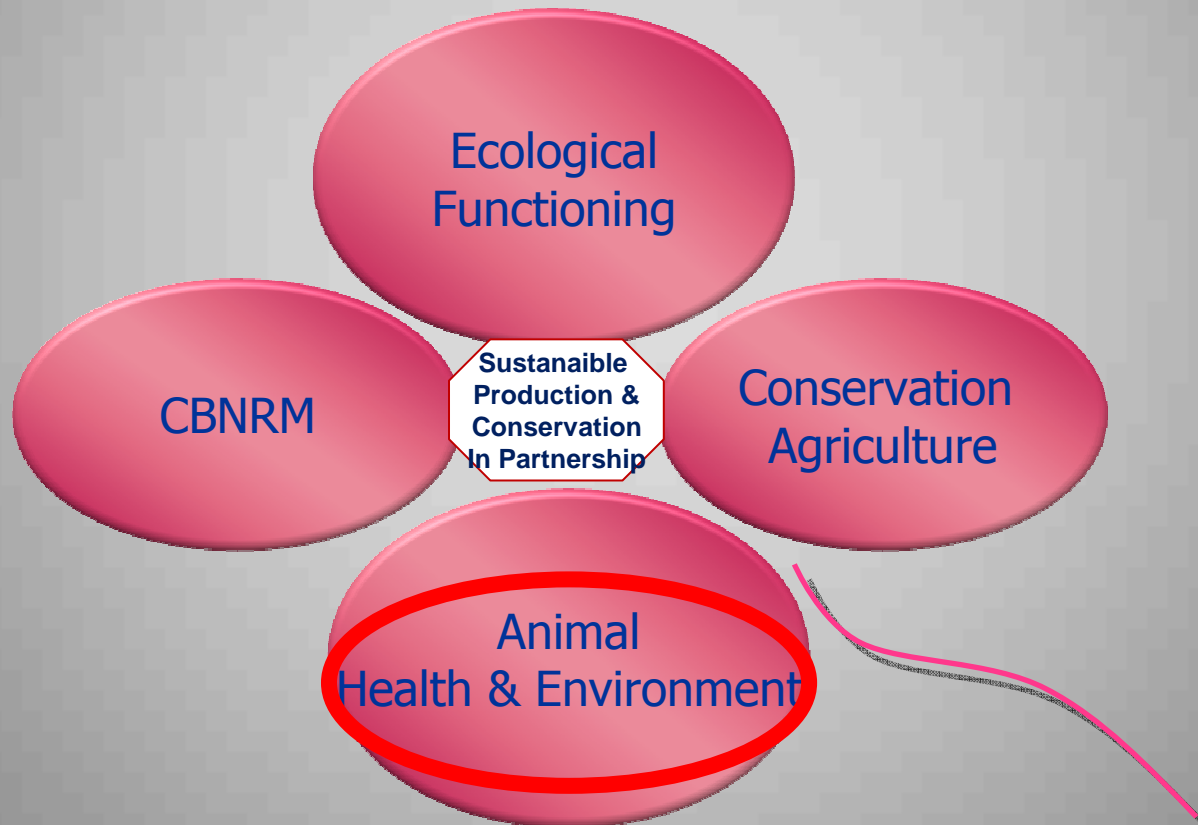
15-19 / 12 / 2008 • Montpellier • France



Rencontres scientifiques autour de deux projets de recherche:
Scientific meeting around two research projects:

GRIPAVI (CIRAD, MAEE) & ARDIGRIP (AIRD)

RP-PCP = Produce & Conserve in Partnership





“Regards Croisés” sur l'Influenza aviaire

15-19 / 12 / 2008 • Montpellier • France



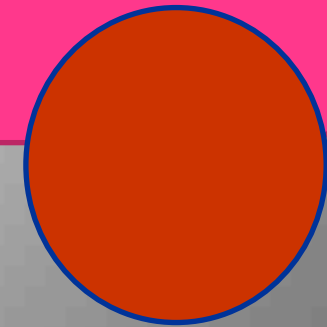
Rencontres scientifiques autour de deux projets de recherche: **GRIPAVI (CIRAD, MAEE) & ARDIGRIP (AIRD)**
Scientific meeting around two research projects:

Concept of « Community »



A community is an assemblage of species populations that coexists in space and time in potential interaction
(Begon et al., 2006)

e.g.: The waterbirds community of lake Chivero





“Regards Croisés” sur l'Influenza aviaire

15-19 / 12 / 2008 • Montpellier • France



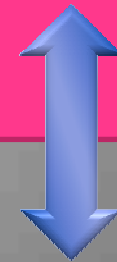
Rencontres scientifiques autour de deux projets de recherche: **GRIPAVI (CIRAD, MAEE) & ARDIGRIP (AIRD)**
Scientific meeting around two research projects:



Concept of « Host-Pathogen Interaction »

What defines interactions:

- Pathogen specific transmission pathways
 - Structure of the host community
 - Host Mobility
 - Host Contacts





“Regards Croisés” sur l'Influenza aviaire

15-19 / 12 / 2008 • Montpellier • France



Rencontres scientifiques autour de deux projets de recherche: **GRIPAVI (CIRAD, MAEE) & ARDIGRIP (AIRD)**
Scientific meeting around two research projects:



Concept of « Compartment »

A compartment is an assemblage of species populations living under the same environmental constraints (natural or artificial)



e.g.: Intensive poultry production system around lake Manyame

"Regards Croisés" sur l'Influenza aviaire

15-19 / 12 / 2008 • Montpellier • France

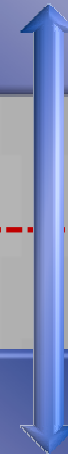


de deux projets de recherche
around two research projects (AIRD)

Domestic

Intensive Poultry Production System

Backyard Poultry System



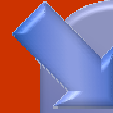
Wild Bird Community ?

?

Wildlife

Ostrich Production System

Waterfowl populations



?

High Sanitary Control

Low or Zero Sanitary Control



"Regards Croisés" sur l'Influenza aviaire

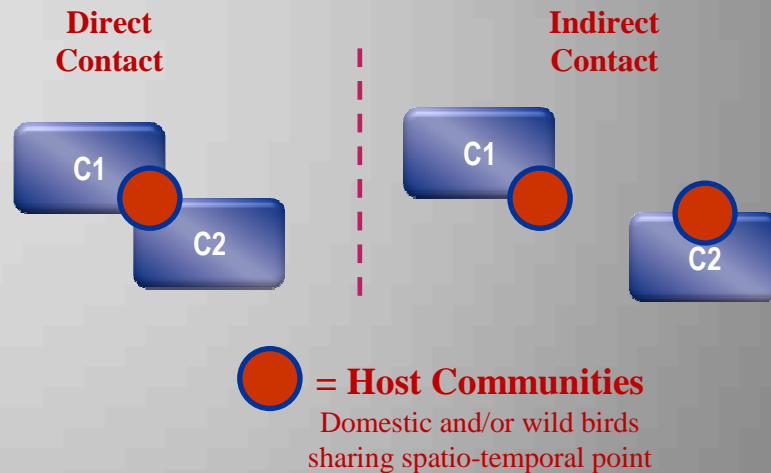
15-19 / 12 / 2008 • Montpellier • France



Rencontres scientifiques autour de deux projets de recherche: **GRIPAVI (CIRAD, MAEE) & ARDIGRIP (AIRD)**
Scientific meeting around two research projects:

1. Describe communities

- Describe communities in & around each **compartment** (regular focal points in each compartment)



Identify potential « bridge » species between compartment



"Regards Croisés" sur l'Influenza aviaire

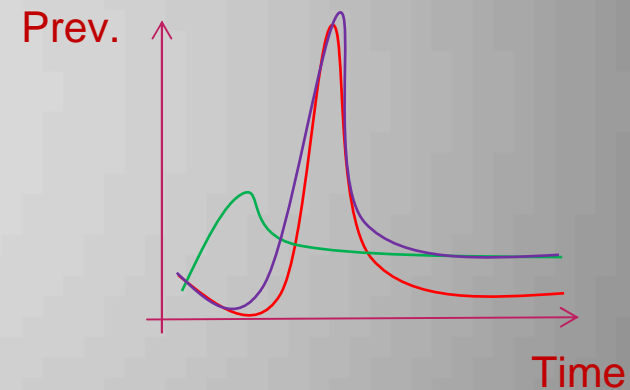
15-19 / 12 / 2008 • Montpellier • France



Rencontres scientifiques autour de deux projets de recherche: GRIPAVI (CIRAD, MAEE) & ARDIGRIP (AIRD)
Scientific meeting around two research projects:

2. Estimate pathogens prevalence

- Sampling in each compartment (Avian Influenza & Newcastle Viruses)

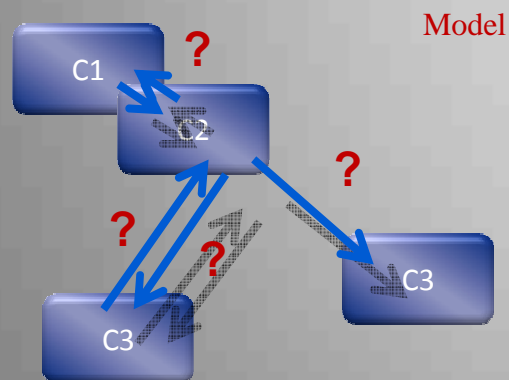


Where & When the virus is present in the system



3. Hypotheses of interactions

- When the virus is circulating which species can spread it from one compartment to the other?



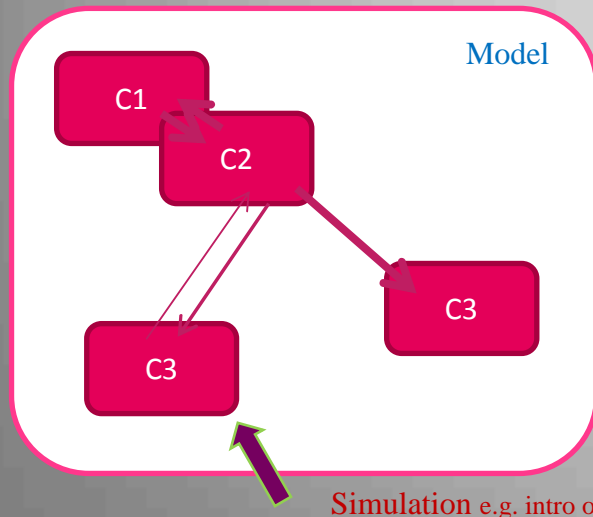
H0: Species X is spreading virus A from C1 to C2

Confirm or cancel interactions



4. Validation of Risk Model

- Estimation of intra-compartment variables & pathways inter-compartment



- ◉ Simulation with virtual introduction
- ◉ Management tool
- ◉ Identification of potential reservoir (e.g. C2+C3)



"Regards Croisés" sur l'Influenza aviaire

15-19 / 12 / 2008 • Montpellier • France



Rencontres scientifiques autour de deux projets de recherche: GRIPAVI (CIRAD, MAEE) & ARDIGRIP (AIRD)
Scientific meeting around two research projects:

Update report GRIPAVI Zimbabwe

- Since May 2007: every 2 months, 4 counts per site (n=15) in Waterfowls compartment = **600 counts - 300 hours of observation**
- Since June 2008, every 2 months, 4 counts per site (n=19) in Domestic compartment = **304 counts - 152 hours of observation**



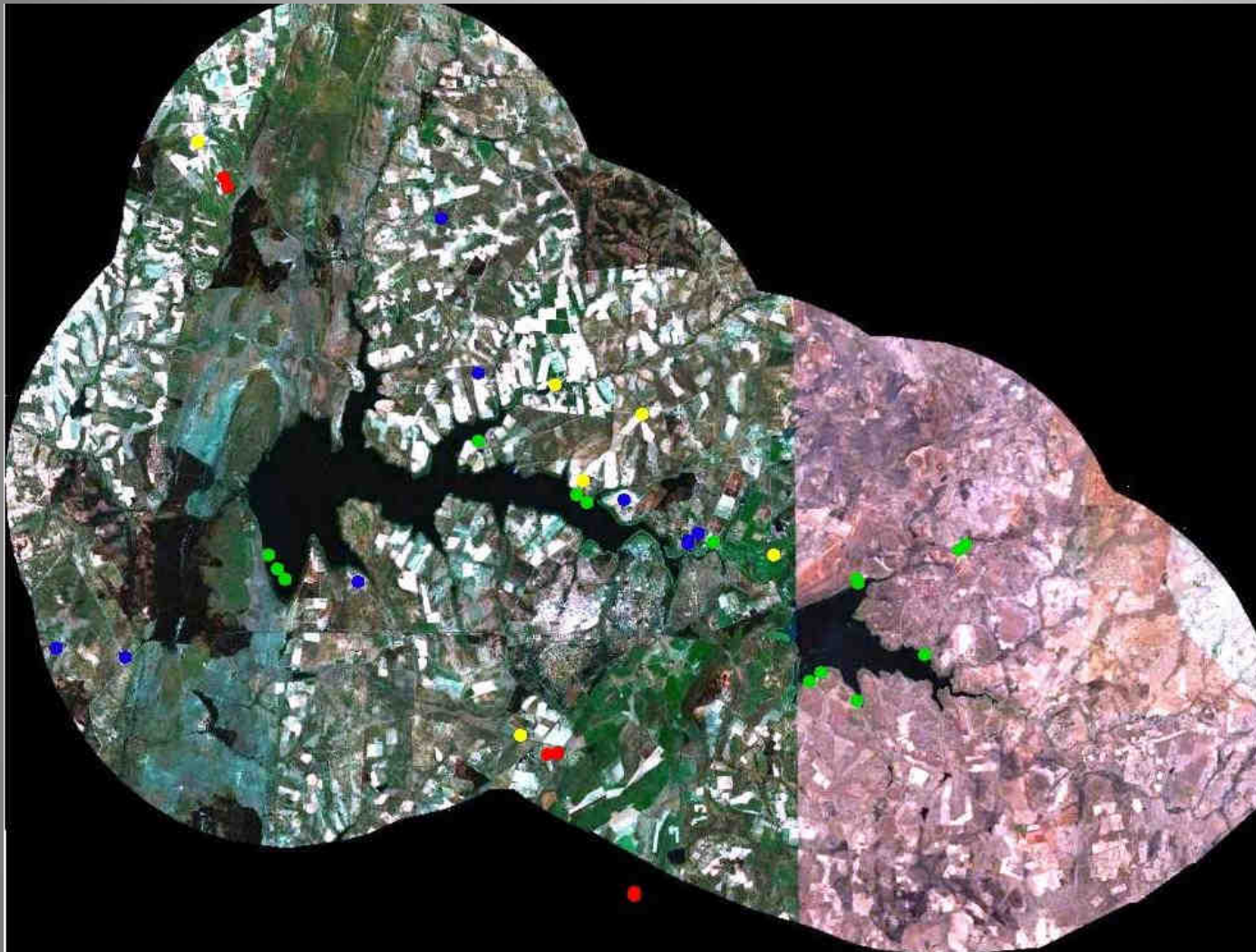
"Regards Croisés" sur l'Influenza aviaire

15-19 / 12 / 2008 • Montpellier • France



Rencontres scientifiques autour de deux projets de recherche:
Scientific meeting around two research projects:

GRIPAVI (CIRAD, MAEE) & ARDIGRIP (AIRD)



- Backyard
- Waterfowl
- Intensive Poultry
- Ostrich



"Regards Croisés" sur l'Influenza aviaire

15-19 / 12 / 2008 • Montpellier • France



Rencontres scientifiques autour de deux projets de recherche: **GRIPAVI (CIRAD, MAEE) & ARDIGRIP (AIRD)**
 Scientific meeting around two research projects:

- **1750 wild birds sampled; 89 species**

AIAS project - Wildlife

	Total Chivero	Total Manyame	Total espèce
Red-billed Teal	1	686	687
African Jacana	37	212	249
White-faced Whistling Duck	128	120	248
Blacksmith Plover	2	100	102
Kikklitz's Plover	0	84	84
Wood Sandpiper	0	24	24
Hottentot Teal	0	23	23
Southern Red Bishop	2	21	23
Pied Kingfisher	0	22	22
Grey-headed Gull	3	12	15
Collared Pratincole	0	14	14
Red-billed Quelea	5	8	13
Sanderling	0	13	13
Chesnut-backed Finch-lark	0	13	13
Red-eyed Dove	2	10	12
Total	Total Chivero	Total Manyame	Total Zimbabwe
Total par mission	217	1527	1744



"Regards Croisés" sur l'Influenza aviaire

15-19 / 12 / 2008 • Montpellier • France



Rencontres scientifiques autour de deux projets de recherche: GRIPAVI (CIRAD, MAEE) & ARDIGRIP (AIRD)
Scientific meeting around two research projects:

Update report GRIPAVI Zimbabwe

- 1050 blood samples collected in backyard compartment (stratified sample in December 08)
- 400 blood samples collected in Intensive poultry
- 400 blood samples collected in Ostrich compartment
- Questionnaires in Domestic compartments done
- Capture-Recapture protocole started on 200 backyard chicken at 2 sites (to determine life history parameters)



"Regards Croisés" sur l'Influenza aviaire

15-19 / 12 / 2008 • Montpellier • France



Rencontres scientifiques autour de deux projets de recherche:
Scientific meeting around two research projects:

GRIPAVI (CIRAD, MAEE) & ARDIGRIP (AIRD)

Update report GRIPAVI Zimbabwe

- Phd Student recruited and proposal under development; database under analysis (presentation at the European Duck Symposium in Mars 2009)
- Total counts of both lake 4 times a year for 2 years.
- Surveillance system: with PWMA and DVS (Wildlife Veterinary Unit); operational (3 cases of wild bird mortality investigated)



“Regards Croisés” sur l'Influenza aviaire

15-19 / 12 / 2008 • Montpellier • France



Rencontres scientifiques autour de deux projets de recherche: **GRIPAVI (CIRAD, MAEE) & ARDIGRIP (AIRD)**
Scientific meeting around two research projects:

Update report GRIPAVI Zimbabwe

- Caron, A., Gaidet, N., de Garine-Wichatitsly, M., Morand, S., Cameron, E.
Evolutionary biology, Community Ecology and Avian Influenza Research. *Infection , Genetics and Evolution. In press*





"Regards Croisés" sur l'Influenza aviaire

15-19 / 12 / 2008 • Montpellier • France



Rencontres scientifiques autour de deux projets de recherche:
Scientific meeting around two research projects:

GRIPAVI (CIRAD, MAEE) & ARDIGRIP (AIRD)

Next year preview



- Data analysis
- 1 article in prep.
- Bridge species sampling



"Regards Croisés" sur l'Influenza aviaire

15-19 / 12 / 2008 • Montpellier • France



Rencontres scientifiques autour de deux projets de recherche:
Scientific meeting around two research projects:

GRIPAVI (CIRAD, MAEE) & ARDIGRIP (AIRD)

Thank you

Collaboration:

Zimbabwe: DSV, NUST, PWMA,
BirdLife Zimbabwe

South Africa: ARC-OVI, GAINS-SA,
Uni. Of Cap Town & Pretoria

