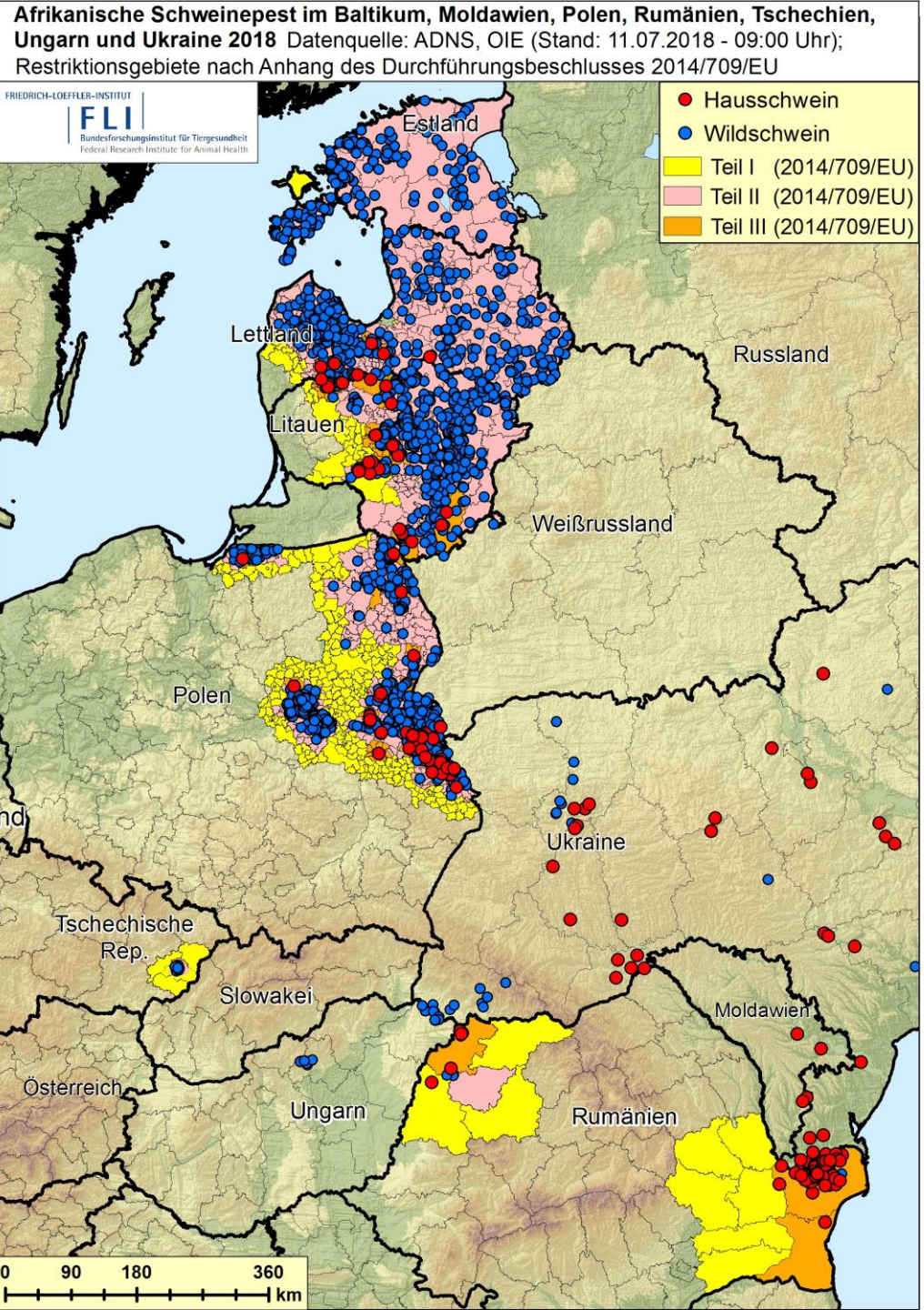
ISPRA
Istituto Superiore per la Protezione
e la Ricerca Ambientale

Sistema Nazionale
per la Protezione
dell'Ambiente

ASF in wild boar
prevention and management

Vittorio Guberti
ISPRA – Ozzano E. (BO)
30 January 2019

Preparing European hunters to eradicate African Swine Fever
"Jagd und Hund"
Dortmund



The problem

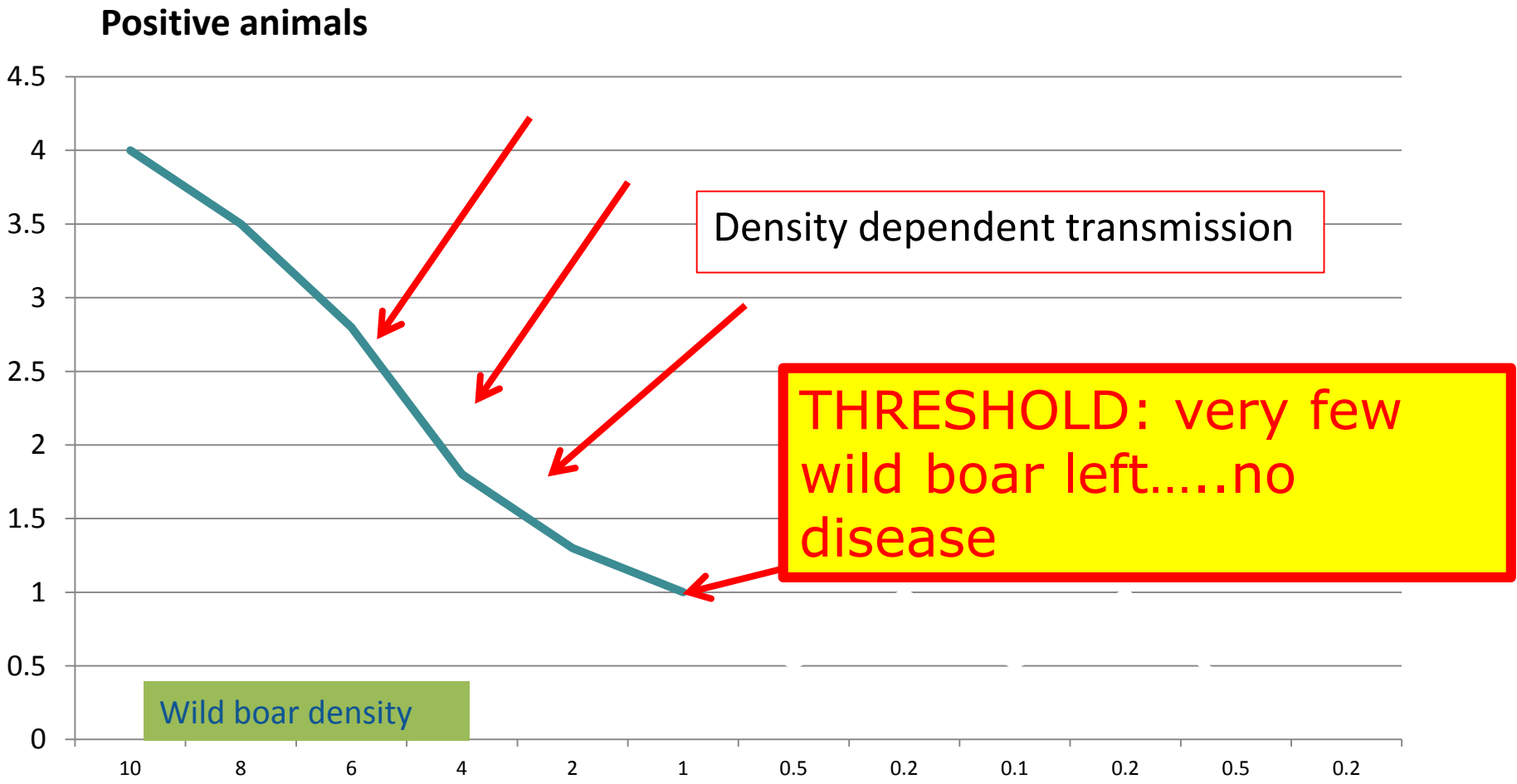
In the EU only more than 300.000 km2 of forest and agricoltural land are involved

More than 500.000 wild boars

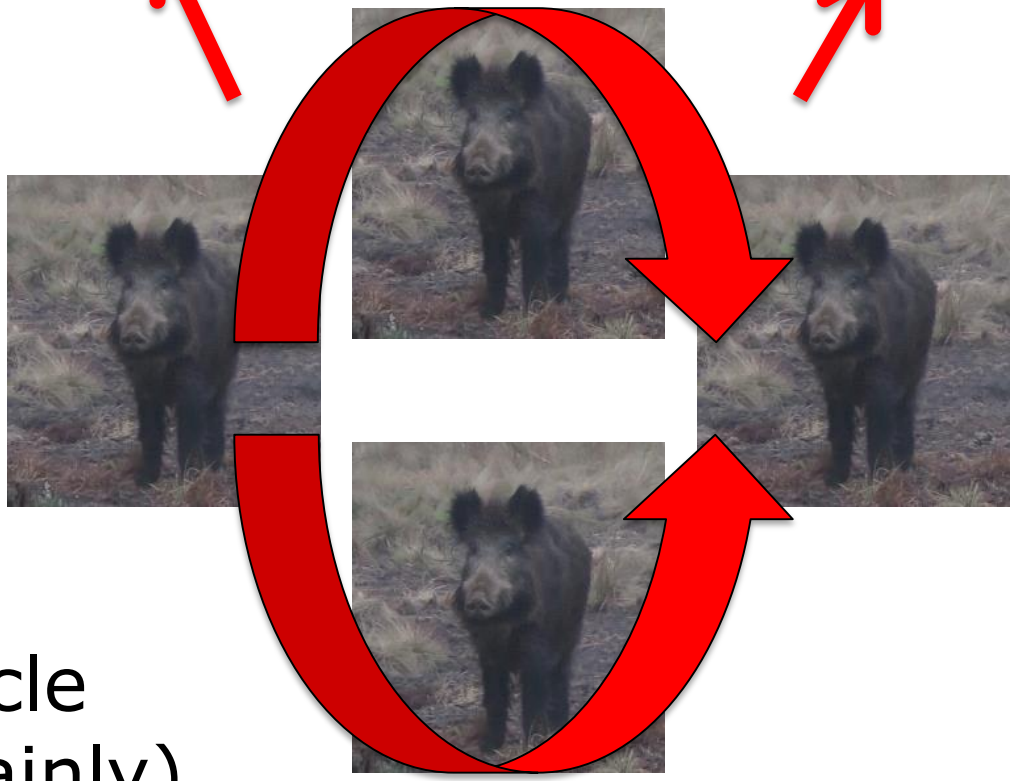
2014: ASF epidemiology in wild boar

Direct cycle
(direct contacts mainly)

ASF a truly density dependent infection. The virus could have fade out locally due to reduced wild boar density

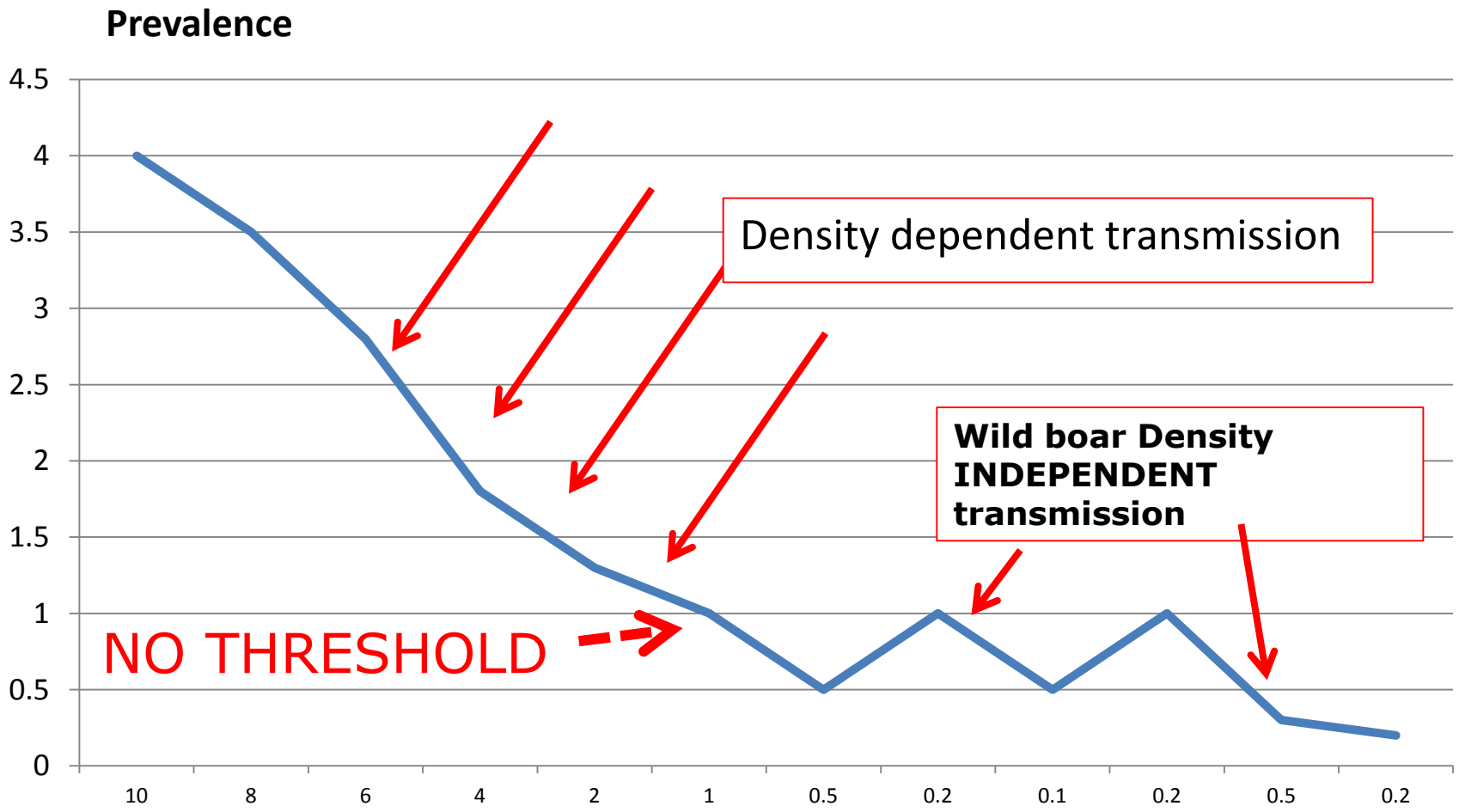


Virus survival
in carcasses
(winter)



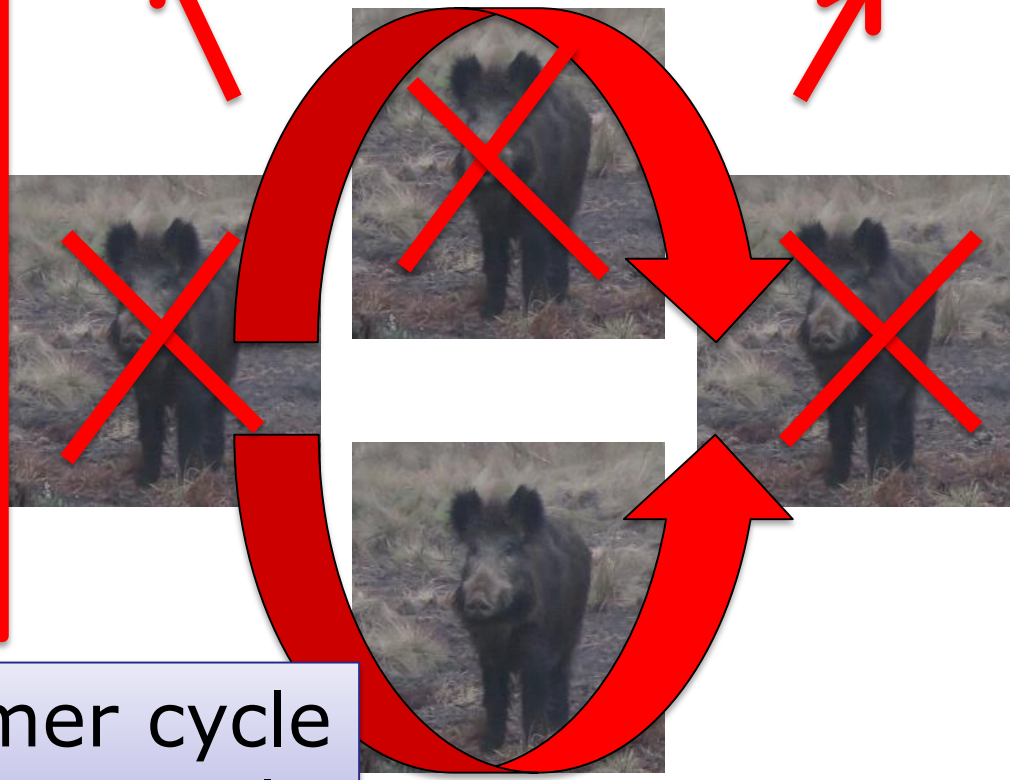
Spring-summer cycle
(direct contacts mainly)

ASF in not a truly density dependent infection. The ultimate persistence of the virus is guaranteed by carcasses



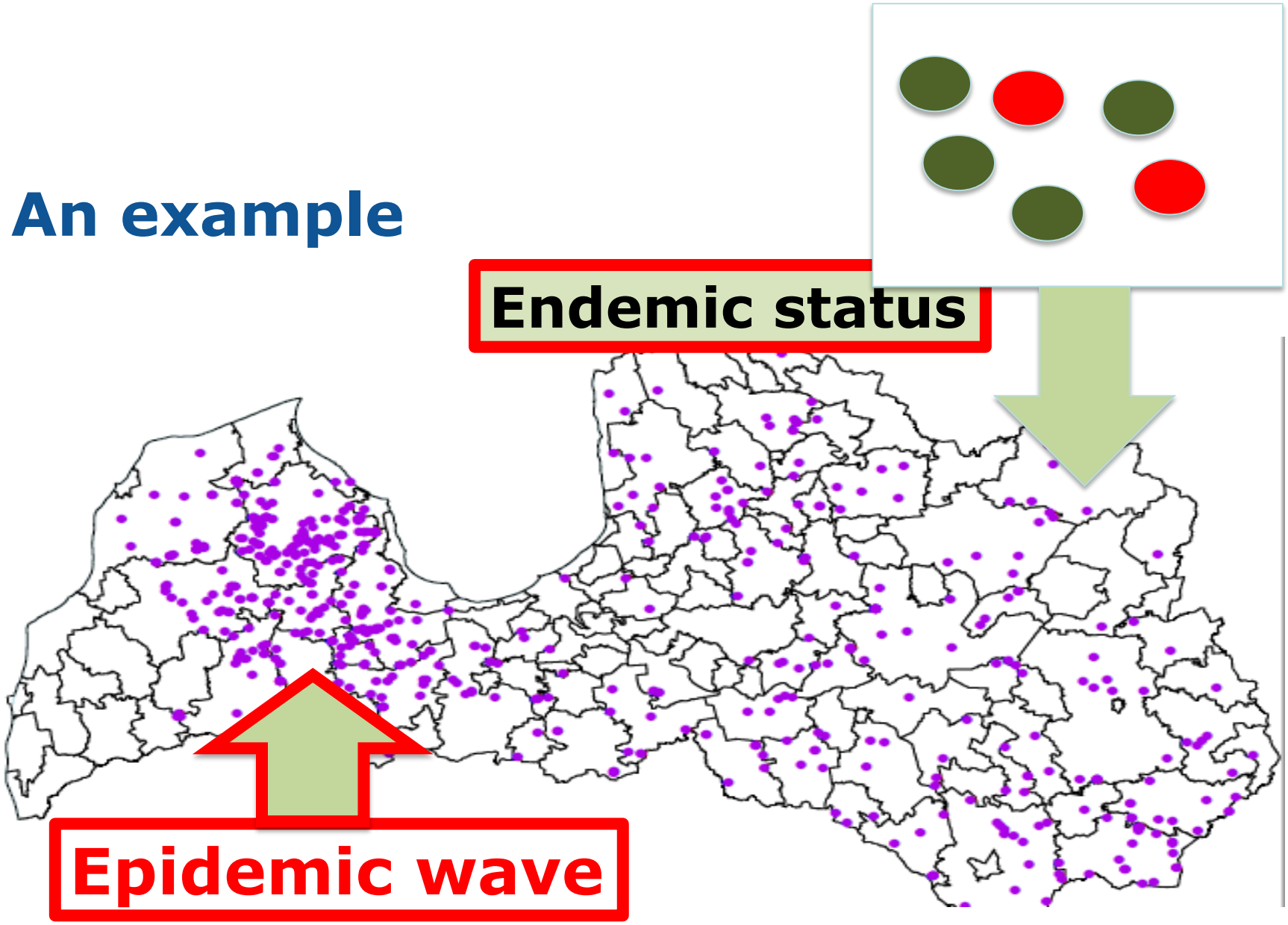
Virus survival in carcasses (winter)

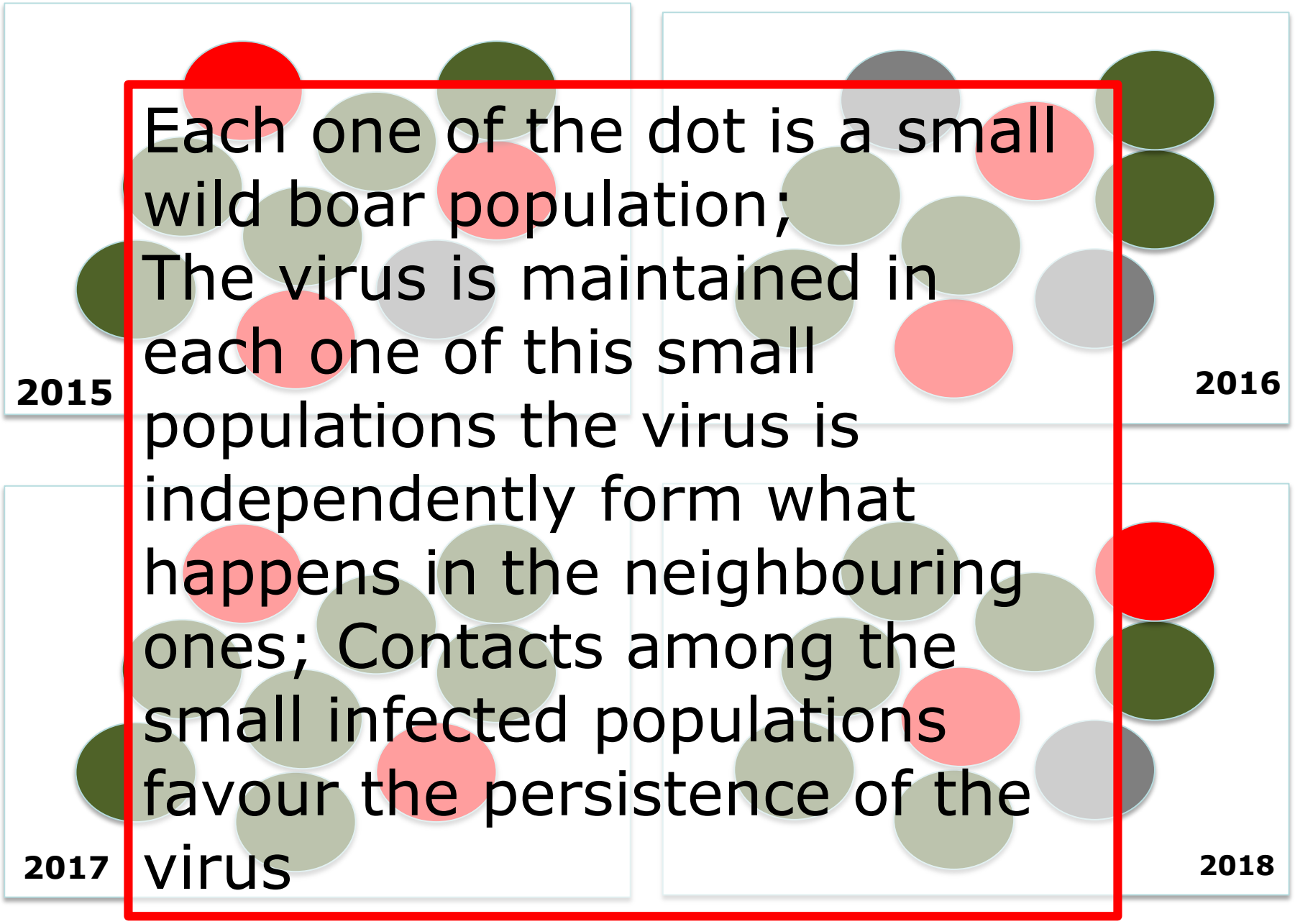
Despite very few wild boar still alive, the virus survives in carcasses and thus still available for the next breeding season or incoming animals. When new born or neighbouring animals will be infected and a new cycle will initiate



Spring-summer cycle direct contact mainly

An example





Each one of the dot is a small wild boar population;
The virus is maintained in each one of this small populations the virus is independently form what happens in the neighbouring ones; Contacts among the small infected populations favour the persistence of the virus

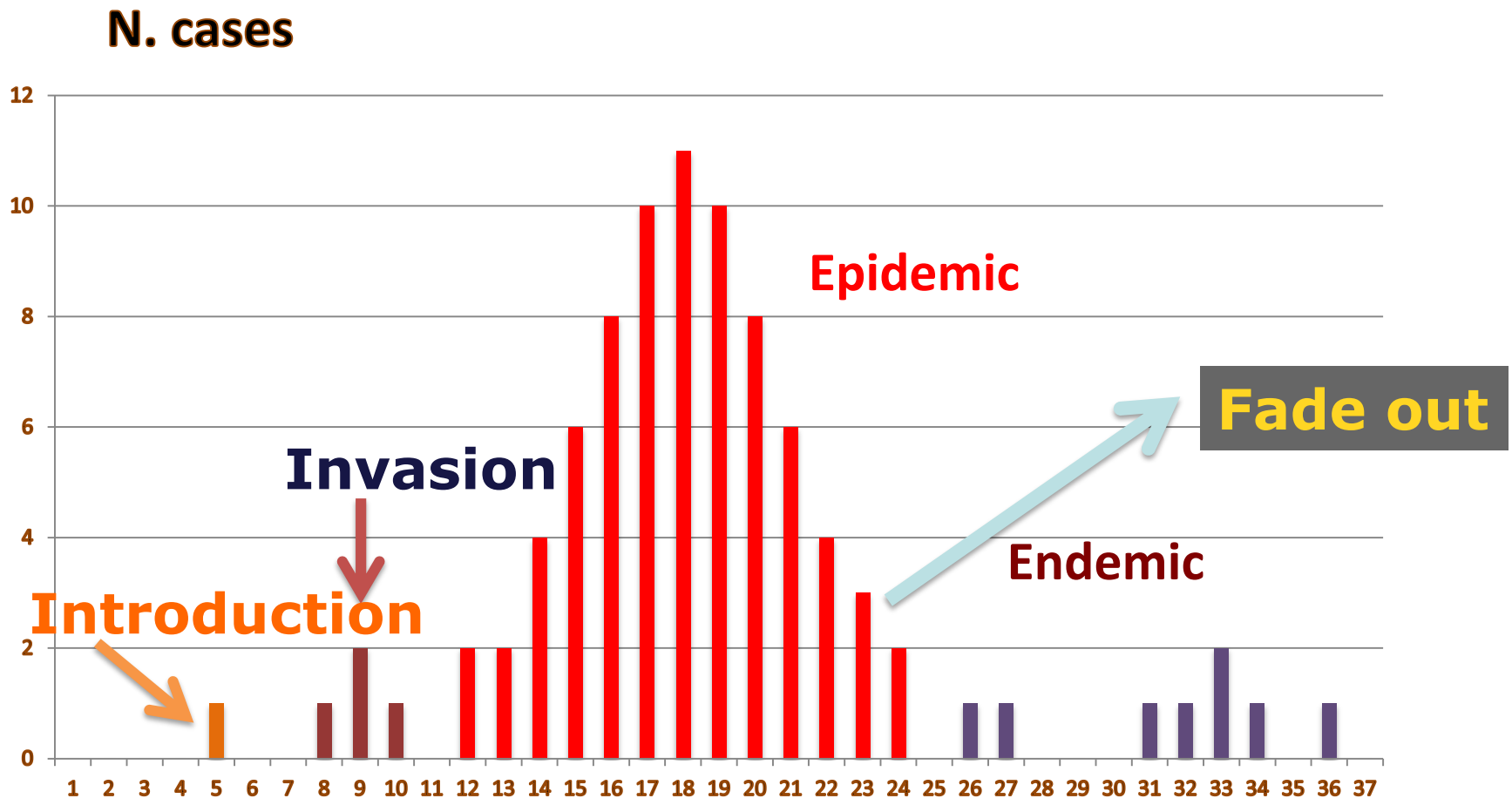
So....it was realised that this management of hunted wild boar was a RISK


2019
PFCU 200472 9
PETIT FORESTIER
Location de containers frigorifiques


Today I have
A terrible headache

Vittorio Guberti, ISPRA, Italy

The 4 phases of a transmissible disease

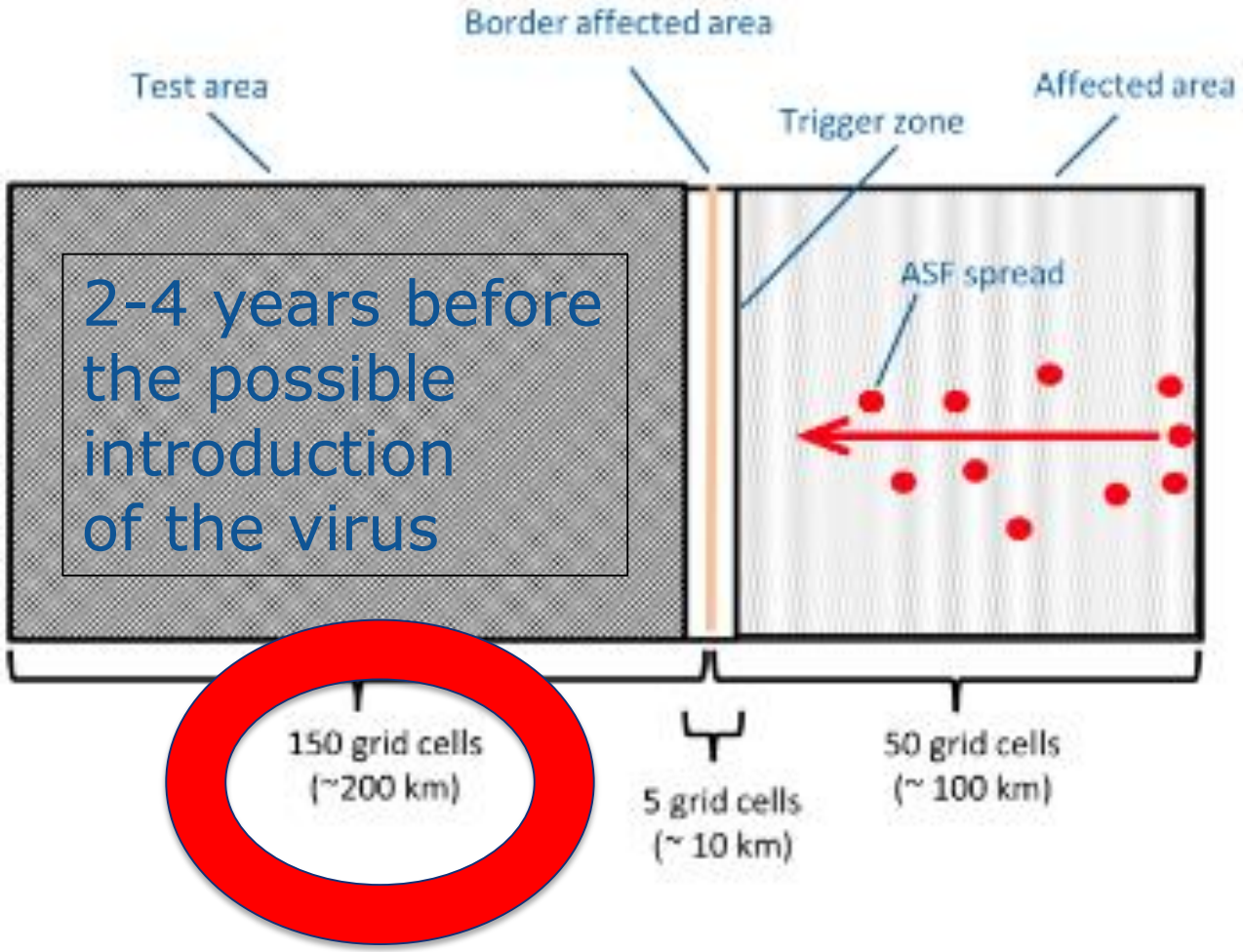


PREVENTION

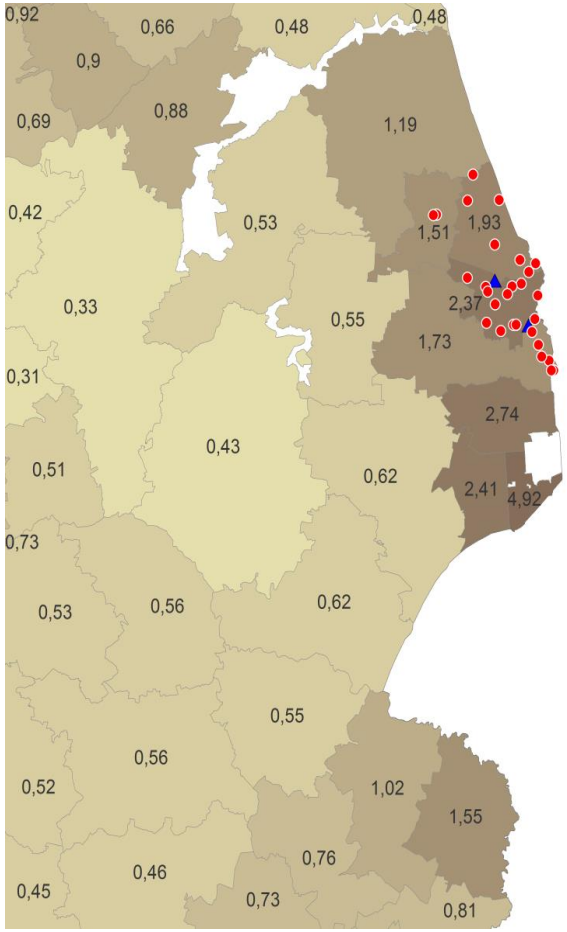
Wild boar depopulation before ASF will arrive

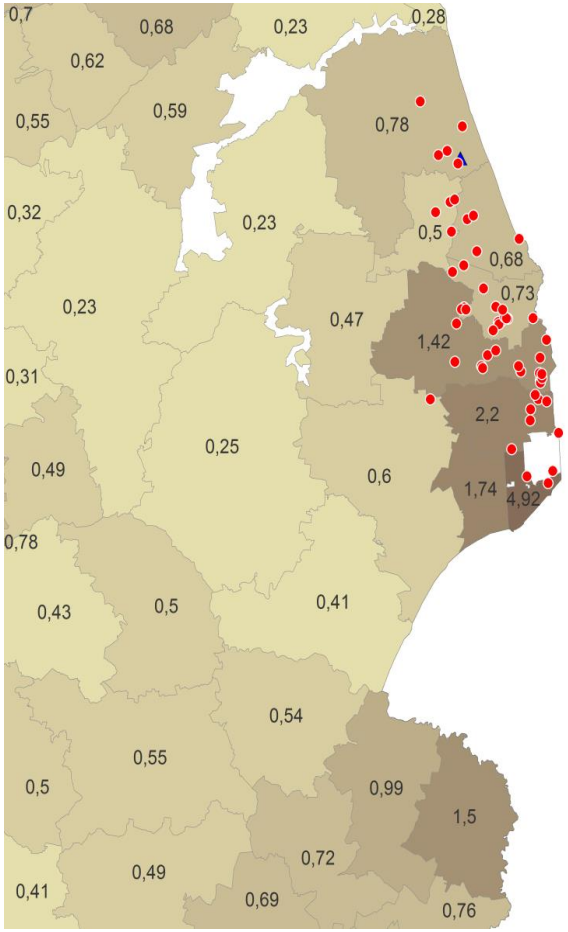
Wider Area for Medium Term Actions (WAMTA)

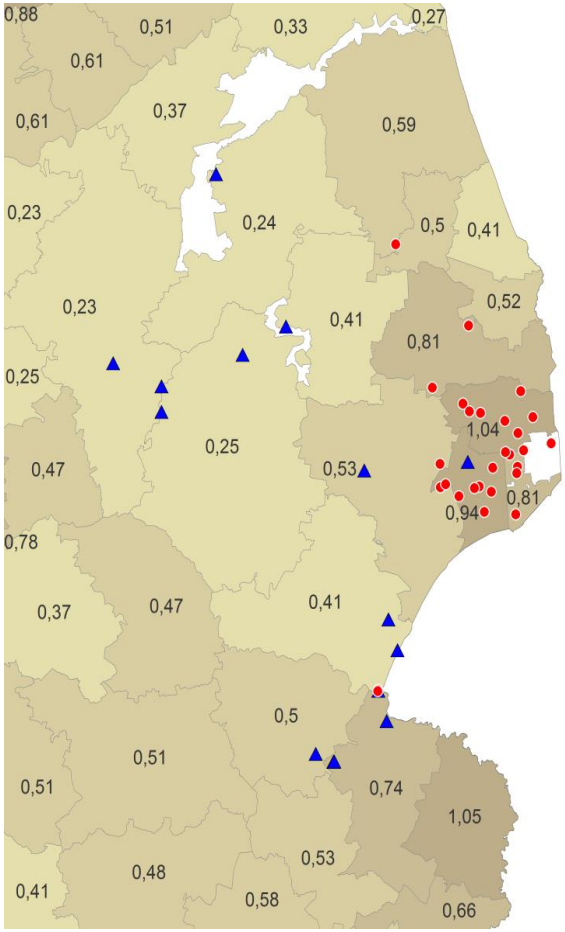
EFSA, 2014


Border affected area
Test area
Trigger zone
Affected area
ASF spread
2-4 years before the possible introduction of the virus
150 grid cells
(~200 km)
5 grid cells
(~ 10 km)
50 grid cells
(~ 100 km)

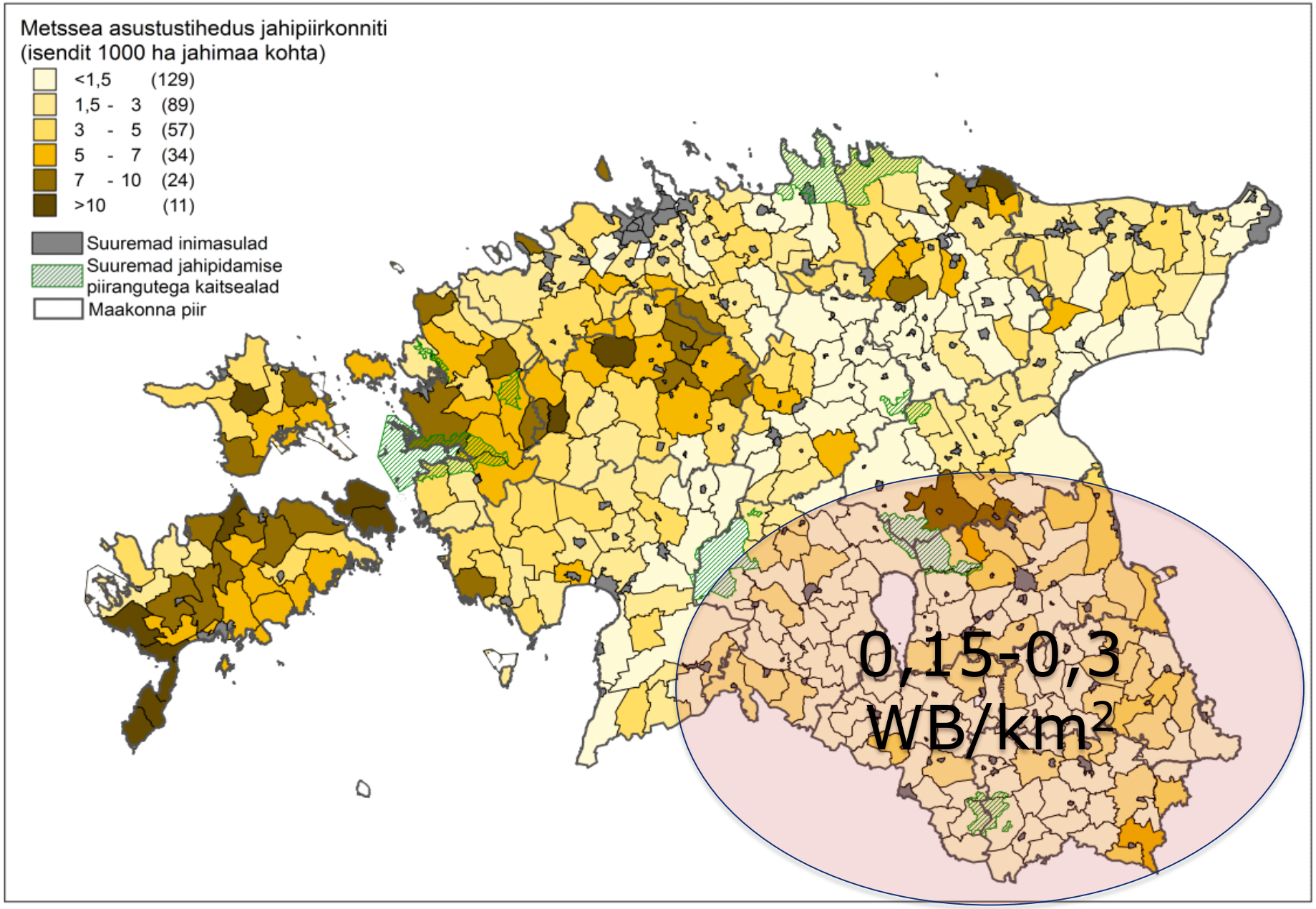
Poland: tendency to spread within areas with wild boar density > 1 individual/km^2







2014 – 30 cases **2015 – 53 cases** **2016 – 28 cases**



Density of wild boars (individuals per 10 km² of hunting ground) in hunting districts by hunters estimations (census) in spring 2016.

What about this Threshold?

- The threshold exists (at least it should exist!!)
- It exists for any infection that spreads in a density dependent pattern;
- Nt is a deterministic threshold (a precise N. of individuals…that could be espressed also by density i.e. 0,5/1000ha);
- It is simply the number of WB, no gender and age classes have to be considered/known;
- Nt addresses preventive measures aimed in reducing the wild boar population size **BEFORE** the arrival of the infection; **FREE AREAS**

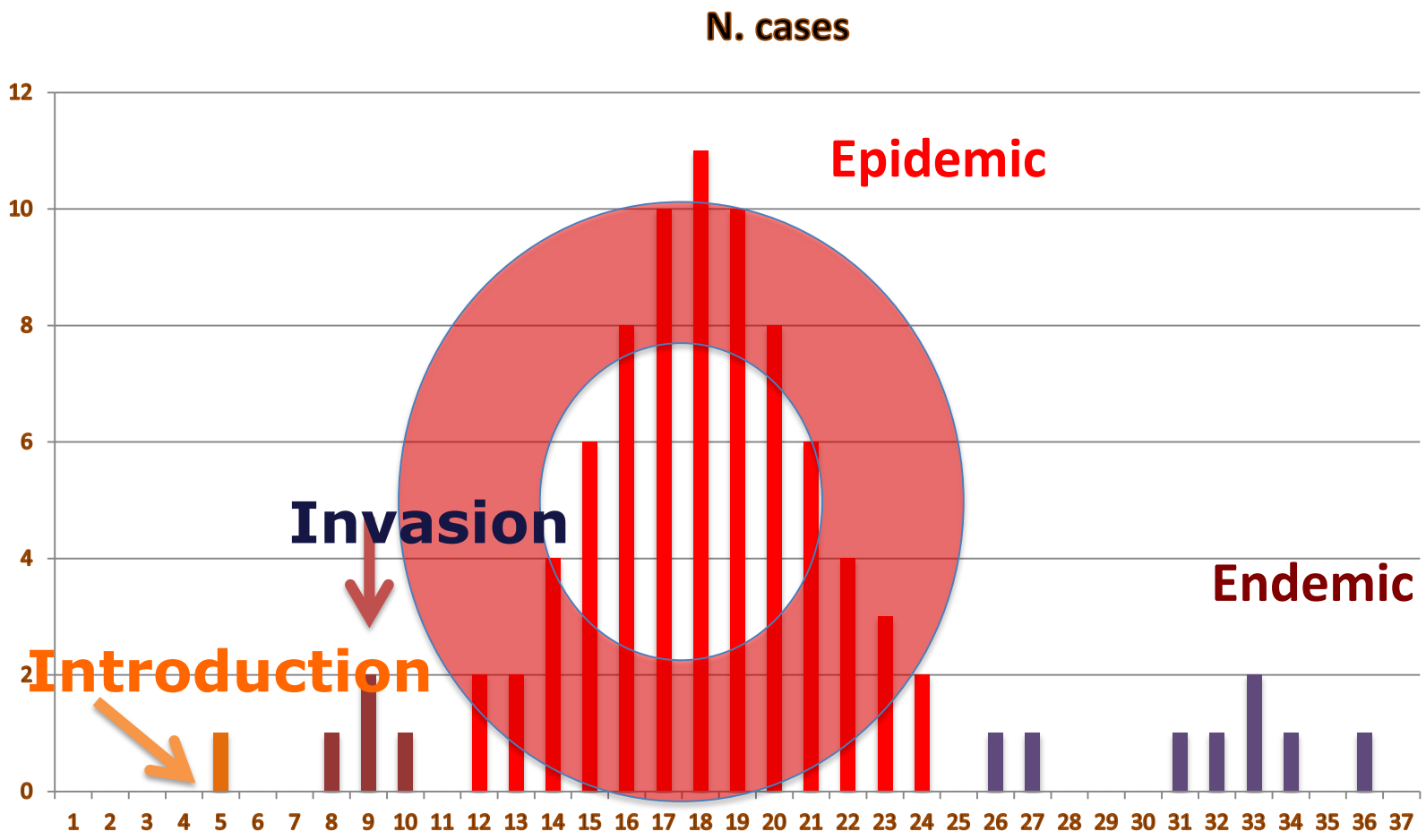
Why we do not have a precise figures yet?

- Because of the role of carcasses
- The ASF threshold is determined mainly by carcasses presence
- Carcasses last for months during winter, weeks during summer
- Winter in Estonia comparable with winter in south Belgium?
- The threshold exists (at least it should exist!!)
- It technically impossible (very difficult) to estimate a so flexible parameter!!!
- So the threshold is: reduce as much as possible before the arrival of the infection: <0,5 WB/kmsq

Can we prevent ASF managing the wild boar population at the threshold?

- Deterministic (exact) threshold estimation;
- Precise host population size estimates:
- Zlin=> initial estimate 2WB/kmsq Final estimate 9WB/kmsq
- Feasibility
- BY NOW ALL ACTIONS IMPLEMENTED WHEN THE VIRUS ARRIVES: NO PREVENTION….BUT …REACTION

Epidemic


N. cases
12
10
8
6
4
2
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37
Epidemic
Invasion
Endemic
Introduction

The epidemic phase

- Usually we dtect the virus during this phase…not before
- The infection spreads in the wild boar population: the chain of infection is fully activated;

- The intensity and the duration of the epidemic results from the interaction between the two populations (host and infection agent) driven by wild boar population size and density;

- DENSITY DEPENDENT

Epidemic phase: considerations

- Wildlife diseases are detected during the epidemic phase and rarely (if ever) during the invasion phase; **1 detected positive = 3-6 in the forest**
- Countries ask for a threshold to be reached during the epidemic: during the epidemic **THERE IS NOT A THRESHOLD**

Is the epidemic phase manageable?

NO!!!

- The infection rate is always higher than any hunting rate
- Hunting will favour an artificial endemic evolution of the infection with **VIRUS PREVALENCE HIGHER THAN NATURAL**
- Hunting will increase the probability of spreading the disease (100 year of wildlife diseases management);

Hunting effort needed to cull the last infectiuous wild boar

- 1 infected out of **1000** = shooting **258** animals there is 95% probability to hunt the **last 1** infectious animal

- 3 infected wild boar out of **1000** = hunting **951** wild boar will have 95% probability to hunt the **last 3** infected wild boars

- **More infected wild boars you have higher effort is needed: feasibility?**

EPIDEMIC PAHSE
when we first detect the virus

Do nothing

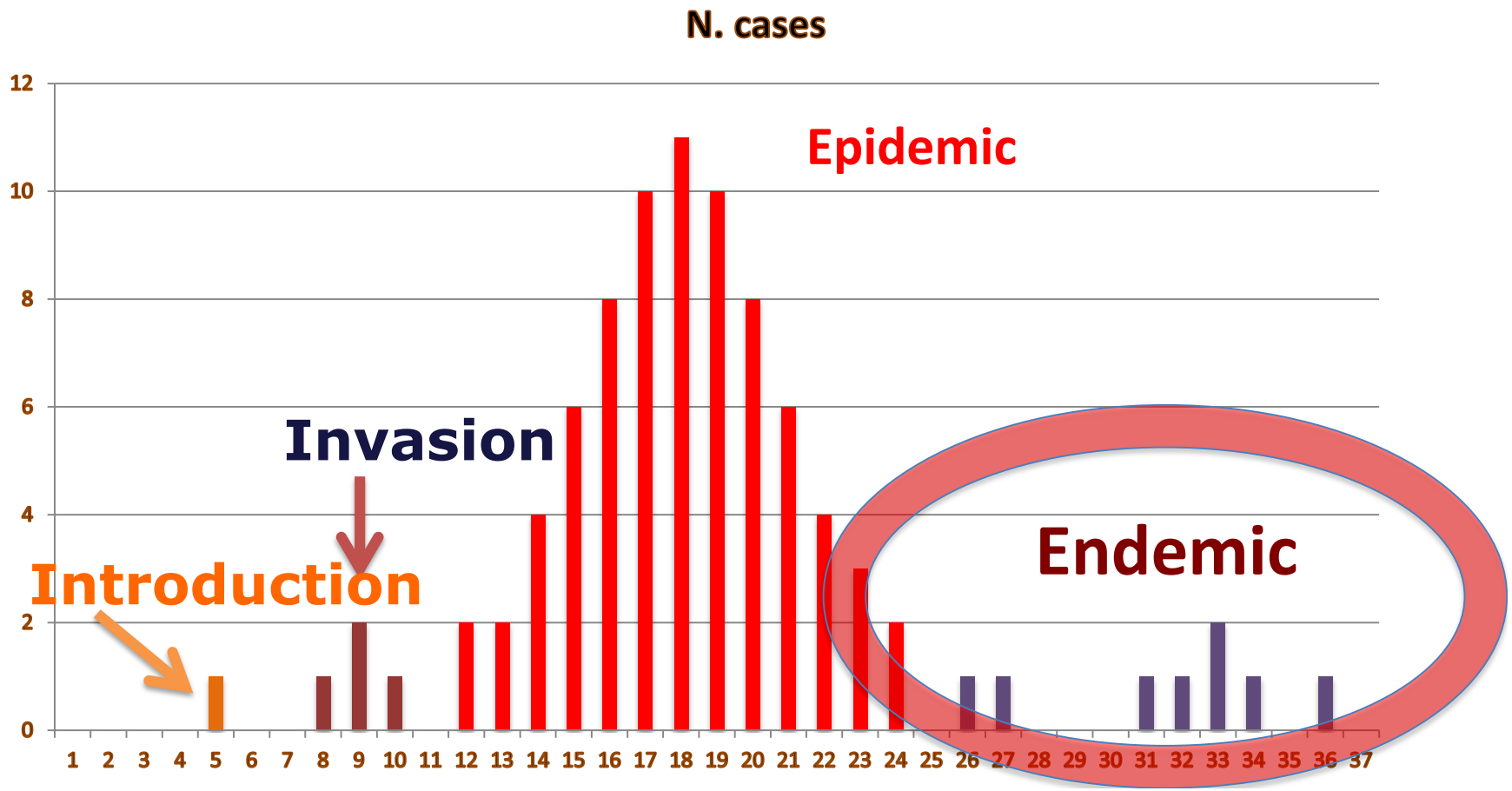
PASSIVE surveillance

Do not get tired of surveillance;

Be accurate when collecting data;

Be patient and wait the end of the epidemic revealed by surveillance;

Epidemic evolves endemic



ENDEMIC PHASE: few infected animals

During the endemic phase it is possible to observe the **fade out** of the virus or to **shot the very few infected wild boars**

There is time to:
Implement biosecurity measures
Trainings
Set timing and efforts

MESSAGE:

- Threshold is **a preventive** measure
- During the Epidemic/endemic eradication is aimed in removing the **last infectious** animal
- The probability to remove the last infectious animal is LOW during the **epidemic** (when the virus is detected)
- During the endemic phase, the probability to eliminate the last infectious animal is higher
- The virus **naturally reaches its minimum prevalence** but carcasses make specific the epidemiological landscape of ASF
- During the endemic phase, the **removal of carcasses** is probably more important than any WB density reduction

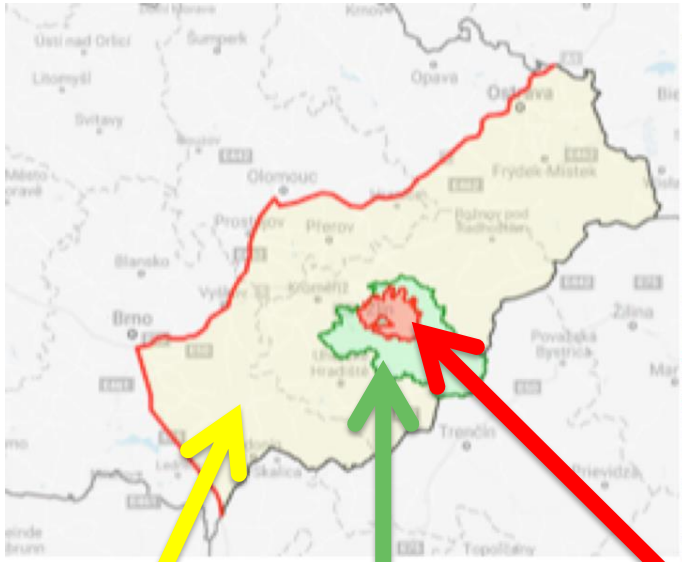

ASF frequently asked questions

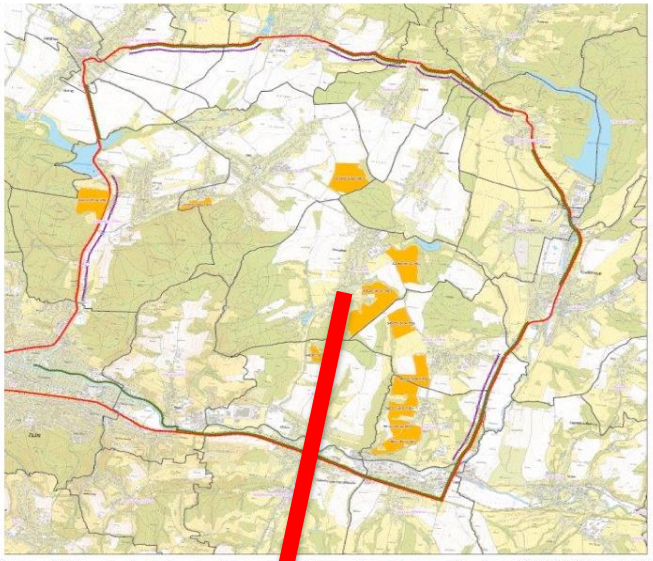
Agricoltural damages

ASF kills more than hunters;

In sourrouding areas IT IS REQUESTED TO INCREASE THE HUNTING EFFORT

Zlin; Czech epublic

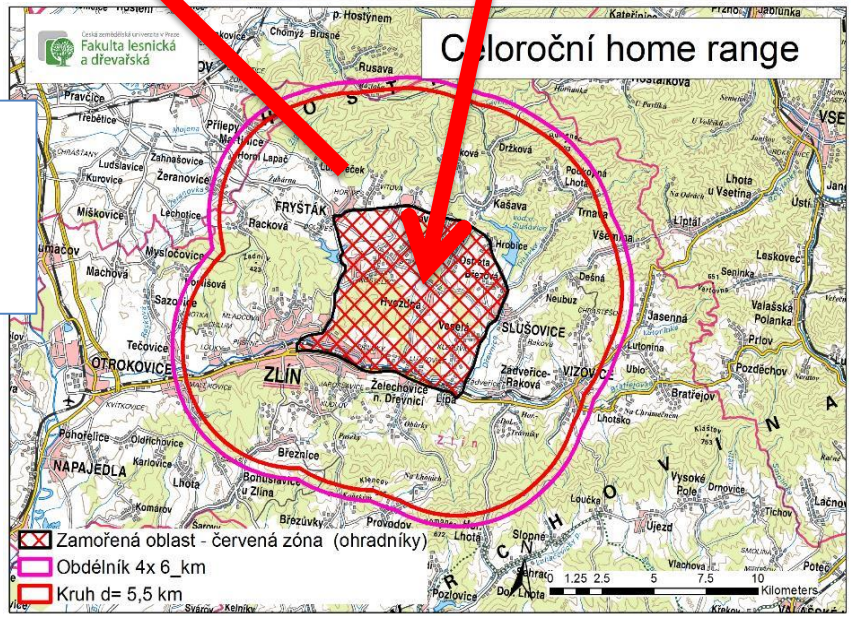




Higest risk fenced area

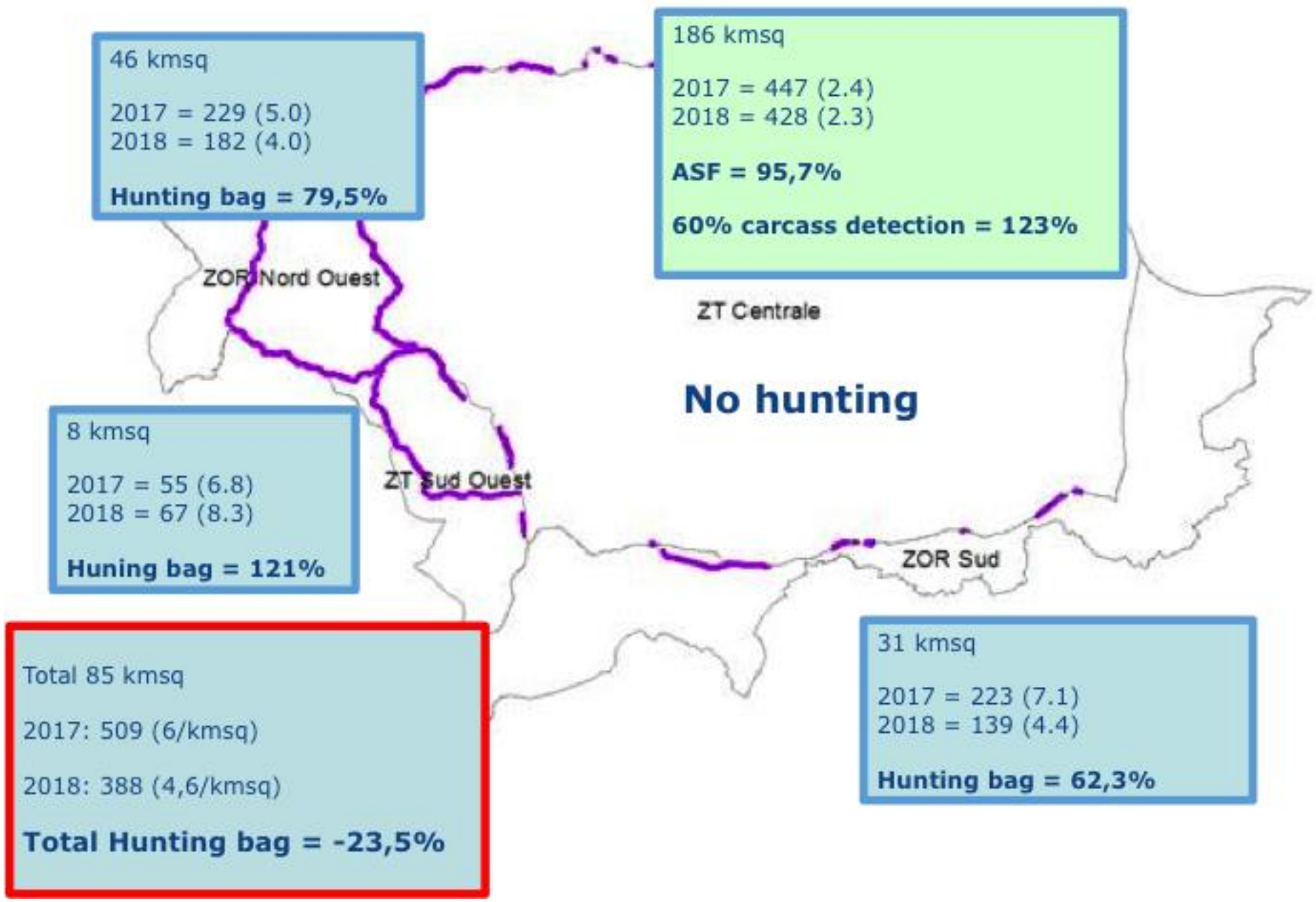
Low risk area

Intensive hunting area 5305 hunted wild boars at 13 October 2017



High risk area (fenced plus buffer Designed according wild boar home range

Hunting year = dead wild boar (density/forest km²)



Artificial feeding

Wild boar population dynamic:

- Increasing number in good years (mast years; scarce snow cover etc.)
- Decreasing number in bad years: population crashes
- Artificial feeding mimics good years: so the wild boar population is boosted each years without any demographic crash;

Driven hunts

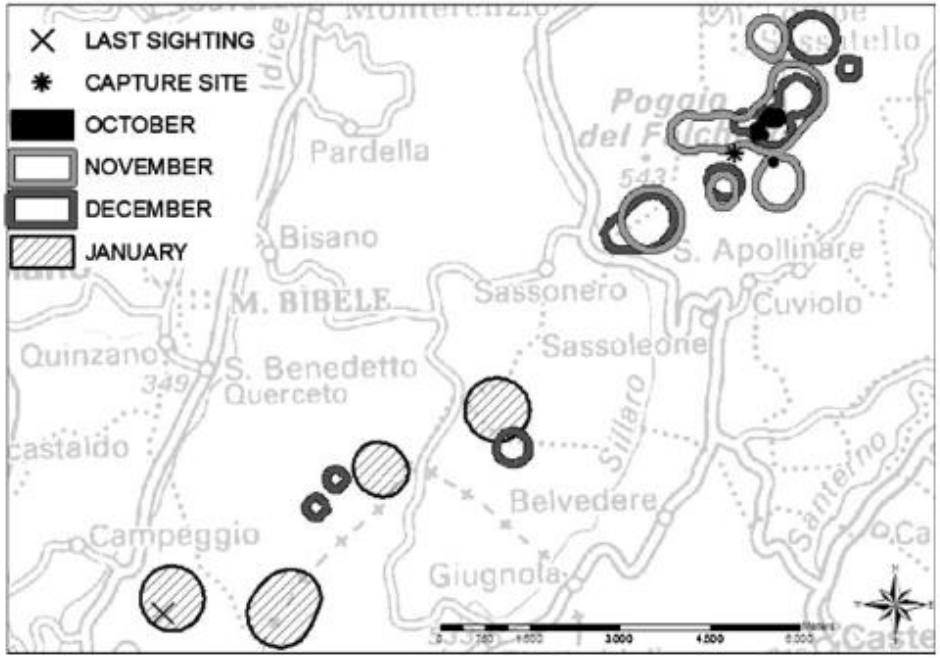
- Driven hunts are certainly more efficient in increasing the hunting bag
- However it has been proven that animals increase their home ranges and thus making more probable the geographical spread of the virus
- IT ASKED TO INCREASE THE HUNTING EFFORT

Hunting and wild boar movement

Drive hunting with dogs: increase of range size during the hunting season

Season	100% MCP				95% kernel				50% kernel			
	Median	Q_3–Q_1	Mean	SE	Median	Q_3–Q_1	Mean	SE	Median	Q_3–Q_1	Mean	SE
Pre-hunting	80	104	88	25	66	156	98	39	4	14	10	3
Hunting	428	1360	825	358	221	696	457	192	23	68	45	16
Post-hunting	195	544	358	151	189	488	284	99	20	88	45	20

Home range displacements during the hunting season (up to 15 km)



Eur J Wildl Res (2010) 56:307–318
DOI 10.1007/s10344-009-0314-z

ORIGINAL PAPER

Do intensive drive hunts affect wild boar (*Sus scrofa*) spatial behaviour in Italy? Some evidences and management implications

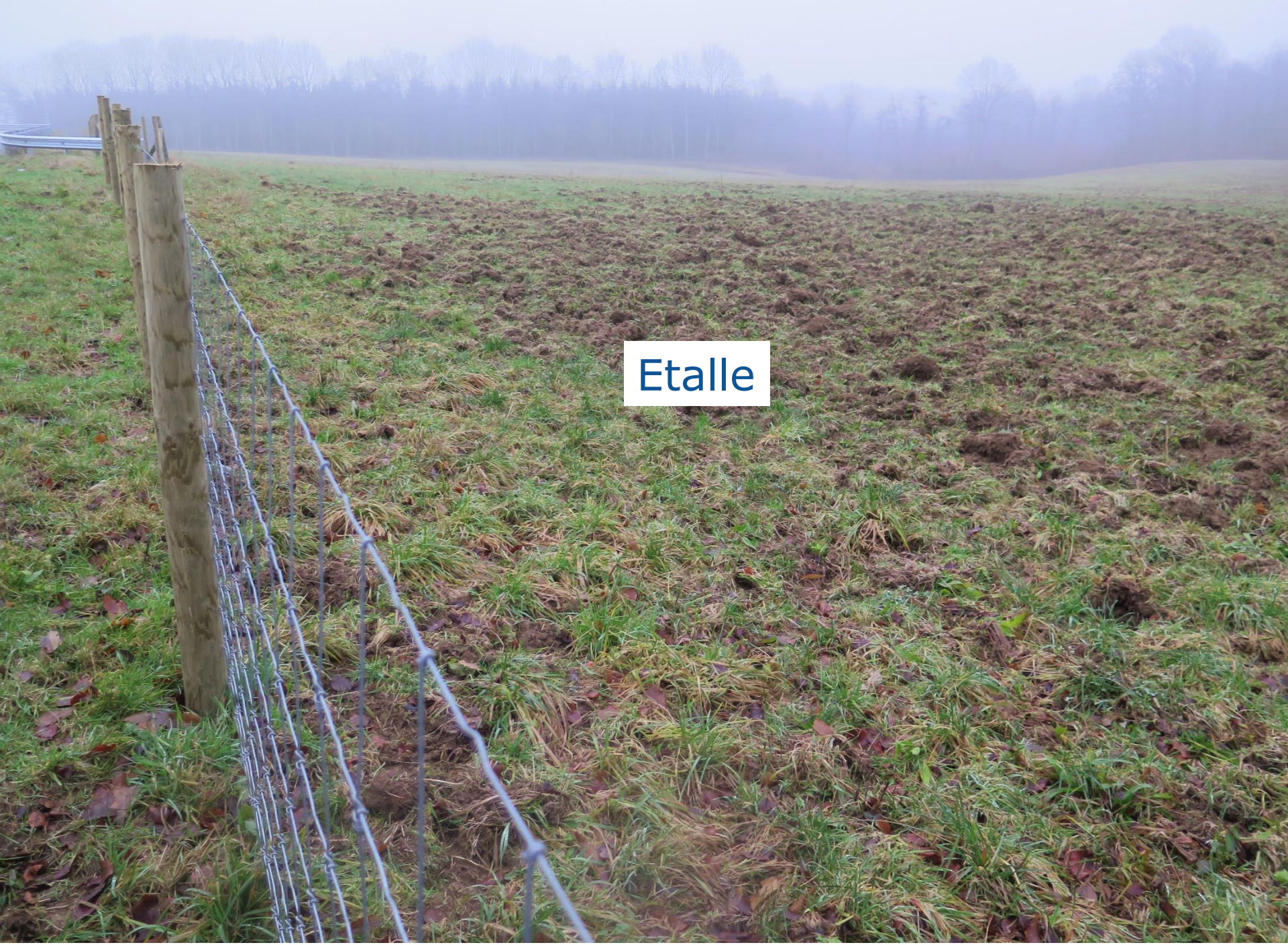
Laura Scillitani · Andrea Monaco · Silvano Toso

Fences

- *Fences mimic habitat fragmentation;*
- *Habitat fragmentation reduces the geographical spread of the infection;*
- *There is more time to properly organize actions*
- *The whole infected area has more probability to reach the endemic phase at which it is worth to hunt/cull animals*

- *Fences have a very low probability to halt the infection without any further appropriate actions*


Zlin


Etalle


France at Belgian border

Final message: ASF in wild boar has some probability to be erdadicated when:

- EARLY detected: report dead animals; small areas are easily managed with higher probability of eradication;
- Hunting/culling only when few infectious animals are still present (higher eradication probability; less virus contamination etc.)
- Increasing **hunting effort** where and when requested
- Compliance of the prescribed management and Biosecurity measures

GF-TADs
GLOBAL FRAMEWORK FOR THE PROGRESSIVE CONTROL OF TRANSBOUNDARY ANIMAL DISEASES

Standing Group of Experts on African swine fever in Europe
under the GF-TADs umbrella

(Courtesy Adriano De Faveri, ISPRA)

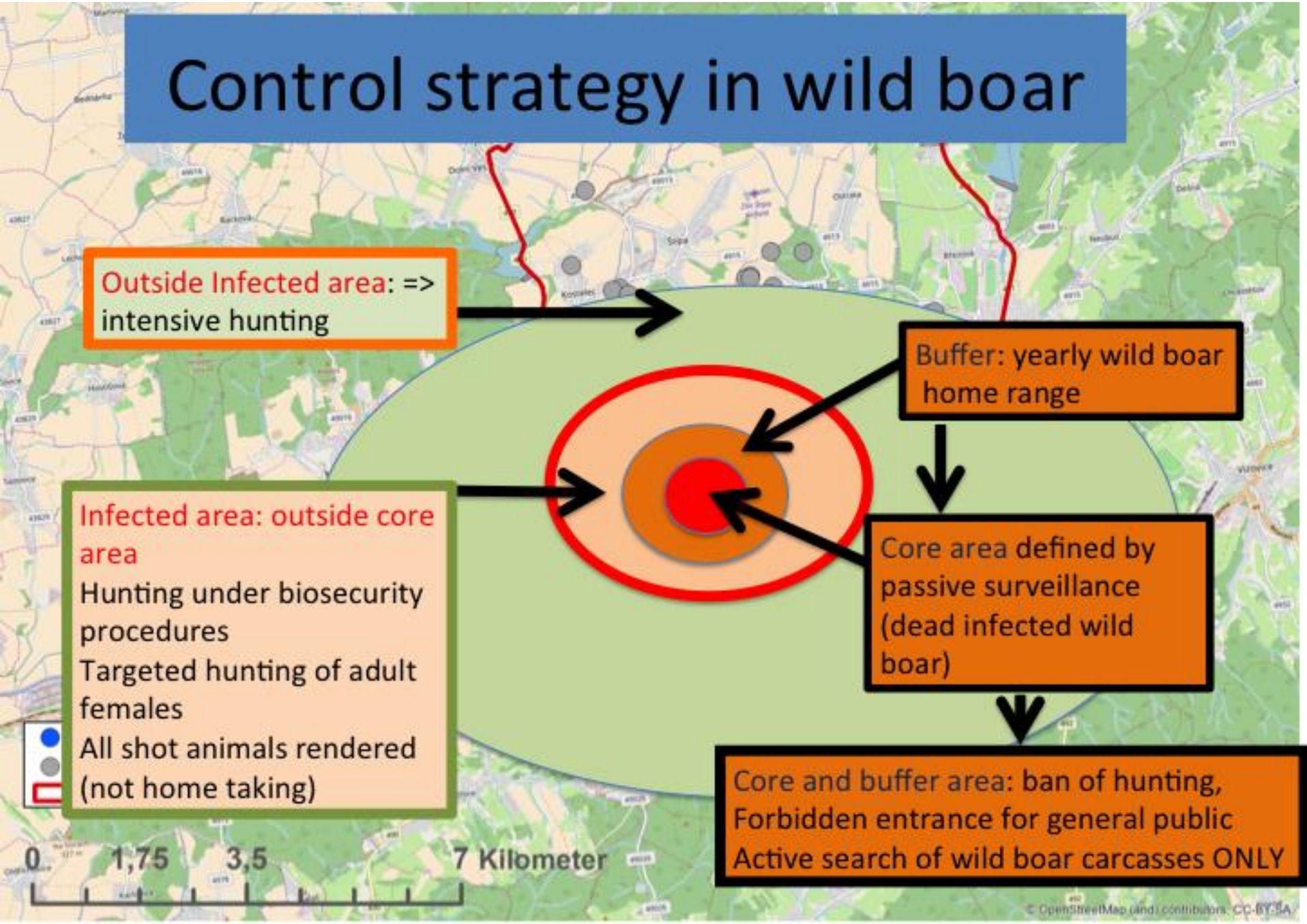
Handbook on African swine fever in wild boar and biosecurity during hunting

Vittorio Guberti
Istituto Superiore per la Ricerca e la Protezione Ambientale (ISPRA), Italy

Sergei Khomenko
PhD, Disease Ecologist and GIS Expert, Animal Health Service, FAO

Marius Masiulis
PhD, Head of Emergency Response Department, State Food and Veterinary Service of the Republic of Lithuania and Lecturer in Veterinary Academy of the Lithuanian University of the Health Sciences

Suzanne Kerba
Risk Communications Consultant, Paris, France


Control strategy in wild boar
Outside Infected area: => intensive hunting
Buffer: yearly wild boar home range
Infected area: outside core area
Hunting under biosecurity procedures
Targeted hunting of adult females
All shot animals rendered (not home taking)
Core area defined by passive surveillance (dead infected wild boar)
Core and buffer area: ban of hunting,
Forbidden entrance for general public
Active search of wild boar carcasses ONLY
0
1,75
3,5
7 Kilometer
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