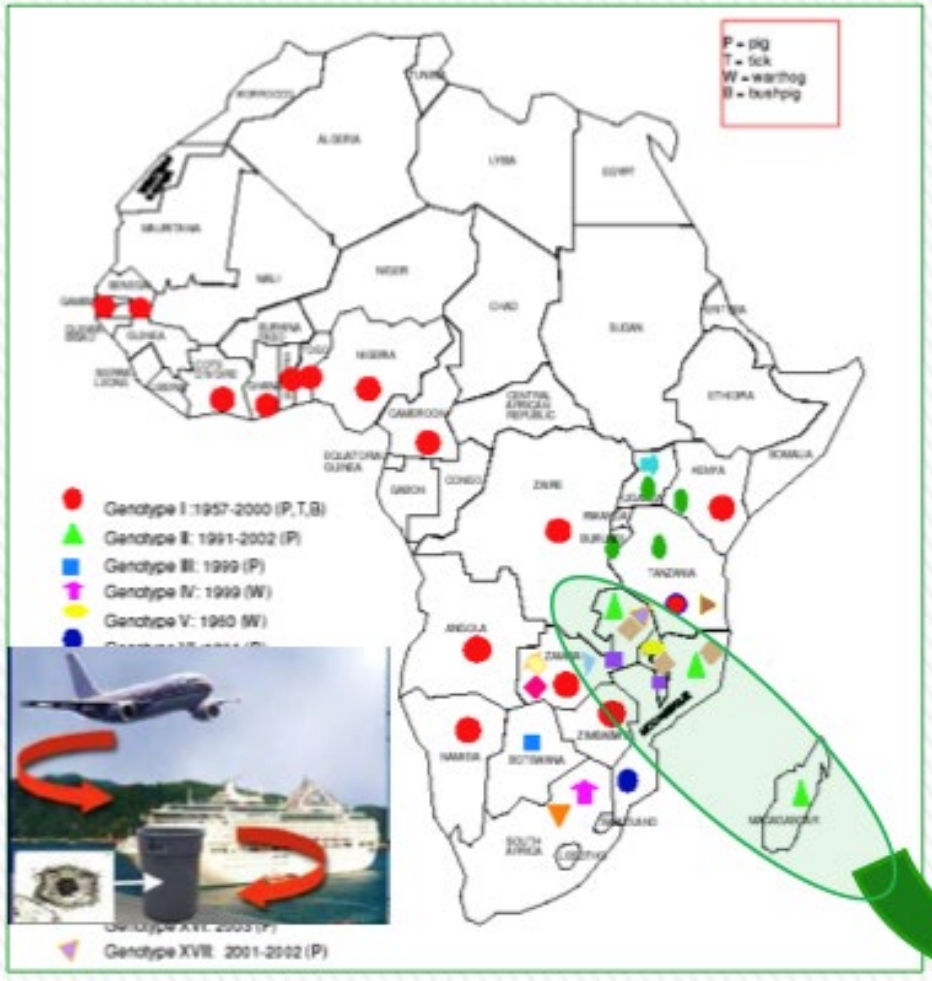
European Commission

Epidemiology of ASF in wild boar

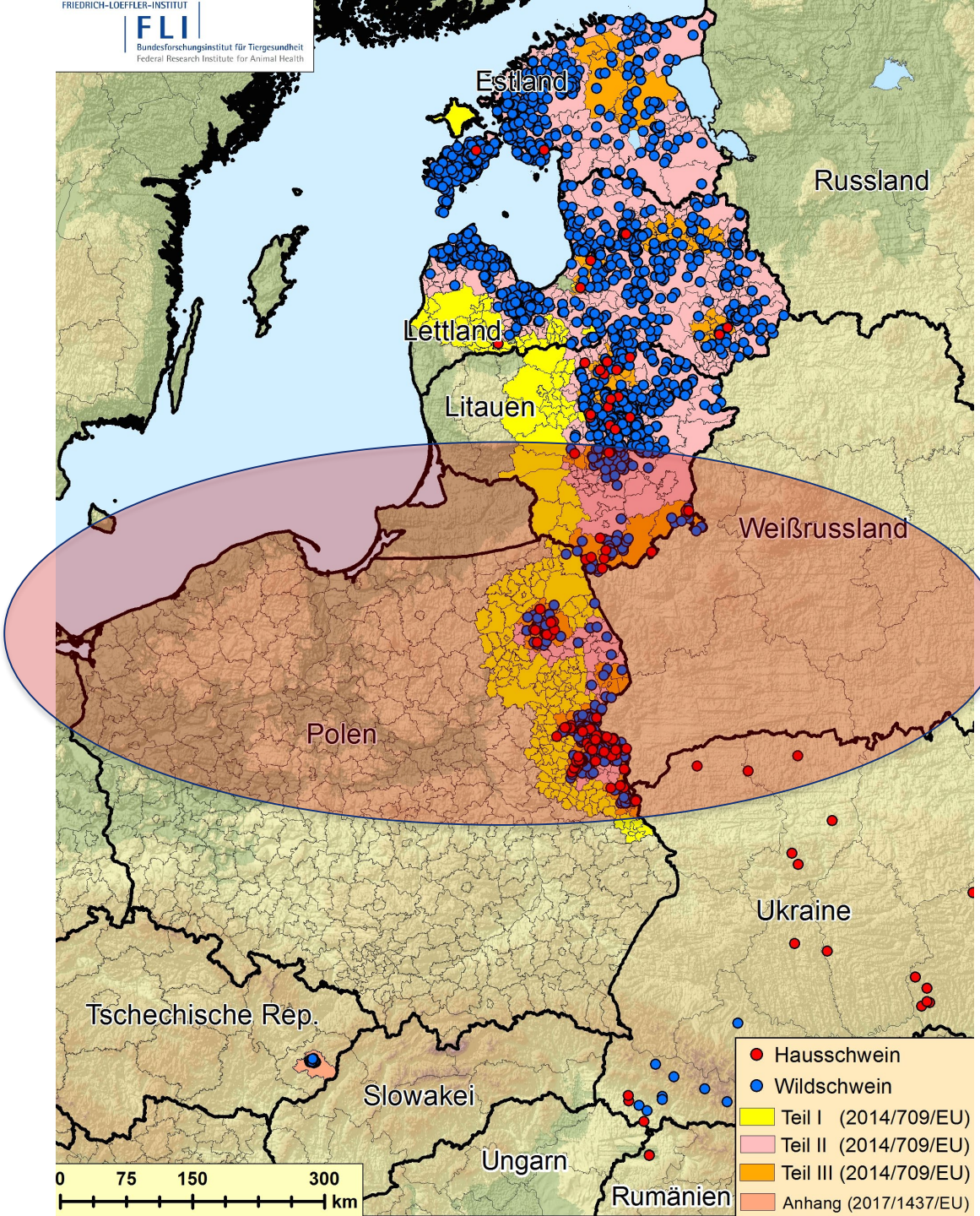
European Commission

Tracing the origin



Georgia
June 2007


Europe
JAN MAYAN
SVALBARD
ICELAND
FAROE ISLANDS
Atlantic Ocean
North Sea
NORWAY
SWEDEN
FINLAND
RUSSIA
ESTONIA
LATVIA
BELARUS
UNITED KINGDOM
DENMARK
IRELAND
ISLE OF MAN
NETHERLANDS
POLAND
GERMANY
BELGIUM
GUERNSEY
JERSEY
SLOVAKIA
SWITZERLAND
AUSTRIA
HUNGARY
ROMANIA
SLOVENIA
FRANCE
CROATIA
BULGARIA
ITALY
SAN MARINO
MONACO
VATICAN CITY
MACEDONIA
GREECE
TURKEY
ALBANIA
Mediterranean Sea
GIBRALTAR
MALTA
Black Sea
Caspian Sea
AZERBAIJAN
GEORGIA
ARMENIA
AZER.
1. LITHUANIA
2. LUXEMBOURG
3. LIECHTENSTEIN
4. CZECH REPUBLIC
5. BOSNIA & HERZEGOVINA
6. SERBIA
7. MONTENEGRO
8. KOSOVO
70°
60°
50°
40°
5°
0°
5°
15°
25°
35°
45°
ASF:0-70 km/year since 2007


FRIEDRICH-LOEFFLER-INSTITUT
FLI
Bundesforschungsinstitut für Tiergesundheit
Federal Research Institute for Animal Health
Estland
Russland
Lettland
Litauen
Weißrussland
Polen
Ukraine
Tschechische Rep.
Slowakei
Ungarn
Rumänien
0
75
150
300
km
Hausschwein
Wildschwein
Teil I (2014/709/EU)
Teil II (2014/709/EU)
Teil III (2014/709/EU)
Anhang (2017/1437/EU)

Few certainties

Wild boar CAN ACT AS the true epidemiological reservoir of the virus;

The virus is maintained by the wild boars independently from the infection in domestic pigs and ticks

Infected Wild boar contaminate the environment making more likely secondary outbreaks in domestic pigs (non commercial and commercial farms)

How the virus spreads

Direct e contacts (nose to nose)

Contaminated environment (infected material)

Feeding infected wild boar carcasses

Virus prevalence in infected wild boar population: **1-4,5%**

Sero-prevalence in hunted WB: **0,5-2%**

Incubation **3-5 days**

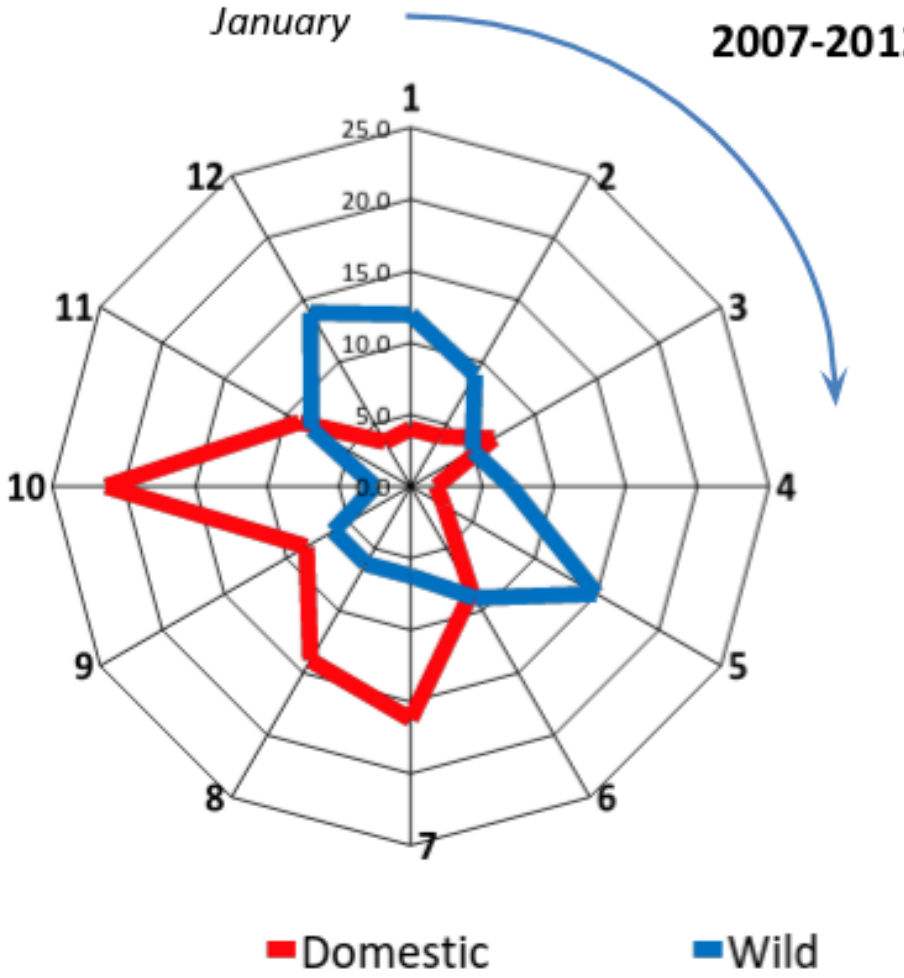
Lethality **90-95%**

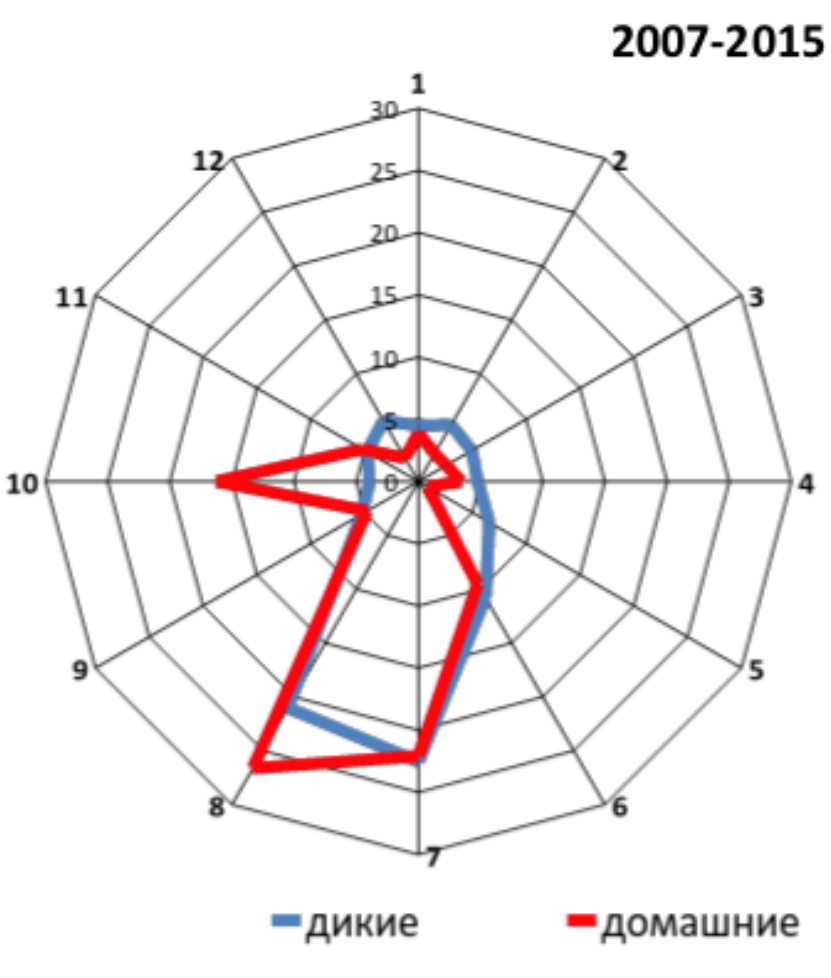
70-80% found dead wild boar are virus

≈ 50 km/year is the average speed, but the virus lasts also in old infected areas

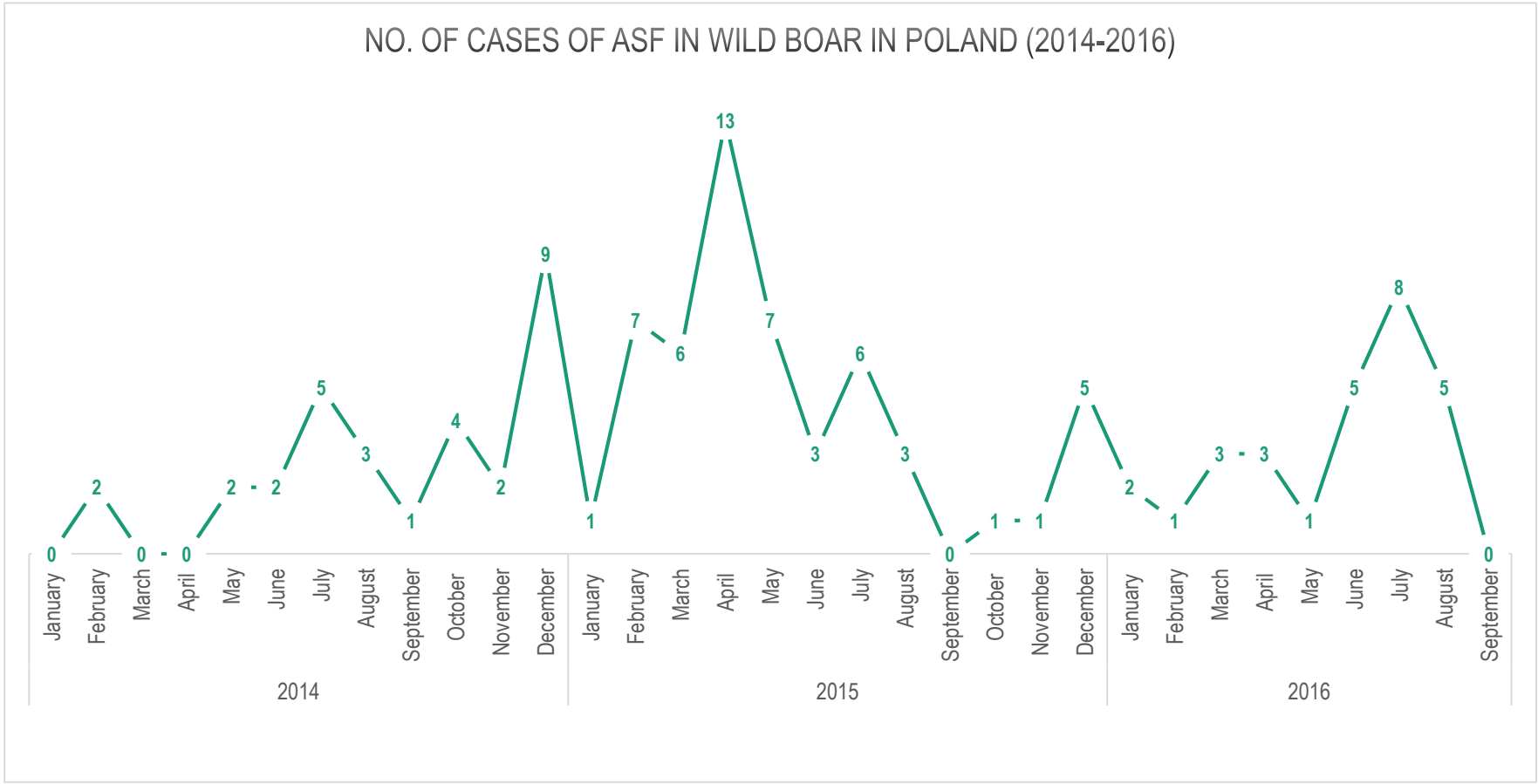
The virus **spreads** through the **geographical continuity of the wild boar population** RATHER THAN of wild boar migration

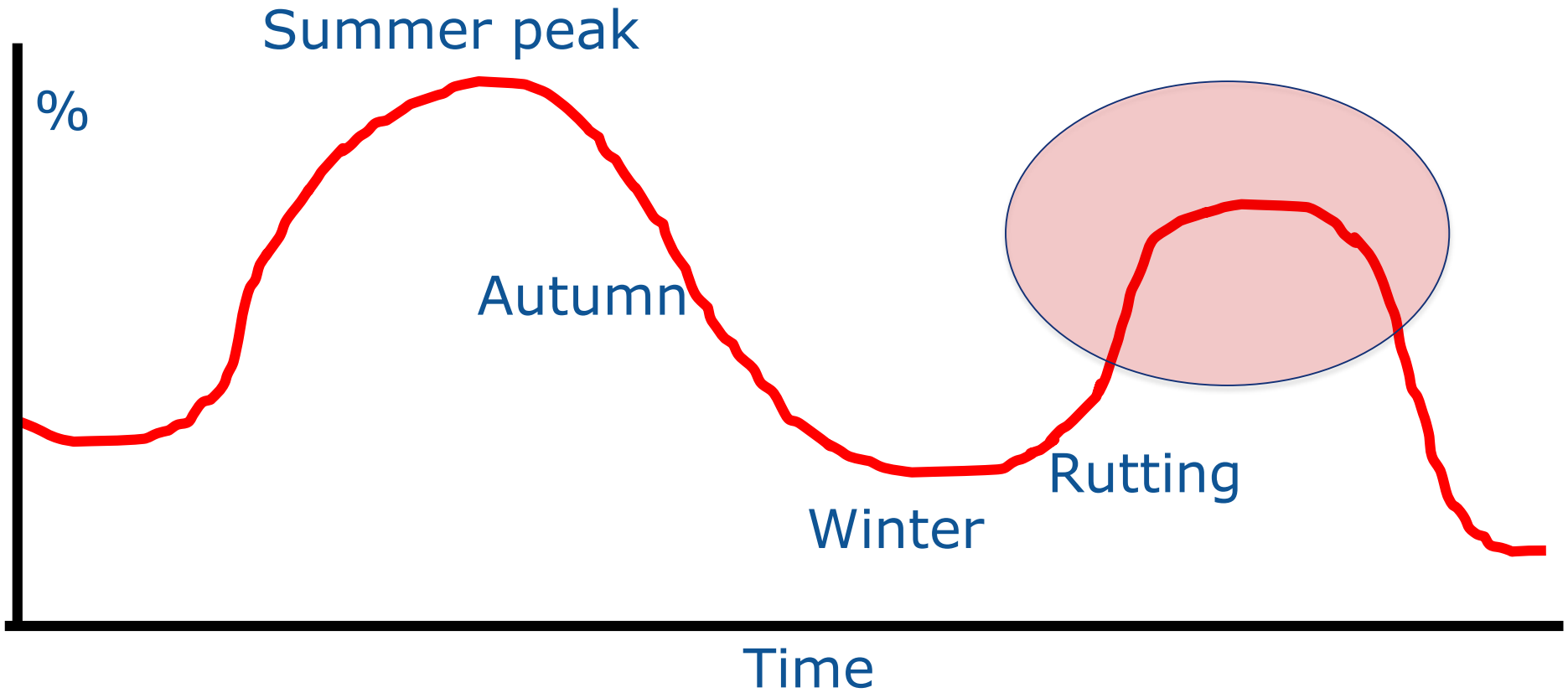
Monthly incidence of ASF in domestic pigs and wild boar





European Commission





Higher prevalence in summer: new born animals, insectes?
Lower prevalence in winter: virus survives in carcasses
Increasing prevalence: rutting period ?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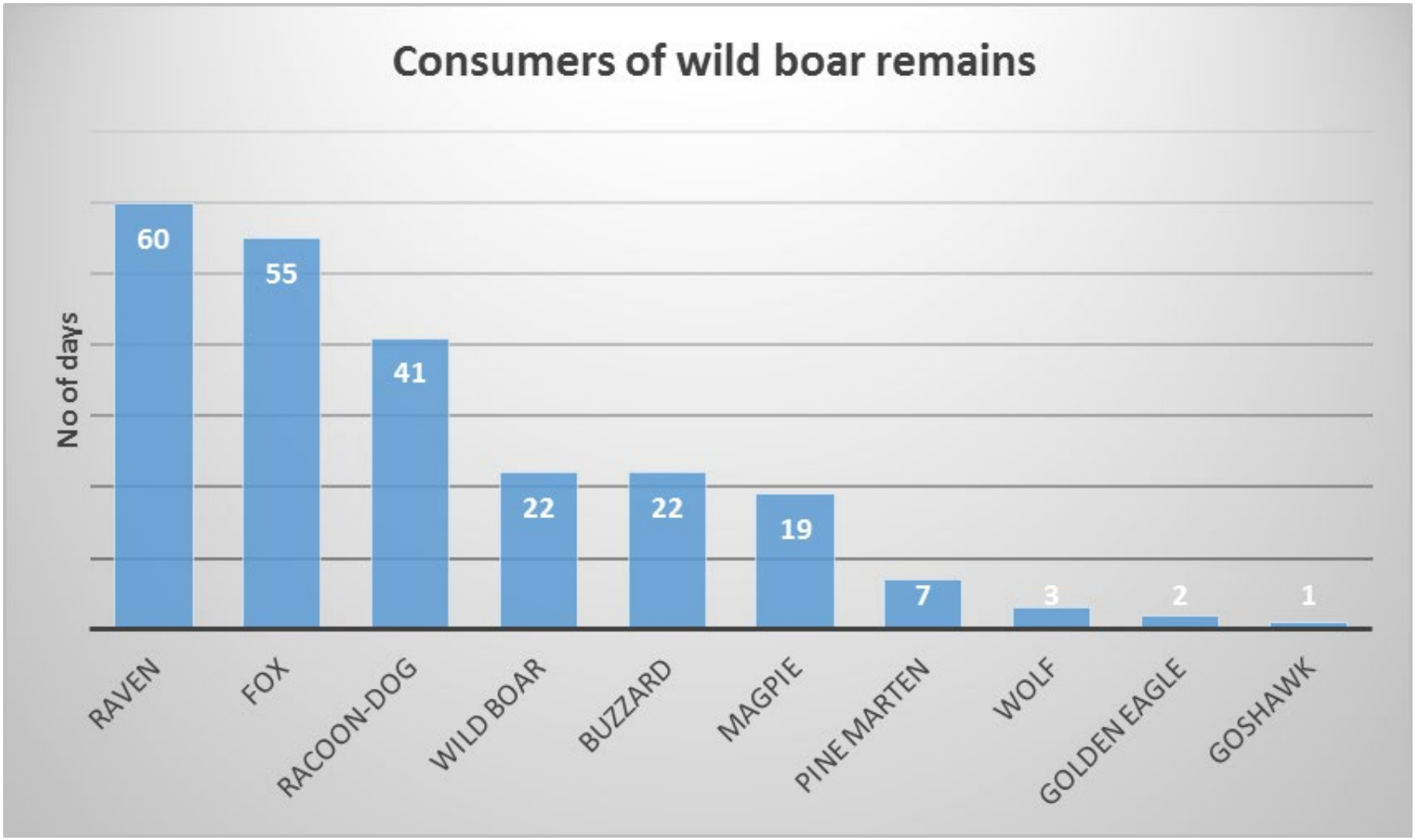


+ 19 wild boar approaches without contact

Role of insects and caracasses no ticks

Maggots could increase contacts between wild boar and infected carcasses but they have been never positive to the virus (only DNA presence but no virus): enhanced summer transmission

Scavenging insects: long attraction for wild boar, increased probability of direct contact with infected carcasses

Carcasses: virus maintenance in the environment; direct transmission to the susceptible animals

Risk of spread after introduction of the virus

Delayed diagnosis

Wild boar population size and density

Forest connectivity

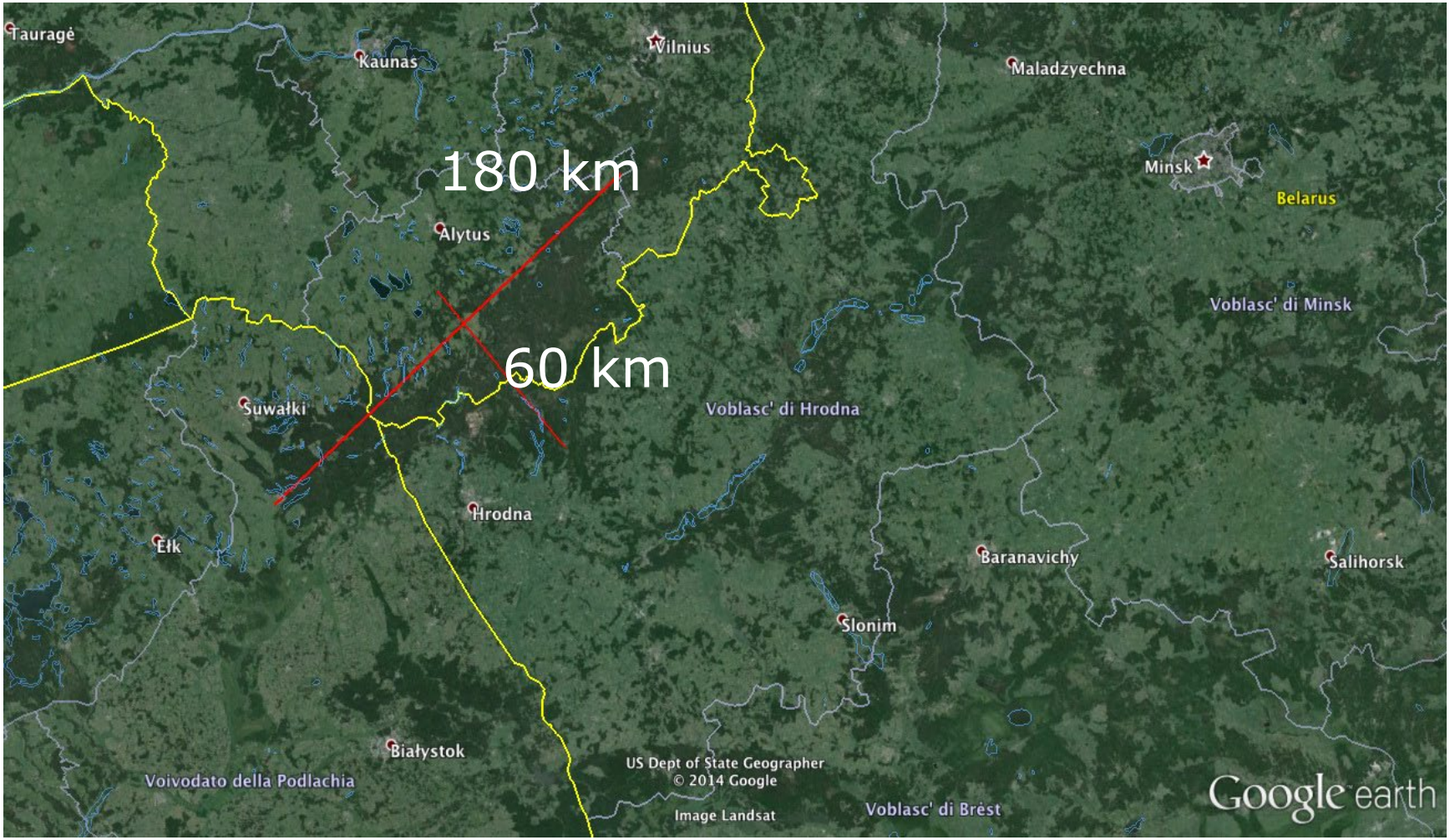
Inappropriate hunting methodologies

Lack of biosecurity measures applied during hunting

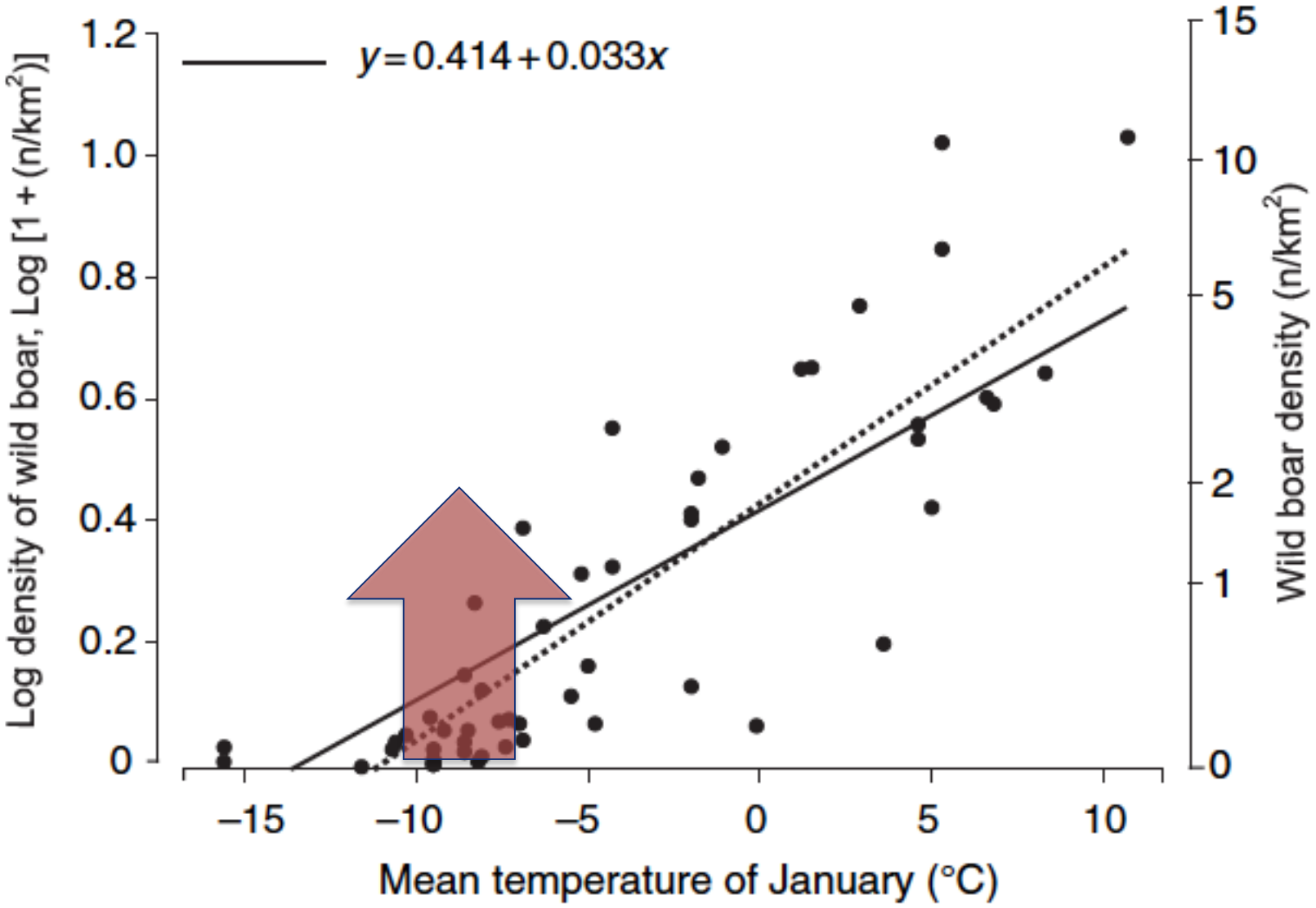
Infected wild boar carcasses available for healthy wild boars

Poaching

Geographical continuity



Winter feeding increases densities

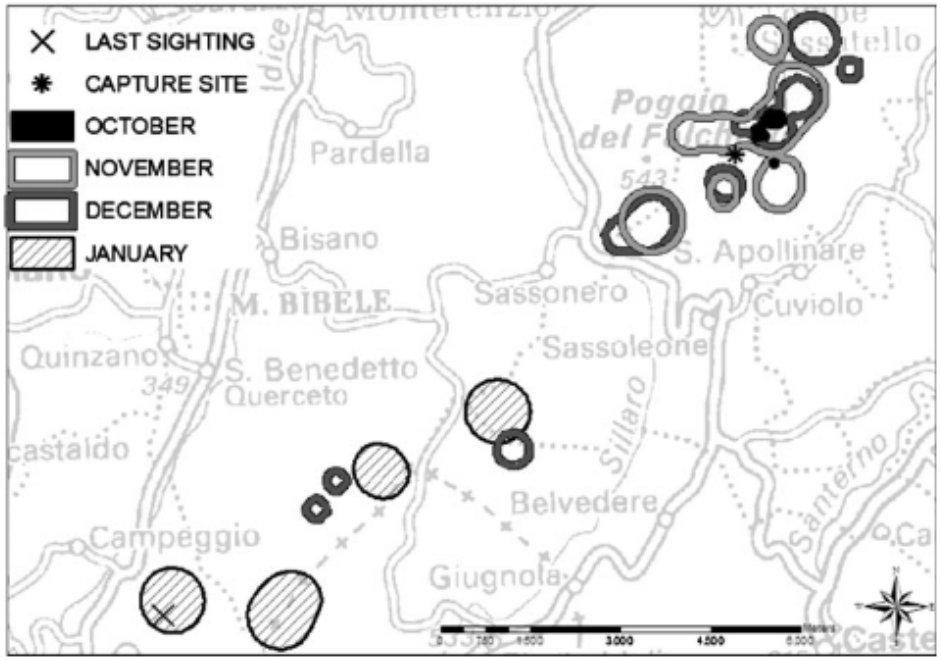


Hunting and wild boar movement

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)



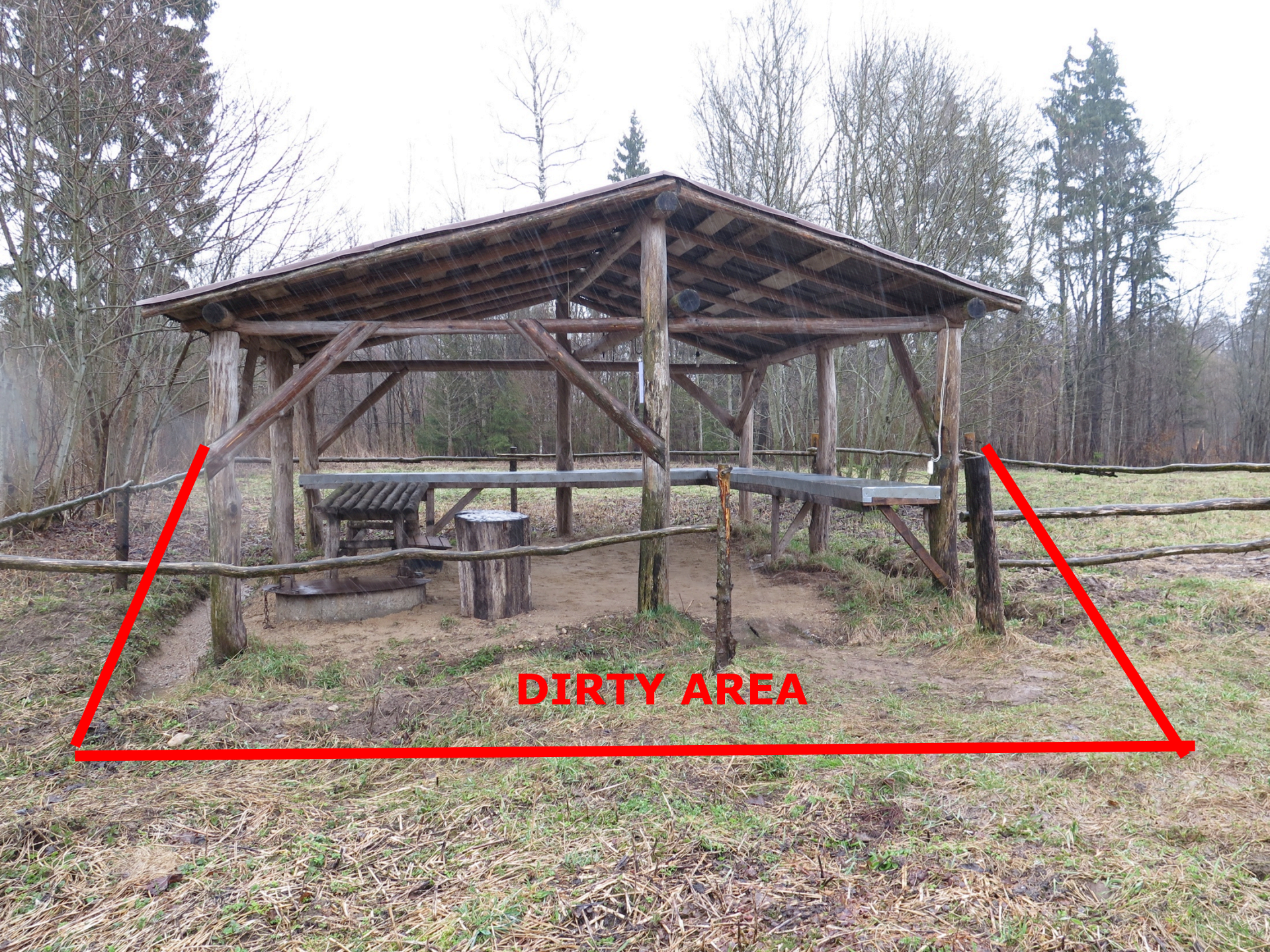
Eur J Wildl Res (2010) 56:307–318
DOI 10.1007/s10344-009-0314-z

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

Driven hunt with dogs – effective method to reduce the population density


DIRTY AREA

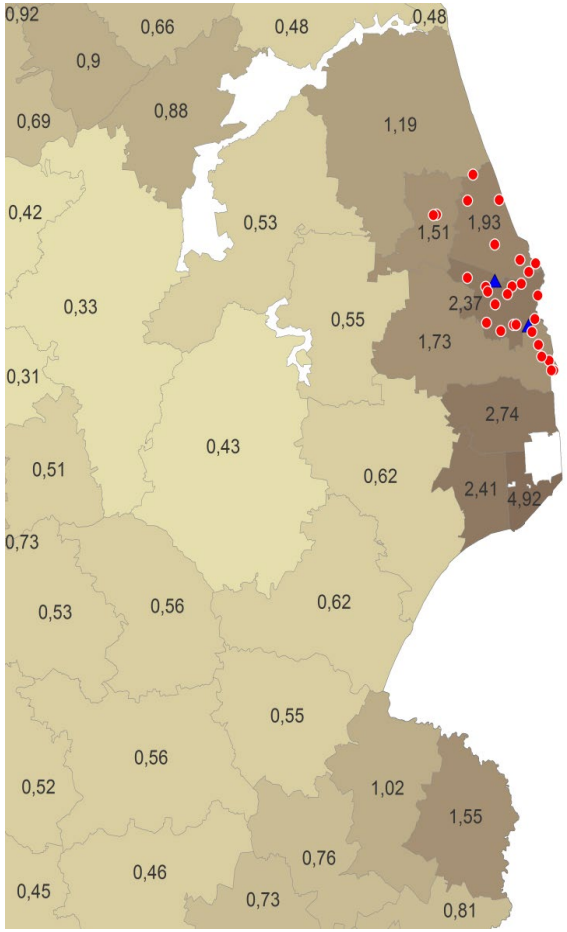

How many
wild boars?

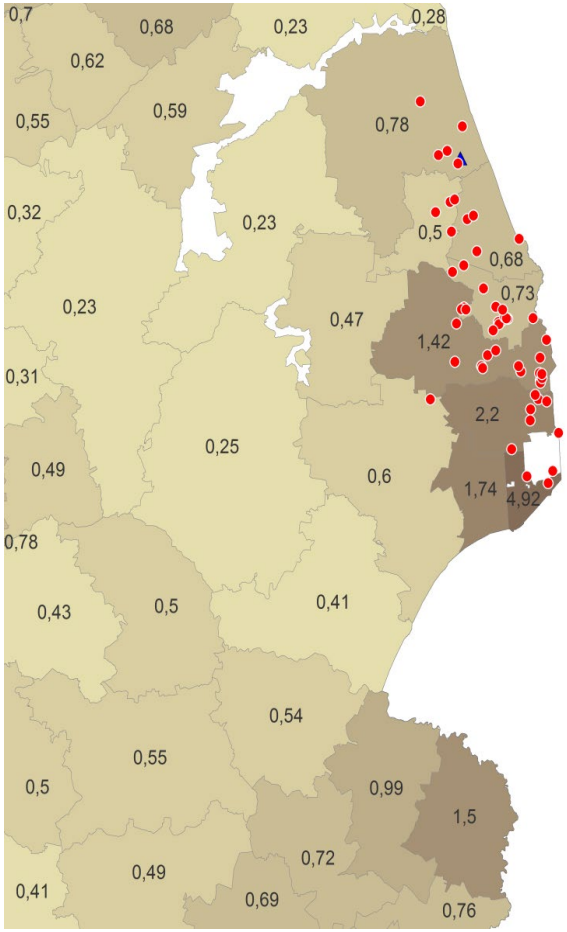
Density dependent spread

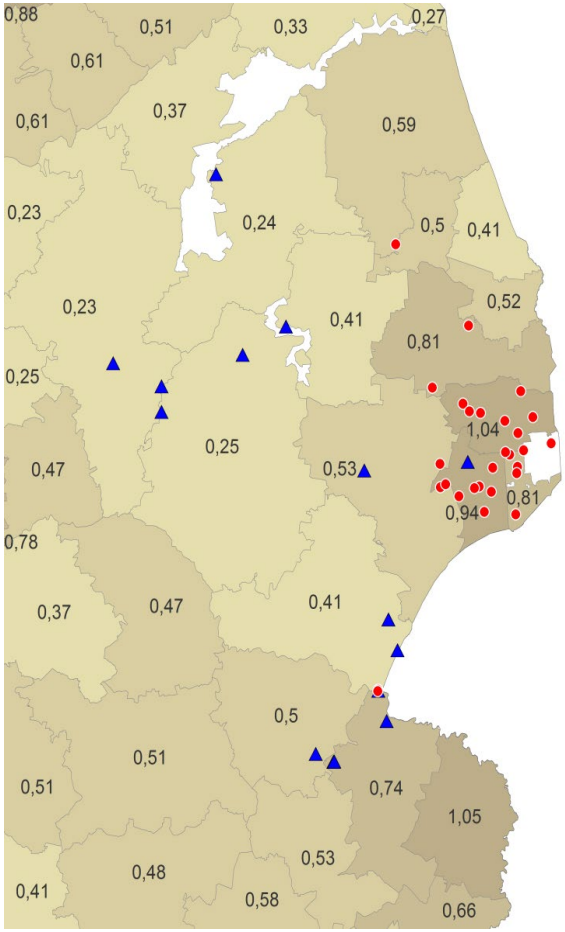
The number of NEW INFECTED wild boar is proportional to the wild boar population size

The duration of the epidemic is proportional to the wild boar population size

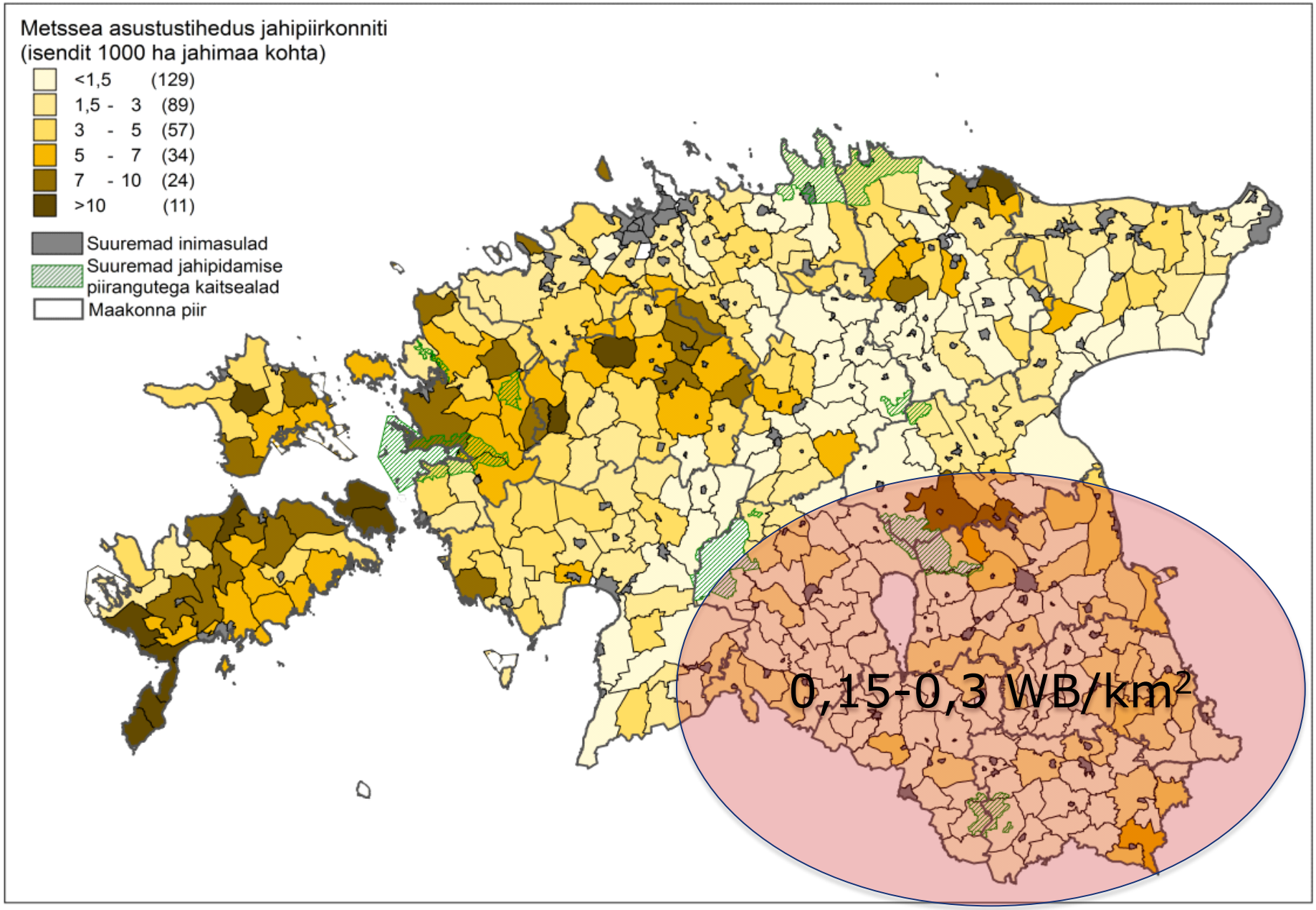
Poland: tendency to spread within areas with wild boar density > 1 individual/km^2



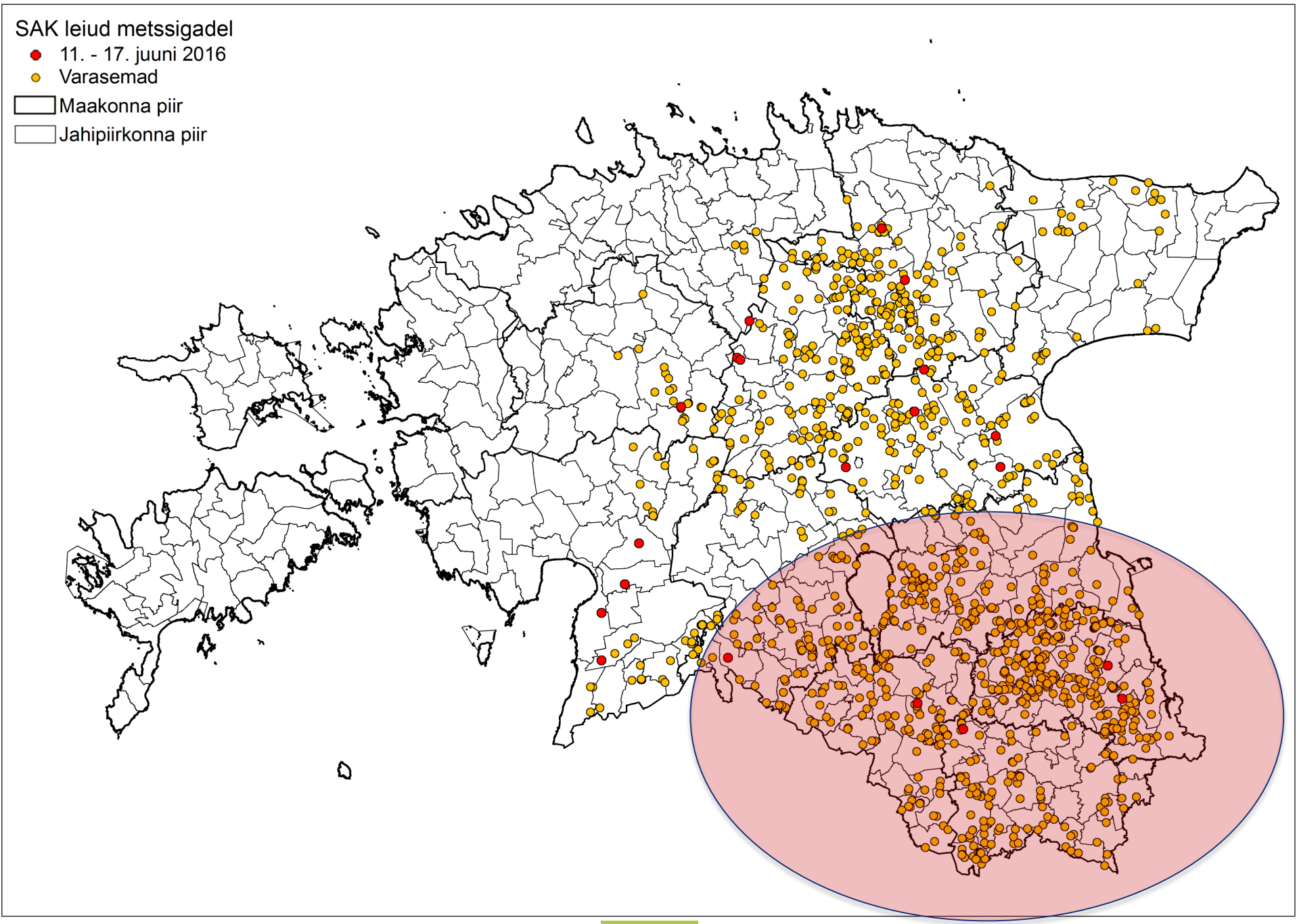




2014 – 30 cases **2015 – 53 cases** **2016 – 28 cases**



Density of wild boars (individuals per 10 km^2 of hunting ground) in hunting districts by hunters estimations (census) in spring 2016.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11. - 17. juuni 2016
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Can we define the threshold density?

The threshold density (nt) is that wild boar density at which an infectious wild boar does not encounter any susceptible wild boar in due time to spread the infection

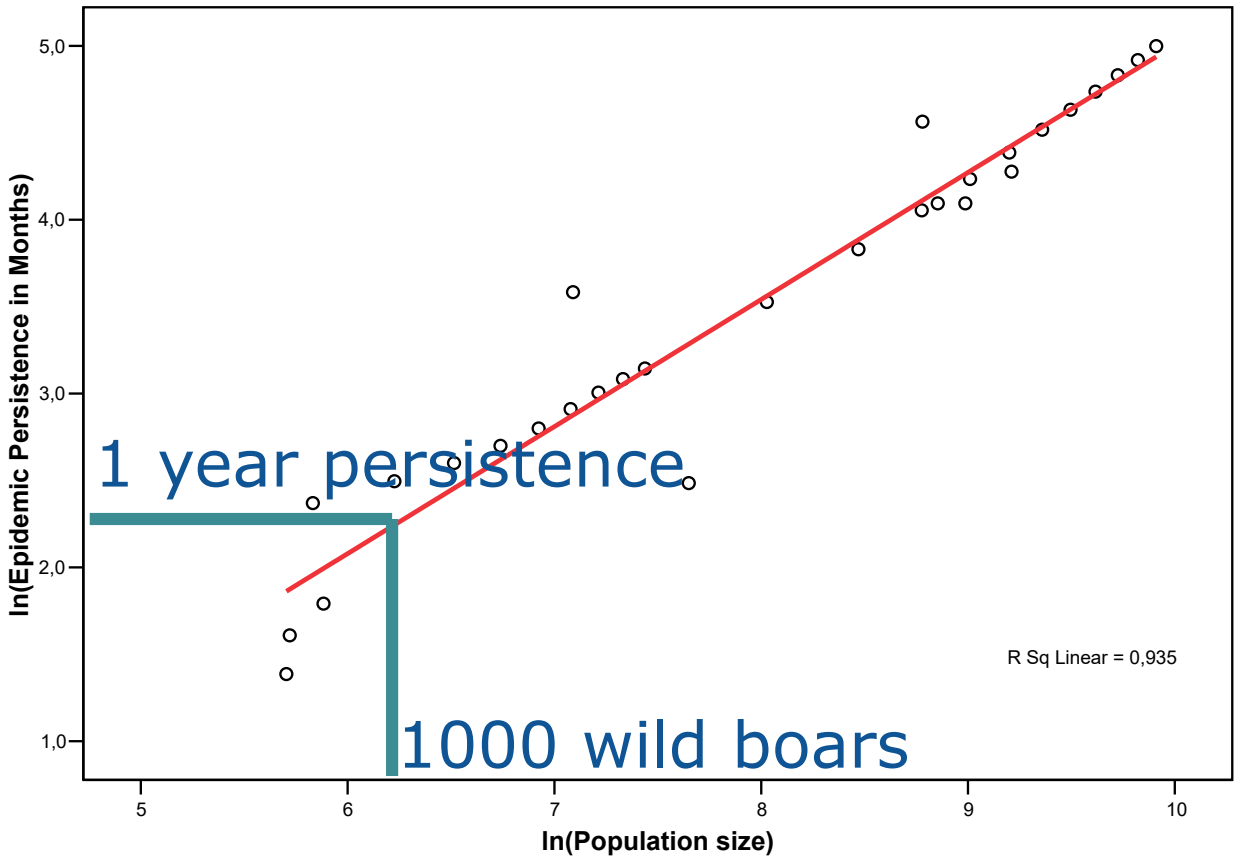
Duration of infectiousness

Density/availability of susceptible hosts

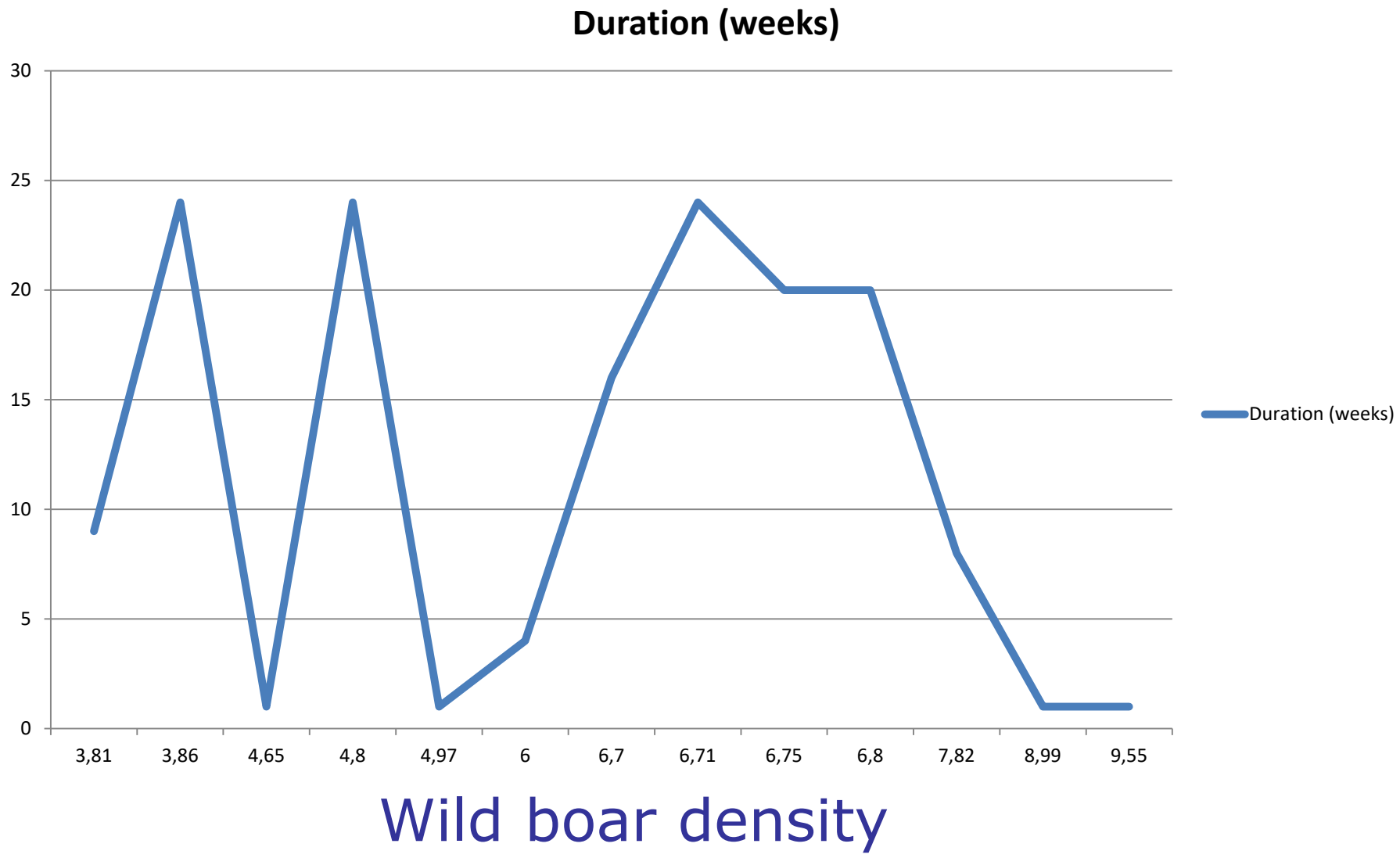
If the wild boar population size is decreased till a certain density, the infection fade out through a density dependent mechanism

NO WILD BOARS = NO DISEASE

CLASSICAL SWINE FEVER in WILD BOAR

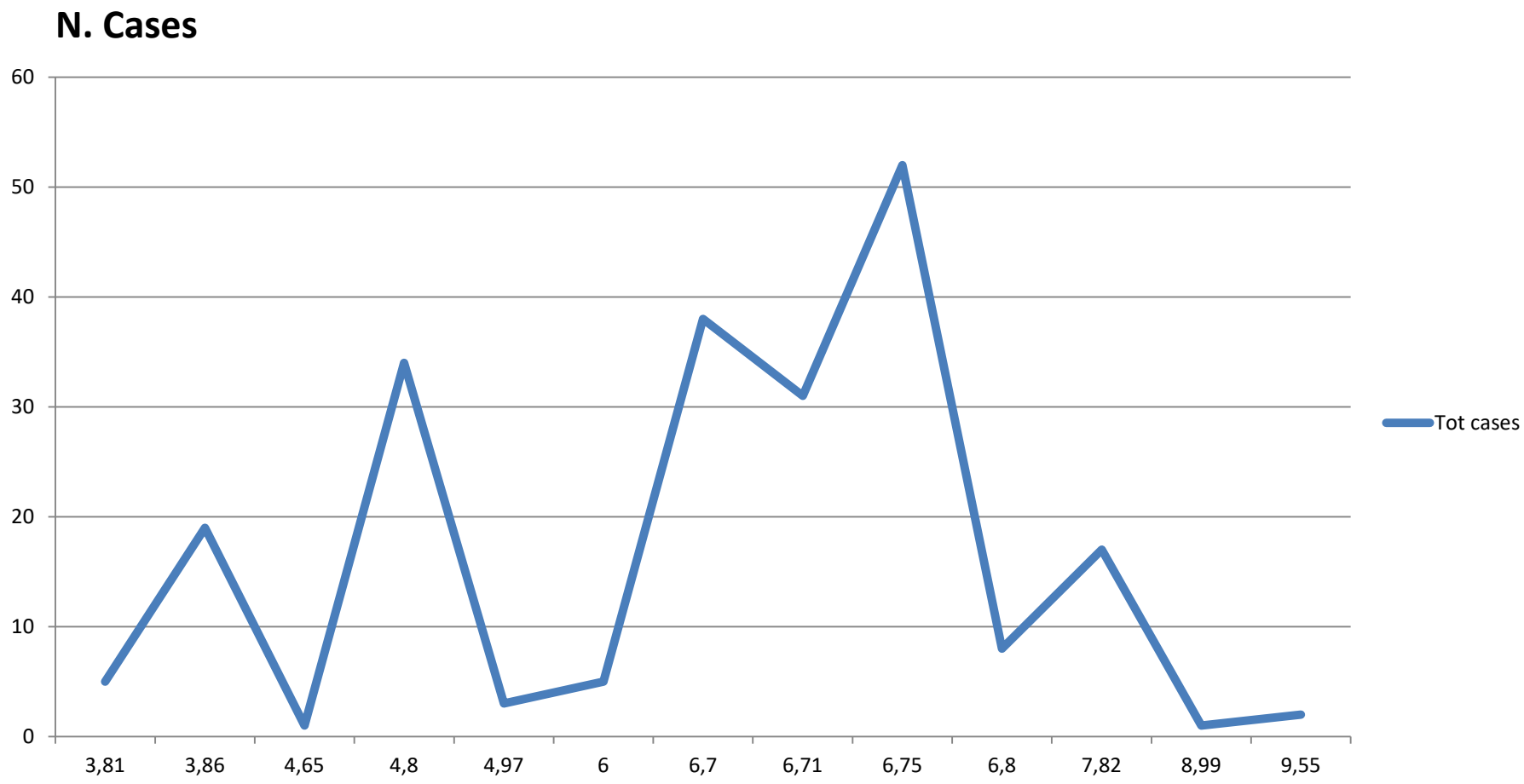


Density dependence of ASF



Wild boar density

Apparently: not a density dependent spread



WB density

ASF in wild boar

A density dependent transmission during summer-autumn (new born and adult animals)….insects?

Virus survival during winter with few (or many) **infected carcasses** according to the local ecological situation

A mixed transmission: density dependent and frequency dependent => **NO THRESHOLD**

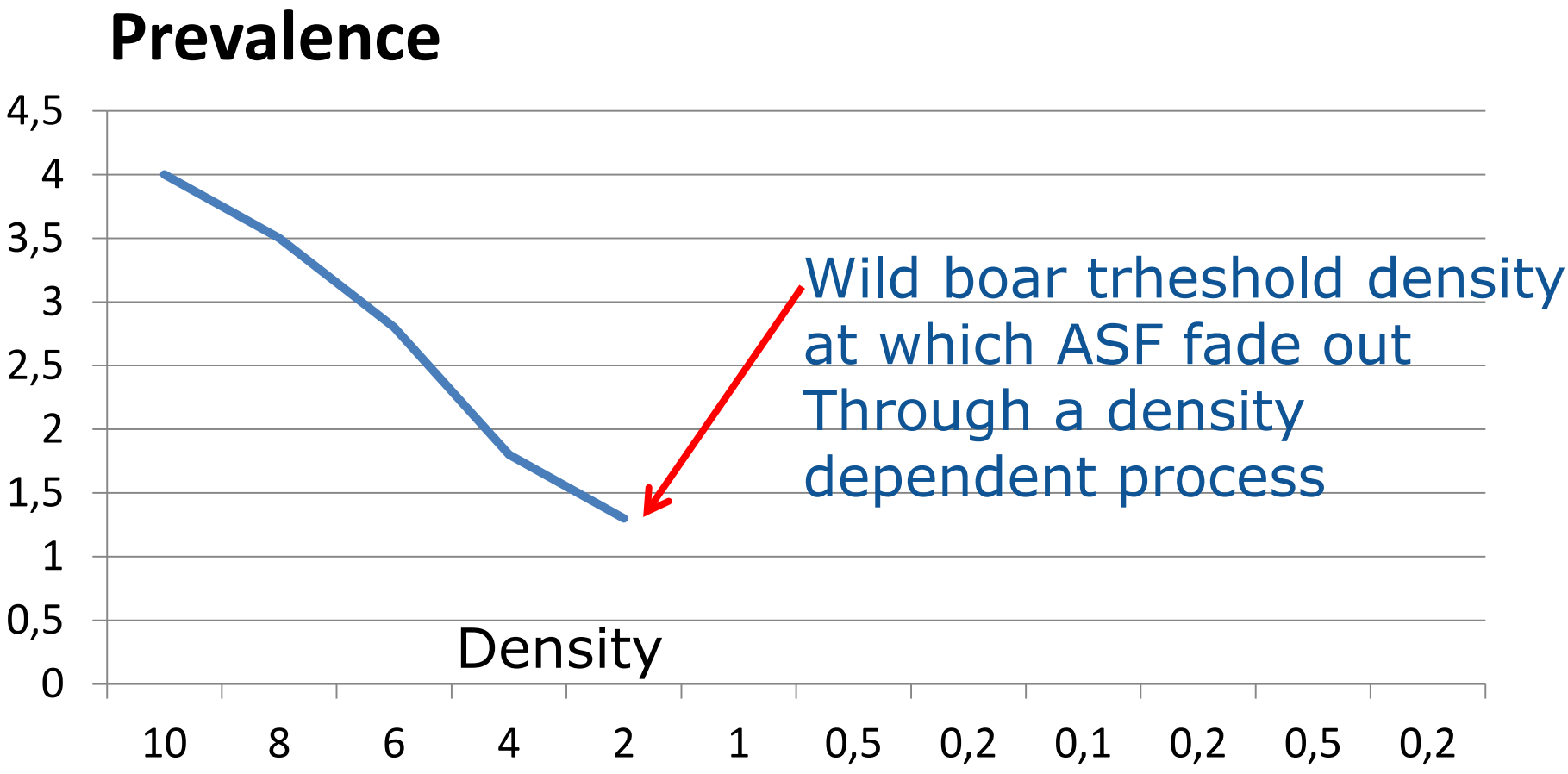
ASF in wild boar

The question is:

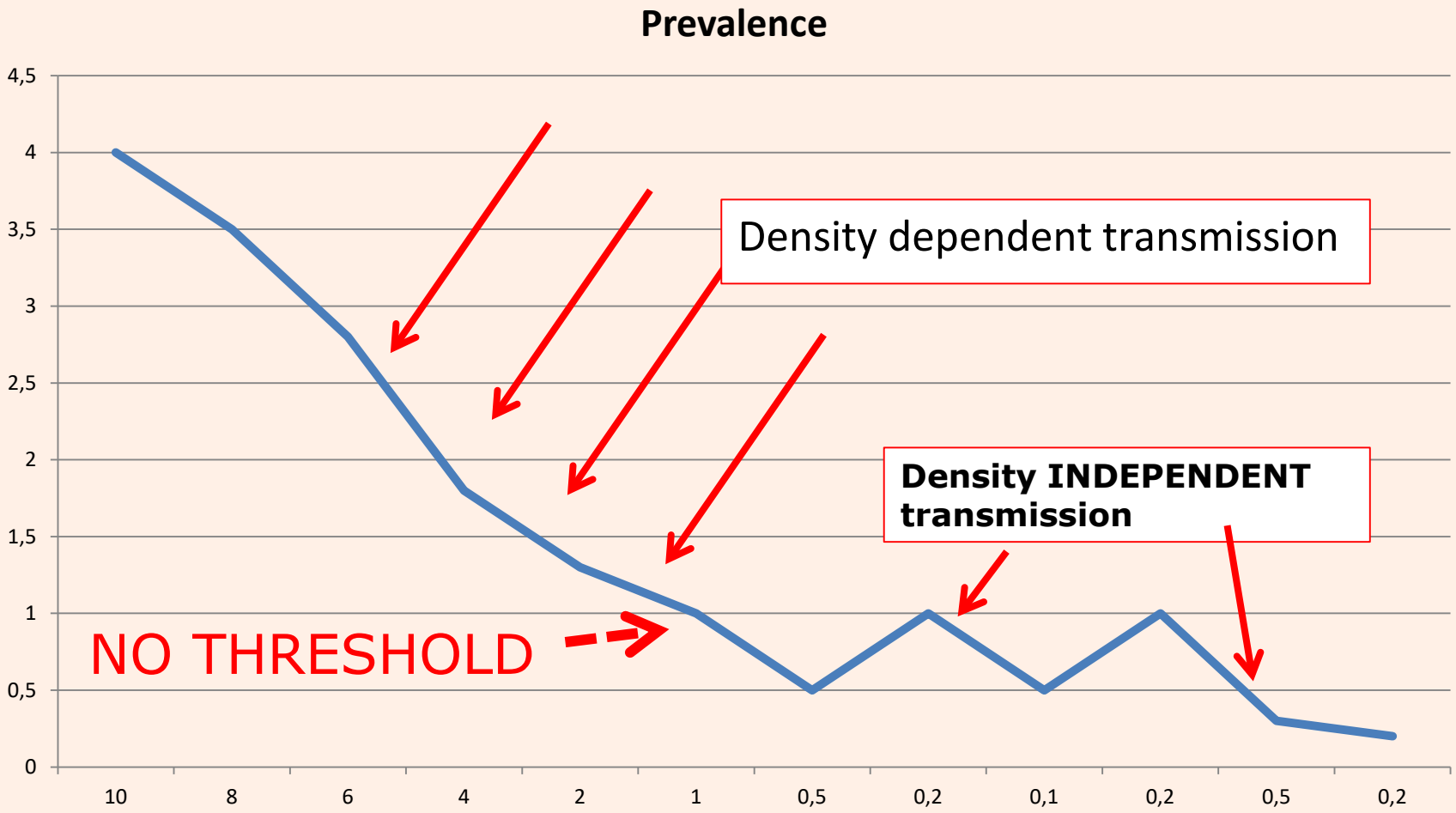
Which is the wild boar density that prevent the contact between a susceptible wild boar with an infected carcass?

An ASF virus will overwinter in a infected carcass……3-4 months…and the virus will appear again during the late spring in alive susceptible individuals

CSF: a density dependent disease



ASF in not a truly density dependent infection. The final tail of the infection is determined by carcasses



Practically

ASF in wild boar eradication is PROBABILISTIC EVENT (stochastic) NOT a DETERMINISTIC one;

Eradication probability increases when: **wild boar population** size is **reduced** (as much as possible); **carcasses** are safely **disposed** (as much as possible); **hunting** is carried out under **bio-security**

ASF: the virus and the environment

Since the infection is not entirely transmitted through density dependent mechanism we have to shift to

The reduction of the environmental contamination of the virus

The problem then is not purely addressed in the mechanistic reduction of the wild boar density but in reducing the viral load of the environment

European Commission

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

SGE ASF3: Moscow, Russia, 15-16 March 2016

Wild boar population reduction should be considered, in combination with other control measures, within the framework of a wild boar management strategy **aimed at reducing ASF virus contamination of the environment.**

EU strategy
(see EFSA, 2015)

- Reduce the wild boar population size through targeted hunting of adult females
- Detection of – at least - 50% infected carcasses and their safe disposal
- Ban of winter/sustaining artificial feeding

Strategy applied - for at least - 100 km in front of the detected case

It is a medium term strategy that accepts the presence of the virus for a certain number of years

Thanks for the attention

Questions, comments?

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Food safety