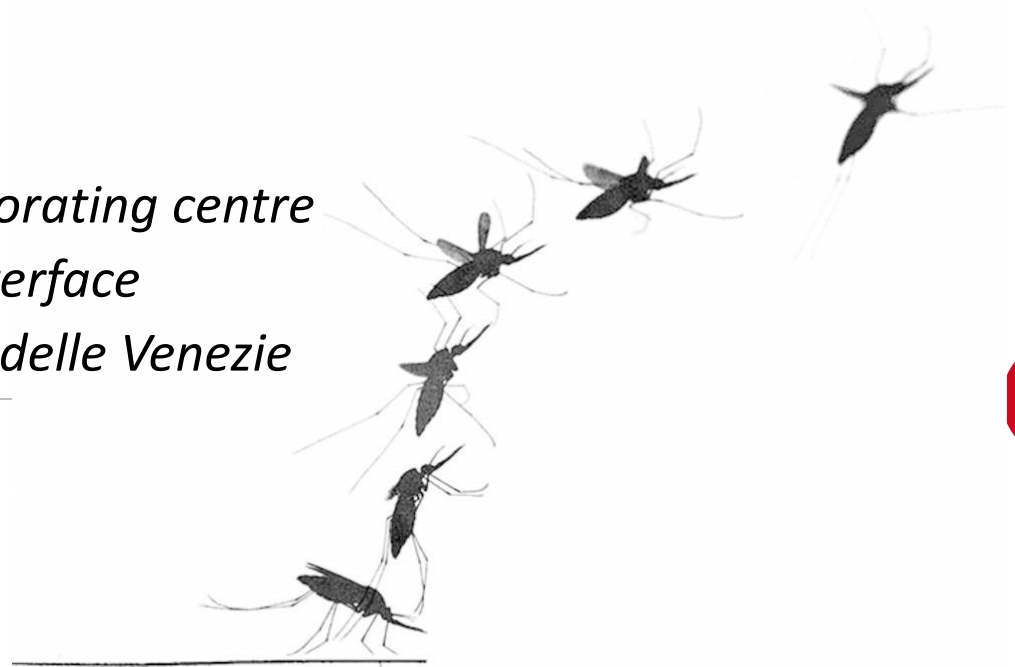


LA SORVEGLIANZA ENTOMOLOGICA E VETERINARIA

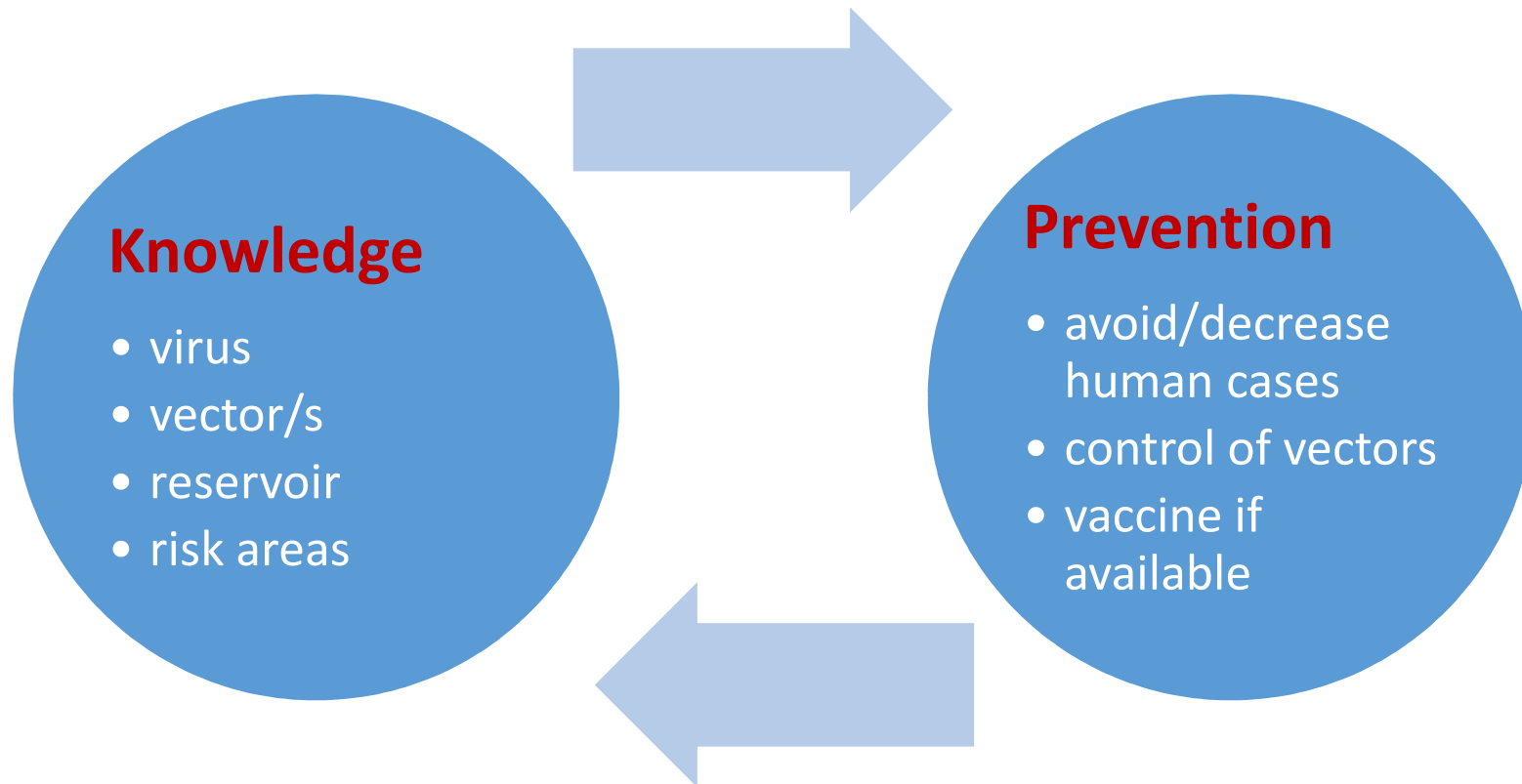
Gioia Capelli

*National reference centre/OIE collaborating centre
for diseases at the animal-human interface
Istituto Zooprofilattico Sperimentale delle Venezie*

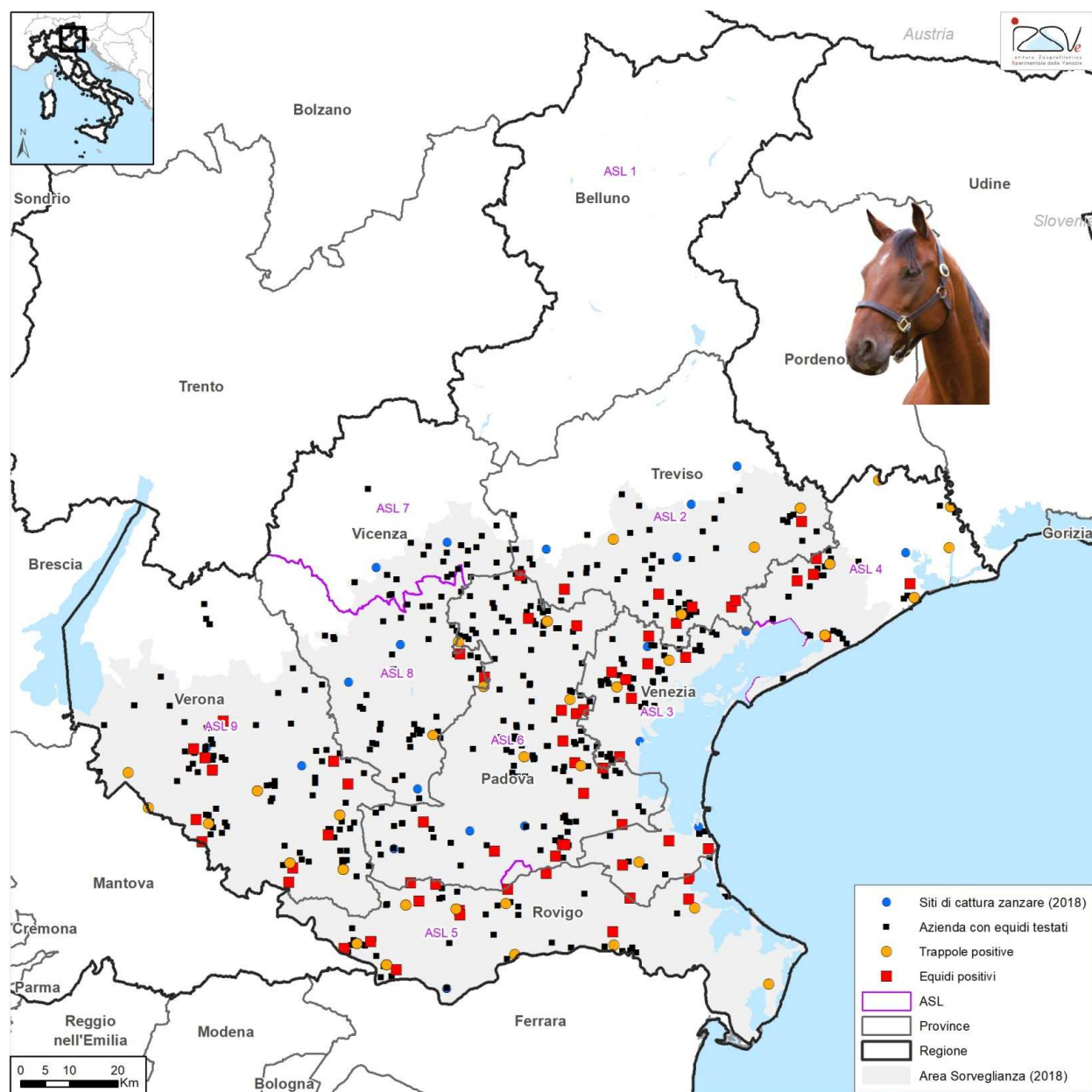
Venezia, 6 novembre 2018



● Why surveillance for WNV

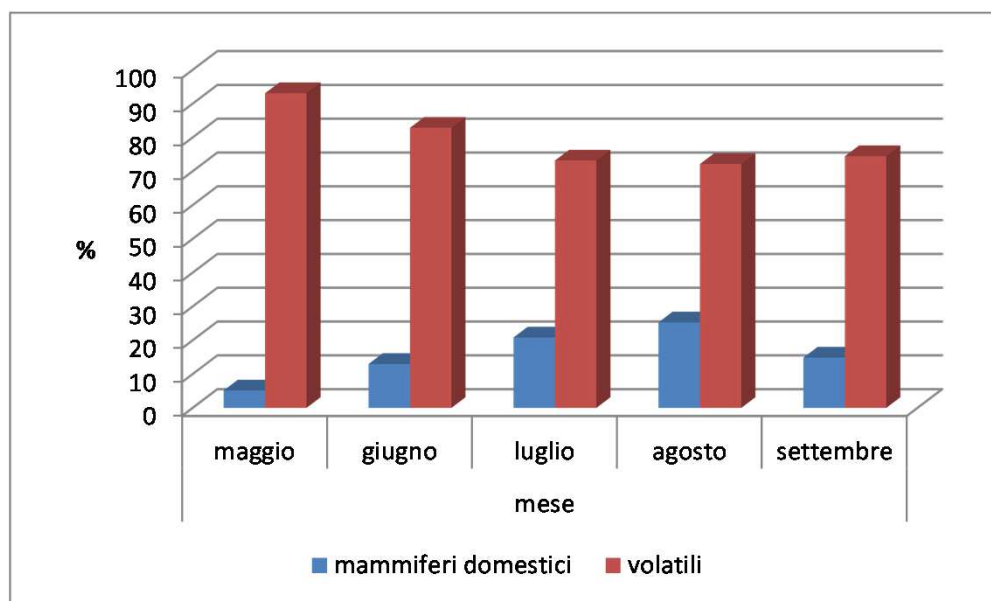


Veterinary surveillance



Zanzare e avifauna selvatica

Variazione della preferenza di ospite (volatili e mammiferi domestici) di *Culex pipiens* da maggio a settembre



Nome scientifico	Nome comune	n	%
<i>Turdus merula</i>	merlo	94	16,5
<i>Anser albifrons/anser</i>	oca selvatica	47	8,3
<i>Passer domesticus</i>	passero domestico	40	7,0
<i>Pica pica</i>	gazza	39	6,9
<i>Streptopelia decaocto</i>	tortora dal collare	37	6,5
<i>Columba livia</i>	piccione	32	5,6
<i>Athene noctua</i>	civetta	14	2,5
<i>Columba palumbus</i>	colombaccio	12	2,1
<i>Parus major</i>	cinciallegra	11	1,9
<i>Corvus corone</i>	cornacchia	9	1,6
<i>Passer montanus</i>	passera mattugia	6	1,1
<i>Anas platyrhynchos-tadorna</i>	germano	5	0,9
<i>Picus viridis</i>	picchio verde	5	0,9
<i>Sylvia atricapilla</i>	capinera	5	0,9
<i>Cairina moschata</i>	anatra muschiata	4	0,7
<i>Anas platyrhynchos</i>	germano reale	3	0,5
<i>Coturnix japonica</i>	quaglia giapponese	3	0,5
<i>Phasianus colchicus</i>	fagiano	3	0,5
<i>Asio otus</i>	assiolo	2	0,4
<i>Otus scops</i>	gufo comune	2	0,4
<i>Sturnus vulgaris</i>	storno comune	2	0,4
<i>Anser cygnoides</i>	alocco	1	0,2
<i>Carduelis carduelis</i>	cardellino	1	0,2
<i>Delichon urbicum</i>	balestruccio	1	0,2
<i>Dendrocopos major</i>	picchio rosso maggiore	1	0,2
<i>Falco subbuteo</i>	lodaiole eurasiatrico	1	0,2
<i>Falco tinniculus</i>	gheppio comune	1	0,2
<i>Gallinula chloropus</i>	gallinella d'acqua	1	0,2
<i>Garrulus glandarius</i>	ghiandaia	1	0,2
<i>Ixobrychus minutus</i>	tarabusino	1	0,2
<i>Motacilla alba</i>	ballerina bianca	1	0,2
<i>Muscicapa striata</i>	pigliamosche comune	1	0,2
<i>Serinus serinus</i>	verzellino	1	0,2
<i>Strix aluco</i>	alocco	1	0,2
<i>Upupa epops</i>	upupa	1	0,2

● Why we do entomological surveillance

1. Verify the presence of a proved or suspected/potential vector
2. Determine vector density and distribution in the area
3. Look for pathogens presence (define risk areas)
4. Determine the infection rate in vector population
5. Find new vectors (new or undetected introductions)
6. Find new pathogens (recently introduced or never recovered before)

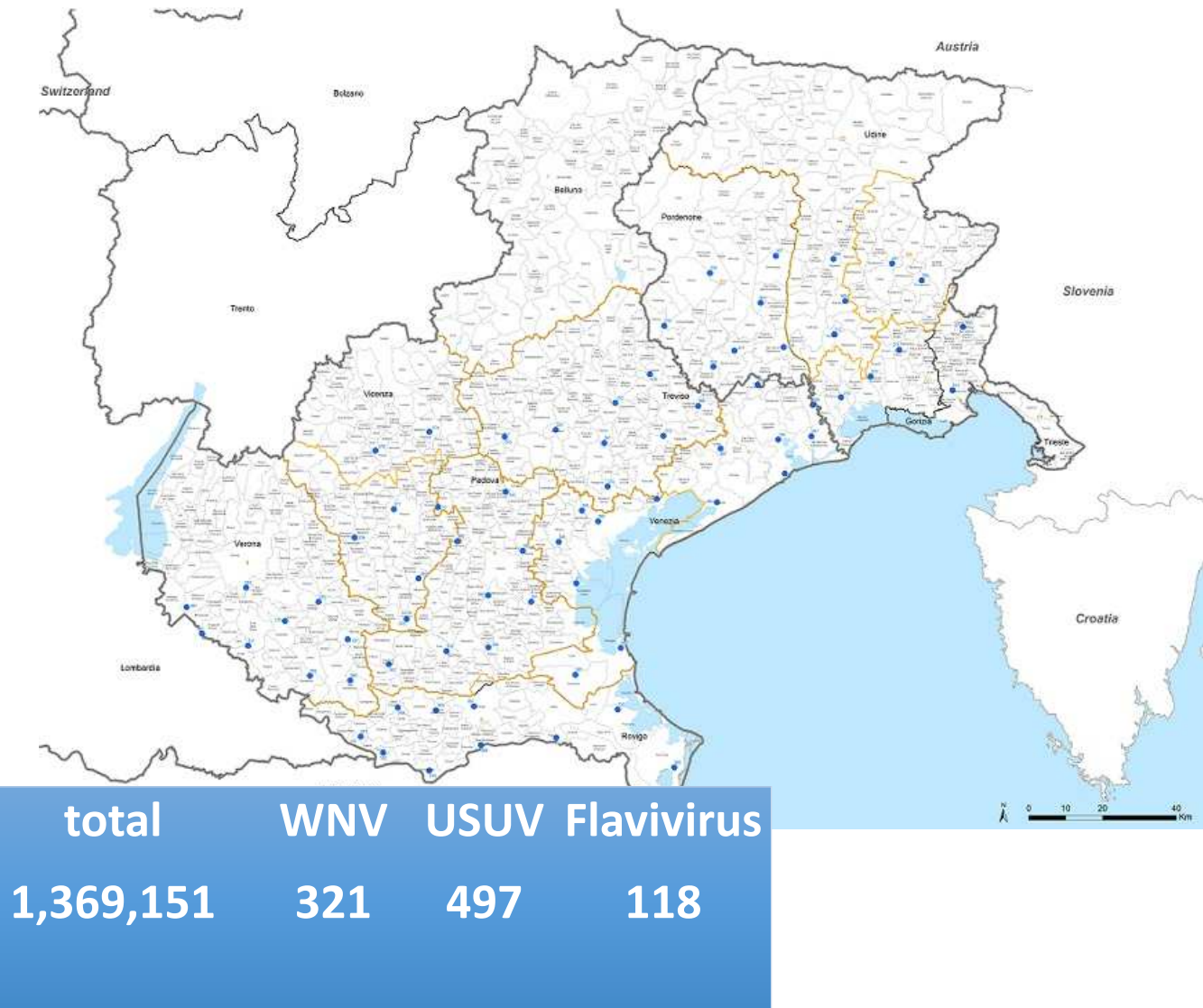
Actions (methods and intensity of data collection) vary in relation to the main objective/s of the surveillance



● WNV in north-eastern Italy

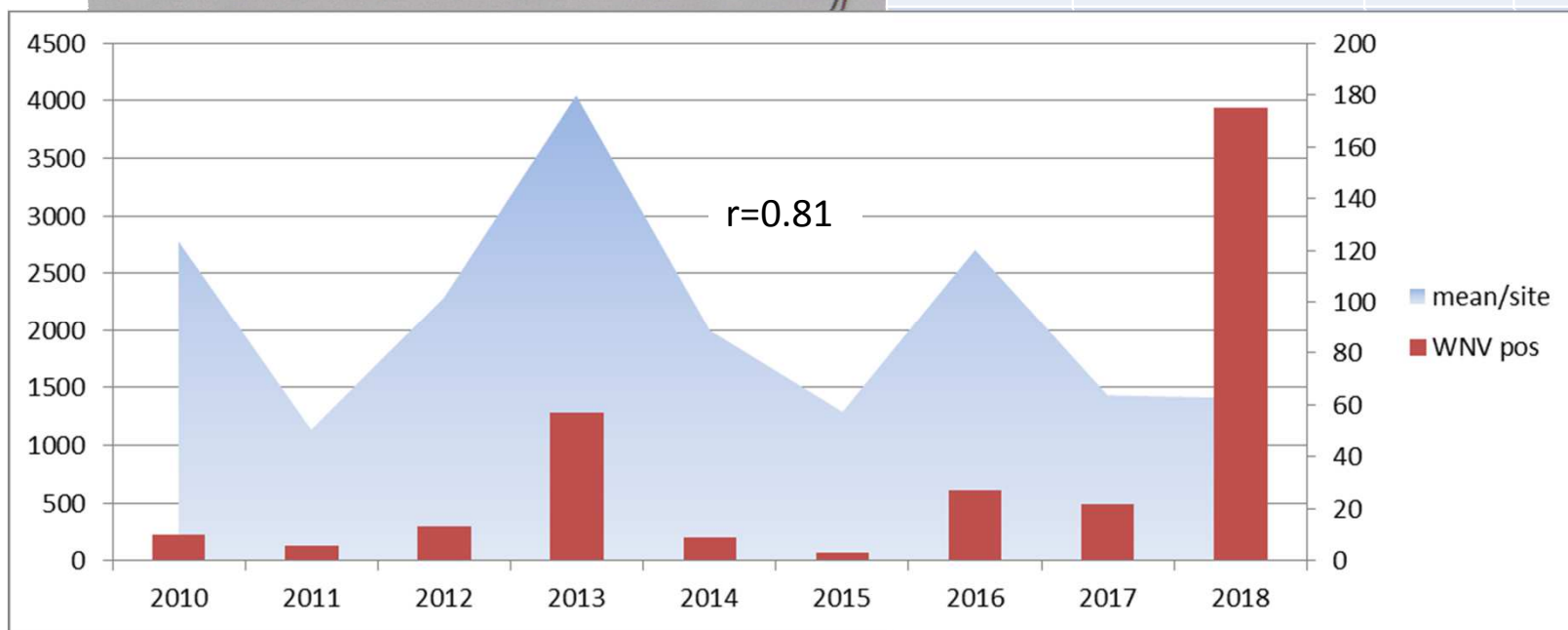
- From 2008 a **continuous** and detectable viral circulation
- From WN**1** to WN**2**
- At least 3 **new introductions**

<i>Cx pipiens</i>	1,097,312	80,15%
<i>Oc. caspius</i>	105,598	7,71%
<i>Ae. albopictus</i>	18,095	1,32%
other Aedes	12,429	0,91%
Anopheles	8,922	0,65%
other species	4,276	0,31%



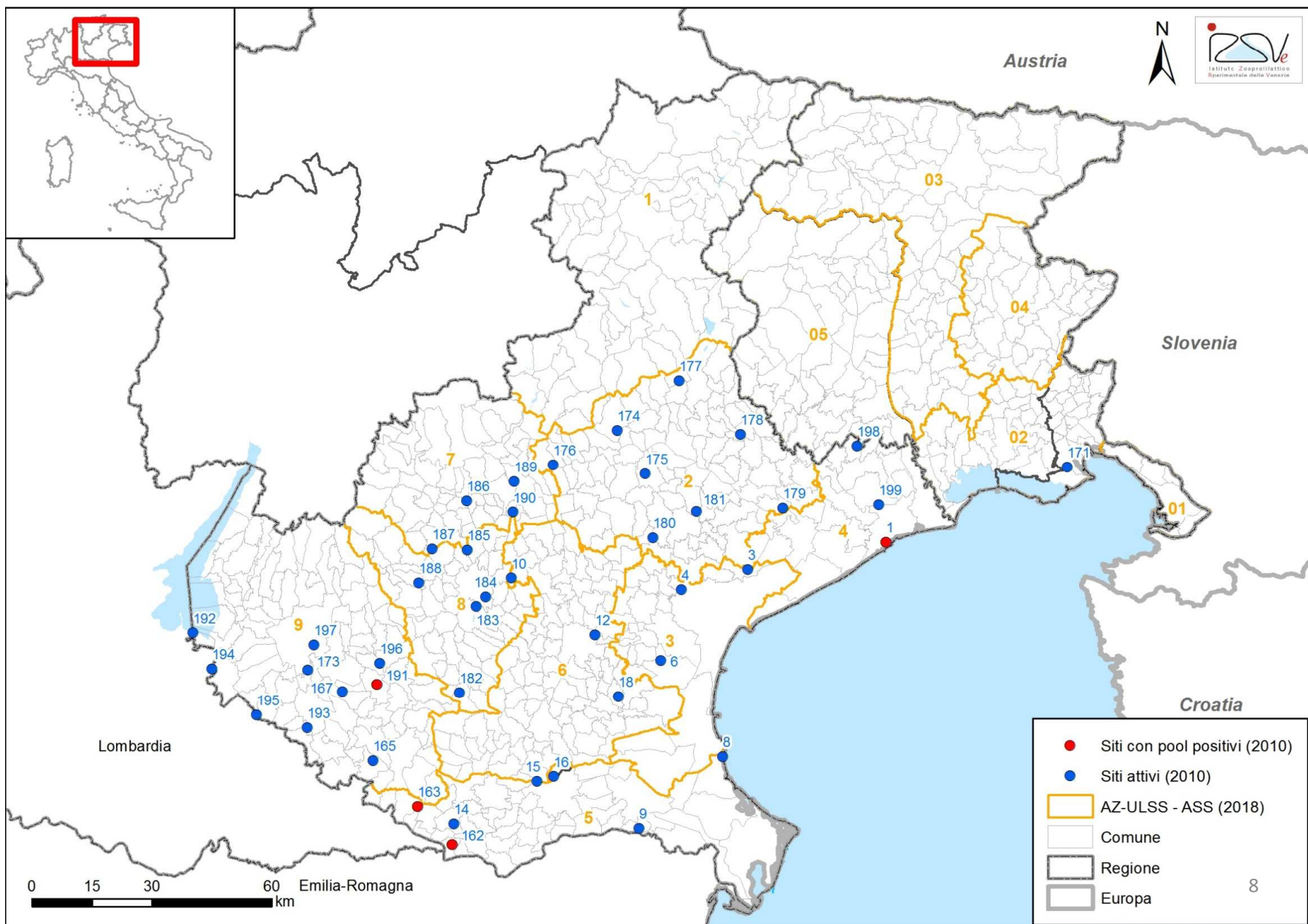
● *Culex pipiens* and WNV

year	total	traps	mean/trap	WNV
2010	119,725	43	2784	10
2011	69,057	61	1132	6
			2286	13
			4055	57
			2003	9
			1295	3
			2709	27
			1436	22
2018	101,873	72	1414	165+10



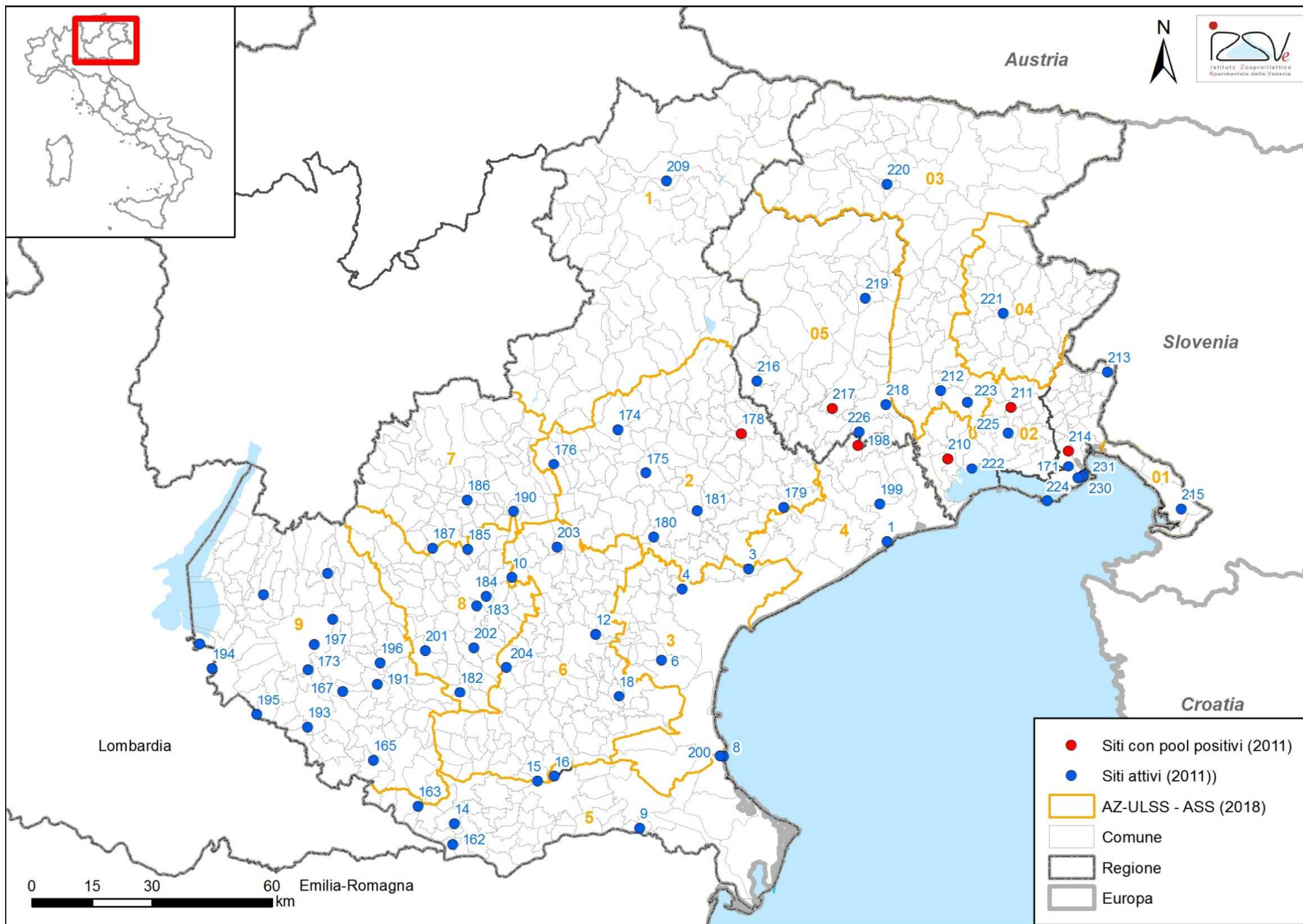


2010



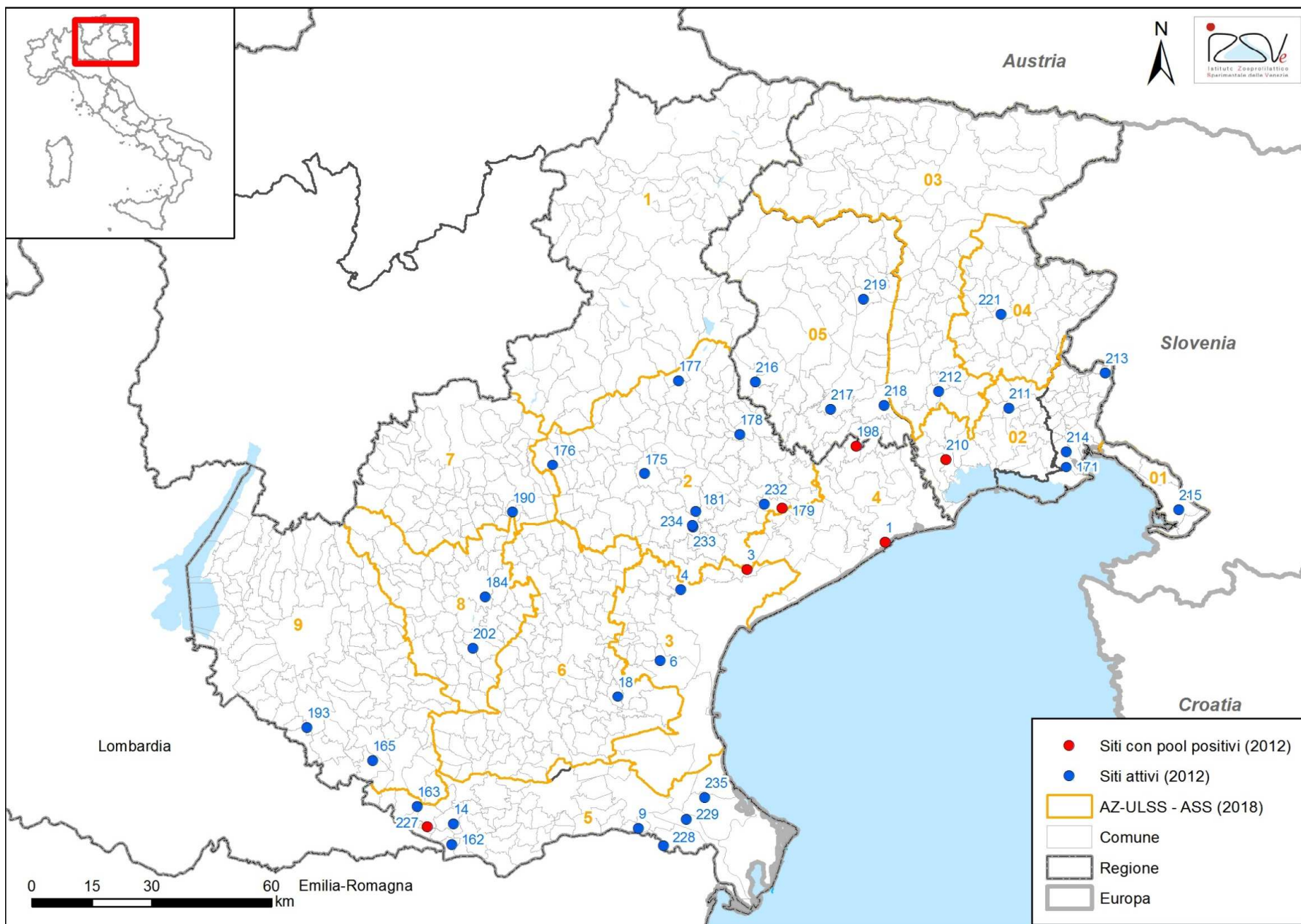


2011



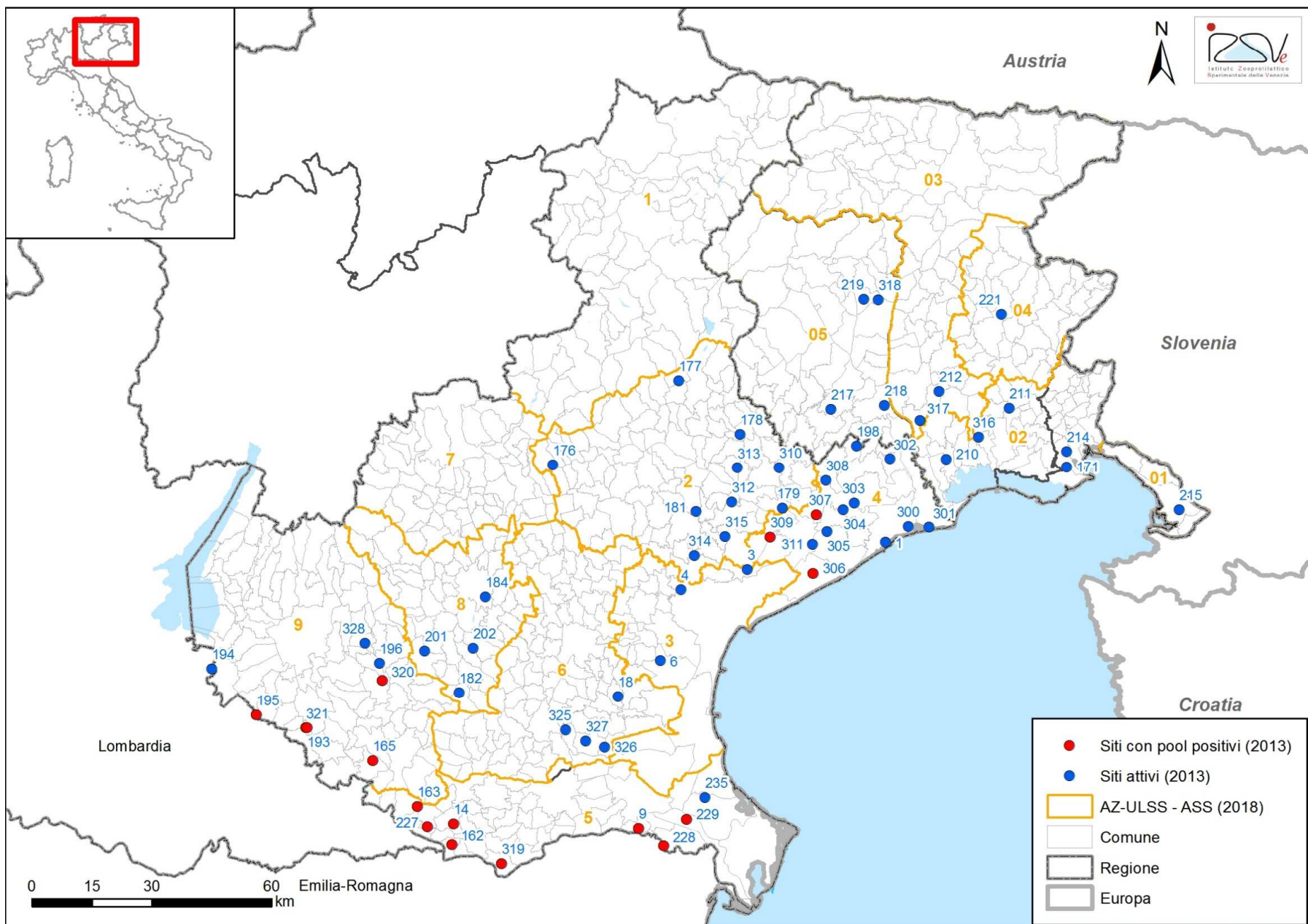


2012

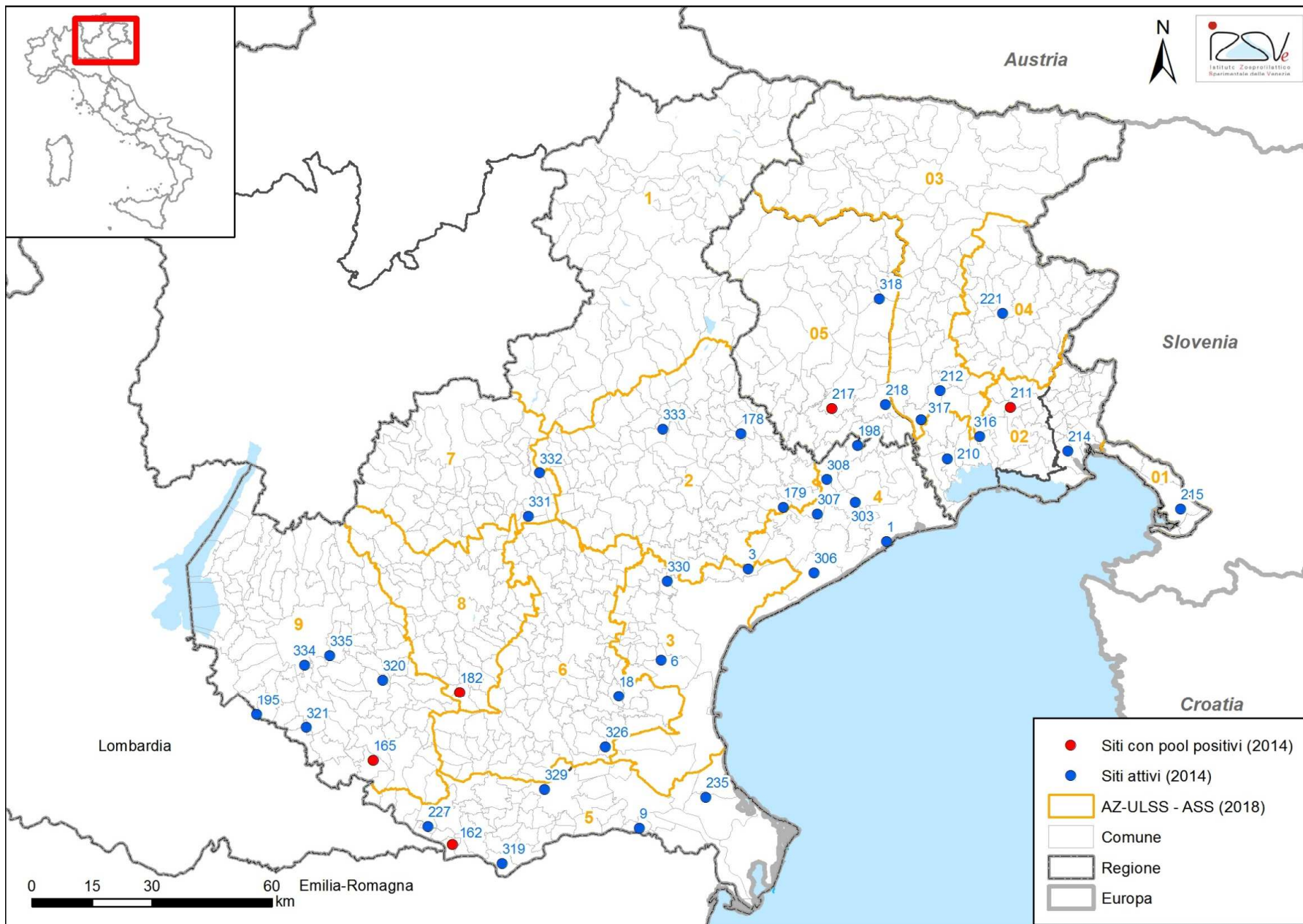




2013

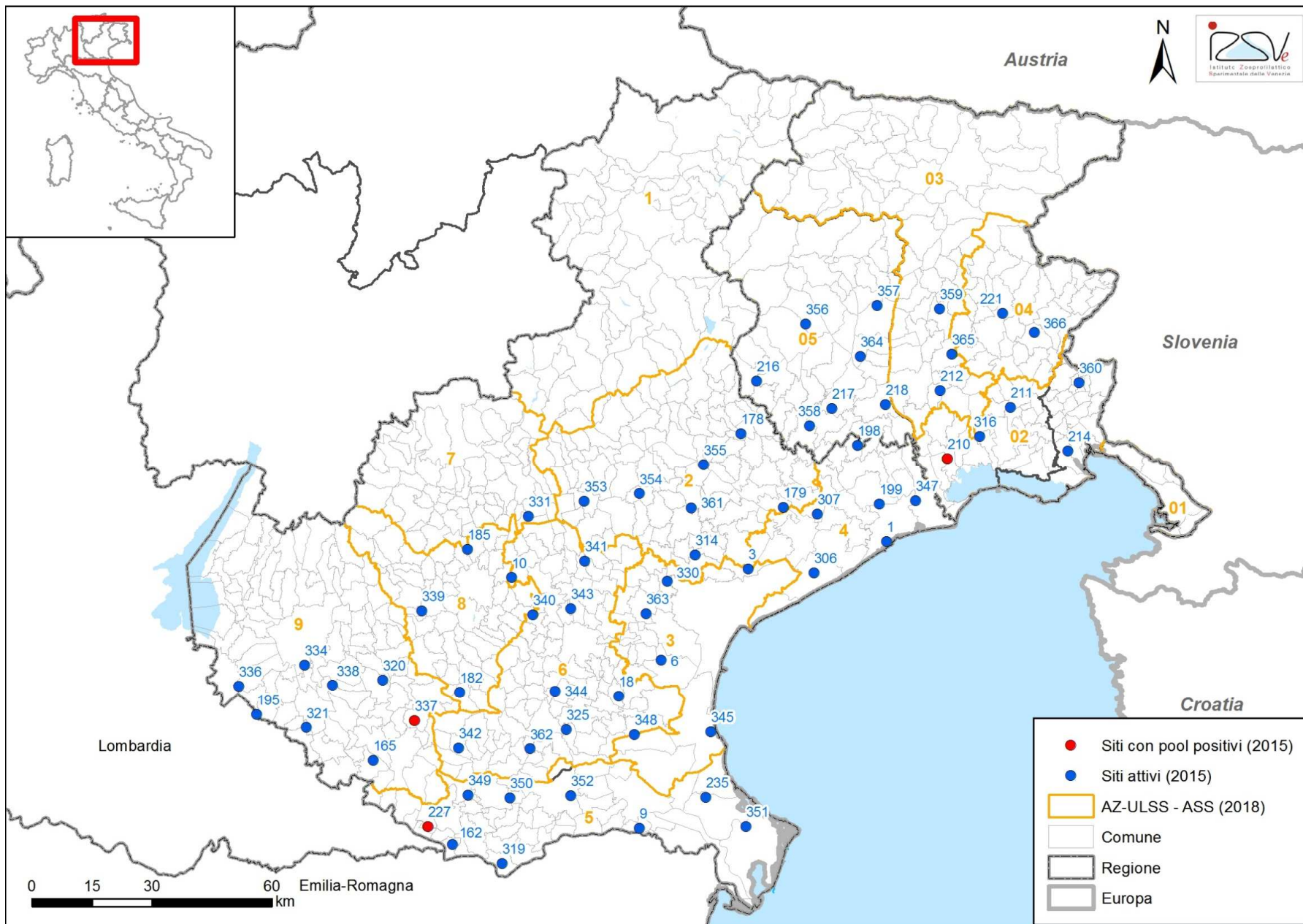


2014



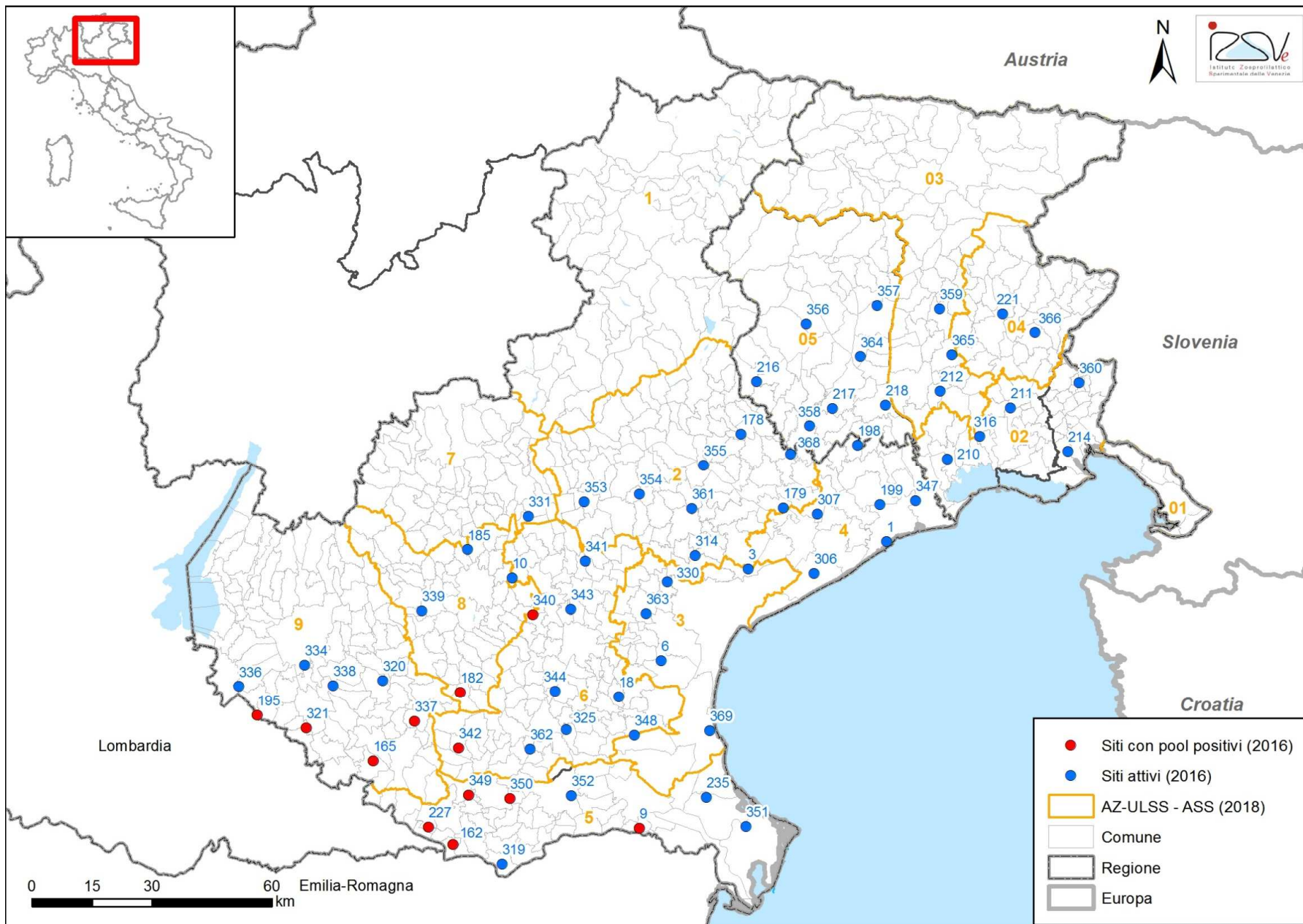


2015



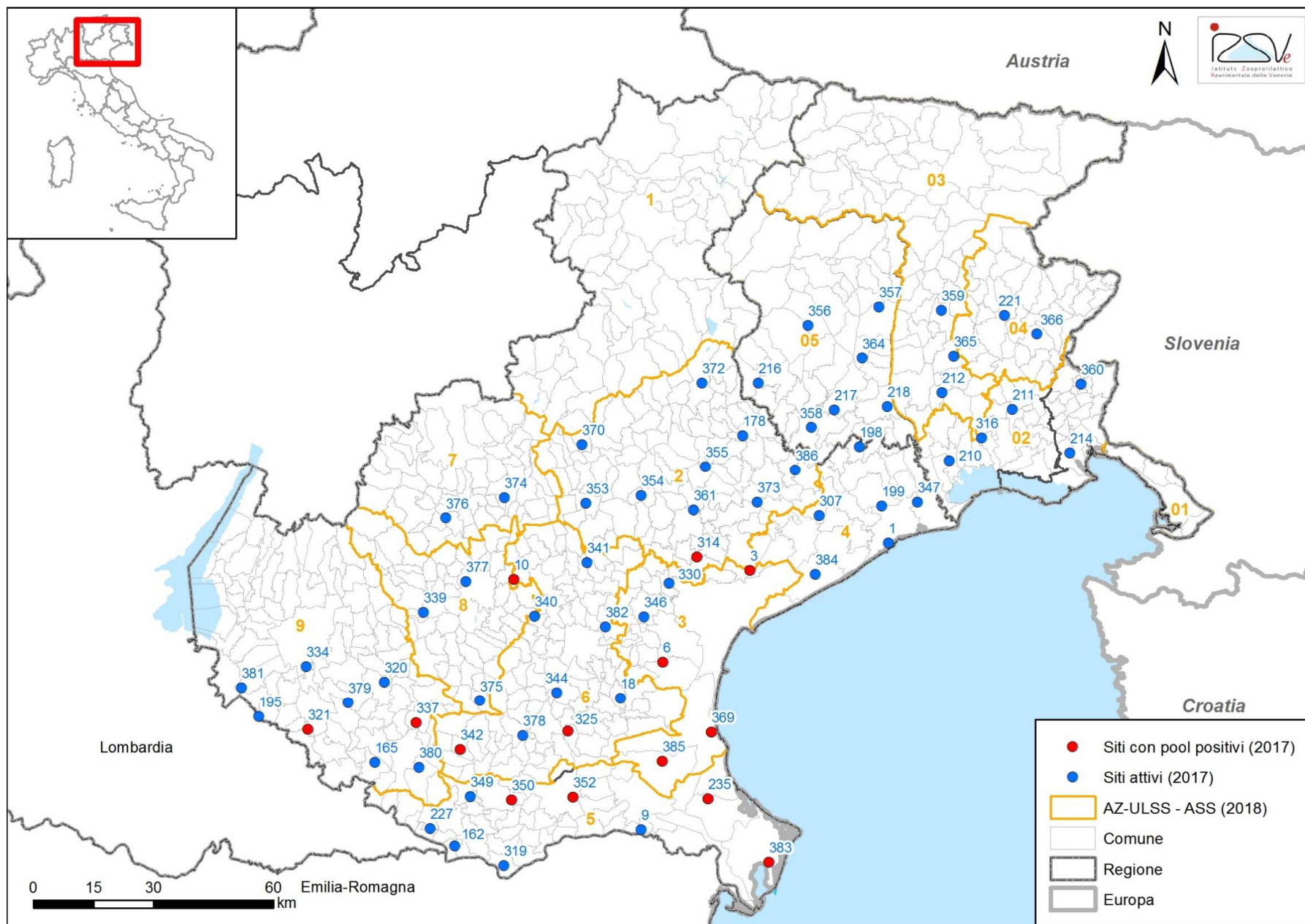


2016





2017

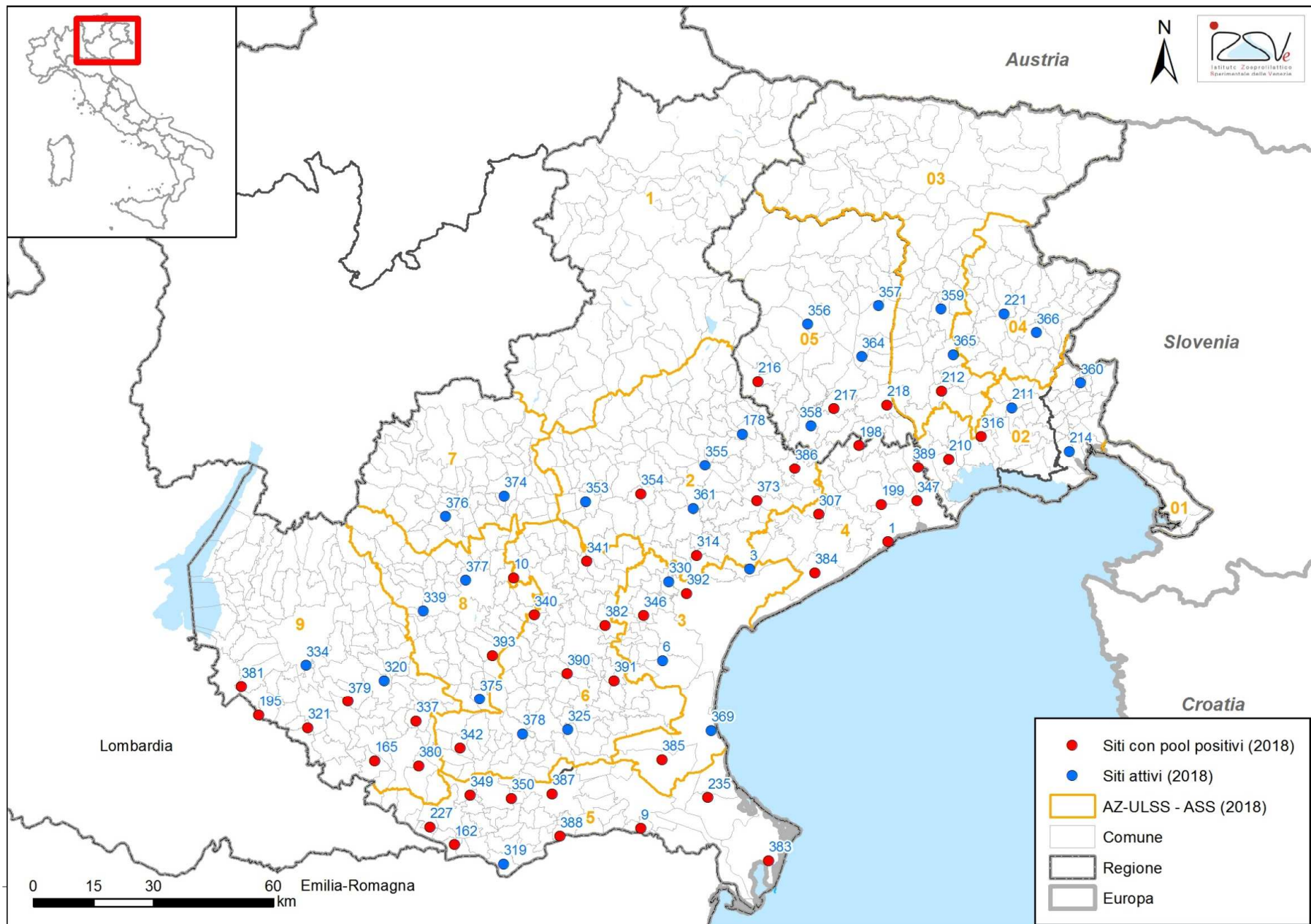




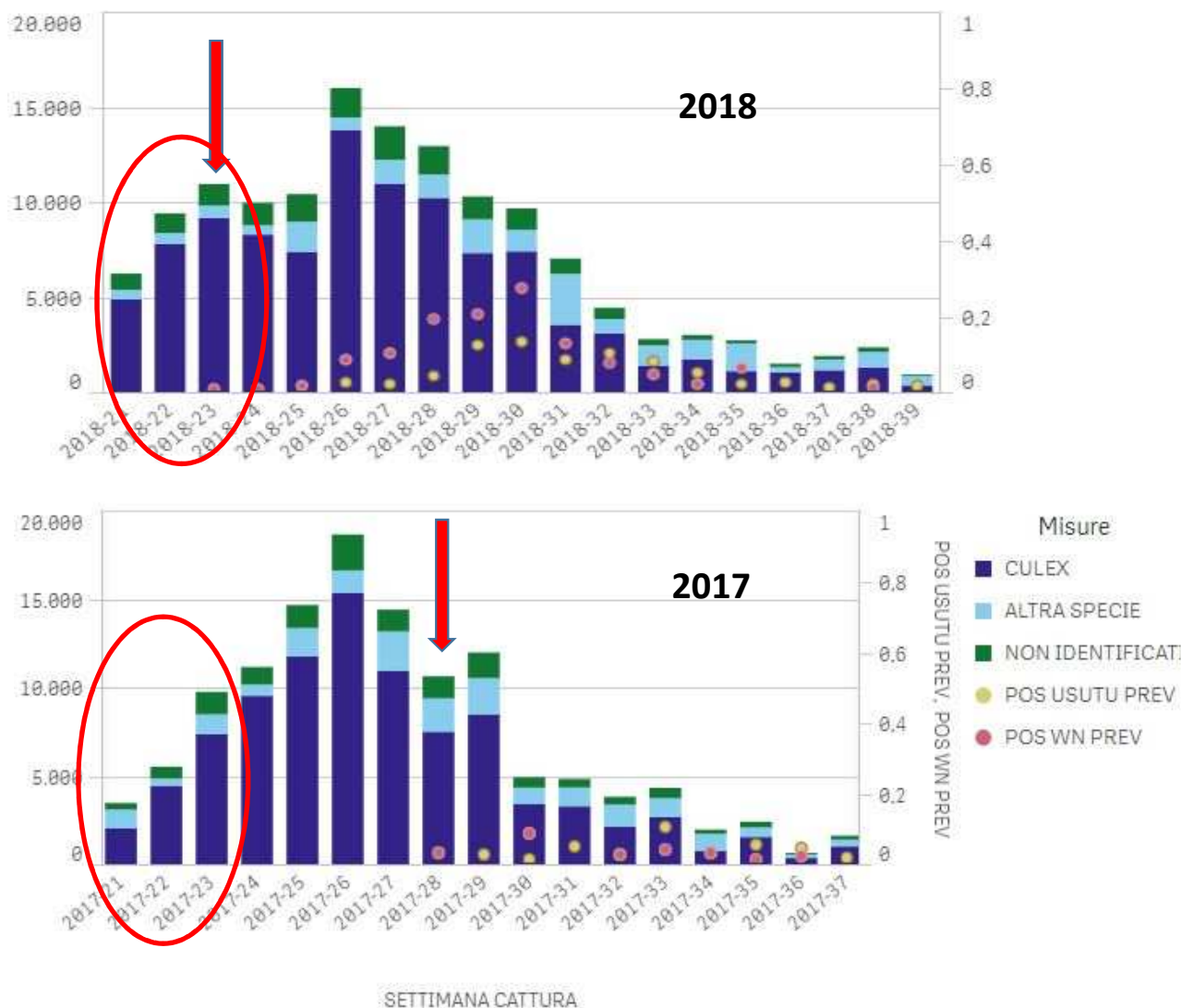
2018



nome cognome _____

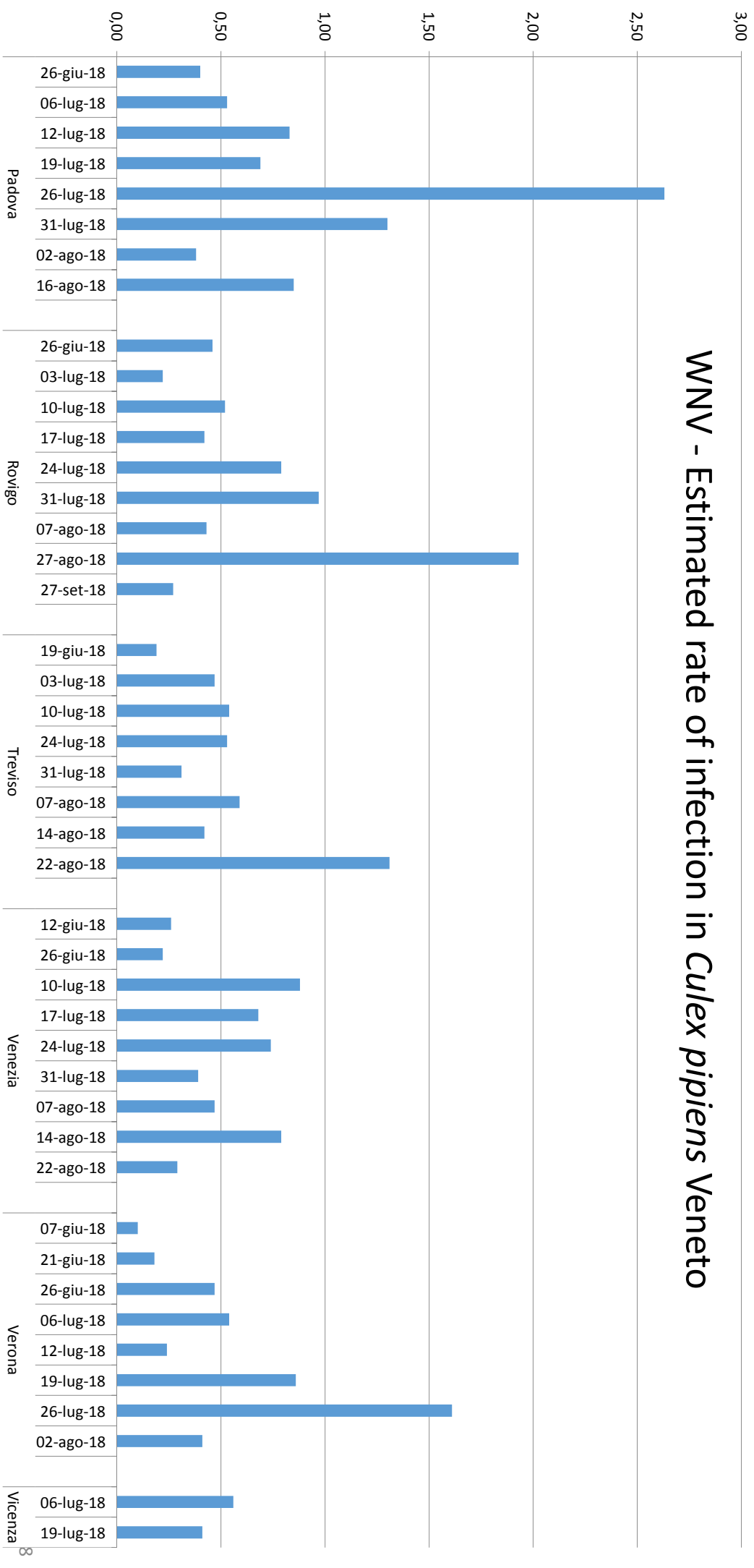


● timing

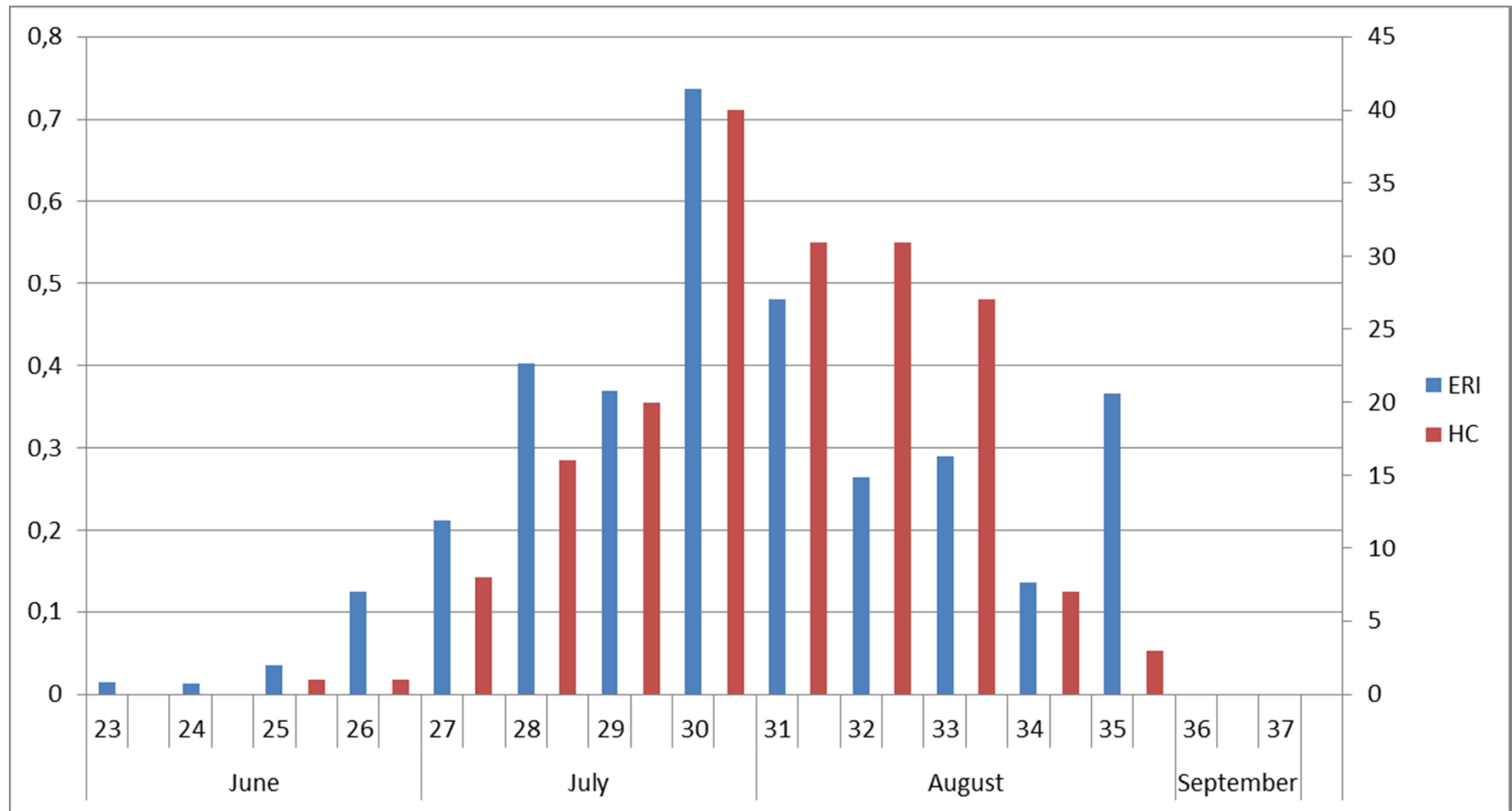


year	First WNV pool pos
2010	27 July
2011	27 July
2012	1 August
2013	4 July
2014	9 July
2015	6 August
2016	19 July
2017	11 July
2018	7 June!!

The infection rate (ERI)

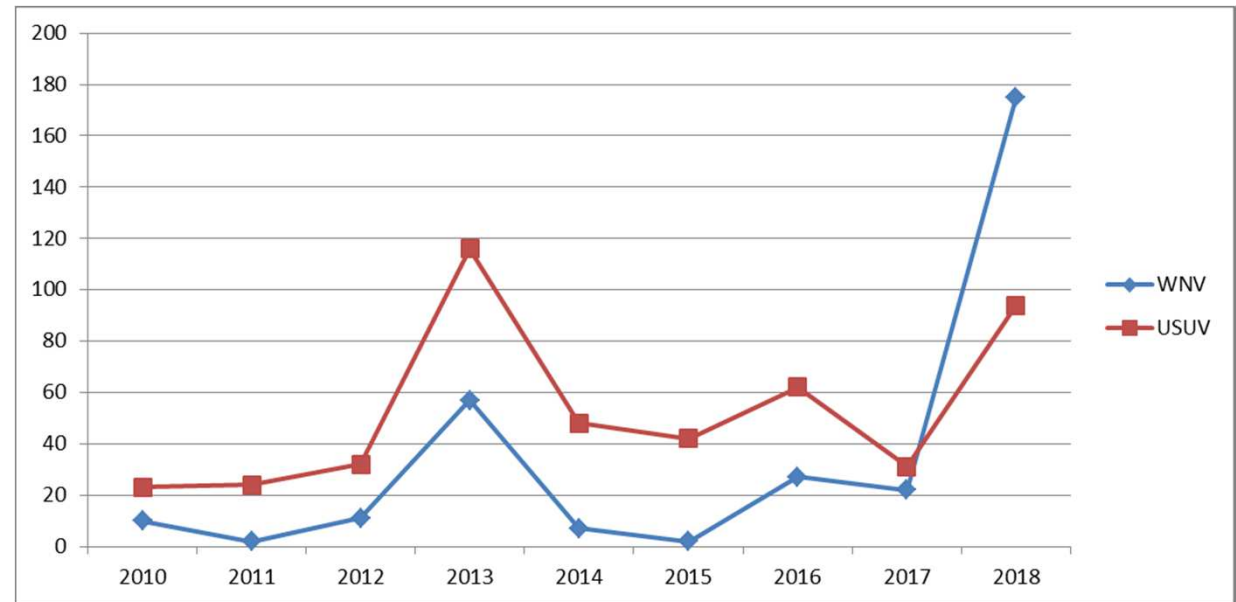


● The infection rate vs human cases



● Other TWO NEWS of 2018

- 10 pool positives for WNV of *Ochlerotatus caspius*
 - abundant
 - mammophylic



● What has changed in 2018?

Something related to the Veneto ?

NO same situation allover north (and Europe)

virus ?

NO is the same WNVlin2

avifauna reservoir?

Maybe a decreased immunity (?)

mosquitoes?

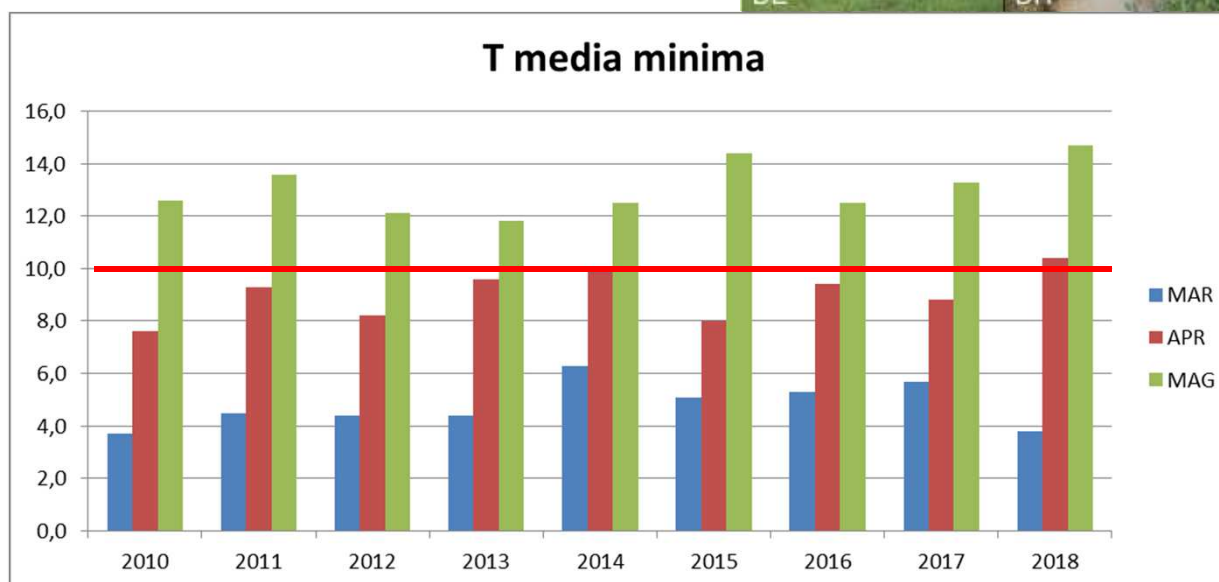
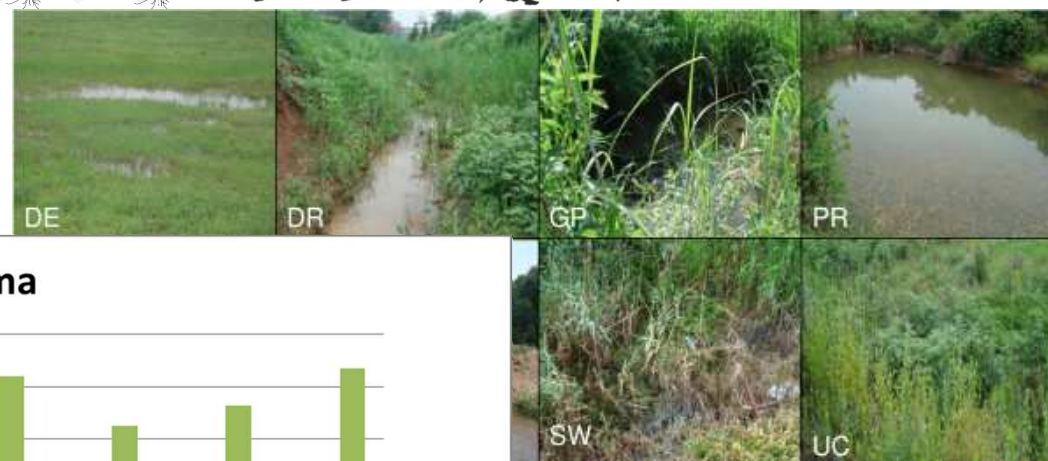
Always the same (*caspius??*)

climate?

SI early summer, humid and rainy

● WNV 2018 – cosa c'è di diverso

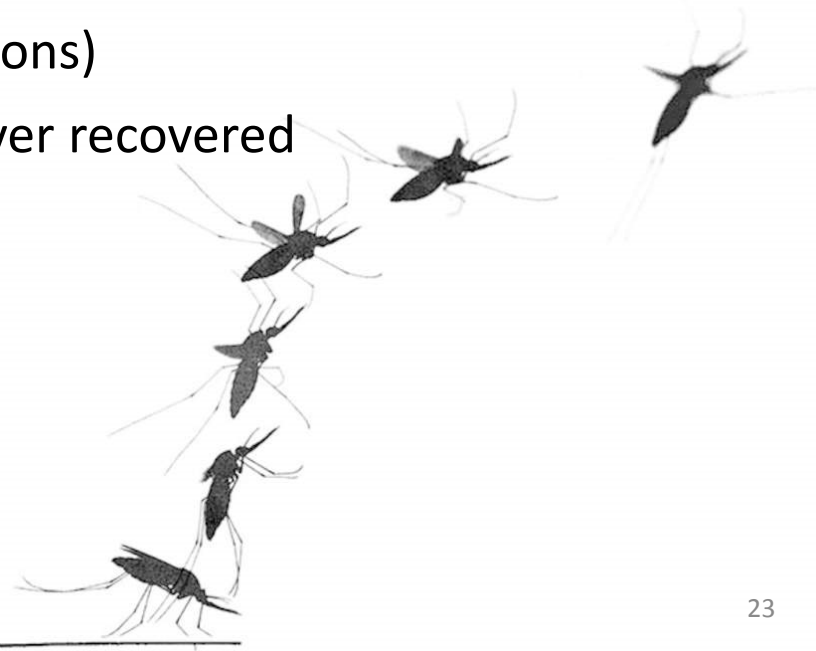
- Clima sub-tropicale
 - estate anticipata (maggio)
 - frequenti piogge seguite da temperature elevate



● Done!

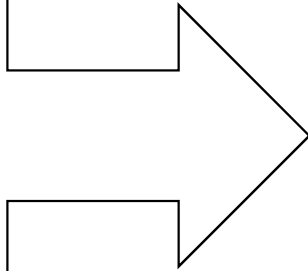
- 1 ✓ Verify the presence of a proved or suspected/potential vector
- 2 ✓ Determine vector density and distribution in the area
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- 4 ✓ Determine the infection rate in vector population
- 5 ✓ Find new vectors (new or undetected introductions)
- 6 ✓ Find new pathogens (recently introduced or never recovered before)

..but we still have WNV



● The meaning of surveillance

It must be clear that surveillance alone does not solve anything!



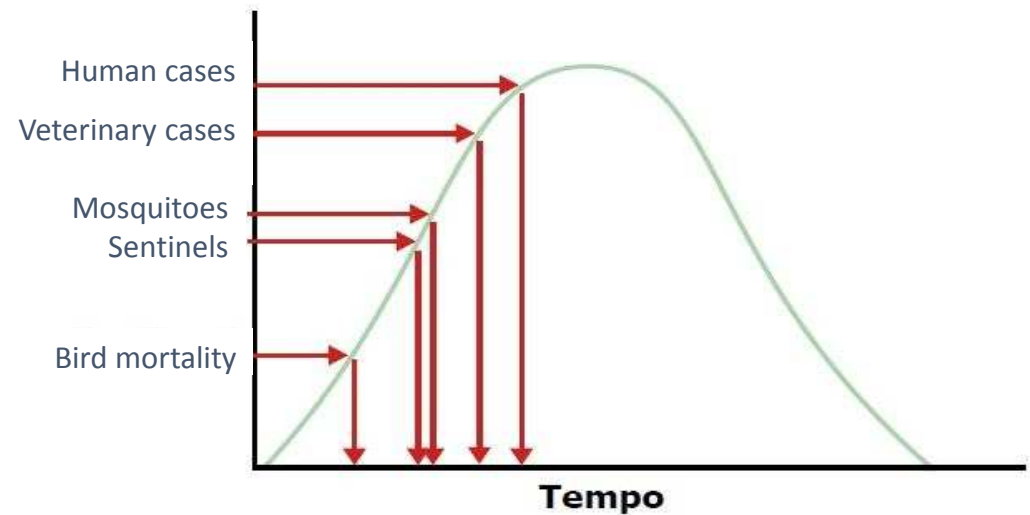
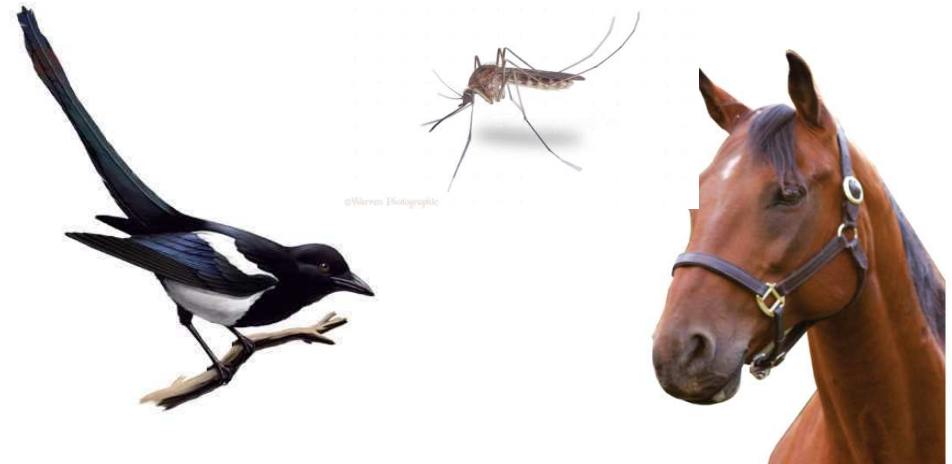
It's necessary to plan interventions...
....and to save money



● The change of paradigm

- A VBD pose a serious threat to the human **blood donation system**
- The entomological and veterinary surveillance proved to act as an **early warning** of viral circulation

USE THE DATA OF ENTOMOLOGICAL
AND VETERINARY DATA TO
«**MODULATE**» THE SYSTEM OF WNV
CONTROL OF DONATIONS





Ministero della Salute

DIREZIONE GENERALE DELLA PREVENZIONE SANITARIA
Ufficio V – Prevenzione delle malattie trasmissibili e profilassi internazionale

DIREZIONE GENERALE DELLA SANITÀ ANIMALE E DEI FARMACI VETERINARI
Ufficio III – Sanità animale e gest. oper. Centro Naz. di lotta ed emergenza contro le malattie animali e unità centrale di crisi



REGIONI
CIALE

PROVINCE
ZANO

REA

ISTITUTI ZOOPROFILATTICI SPERIMENTALI
LORO SEDI

OGGETTO: Piano nazionale integrato di sorveglianza e risposta ai virus
West Nile e Usutu - 2017

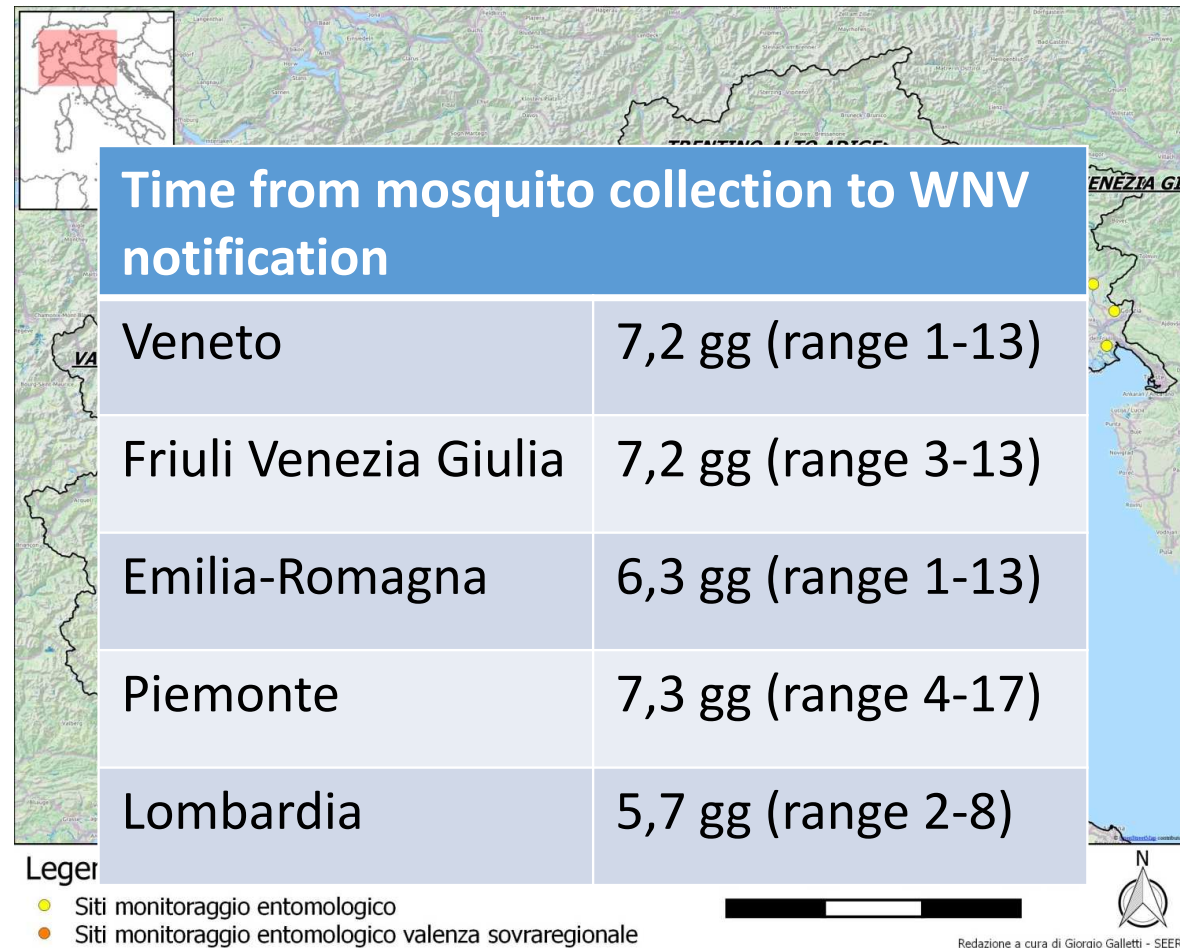
Endemic area for WNV

The entomological and
veterinary WNV positivities
act as **TRIGGER** for the start
of control of the blood bags

example of integrated
surveillance and
ONE HEALTH in practice

....it's not for free!!

- mosquito traps all over the suitable area in a grid of 11-20 km
- no borders for WNV info
- collection of mosquitoes within 15 days (and no more)
- fast answer



●and the costs? An example from Veneto region

Year	entomological surveillance	veterinary surv. (birds/equids)	ento+vet
2015	75.363	6.970	82.333
2016	108.802	9.695	118.497

Year	blood screening without surveillance	blood screening with surveillance	Difference with and without Integrated surveillance
2015	1.646.172	313.716	1,250,123
2016	1.561.164	828.216	614,451

● Take home message

entomological and
veterinary surveillance
tell us a lot

but after we need to
take actions

otherwise **save money**
for other priorities

● Thank you for your attention

The teams of IZSVe:

- Fabrizio Montarsi, Sara Carlin, Alice Michelutti, Francesco Gradoni, Michela Bertola, Sonia Accordi
- Silvia Ravagnan, Elena Porcellato, Graziana Da Rold, Federica Toniolo
- Calogero Terregino, Isabella Monne, Silvia Ormelli, Sabrina Marciano
- Lebana Bonfanti, Paolo Mulatti, Giovanni Cunial, Matteo Mazzucato, Katia Capello



**Istituto Zooprofilattico
Sperimentale della Lombardia e
dell'Emilia Romagna "B. Ubertini"**



Regione Emilia-Romagna



**Istituto Zooprofilattico
Sperimentale delle Venezie**



Regione Lombardia



**Istituto Zooprofilattico
Sperimentale Piemonte Liguria
Valle d'Aosta**



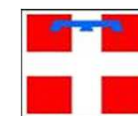
Regione Veneto



**Centro Agricoltura Ambiente
"G. Nicoli"**



**Regione Friuli Venezia-
Giulia**



Regione Piemonte