

# Animali in città



I pipistrelli come modello ecologico di risposta della fauna all'urbanizzazione







«Antropausa»





# Ambienti urbani: «filtri ambientali»



«Winners...»







*Daniilo Russo*





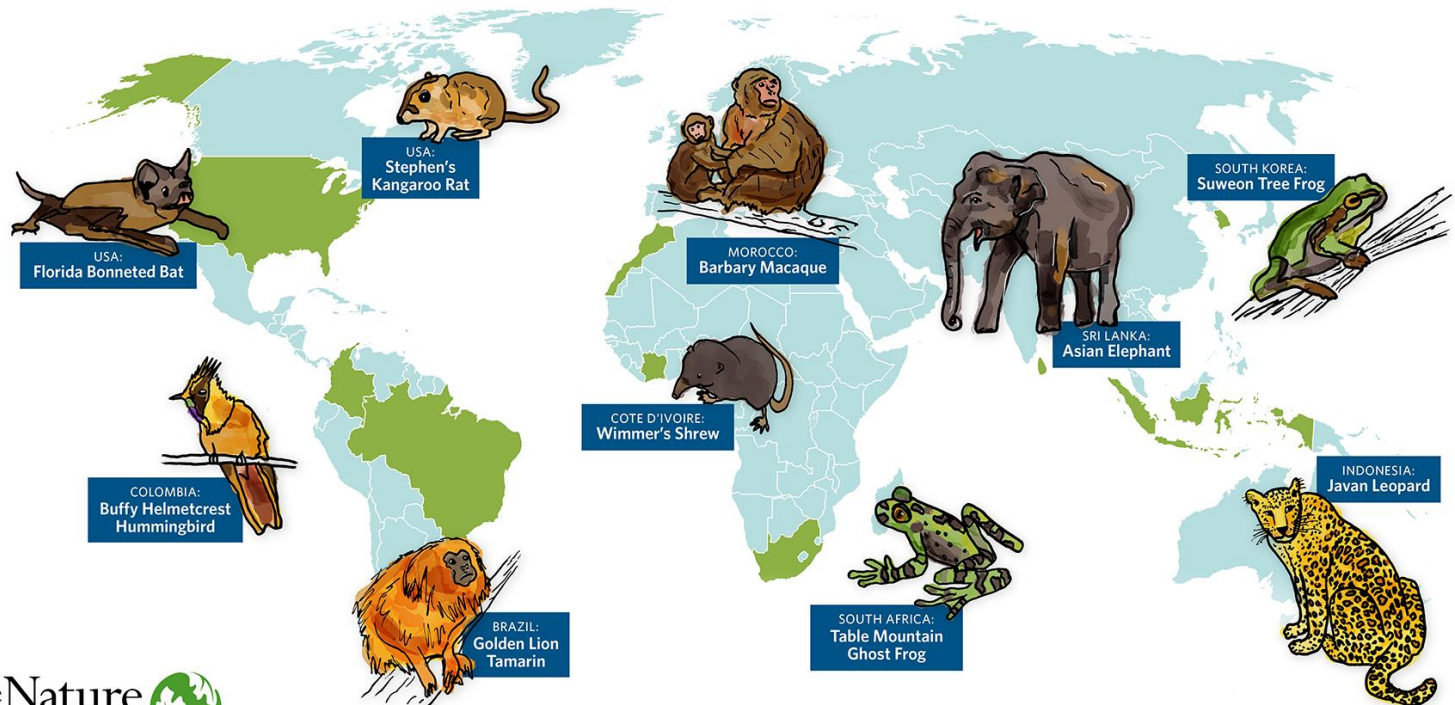
*Danilo Russo*



# «... e losers»

## As Cities Boom, Wildlife is Close to Urban Areas

Urban growth can be a major cause of habitat loss, but this trend can be shifted with better planning. These species represent animals that live in protected areas that are near areas of rapid urban growth.



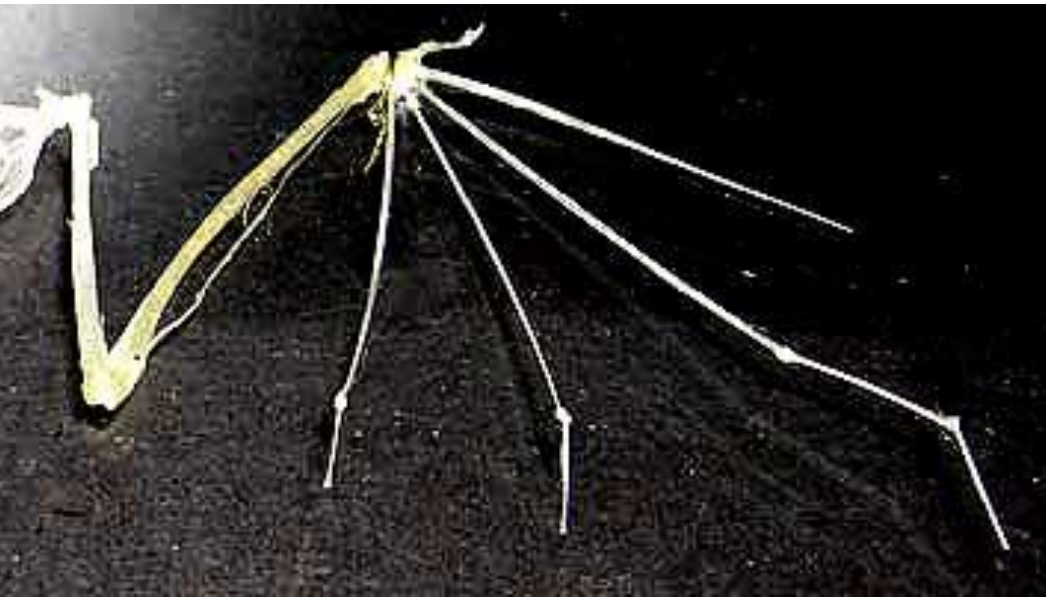


# Ecologia della fauna urbana

- Servizi ecosistemici
- «disservizi»
- Ricerca e gestione









# Biodiversità





# Biodiversità





January



Hibernating.  
Using stored fat as fuel.

February



Hibernating.  
Little fat left.

March



Signs of limited  
activity: small  
numbers feeding at  
night.

April



Active and hungry.  
Become torpid again  
when cold.

May



Fully active.  
Females search for  
suitable nursery sites.

June



Young are born.

July



Mothers suckle young.  
Some young almost  
full-size; others still  
very small.

August



Females desert nursery  
sites and seek males.  
Juveniles begin  
catching insects.

September



Mating takes place.  
Fat begins to build up  
ready for winter.

October



More mating.  
Seeking suitable  
hibernation sites.  
Periods of torpor.

November



Bats begin hibernation,  
becoming torpid for  
longer periods.

December



Hibernating.



# Aree urbane e pipistrelli

- ⦿ > specie escluse
- ⦿ Light pollution
- ⦿ Cibo scarso



Habitat selection by the Mediterranean horseshoe bat, *Rhinolophus euryale* (Chiroptera: Rhinolophidae) in a rural area of southern Italy and implications for conservation

Danilo Russo<sup>a,\*</sup>, Gareth Jones<sup>a</sup>, Antonello Migliozi<sup>b</sup>

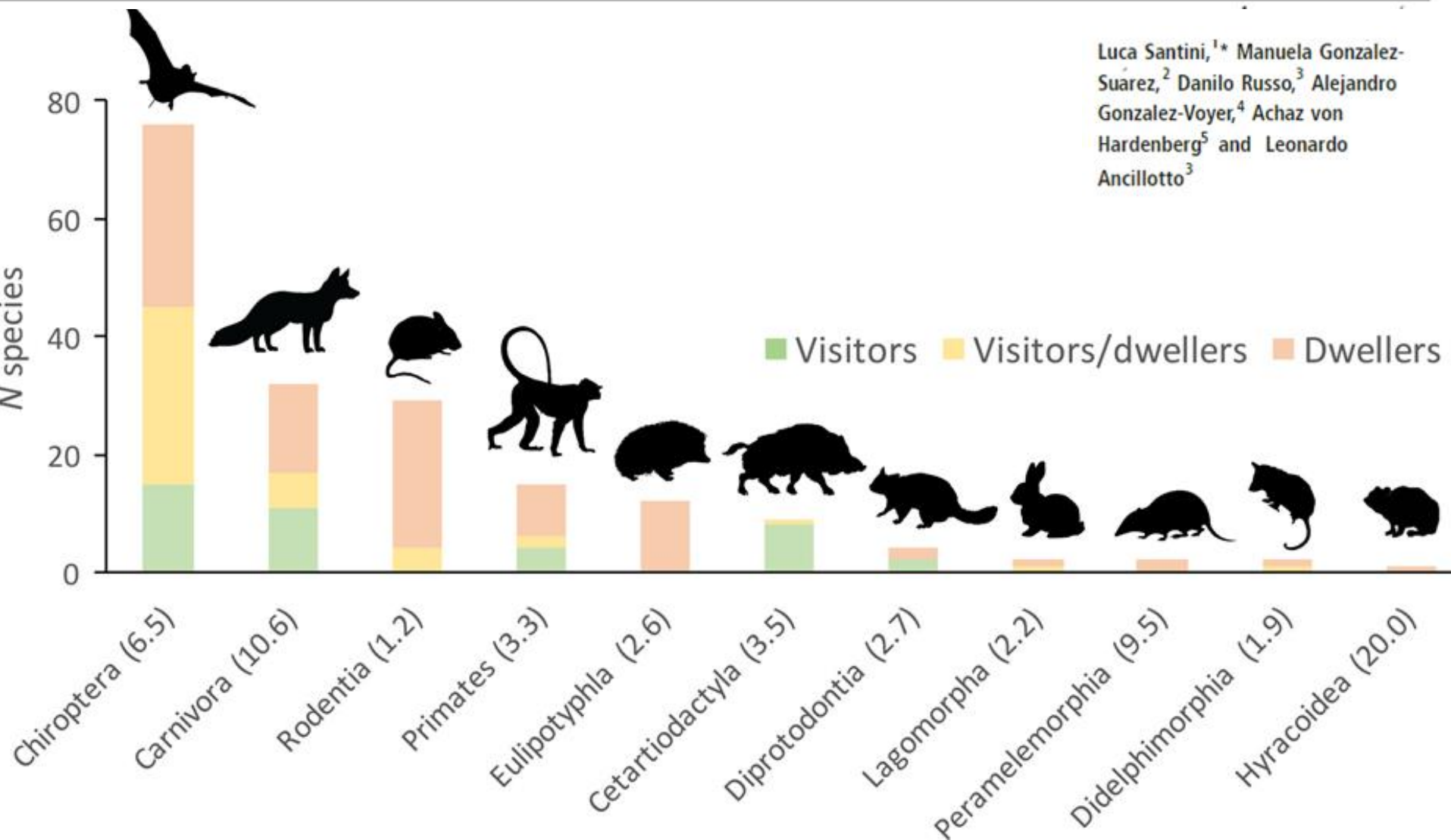
Biological Conservation 107 (2002) 71–81



## LETTER

## One strategy does not fit all: determinants of urban adaptation in mammals

Luca Santini,<sup>1\*</sup> Manuela Gonzalez-Suárez,<sup>2</sup> Danilo Russo,<sup>3</sup> Alejandro Gonzalez-Voyer,<sup>4</sup> Achaz von Hardenberg<sup>5</sup> and Leonardo Ancillotto<sup>3</sup>

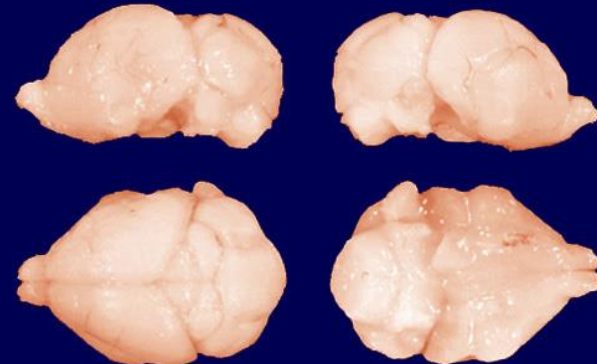


## LETTER

## One strategy does not fit all: determinants of urban adaptation in mammals



**Lesser Horseshoe Bat**  
*Rhinolophus hipposideros*



1 cm



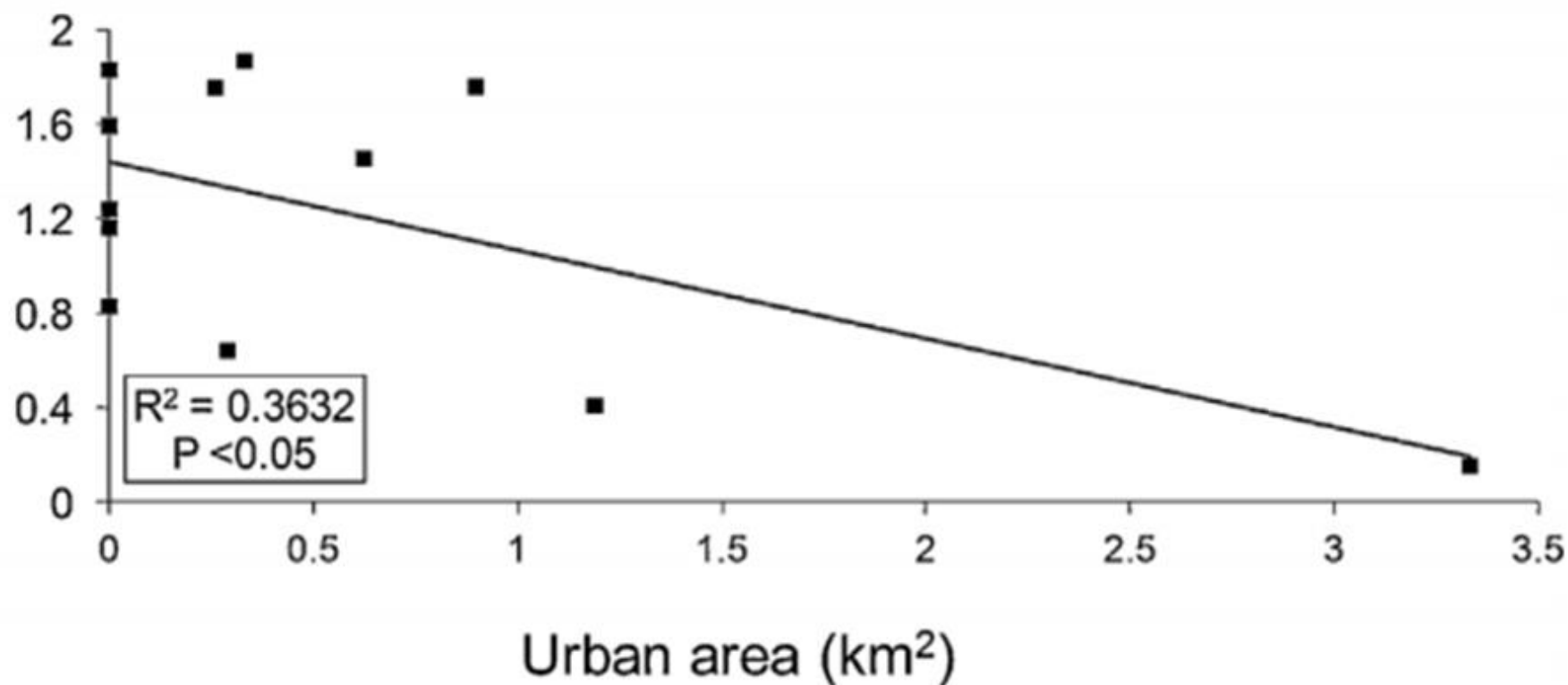


Review

## Sensitivity of bats to urbanization: a review

Danilo Russo<sup>a,b,\*</sup>, Leonardo Ancillotto<sup>a,c</sup>

Shannon Diversity Index



# La qualità dell'urbano conta



Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Landscape and Urban Planning

journal homepage: [www.elsevier.com/locate/landurbplan](https://www.elsevier.com/locate/landurbplan)

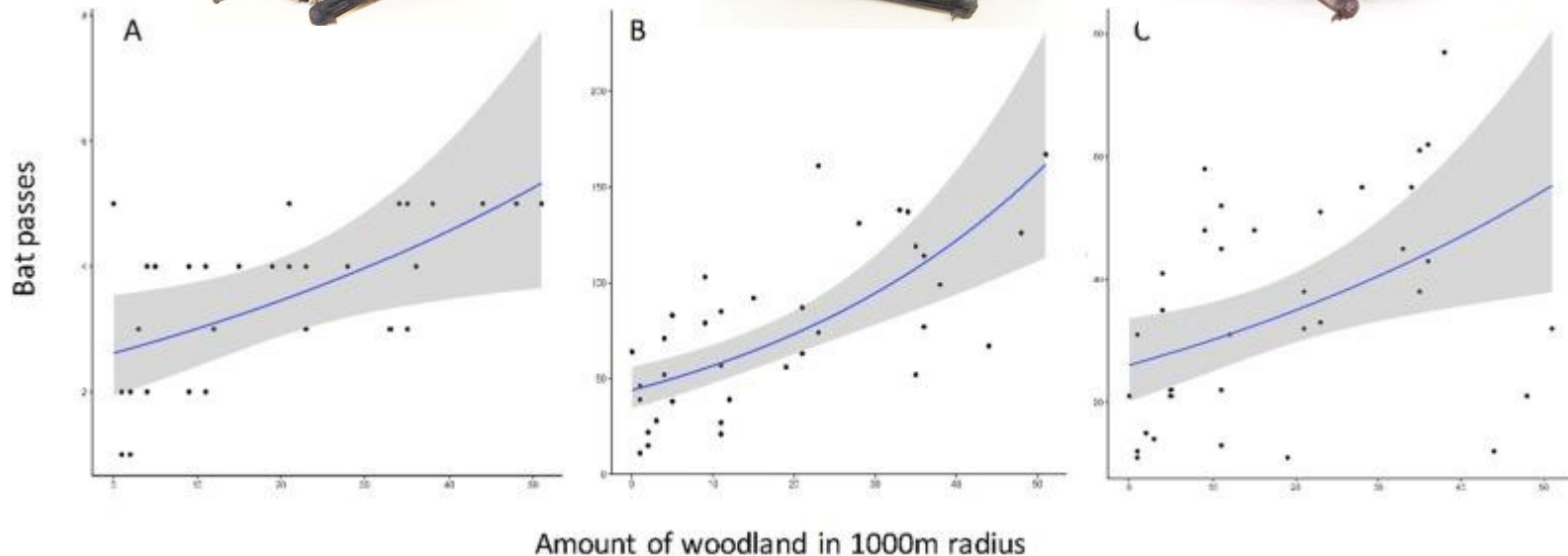


Research Paper

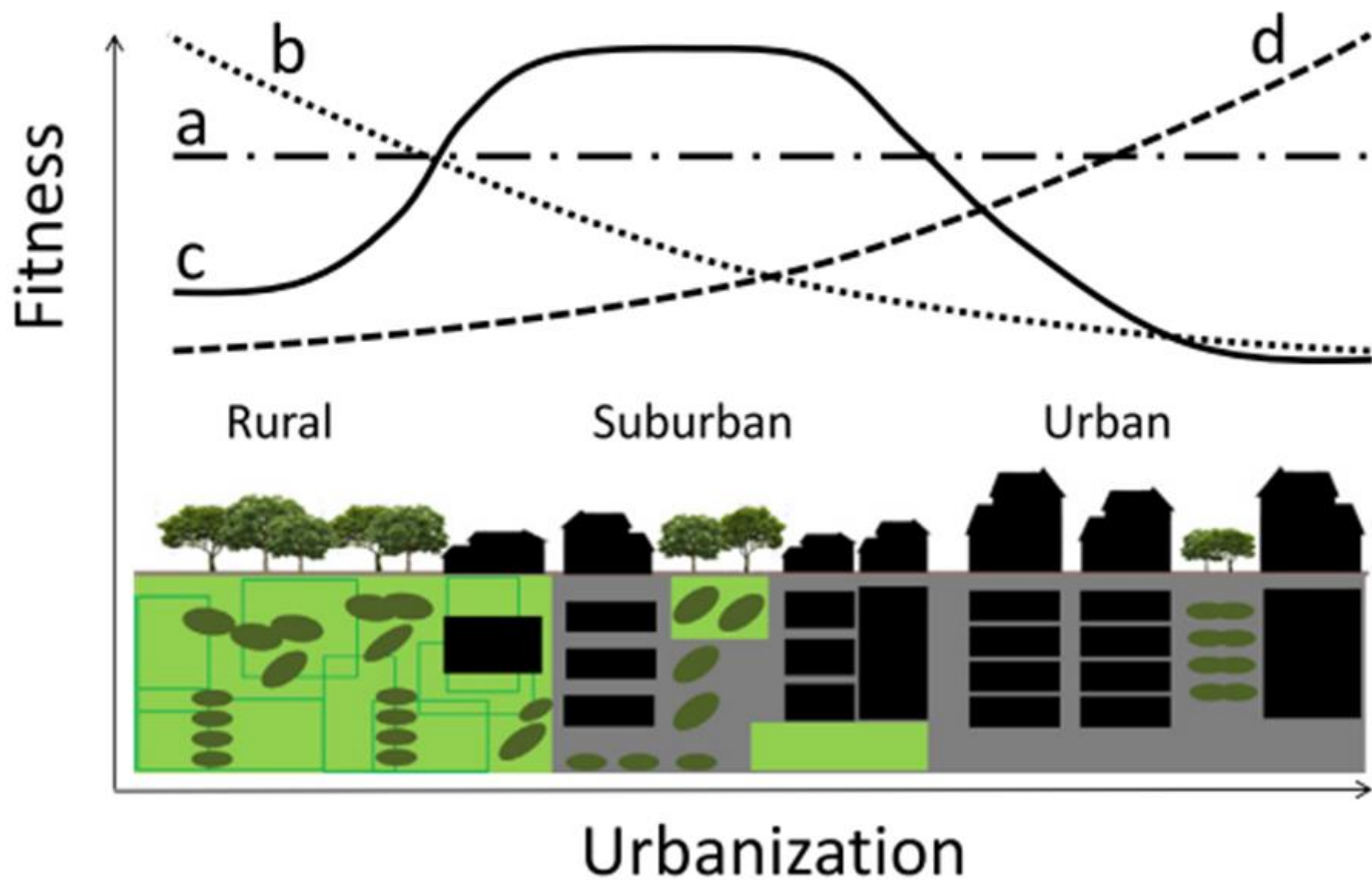
Landscape and Urban Planning 190 (2019) 103607

## The importance of ponds for the conservation of bats in urban landscapes

L. Ancillotto, L. Bosso, V.B. Salinas-Ramos, D. Russo\*









Presence of humans and domestic cats affects bat behaviour in an urban nursery of greater horseshoe bats (*Rhinolophus ferrumequinum*)

L. Ancillotto<sup>a</sup>, G. Venturi<sup>b</sup>, D. Russo<sup>a,c,\*</sup>

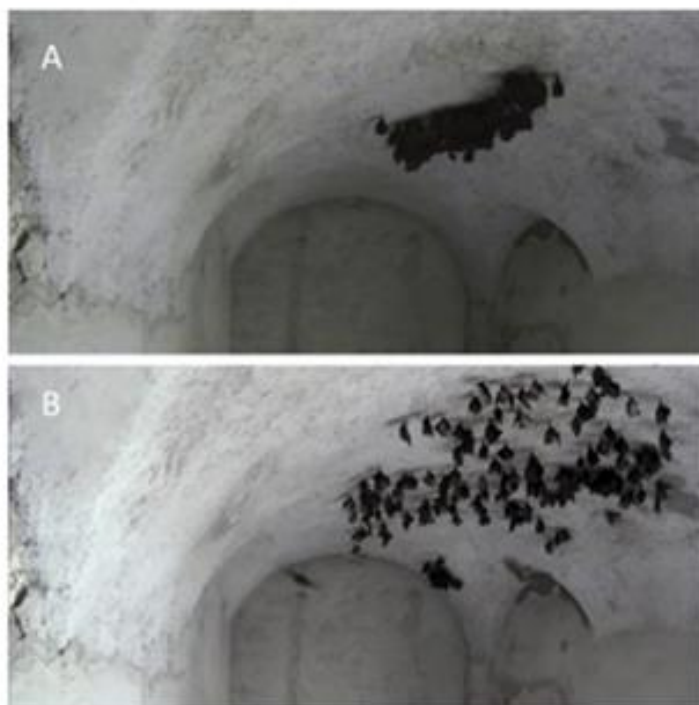


Fig. 1. Roosting behaviour of the colony of *Rhinolophus ferrumequinum* under control conditions (A) and after a disturbance event occurring outside the roost, which typically disrupted bat clusters (B).



Fig. 3. Frames extracted from videos shot by a camera trap set inside the maternity roost of *Rhinolophus ferrumequinum* monitored in central Italy; A: cat inspecting the camera trap; B: two cats visiting the roost.





# Inquinamento luminoso

Artificial illumination near rivers may alter bat-insect trophic interactions<sup>☆</sup> [Environmental Pollution 252 \(2019\) 1671–1677](#)

Danilo Russo <sup>a, b, \*</sup>, Francesca Cosentino <sup>c</sup>, Francesca Festa <sup>c</sup>, Flavia De Benedetta <sup>a</sup>, Branka Pejic <sup>d</sup>, Pierfilippo Cerretti <sup>c</sup>, Leonardo Ancillotto <sup>a</sup>

Animal Conservation

ZSL  
LET'S WORK  
FOR WILDLIFE

Animal Conservation. Print ISSN 1367-9430

**Adverse effects of artificial illumination on bat drinking activity**

D. Russo<sup>1,2</sup>, L. Cistrone<sup>3</sup>, N. Libralato<sup>4</sup>, C. Korine<sup>5</sup>, G. Jones<sup>2</sup> & L. Ancillotto<sup>1</sup>

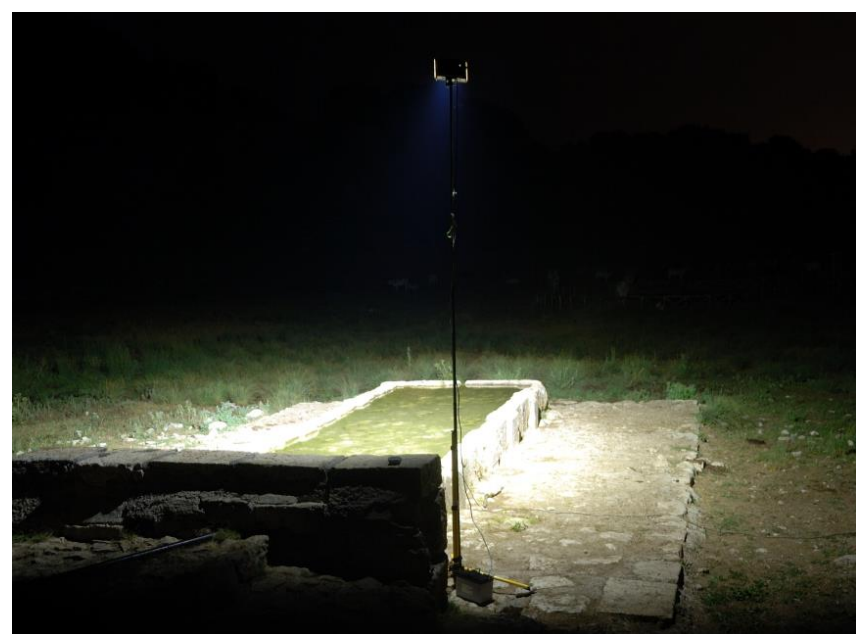
Animal Conservation

ZSL  
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Animal Conservation. Print ISSN 1367-9430

**Effects of artificial illumination on drinking bats: a field test in forest and desert habitats**

D. Russo<sup>1,2</sup> , L. Ancillotto<sup>1</sup>, L. Cistrone<sup>3</sup>, N. Libralato<sup>4</sup>, A. Domer<sup>5,6</sup>, S. Cohen<sup>6</sup> & C. Korine<sup>6</sup>



# Adattarsi all'uomo o non farcela



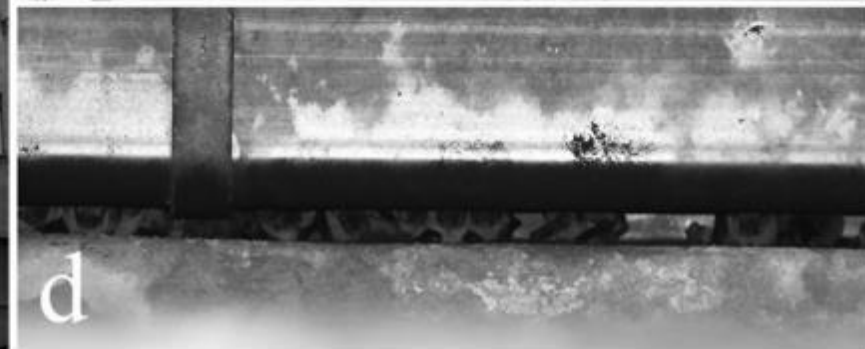
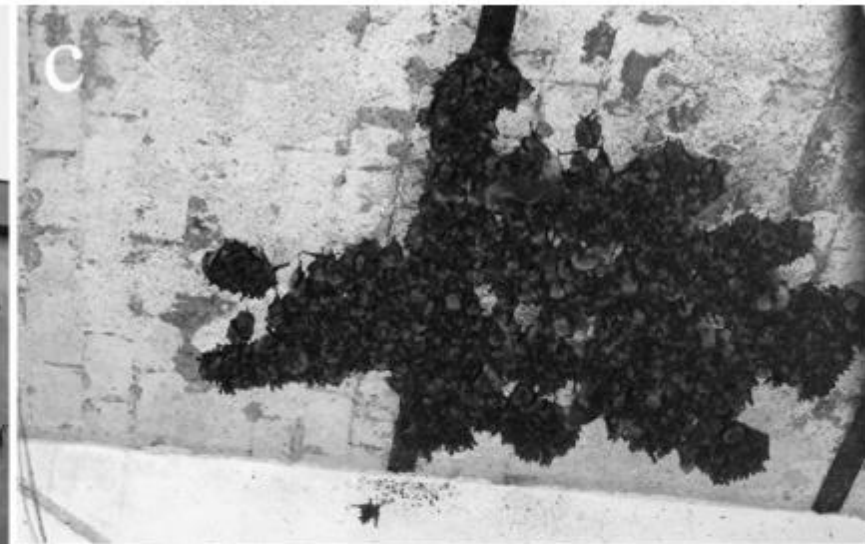




Review

## Sensitivity of bats to urbanization: a review

Danilo Russo<sup>a,b,\*</sup>, Leonardo Ancillotto<sup>a,c</sup>







*Jens Rydell*







# Resistere al caldo



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Behavioural Processes

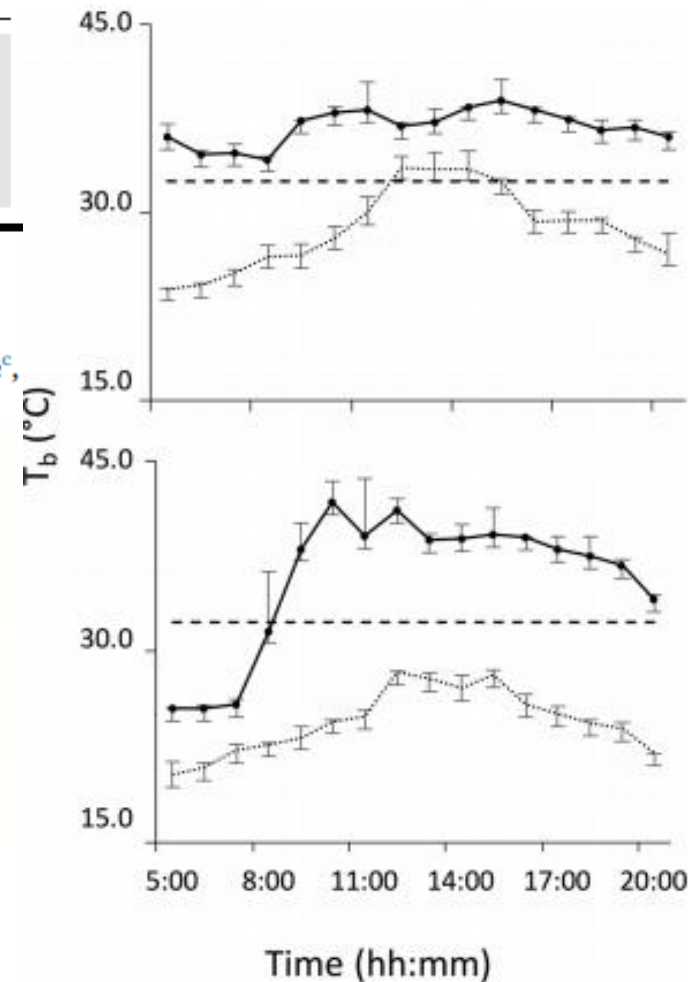
journal homepage: [www.elsevier.com/locate/behavproc](https://www.elsevier.com/locate/behavproc)

What is driving range expansion in a common bat? Hints from thermoregulation and habitat selection

Leonardo Ancillotto<sup>a</sup>, Ivana Budinski<sup>b</sup>, Valentina Nardone<sup>a</sup>, Ivy Di Salvo<sup>a</sup>, Martina Della Corte<sup>c</sup>, Luciano Bosso<sup>a</sup>, Paola Conti<sup>d</sup>, Danilo Russo<sup>a,e,\*</sup>



© Leonardo Ancillotto





# Extraordinary range expansion in a common bat: the potential roles of climate change and urbanisation

L. Ancillotto<sup>1</sup> · L. Santini<sup>2</sup> · N. Ranc<sup>3,4</sup> · L. Maiorano<sup>2</sup> · D. Russo<sup>1,5</sup>



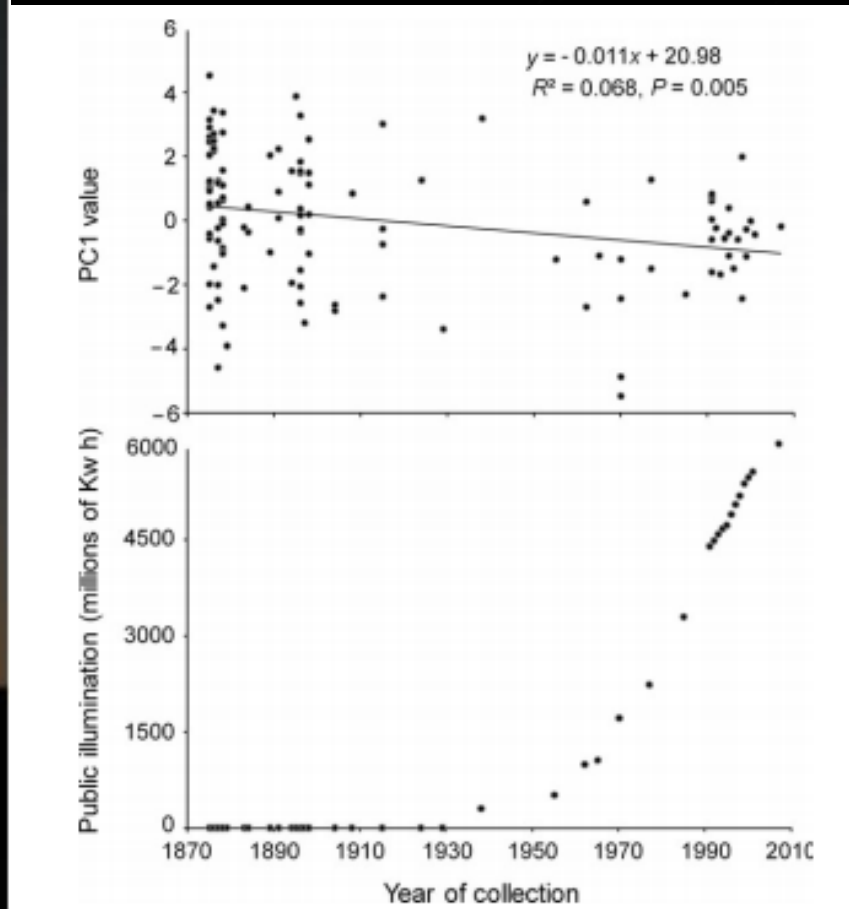
**Fig. 1** Eurasian range of *Pipistrellus kuhlii* (shades of grey). Dark grey historical range (after Stebbings and Griffiths 1986), light grey current range comprising 1980–2013 occurrence data

ORIGINAL  
ARTICLE



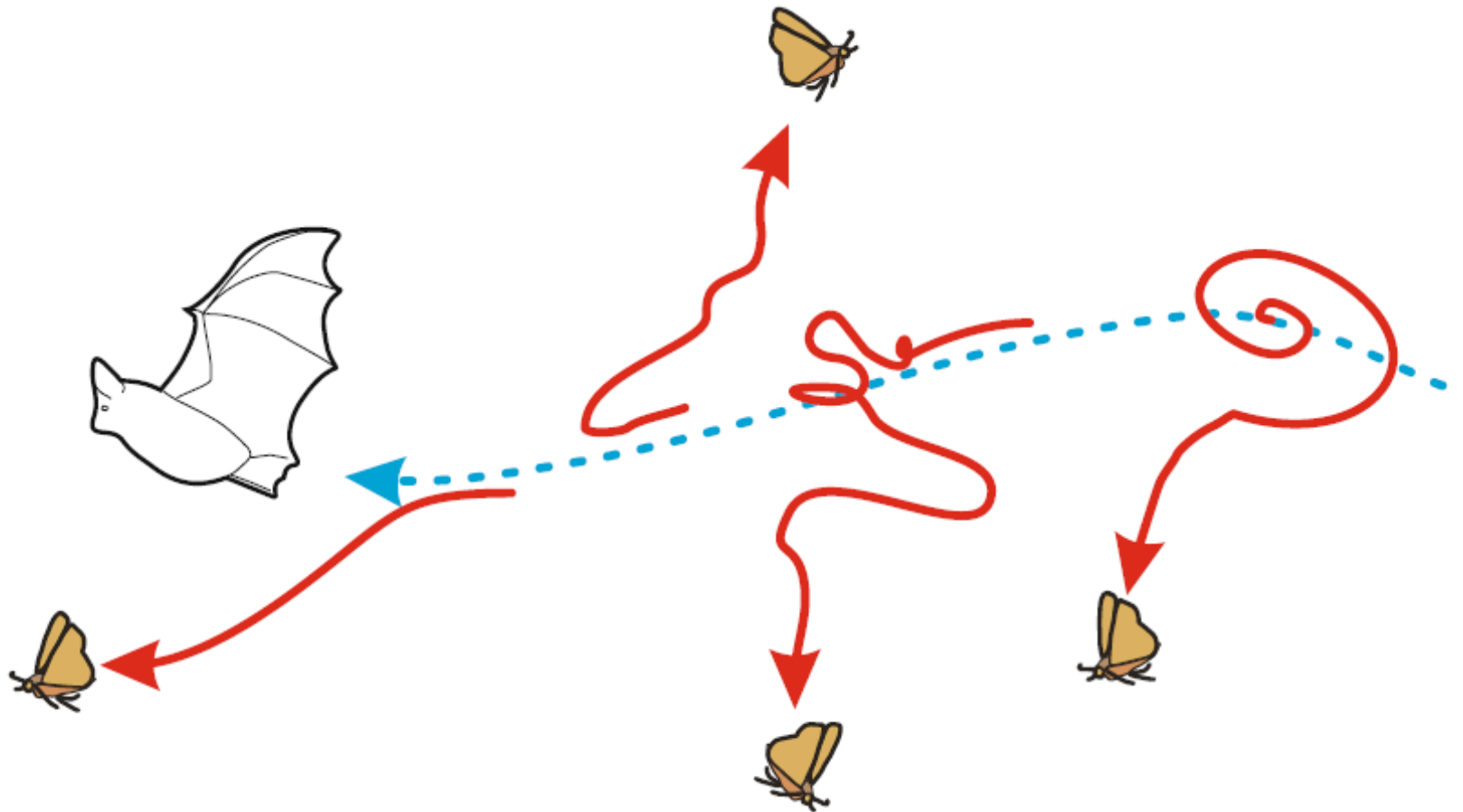
# Cranial size has increased over 133 years in a common bat, *Pipistrellus kuhlii*: a response to changing climate or urbanization?

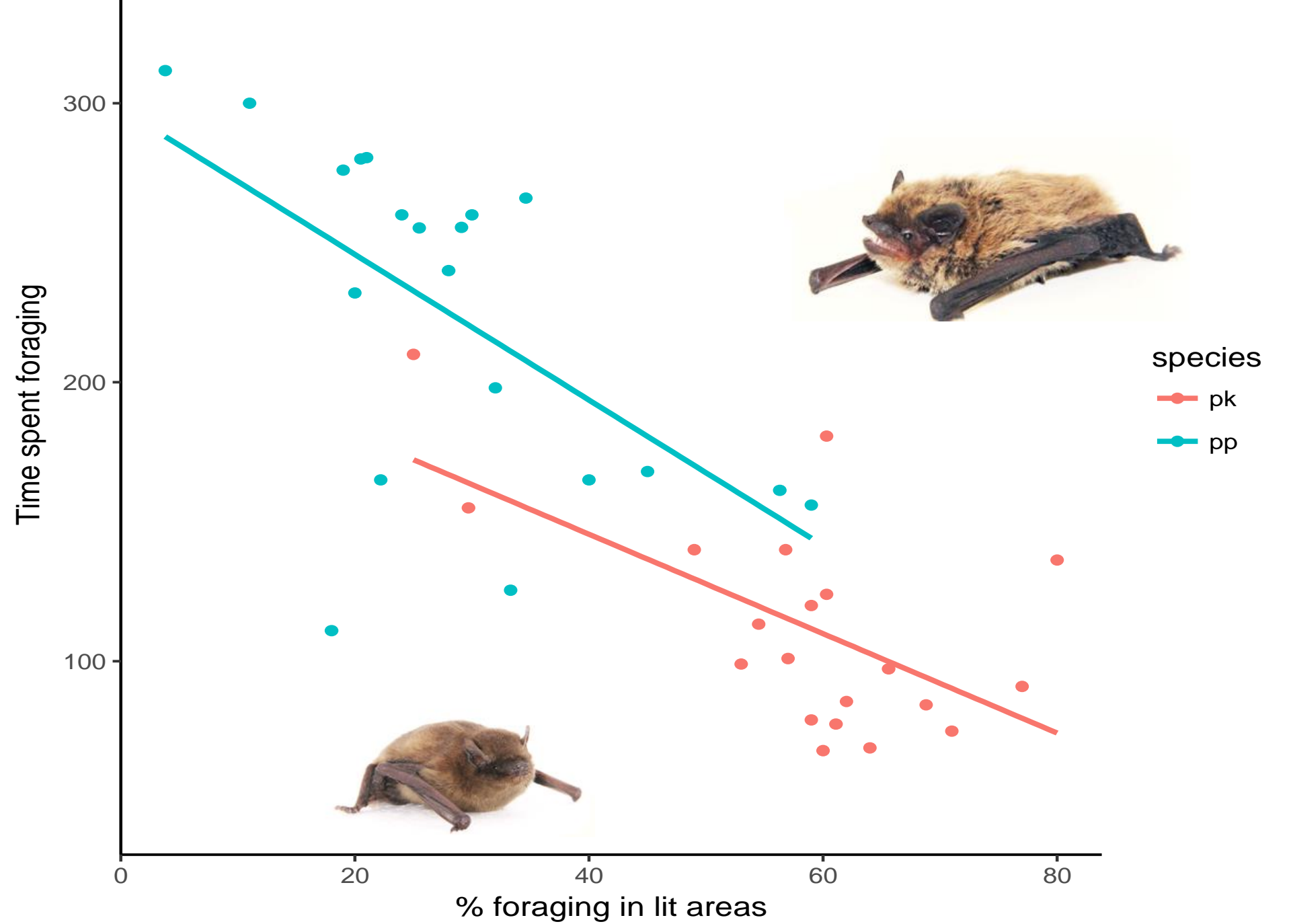
Alessandra Tomassini<sup>1</sup>, Paolo Colangelo<sup>1</sup>, Paolo Agnelli<sup>2</sup>, Gareth Jones<sup>3</sup> and Danilo Russo<sup>3,4\*</sup>





# Falene timpanate, pipistrelli e luci stradali

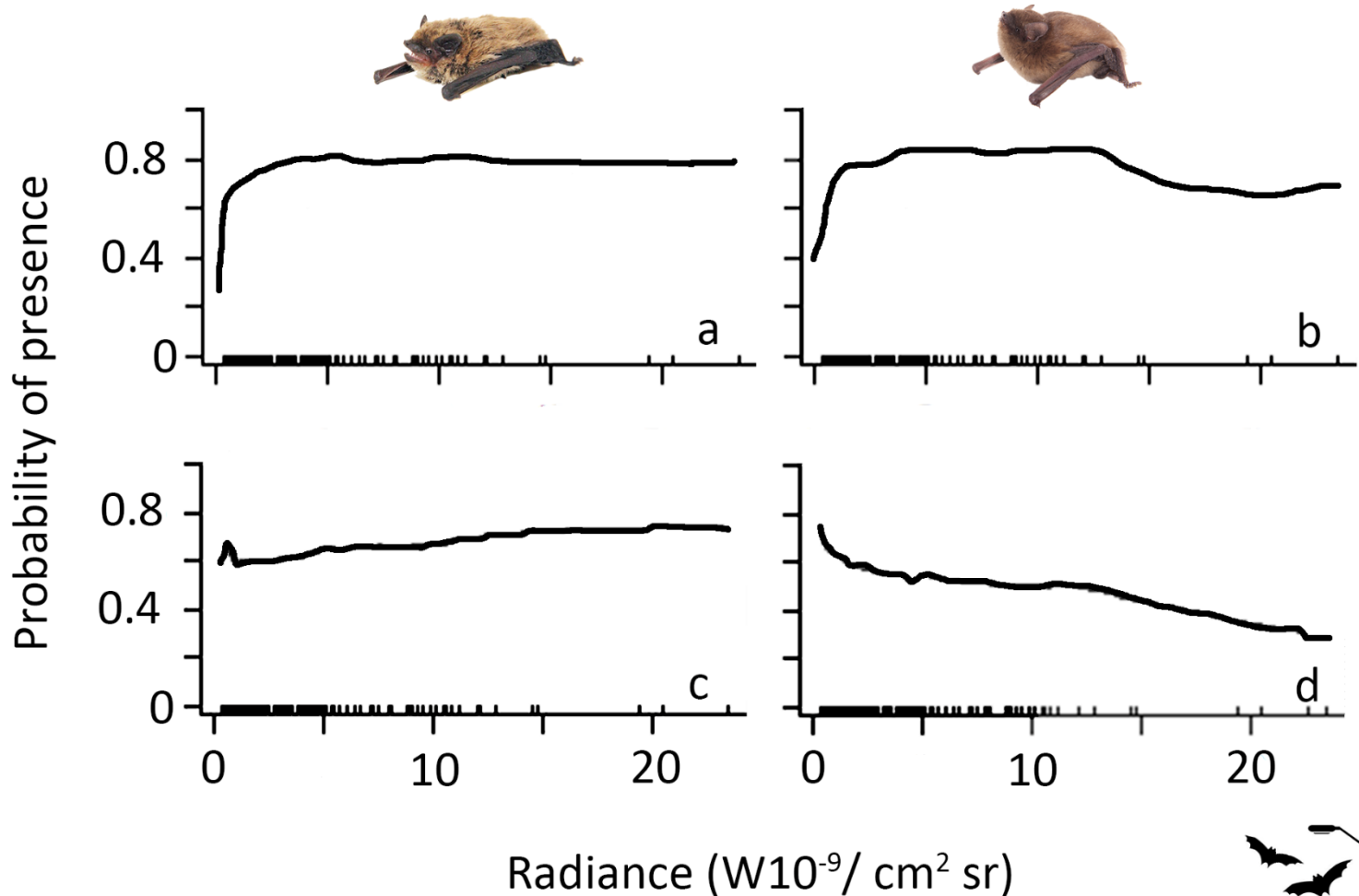






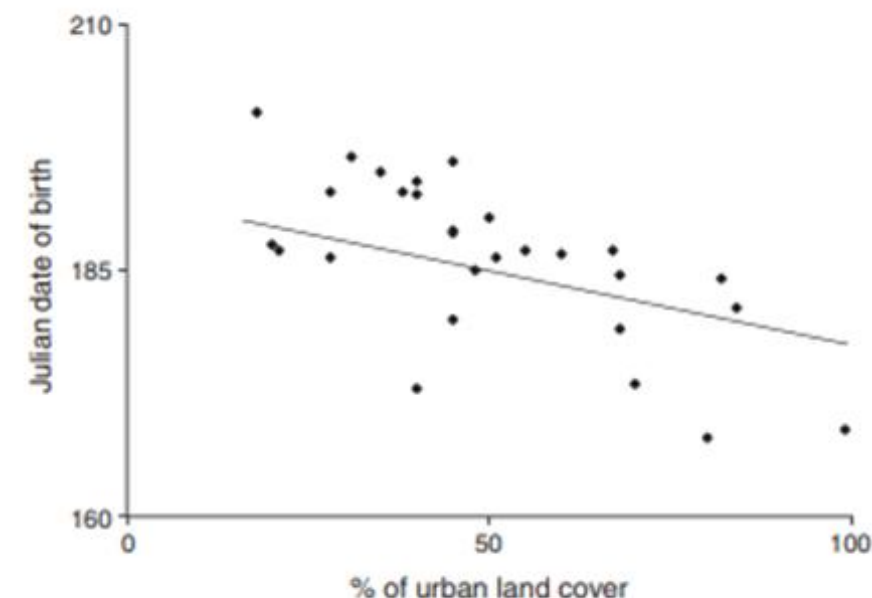
# Artificial illumination drives niche segregation in bats

Salinas-Ramos V. B.<sup>1,\*</sup>, Ancillotto L.<sup>1,\*</sup>, Cistrone L.<sup>1,#</sup>, Nastasi M. C.<sup>2,#</sup>, Bosso L.<sup>1,#</sup>, Smeraldo S.<sup>1,#</sup>, Sanchez Cordero V.<sup>3</sup>, Russo D.<sup>1,\*\*</sup>

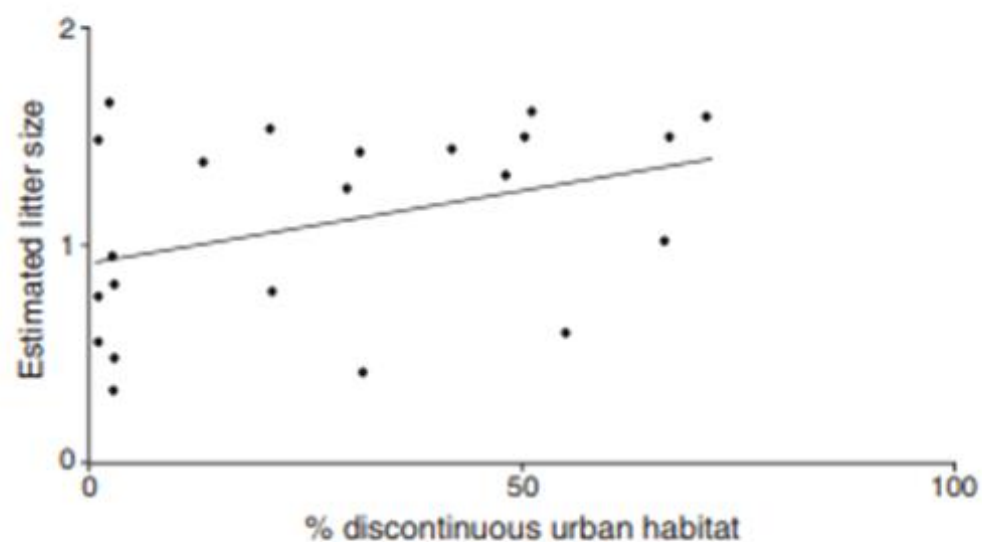


## The fancy city life: Kuhl's pipistrelle, *Pipistrellus kuhlii*, benefits from urbanisation

Leonardo Ancillotto<sup>A</sup>, Alessandra Tomassini<sup>B</sup> and Danilo Russo<sup>A,C,D</sup>



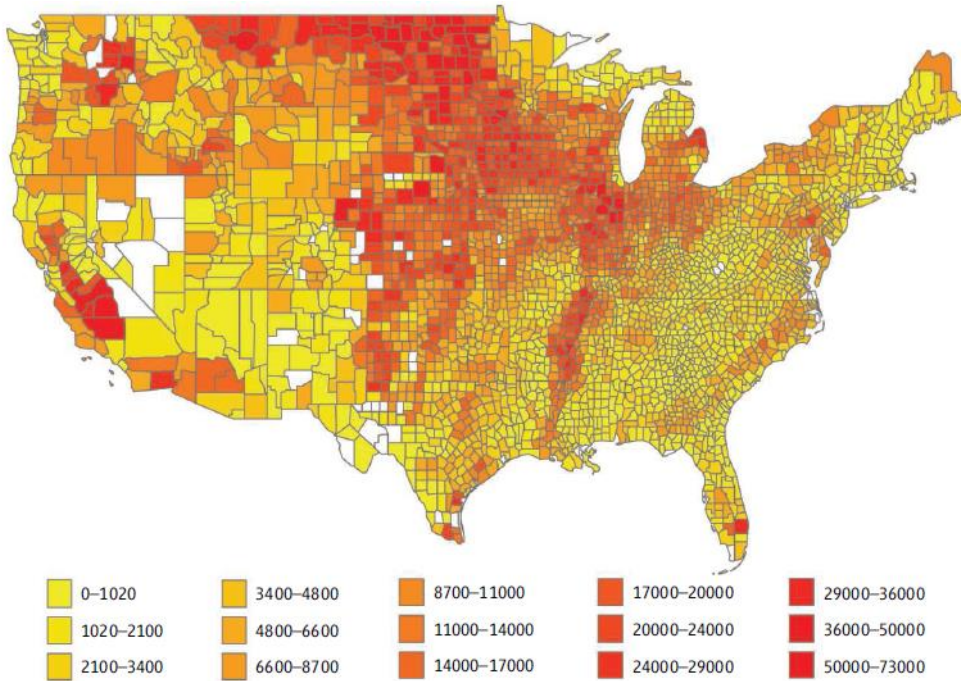
**Fig. 2.** Regression between Julian dates of birth and amount of urban land cover within 0.2 km around nursery roosts of *Pipistrellus kuhlii* ( $n=28$ ) in peninsular Italy, in 2009–2014 ( $R^2=0.080$ ,  $P<0.01$ ).



**Fig. 3.** Regression between estimated litter size and amount of discontinuous urban cover occurring within 0.2 km around nursery roosts of *Pipistrellus kuhlii* ( $n=25$ ) in peninsular Italy, in 2010–13 ( $R^2=0.15$ ,  $P<0.01$ ).



# Servizi e disservizi



**The worth of insectivorous bats.** Estimated annual value of insectivorous bats in the agricultural industry at the county level. Values ( $\times \$1000$  per county) assume bats have an avoided-cost value of  $\sim \$74/\text{acre}$  of cropland (12). (See SOM for details.)

[www.sciencemag.org](http://www.sciencemag.org) SCIENCE VOL 332 1 APRIL 2011

*Published by AAAS*

GLI ADELPHI



*David Quammen*

**Spillover**

# Concludendo

- ⦿ Comprensione della sinantropia
- ⦿ Servizi ecosistemici
- ⦿ Mitigazione del conflitto
- ⦿ Capire i *winner* per aiutare i *loser*
- ⦿ *Take-home message* della pandemia...



# Grazie



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