

1. Personal ID

Name: Lilley, Thomas Mikael

Researcher Identifier: 0000-0001-5864-4958

Year of birth: 1977

Nationality: Finnish/British

Website: https://www.researchgate.net/profile/Thomas_Lilley

2. Education and degrees completed

Doctor of Philosophy (PhD), University of Turku, Ecology (31.12.2012)

Master of Science, University of Turku (19.6.2007)

Bachelor of Science, Sussex University, Ecology and Conservation (30.7.2002)

Adjunct Professor (Docent), University of Turku (14.8.2017)

3. Current position

Curator of mammals, Metazoa Team of the Zoology Unit, Luomus, temporary, until 31.12.2020.

4. Previous work experience

Marie Skłodowska-Curie Research Fellow at University of Liverpool, UK, studying “Genome-wide response to White-nose syndrome in North American and European bats”. 1.11.2016-31.10.2018.

Post-Doc, 1.9.2014- 31.12.2016. Bucknell University, Lewisburg PA, working on the project “*Physiological changes in remnant bat populations in WNS-affected areas*” on a Finnish post-doc pool sponsored grant. Responsible for project design, field work, laboratory assays, student supervision, grant reporting and manuscript preparation.

Post-Doc, 1.1.2012-31.12.2014, University of Turku, Zoological museum. Post-doc in a project studying “*habitat selection of bats in forests*”. Responsible for securing funding, experimental design, field sampling, automated acoustic monitoring, data managing, publishing manuscripts.

Advanced Researcher, 1.4.-30.9.2010, EVIRA. Acting as a research assistant in a project that monitored the prevalence of EBLV-2 in Finnish bats. Responsible for bat trapping, sample collection and manuscript preparation.

PhD student, 1.1.2007– 31.12.2012, University of Turku. Preparing a thesis on “*The effects of butyltin compounds in the food web and its impact on chironomids and Daubenton’s bats*”. Responsible for securing funding, experimental design, fieldwork, laboratory work, manuscript preparation and publishing.

Researcher, University of Turku (15.5.-31.9.2006, 15.5.-31.9.2007). Researcher in a project looking at “*Northern Bat habitat selection in an urban environment*”. Responsible for bat trapping, sample collection, radio telemetry work and data management.

Laboratory assistant, University of Turku (1.3.-30.4.2006). Laboratory assistant in a project investigating “*The significance of ultrasound in Greater wax, Galleria mellonella, moth mate choice*”. Responsible for experimental design and acoustic recordings.

Laboratory assistant, University of Turku (1.10.-30.11.2005) Laboratory assistant in a study investigating “*maternal stress in field voles*”. Responsible for animal handling, sample collection, manuscript preparation and publishing.

Museum assistant, University of Turku (1.6.2005 – 30.9.2005). Collection maintenance and collecting samples for the Zoological museum.

Field assistant, University of Turku (1.4.2005 – 20.5.2005). Field assistant in a project looking at “*habitat selection of field voles in rural Finland*”. Responsible for vole trapping, sample collection and radio telemetry.

5. Career breaks

Side-career outside science, approx. 2002-2006.

6. Research funding

I have secured a total of **€932 330** in research funding in my own name in order to pursue my own research questions. In addition to this I was involved in writing the proposal for the “Hydrologia” LIFE-project, which was granted over 9 million euros by the EU. These demonstrate my independence as a scientist and my potential lead an active, externally funded research laboratory. I have acted as PI unless otherwise noted.

Kone Foundation, Temporal changes in bat populations (€225 000)	2018
Raija ja Ossi Tuuliaisien Säätiö, Bat hibernation research (€5000)	2018
Varsinais-Suomi Cultural Foundation, Public outreach (€40 000)	2018
Ministry of the Environment, Distribution of bats in Finland (€2000)	2018
UoL Technology Directorate (€5500)	2017
The Johnston Post-Doctorial Foundation (€4000)	2017
The Rufford Foundation, WNS in South America (€6000)	2017
H2020 Marie Skłodowska Curie Research Actions (€190 000)	2016
The Rufford Foundation, WNS in South America (€6000)	2016
Finnish Post-Doc Pool, White nose survivor research (€40000)	2016
Finnish Post-Doc Pool, White nose survivor research (€40000)	2015
Turku University Foundation, Forest bat ecology (€3900)	2014
Ministry of the Environment, Forest bat ecology (€60000)	2013
Emil Aaltonen Foundation, Forest bat ecology (€5200)	2013
Ministry of the Environment, Forest bat ecology (€60000)	2012
Turku University Foundation Forest bat ecology (€5400)	2012
Ministry of the Environment, Forest bat ecology (€54000)	2011
Ministry of Agriculture (Co-PI), Bat lyssavirus project, (€80000)	2010
Kone Foundation, PhD-project expenses (€9000)	2010
Alfred Kordelin Foundation, Bat lyssa-virus project (€11000)	2010
Oskar Öfflunds Foundation, PhD-project expenses (€3000)	2010
Turku University Foundation, PhD-project expenses (€4000)	2009
Suomen Luonnonsuojelunsäätiö, PhD-project expenses (€1500)	2009
Emil Aaltonen Foundation, PhD-project expenses (€4000)	2009
Maj ja Tor Nessling Foundation, Personal grant (€20730)	2009
Maj ja Tor Nessling Foundation, Personal grant (€21250)	2008
Turku University Foundation, PhD-project expenses (€4400)	2007
V-S Cultural Foundation, PhD-project expenses (€4000)	2007
Maj ja Tor Nessling Foundation, Personal grant (€22450)	2007

7. Leadership and supervision experience

University of Turku

Veronika Laine (MSc), supervision of Master's thesis (2010), Janina Stauffer (MSc), supervision of Master's thesis (2012), Riina Aarrekorpi (MSc), supervision of Master's thesis (2012), Sandra Ruiz (MSc), supervision of Master's thesis (2014) and PhD thesis (2018), Anna Blomberg (MSc), supervision of Master's thesis (2017) and PhD thesis (Kone Foundation 3 –year personal grant, expected 2021), Miika Kotila (MSc), supervision of PhD thesis (Nessling Foundation 4-year personal grant, expected 2022).

Bucknell University

Beth Rogers, supervision of Honours thesis (2016), Cali Wilson, supervision of Honours thesis (2017).

University of Liverpool

William Bourns, supervision of Honours thesis (2018), Nicola Ford, supervision of Honours thesis (2018), Megan Forster, supervision of Honours thesis (2018).

University of Helsinki

Katarina Meramo (MSc), supervision of PhD thesis (expected 2022), Kati Suominen (MSc), supervision of PhD thesis (expected 2022). Both funded through Kone Foundation 4 year personal working grants.

8. Teaching experience

I designed and implemented a bat ecology research project to introduce bat research to students at the University of Turku. This was my initiative, driven by a desire to, first, gain experience of planning and delivering teaching and, second, pass my skills in bat biology to students in Finland, U.S. and U.K. in order to equip them with employability skills. I have a strong record of supervising undergraduate, graduate and PhD-projects, which I find very rewarding. I have also supported a number of other ecology courses in Finland, the U.S., and now in the U.K. My teaching and supervisory experience therefore demonstrates my ability to lead an active research group, to lead teaching programmes within a university and to play a full role in an academic environment.

Organismal Biology (6 ects)	2013
Small mammal ecology (3 ects)	2011
Methods in ecophysiology (6-14 ects)	2007, 2009

9. Experience in organizing scientific meetings

Main organizer of 15th European Bat Research Symposium, Turku, Finland, 4.-8.8.2020

10. Other key scientific or academic merits.

- Pre-examiner for conversion of masters to doctorate, Genevieve Marsden, University of Kwa-Zulu Natal, South Africa.
- Reviewer for Bat Conservation International Student Research Scholarships
- Coordinator for Biological Interaction Graduate School and Environmental Sciences Masters Degree programme 2009-2010.
- Handling editor, *Oecologia*, since 2017
- *Oecologia* (2008), *Boreal Environment Research* (2009), *Animal Behaviour* (2011), *Aquatic Toxicology* (2011, 2012, 2014, 2015), *PlosONE* (2011, 2014, 2015), *Environmental Toxicology and Chemistry* (2012), *Environmental Science and Technology* (2012), *Canadian Journal of Zoology* (2015), *Acta Chiropterologica* (2016, 2017), *Journal of Comparative Physiology B* (2017), *Northeastern Naturalist* (2107), *Journal of Applied Ecology* (2017), *Molecular Ecology* (2018)

- Artistic merits: Numerous releases as composer, singer and guitarist in Daisy, Tero-Petri & Korvaamattomat, and Liljankukka (2002-2018). See career breaks.

11. Membership and position of trust in scientific societies

IMPACT/ENGAGEMENT ACTIVITIES

I have been a board member (2004-2014) and chair (2014) of the Chiropterological Society of Finland. The main activity of the society is civic engagement and promoting the conservation of bats. I was also involved in the Children's University programme at the University of Turku, where I gave lectures to school children during their summer break. The idea behind the Children's University is to allow children to have an opportunity to acquaint themselves with science and research. I have also worked together with the Finnish Forest Research Institute, Finland Ministry of the Environment, the Finnish Food Safety Authority and Pennsylvania Game Commission on bat associated topics.

INVITED TALKS

University of Bristol, BEEM-seminar, Invited speaker, 17.10.2017

University of Jyväskylä, Seminars in Biology and Env. Science, Invited speaker, 19.4.2018

University College Dublin, Seminar series in Env. Sciences, Invited speaker, 26.4.2018

PARTICIPATION IN INTERNATIONAL CONFERENCES AND MEETINGS

Symposium in Ecology, Biological Diversity, Genetics, Environmental and Marine Biology, Turku, Finland, 1.-2.4.2008 (Oral)

11th European Bat Research Symposium, Cluj-Napoca, Romania, 18.-22.8.2008 (Oral)

1st International Symposium on Bat Migration, Berlin, Germany, 16.-18.1.2009 (Poster)

15th International Bat Research Conference, Prague, Czech Republic, 22.-27.8.2010 (Poster)

Finnish Conference of Environmental Science, Turku, Finland, 5.-6.5.2011 (Oral)

Society for Experimental Biology, Glasgow, UK 1.-4.7.2011 (Poster)

3rd International Berlin Bat Meeting, Berlin, Germany, 2.-4.3.2013 (Oral)

13th European Bat Research Symposium, Sibenik, Croatia, 1.-5.9.2014 (Oral)

White Nose Syndrome-symposium, St. Louis, Missouri, 8-12.9.2014 (Oral)

4th International Berlin Bat Meeting, Berlin, Germany, 13.-15.3.2015 (Poster)

North American Symposium for Bat Research 2015, Monterey CA, 28.-31.10.2015 (Oral)

White Nose Symposium, Denver CO, 6.-10.6.2016 (Oral)

17th International Bat Research Conference, Durban South Africa, 31.7.-5.8.2016 (Oral)

13th European Bat Research Symposium, Donostia Basque Country, 1.-6.8.2017 (Oral)

North American Symposium for Bat Research 2018, Puerto Vallarta, Mexico, 24.-28.10.2018 (Oral)

LIST OF PUBLICATIONS

PEER-REVIEWED SCIENTIFIC ARTICLES

1. Ossa G, Johnson J, Puisto AIE, Waag A, Rinne V, Sääksjärvi IE, Lilley TM (2018). The Klingon batbugs: morphological adaptations in the primitive bat bugs, *Bucimex chilensis* and *Primicimex cavernis*, including updated phylogeny of Cimicidae. Ecology and Evolution. In Press.
2. Ruiz S, Eeva T, Kanerva M, Blomberg AS, Lilley TM (2018). Metal and metalloid exposure and oxidative status in free-living individuals of *Myotis daubentonii*. Ecotoxicology and Environmental Safety 12:169:93-102
3. Vesterinen EJ, Puisto AIE, Blomberg AS, Lilley TM (2018). Table for five, please: dietary partitioning in boreal bats. Ecology and Evolution. <https://doi.org/10.1002/ece3.4559>
4. Field KA, Sewall BJ, Prokkola J.M., Turner GG, Gagnon M, Lilley TM, White JP, Johnson JS, Hauer CL, Reeder DM (2018). Effect of torpor on host transcriptomic responses to a fungal pathogen in hibernating bats. Mol. Ecol. <https://doi.org/10.1111/mec.14827>.
5. Lilley TM, Anttila J, Ruokolainen L. (2018). Landscape structure and ecology influence the spread of a bat fungal disease. Functional Ecology. 32(11):2483-2496
6. Ossa G, Lilley TM, Ugarte-Núñez J, Ruokolainen L, Vilches K, Valladares-Faúndez P, Yung V (2018). First record of *Promops davisoni* (Thomas, 1921) (Chiroptera, molossidae) from Chile and a description of its echolocation calls. Mastozoología Neotropical. 25:1.
7. Moore MS, Field KA, Behr MJ, Turner GG, Furze ME, Stern DWF, Allegra PR, Bouboulis SA, Musante CD, Vodzak ME, Biron ME, Meierhofer MB, Frick WF, Foster JT, Howell D, Kath JA, Kurta A, Nordquist G, Johnson JS, Lilley TM, Barrett BW, Reeder DM (2018). Energy conserving thermoregulatory patterns and lower disease severity in a bat resistant to the impacts of white-nose syndrome. Journal of Comparative Physiology B 188(1):163-176
8. Reeder SM, Palmer JM, Prokkola JM, Lilley TM, Reeder DM, & Field KA (2017). *Pseudogymnoascus destructans* transcriptome changes during white-nose syndrome infections. Virulence 14: 1-13.
9. Espín, S., Ruiz, S., Sánchez Virosta, P., Lilley, T.M. and Eeva, T. (2017): Oxidative status in relation to metal pollution and calcium availability in pied flycatcher nestlings – A calcium manipulation experiment. Environmental Pollution 229:448-458
10. Lilley TM, Prokkola JM, Johnson JS, Rogers EJ, Gronsky S, Kurta A, Reeder DM, Field KA (2017). Immune responses in hibernating little brown myotis (*Myotis lucifugus*) with white-nose syndrome. Proceedings of the Royal Society B. 284: 20162232.

11. Ijäs A, Kahilainen A, Vasko V, Lilley TM (2017). Evidence of the migratory bat, *Pipistrellus nathusii*, aggregating to the coastlines in the Northern Baltic Sea. *Acta Chiropterologica*, 19(1): 127–139.
12. Lilley TM, Wilson CA, Bernard RF, Willcox EV, Vesterinen EJ, Webber QMR, Kurpiers L, Prokkola JM, Ejotre I, Kurta A, Field KA, Reeder DM, Pulliainen AT (2017). Molecular Detection of *Candidatus Bartonella mayotimonensis* in North American Bats. *Vector Borne and Zoonotic Diseases*. DOI: 10.1089/vbz.2016.2080
13. Ruiz S., Espin S, Sanchez Virosta P, Salminen JP, Lilley TM, Eeva T. (2017). Vitamin profiles in two free-living passerine birds under a metal pollution gradient – A calcium supplementation experiment. *Ecotoxicology and Environmental Safety* 138:242-252
14. Hokynar K, Vesterinen E, Lilley TM, Pulliainen A, Korhonen S, Paavonen J, Puolakkainen M. Molecular evidence of Chlamydia-like organisms in the faeces of the bat *Myotis daubentonii* (2016). *Applied and Environmental Microbiology*. doi: 10.1128/AEM.02951-16
15. Hokynar K, Sormunen JJ, Vesterinen EJ, Partio EK, Lilley TM, Timonen V, Panelius J, Ranki A, Puolakkainen M. (2016). Chlamydia-like organisms (CLOs) in Finnish *Ixodes ricinus* ticks and human skin. *Microorganisms* 4: 28
16. Ruiz S, Espín S, Rainio M, Ruuskanen S, Salminen JP, Lilley TM, Eeva T. (2016). Effects of dietary lead exposure on vitamin levels in great tit nestlings—An experimental manipulation. *Environmental Pollution* 213: 688-697
17. Lilley T, Johnson J, Ruokolainen L, Rogers E, Wilson C, Schell S, Field K, Reeder D. (2016). White Nose Syndrome survivors have pre-WNS hibernation patterns despite *Pseudogymnoascus destructans* infection. *Front Zool.* 3:13:12
18. Vesterinen EJ, Ruokolainen L, Wahlberg N, Pena C, Roslin T, Laine VN, Vasko V, Sääksjärvi I, Norrdahl K, Lilley TM. (2016) What you need is what you eat? Prey selection of the bat *Myotis daubentonii*. *Mol Ecol* 25(7):1581-94
19. Lilley TM, Veikkolainen V, Pulliainen A. (2015). Molecular detection of *Candidatus Bartonella hemsundetiensis* in bats. *Vector Borne and Zoonotic Diseases*: 15(11):706-8.
20. Field KA, Johnson JS, Lilley TM, Reeder SM, Rogers EJ, Behr MJ, Reeder DM. (2015). The White-Nose Syndrome transcriptome: activation of anti-fungal host responses in wing tissue of hibernating little brown myotis. *PLOS Pathogens*: 11(9): e1005168.
21. Johnson JS, Reeder DM, Lilley TM, Cziráj GÁ, Voigt CC, McMichael JW, Meierhofer MB, Seery CW, Lumadue SS, Altmann AJ, Toro MO, Field KA. (2015). Antibodies to *Pseudogymnoascus destructans* are not sufficient for protection against white-nose syndrome. *Ecology and Evolution* 5: 2203–2214.
22. Rainio M, Eeva T, Lilley T, Stauffer J, Ruuskanen S. (2015). Effects of early-life lead exposure on oxidative status and phagocytosis activity in great tits (*Parus major*). *Comparative Biochemistry and Physiology* 167:24-34.

23. Veikkolainen V, Vesterinen E, Lilley T. & Pulliainen A.T. (2014). Bats are reservoir hosts of the human bacterial pathogen *Candidatus Bartonella mayotimonensis*. *Emerging Infectious Diseases*. 20: 960–967.
24. Lilley T, Stauffer J, Kanerva M. & Eeva T. (2014). Interspecific variation in redox status regulation and immune defence in five bat species: the role of ectoparasites. *Oecologia*. 175: 811-823.
25. Vesterlund SR, van Ooik T, Lilley T, Sorvari J. (2014). The effect of overwintering temperature on the body energy reserves and phenoloxidase activity of bumblebee *Bombus lucorum* queens. *Insectes Sociaux*. 61: 265–272.
26. Rydell J, Bach L, Bach P, Guia Diaz L, Furmankiewicz J, Hagner-Wahlsten N, Kyheröinen E, Lilley T, Masing M, Meyer M, Petersons G, Suba J., Vasko V, Vintulis V, Hedenström A. (2014). Phenology of bat migration around the Baltic Sea and south-eastern North Sea. *Acta Chiropterologica*.
27. Vesterinen EJ, Lilley T, Laine VN. & Wahlberg N. (2013). Next Generation Sequencing of Fecal DNA Reveals the Dietary Diversity of the Widespread Insectivorous Predator Daubenton's Bat (*Myotis daubentonii*) in Southwestern Finland. *PLoS ONE*, 8, e82168.
28. Lilley T, Ruokolainen L, Meierjohann A, Kanerva M, Stauffer J, Laine VN, Atosuo J, Lilius E-M, Nikinmaa M. (2013). Resistance to oxidative damage, but not immunosuppression by organic tin compounds in natural populations of Daubenton's bats (*Myotis daubentonii*). *Comparative Biochemistry and Physiology*. 157: 298-305.
29. Laine VN, Lilley T, Norrdahl K, Primmer CP. (2013). Population genetics of Daubenton's bat (*Myotis daubentonii*) in the Archipelago Sea, southwest Finland. *Annales Zoologici Fennici*. 50: 303-315.
30. Nokireki T, Huovilainen A, Lilley T, Kyheröinen E-M, Ek-Kommonen C, Sihvonen L & Jakava-Viljanen M. (2013). Bat rabies surveillance in Finland. *BMC Veterinary Research*. 9: 147-154
31. Lilley T, Meierjohann A, Ruokolainen L, Peltonen J, Vesterinen E, Kronberg L, Nikinmaa M. (2012). Reed beds may facilitate transfer of tributyltin from aquatic to terrestrial ecosystems through insect vectors in the Archipelago Sea, SW Finland. *Environmental Toxicology and Chemistry*. 31:1781–1787.
32. Lilley T, Ruokolainen L, Pikkarainen A, Laine VN, Kilpimaa J, Rantala MJ, Nikinmaa M. (2012). Impact of tributyltin on immune response and life history traits of *Chironomus riparius*: single and multigeneration effects and recovery from pollution. *Environmental Science Technology* 46:7382–7389.
33. Lilley T, Ruokolainen L, Vesterinen E, Paasivirta L, Norrdahl K. (2012). Sediment organic tin contamination promotes impoverishment of non-biting midge species communities in the Archipelago Sea, S-W Finland. *Ecotoxicology* 21:1333–1344.

34. Jakava-Viljanen M, Lilley T, Kyheröinen E-M, Huovilainen A. (2010). First encounter of European bat lyssavirus type 2 (EBLV-2) in a bat in Finland. *Epidemiol. Infect* 138:1581–1585.
35. Lilley T, Laaksonen T, Huitu O, Helle S. (2010). Maternal corticosterone but not testosterone level is associated with the ratio of second-to-fourth digit length (2D:4D) in field vole offspring (*Microtus agrestis*). *Physiol. Behav.* 99:433–437.
36. Lilley T, Laaksonen T, Huitu O, Helle S. (2009). Digit length ratio (2D/4D): comparing measurements from X-rays and photographs in field voles (*Microtus agrestis*). *Behav. Ecol. Sociobiol.* 63:1539–1547.
37. Helle S, Lilley TM. (2008): Maternal 2nd to 4th digit ratio does not predict lifetime offspring sex ratio at birth. *American journal of human biology.* 20:700-703.
38. Ruokolainen L, Lilley TM, Tammi, M, Vuorinen, I. (2006): Zooplankton in relation to cyanobacteria across a geographic gradient in Archipelago Sea, northern Baltic. *Boreal environment review.* 11: 1–11.

PUBLICATIONS INTENDED FOR THE GENERAL PUBLIC, LINKED TO THE APPLICANT'S RESEARCH

1. Lilley TM, Blomberg AS, Vesterinen EJ, Laine VN, Vasko VV. 2016. Book chapter: Korpien kaikuluotaajat (in: *Metsän salainen elämä*, eds. Hallanaro E, Sirkiä S, Juslén A, Ryttyäri T.). Gaudeamus, Helsinki, Finland.