Monthly Report

African Bat Conservation

June 2018

Pipistrelle (*Hypsugo sp.*)

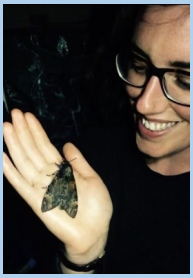
ABC Staff

Dr Emma Stone
Founder/Coordinator

Matt Town
Research Manager

Godwin Zimba
Community Engagement Officer

Becky Hazlewood
Research Assistant, Lilongwe



Karen Shevlin
Entomologist, Vwaza Marsh

Andrew Mcvinish
Research Assistant, Lilongwe

Abi Robison
Research Assistant, Vwaza marsh

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Masters students contribution to bat conservation

June has marked the return of students collecting data for their masters dissertation (Figure 1), this year we have four students conducting research in Lilongwe. Two students from Nottingham Trent University, Amelia Reddish and Angelena Efstathiou, have returned to collect additional data in an attempt to publish their findings. From the University of Leeds is Kieran O'Malley, undertaking a masters of research and Rebecca White completing a masters of science.

Figure 1. Masters students, Angelena, Amelia and Kieran

Roost selection by urban-living Mauritian tomb bats, *Taphozous mauritianus*

By Kieran O'Malley

Lilongwe is an excellent case study for the impacts of urbanisation across Africa, With its rapid growth in urban population, 4% annually. Analysing species responses to urbanisation can inform conservation management by identifying which species may be at greater risk of decline and if any species may benefit.

Bats may be particularly sensitive to urbanisation due to their high reliance on suitable roosting sites. Historically, bats would roost in natural structures such as caves, and whilst an increase in urbanisation has introduced novel challenges for bats, in many instances it has also provided them with unique opportunities. Artificial structures, such as houses and bridges, have been adopted by many bat species, with some roosting almost exclusively within them.

This intimate relationship between bats and their roost environment means the type and location of roosts is likely to play a significant role in determining bat survival and fitness. Therefore, understanding the processes behind roost selection is of utmost importance for future conservation and mitigation strategies in an increasingly urbanised landscape, where human-bat conflict is increasing.

Though studies of roost selection in urban settings are lacking in general, this is particularly the case within Africa. This study will therefore add to the growing but limited research on roost selection, with a focus on the Mauritian tomb bat (*Taphozous mauritianus*) (Figure 2). No studies have determined roost selection criteria in a species which roosts on the eaves of buildings, or indeed, into any aspect of the roosting ecology of the Mauritian tomb bat. This study thus aims to expand our current understanding of issues in behavioural and landscape ecology associated with roost fidelity, availability, and distribution.

Figure 2. Mauritian tomb bat (*Taphozous mauritianus*)

Urban Lilongwe project news

The impact of humane roost exclusion on the white bellied free-tailed bat

By Amelia Reddish and Angelena Efstathiou

Human-wildlife conflict is on the increase, particularly in parts of Africa where urban areas are rapidly encroaching on natural habitats. Despite many studies on human-wildlife conflict, there is limited literature on human-bat conflict. When humans and bats come into conflict, inhumane methods of control such as fumigation (which is used in Malawi) can result in mass mortality of whole colonies.

Figure 3. White bellied free-tailed bat (*Mops nivievente*)

Solutions to such conflict situations is hindered by a lack of research into species roosting preferences and suitable mitigation techniques. Humane roost exclusion is one way of alleviating human-bat conflict. Despite humane exclusion being viewed as preferable to fumigation there is little research as to what happens to bats post exclusion. The bats may struggle to find suitable alternative roosts post-exclusion and be forced to use sub-optimal roosts.

Despite the wide use globally of humane roost exclusion, only three studies have investigated its impact on bats, none of which were in Africa. This study aims to evaluate the effectiveness of humane roost exclusion as a human-bat conflict mitigation measure one of which was published by ABC founder Dr Emma Stone. Based in Lilongwe, the capital of Malawi, the study focuses on the white bellied free tailed bat (*Mops nivieventer*)(Figure 3) which is commonly found in urban areas across sub-Saharan Africa. This will be done using radio telemetry (Figure 4) to determine whether roosting and foraging behaviour differs between pre and post-exclusion conditions. We aim to better understand the impacts of humane roost exclusions on the white bellied free tailed bats roosting and foraging ecology which will help inform mitigation protocols (Figure 5).

Figure 4. Amelia and Angelena fitting radio telemetry tags to *M. nivieventer*

Figure 5. ABC research with Masters students attempting to hand net bats as they leave a roost.

Urban Lilongwe project news

Parasite abundance and diversity of urban bats

By Rebecca White

My name is Rebecca, I am currently studying a Masters of Science at the University of Leeds (Figure 6), in Biodiversity and Conservation. I am working with African Bat Conservation in Malawi to conduct research for my final project. This explores abundance and diversity of ectoparasites on the bats captured within Lilongwe, and how these may be affected by certain biotic and environmental factors. In order to collect the ectoparasites from bats, I will be trialling the use of flea and tick powder which has been used in bat care to remove ticks, fleas and mites, but not in the removal of parasites for research purposes. Additionally, a physical scan of the bats body and wings for parasites will be done to make sure no parasites are missed. However, only parasites greater 1 mm in size can be seen amongst the fur and collected efficiently.

Figure 6. Leeds master student Rebecca White

This research will be insightful into what ectoparasites the bats in Lilongwe are harbouring, and which factors increase the likelihood of certain ectoparasites and parasite load. This will show possible transmission pathways which could be available for new and emerging zoonotic diseases from bats to humans, aiding future research into zoonotic diseases which can be spread from bats to humans.

Urban wildlife club visit

An important aspect of African Bat Conservation's work is community outreach and education to teach Malawians about bats and conservation. On 21st June African Bat Conservation visited Cherub Primary School's Wildlife Club to deliver an educational talk. Our Community, Outreach and Education officer, Godwin Zimba was accompanied by Research Assistants Andrew McVinish and Abigail Robinson and MSc student Rebecca White (Figure 7). Godwin discussed with the children what bats are and explained why bats are important to both us and the ecosystem. Most children already understood that bats are beneficial to us by feeding on mosquitos that carry malaria. However, they learned that bats are important as natural pest control and eat insects that feed on their crops and forest regeneration. Many of the children talked about having bats in their homes, so Godwin left them all with an assignment to go home and see if they do have bats in their houses. Community outreach is a fantastic opportunity to identify new roosts so the ABC team can carry out more surveys for long term roost monitoring.

Figure 7. ABC delivering a talk to Cherubs wildlife club

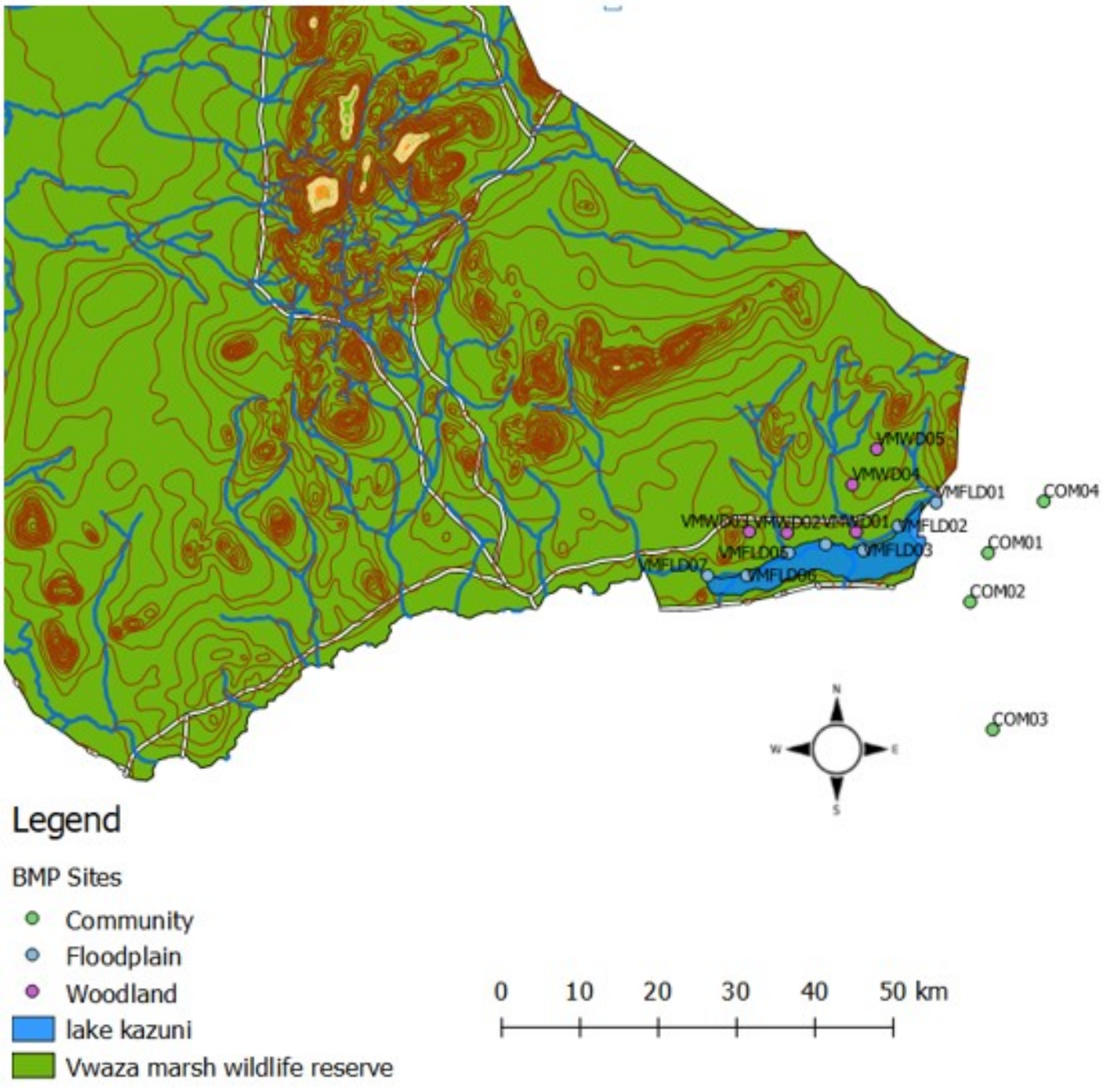
ABC Bat Species List

No	Latin Name	Common Name	Locations Caught				
			Liwonde Park	Lilongwe	Nyika NP	Vwaza Marsh WR	Other
1	Chaerephon sp.	Free-tailed bats		X			
2	Chaerephon ansorgei	Ansorge's free-tailed bat	X				
3	Chaerephon pumilus	Little free-tailed bat	X			X	
4	Eidolon helvum	Straw-coloured fruit bat		X			X
5	Epomophorus crypturus	Peters's epauletted fruit bat	X	X		X	X
6	Epomophorus labiatus	Little epauletted fruit bat	X	X		X	
7	Epomophorus wahlbergi	Wahlberg's epauletted fruit bat	X	X		X	X
8	Epomops dobsonii	Dobson's epauletted fruit bat		X		X	
9	Eptesicus hottentotus	Long-tailed serotine	X				
10	Glauconycteris variegata	Variegated butterfly bat	X			X	
11	Hipposideros caffer	Sundevall's leaf-nosed bat	X	X		X	
12	Hipposideros gigas	Giant leaf-nosed bat	X				X
13	Hipposideros ruber	Noack's leaf-nosed bat	X				
14	*Kerivoula lanosa*	Lesser woolly bat				X	
15	Laephotis botswanae	Botswana long-eared bat	X				X
16	Lissonycteris goliath	Harrison's soft-furred fruit bat					X
17	Mimetillus thomasi	Thomas's flat headed bat	X				
18	Miniopterus sp.	long-fingered bats	X				
19	Mops condylurus	Angolan free-tailed bat	X			X	X
20	Mops niveiventer	White-bellied free-tailed bat		X			X
21	Myotis bocagii	Rufous myotis	X	X		X	X
22	Myotis tricolor	Temminck's myotis	X				X
23	Myotis welwitschii	Welwitsch's myotis	X				
24	Neoromicia sp.*	Pipistrelles	X	X		X	X
25	Neoromicia nana	Banana bat	X	X	X	X	

ABC Bat Species List

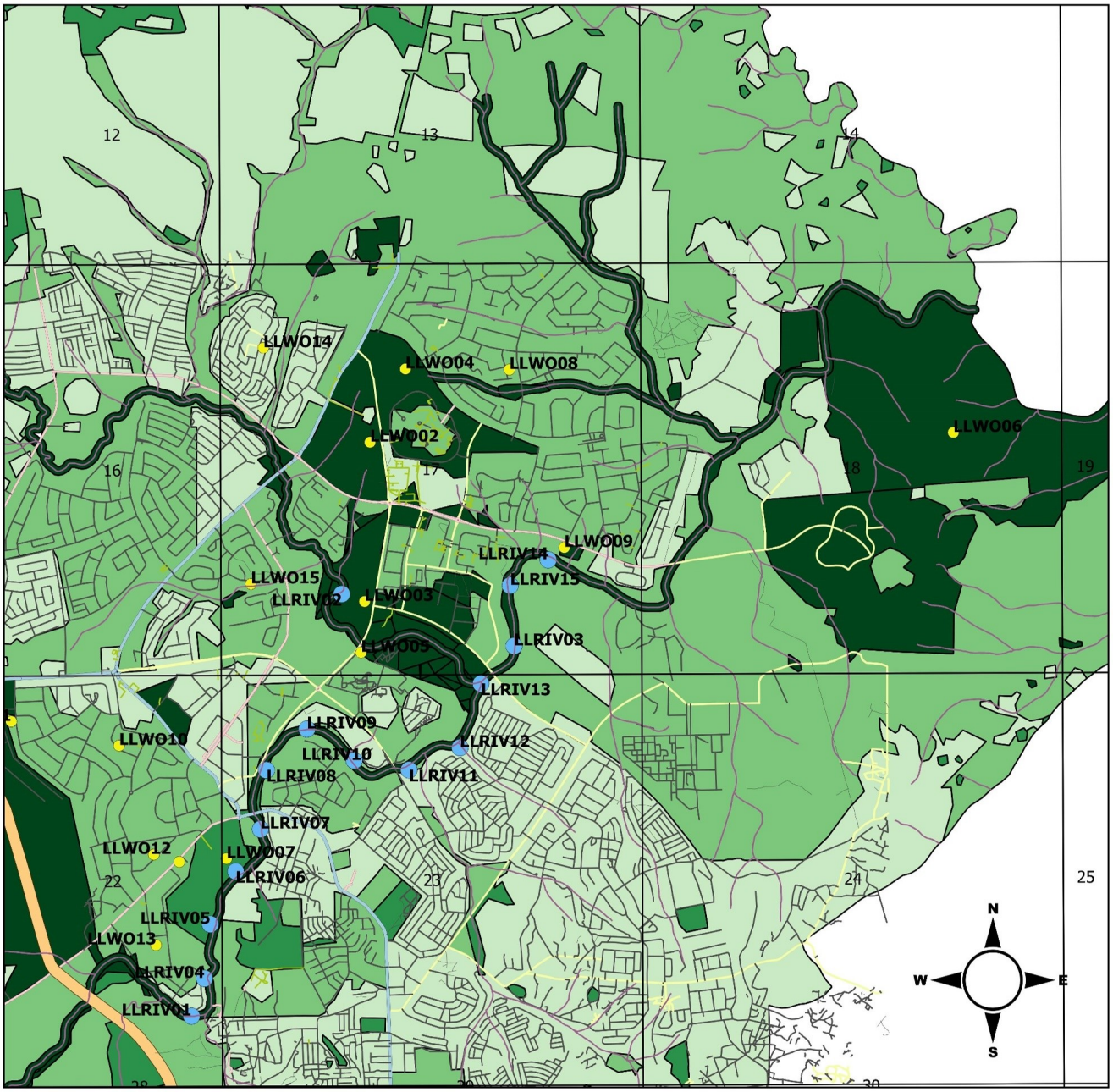
No	Latin Name	Common Name	Locations Caught				
			Liwonde NP	Lilongwe	Nyika NP	Vwaza Marsh WR	Other
26	Neoromicia rendalli	Rendall's serotine	X			X	
27	Nycteris grandis	Large slit-faced bat	X				
28	Nycteris hispida	Hairy slit-faced bat				X	
29	Nycteris macrotis	Large-eared slit-faced bat	X				
30	Nycteris thebaica	Egyptian slit faced bat	X			X	
31	Nycticeinops schlieffeni	Schlieffen's twighlight bat	X			X	
32	Pipistrellus sp.*	Pipistrelles	X	X	X	X	X
33	Pipistrellus rueppellii	Ruppell's pipistrelle	X			X	
34	Rhinolophus clivosus	Geoffroy's horseshoe bat		X			
35	Rhinolophus fumigatus	Ruppell's horseshoe bat	X			X	
36	Rhinolophus hildebrandtii	Hildebrandt's horseshoe bat	X			X	
37	Rousettus aegyptiacus	Egyptian rousette	X				
38	Rousettus lanosus	Hairy rousette			X		
39	Scotoecus hindei/albigula	Dark-winged lesser house bat	X	X		X	X
40	Scotophilus dinganii	Yellow-bellied house bat		X		X	X
41	Scotophilus leucogaster	White-bellied house bat	X				
42	Scotophilus viridis	Green house bat	X	X			
43	Scotophilus nigrita	Giant yellow house bat	X				
44	Tadarida aegyptica	Egyptian free-tailed bat					X
45	Tadarida ventralis	Giant free-tailed bat					X
46	Taphozous mauritianus	Mauritian tomb bat	X	X		X	
47	Triaenops afer	African trident bat	X				X

BMP Sites in Vwaza Marsh



BMP Sites in Lilongwe

Urban Bat Project BMP sites



Legend

- River sites
- Garden sites
- Priority
- High
- Medium
- Low

0 1 2 3 4 5 6 7 8 9 10 km

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