Monthly Report

African Bat Conservation

September 2018

Botswana long eared bat, *Laephotis botswanae*

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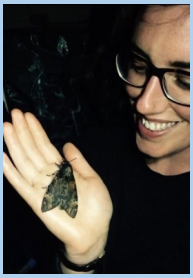

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Contents

ABC News

Staff Member Returns to ABC

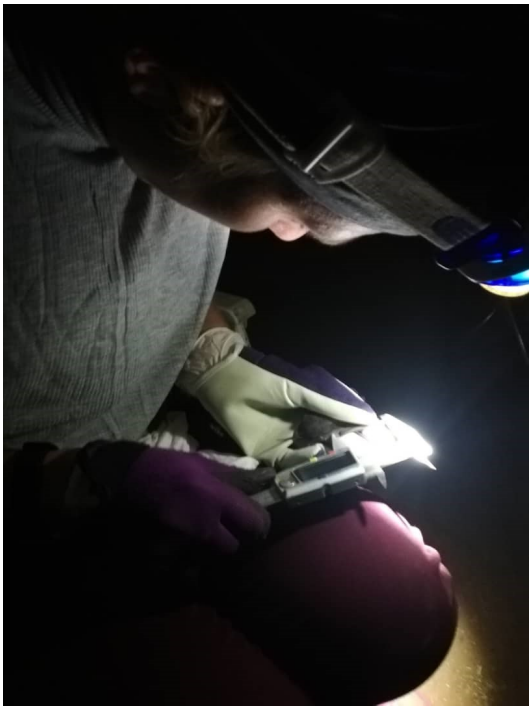

Figure 1. ABC is excited to have back our research assistant from 2016, Kelly Rosier.

ABC welcomes back research assistant Kelly Rosier (Figure 1). Kelly first visited African Bat Conservation in 2016 to work on the Urban Research team for 6 months and we are delighted to welcome her back for a further 3 months as research assistant for both our teams in Lilongwe City and Vwaza Marsh.

Kelly was a part of the ABC team in Vwaza Marsh delivering the Biosphere Expedition programme to visiting citizen scientists. This included introducing them to Malawian bat ecology and conservation and training the participants in ABC's research methods.

Following her time in the bush, Kelly returned to the city to assist the urban team with their current research projects. Kelly is looking forward to working with African bats once again and using her skills previously gained with us to continue bat conservation in Lilongwe. She is most excited to be helping with the Eidolon project and getting this project set up in time for the arrival of the straw-coloured fruit bats (*Eidolon helvum*) in the city and continuing with the outreach and education that is vital to the growth and longevity of our conservation efforts across Malawi.

Bishop Mackenzie International School Field Course

By Becky Hazlewood, Research Assistant

This month ABC welcomed 43 year 7 school students from Bishop Mackenzie International School (BMIS) who came to participate in a 'Week Without Walls' programme.

In preparation for the week, Becky from ABC and Maddie from Carnivore Research Malawi carried out two interactive introductory sessions with the students. These sessions focussed on bat and carnivore ecology, dispelling myths, and discussions around bigger picture environmental issues, both locally and internationally, using some activities based on the UN Sustainable Development Goals to help explain some of our pressing conservation issues.

Following the sessions the children arrived full of energy and enthusiasm for a four day programme of fieldwork and interactive sessions to teach them about bats and carnivores.

The bat courses taught children about bat ecology, roosting behaviour and foraging behaviour as well as going into detail about issues such as habitat loss, species conservation and human-wildlife conflict mitigation. Lots of games, workshops and quizzes were used to make the programme engaging and memorable for the students.

The students also participated in fieldwork activities, such as bat box checks, building surveys and roost visits. Each evening ABC took groups to observe different types of capture and survey methods. We carried out mist and harp trapping at the Kumbali tobacco barn where we caught a number of species to show the children including *Scotophilus dingani, (*Yellow bellied house bat), *Chaerephon pumilius (*Little free-tailed bat), *Mops niviventer* (White-bellied free-tailed bat) and *Hipposideros caffer (Sundevall's Leaf nosed bat)*. The children found it fascinating to see the bats up close and were full of questions for the entire four days.

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At the Kumbali dairy barn we carried out a roost capture and showed the children how to conduct an emergence survey. We caught over 20 *Mops condylurus* (Angolan free-tailed bats) on each night giving plenty of opportunity for everyone involved to see the bats and learn about their roosting behaviour.

On the final day we surveyed at base camp and caught *Epomorphous wahlbergi,* a new bat family for the students to observe, along with a Nightjar and a Blue Waxbill bird.

Overall, the students went away as newly formed up and coming conservationists, filled with enthusiasm for bats and all the interesting things there are to learn about them.

Biosphere Expeditions join us at Vwaza Marsh

Figure 2. The front gate of Vwaza Marsh Wildlife Reserve Research Camp

By Andrew McVinnish and Kelly Rosier

At the start of this month ABC began its exciting new partnership with Biosphere Expeditions (BE) in conjunction with Lilongwe Wildlife Trust (LWT). Biosphere expeditions allow people who may not have a background in wildlife research to assist in conservation projects across the world. Each expedition usually consists of 12 people who work for 13 days helping the local scientist in the collection of data for important conservation research.

This is the first time BE has run an expedition in Malawi and ABC and LWT have joined forces to host them at the Vwaza Marsh Wildlife Reserve Research Camp (figure 2). Participants from BE assist in all forms of research with both organisations. Helping with ABC's Biodiversity Monitoring Program

(BMP), undertaking bat, vegetation and insect surveys, as well as assisting LWT with hippo counting and large mammal transects (LMT's). There have been two groups of participants so far with the last group starting on the 5th of October.

Participants from BE are put through rigorous training in all the survey techniques they will use in the first few days of each expedition. This includes lectures on study animals and how data is collected on them. Participants were given lectures on the identification of bats in Vwaza Marsh then were taught how to set up the mist nets and harp traps (Figure 3).

Figure 3. Biosphere participants on there training days learning to set up a mist net

This has been very successful. BE participants so far have helped to conduct 9 bat surveys including BMP's, opportunistic and roost surveys. With the cold dry season coming to an end the number of bats being caught is quickly increasing; the first group only caught eight over the 2 weeks they were here while the current group has caught 21. So far, with BE's help, 29 bats have been caught from four species across three families (Figure 4).

During the first expedition whilst on the bat capture surveys we caught *Epomophorus labiatus* and *Vesper A* species using the mist nets and 5 *Chaerophon pumilus* in the harp traps. The *Epomorphous labiatus* and Vesper species was caught during a lakeside BMP survey whilst the *Chaerophon* were caught at the office we have local to the field site.

Figure 4. Research Assistant Andrew with a Little epauletted fruit bat (*Epomophorus labiatus*), demonstrating how to take measurements.

We also visited the office at dusk to complete an emergence survey as we noticed bats emerging during the BMP survey. Four participants and two staff members were located around the office blocks counting the number of bats that appeared for an hour after sunset. We estimated that over 130 bats from at least two species were roosting in the woodwork and roof space of the building with different emergence points around the site.

Karen, our entomologist, has taken this opportunity to expand ABC's work with insects. Along with setting out light traps as part of a BMP survey, opportunistic insect traps have also been set up; these include butterfly traps (Figure 5) and pitfall traps.

Figure 5. Staff member, Karen helping participants assemble a insect trap.

One exciting entomological find occurred one evening by absolute chance. Ida, our expedition leader, noticed an interesting looking insect in camp and immediately sought Karen's advice. This insect turned out to be a member of the web-spinner family.

Figure 6. An Emiodea, a new order of insect found at Vwaza Marsh, this wasn't caught in a trap but found on the dinner table.

Web-spinners, belonging to the order Embioptera (Figure 6), are rarely seen insects that live in dead wood creating galleries out of silk it spins from its forelegs. With only 360 described species worldwide the one found in Vwaza may also be a species new to science.

Over the next 4 weeks two more groups of citizen scientists will be joining us to continue the work and we are very excited to see how many more bats they catch in this time and if they can identify any new roosts!

Update on urban guano trial

By Susan Eshelman, Research Assistant

The Urban research team has been continuously working on our guano project over the past month. Bat feces, also known as guano, contains a variety of key nutrients, such as nitrogen, phosphorous and calcium, needed for plant growth. This study focuses on the use of guano as a fertilizer for maize crops, using a combination of treatments with and without organic fertilizers. The main aims are:

1) to determine if guano is a suitable fertilizer for crops
2) to provide local farmers with an appropriate application rate of guano
3) to measure the effectiveness of guano in comparison to other organic fertilizers.

By increasing our knowledge of the ecosystem services provided by Malawian bats, we hope to aid in their conservation.

In total, there are 1775 maize plants receiving one of the five treatment types (guano high, guano low, guano high fertilizer, guano low fertilizer, and fertilizer). So far, a majority of the maize plants have grown significantly (Figure 7) with the guano low treatments growing at the fastest rate. The plants are watered four times a week and measured every two weeks. In the coming weeks we hope to see even more growth and will be harvesting the plants for drying and weighing around the end of October. With the project just over half-way through, the urban research team is excited to see the outcomes and the potential use of guano .

Figure 7. Maize plants showing significant growth at the Urban Research Camp.

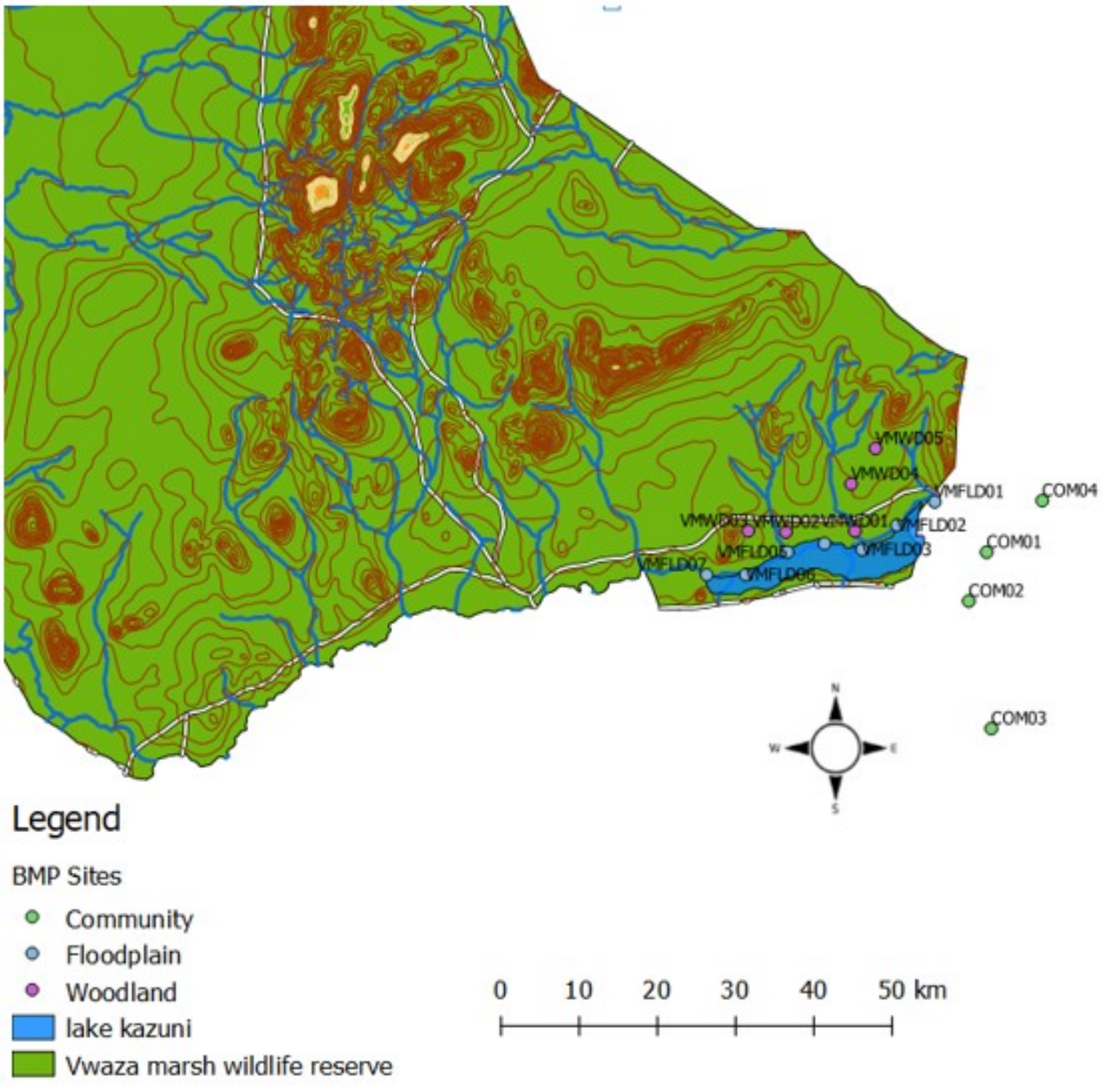
ABC Bat Species List

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	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	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			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

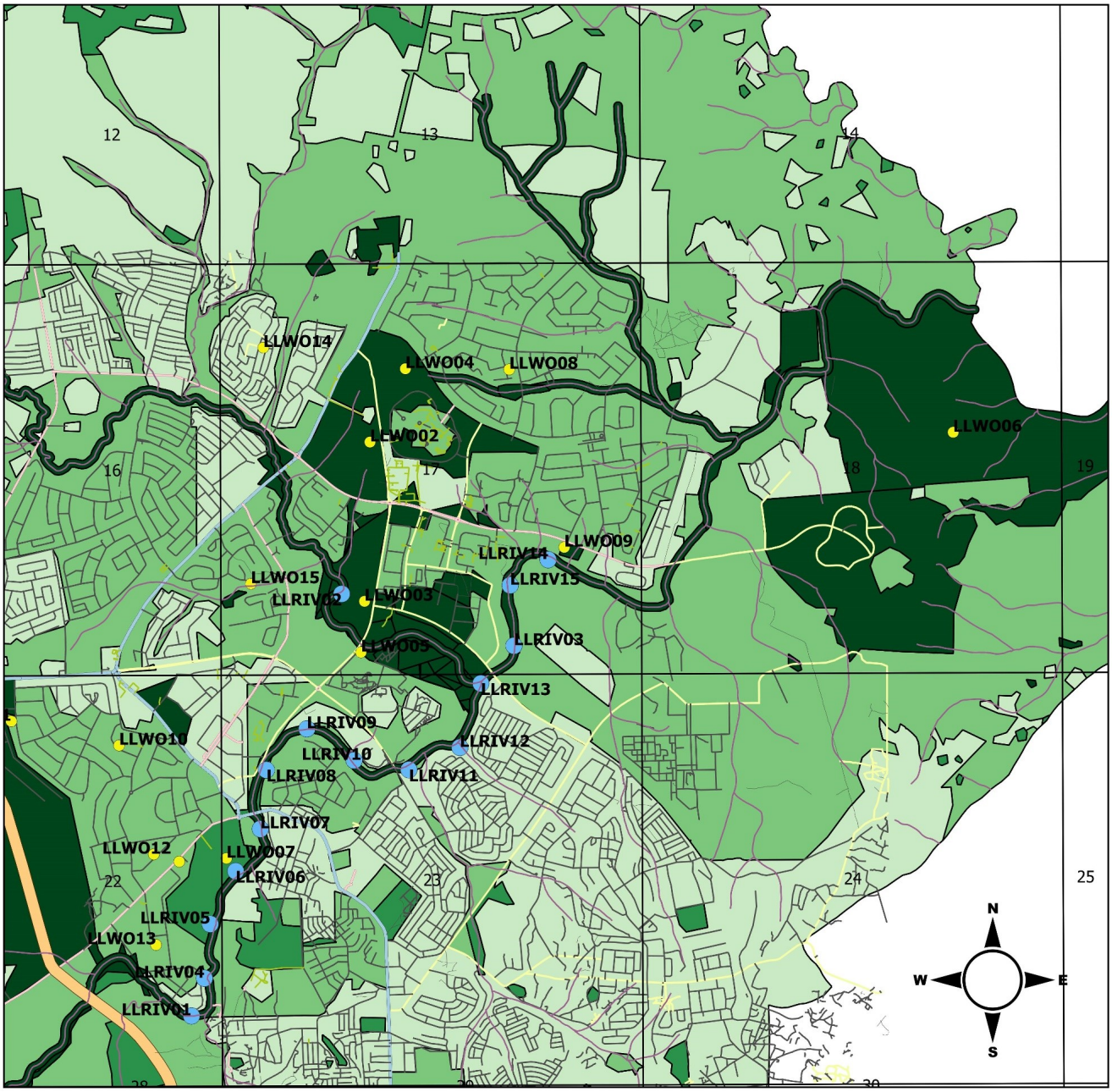
No	Latin Name	Common Name	Locations Caught				
			Liwonde NP	Lilongwe	Nyika NP	Vwaza Marsh WR	Other
26	Neoromicia rendalli	Rendall's serotine	X			X	
27	Nycteris grandis	Large slit-faced bat	X				
28	Nycteris hispida	Hairy slit-faced bat				X	
29	Nycteris macrotis	Large-eared slit-faced bat	X				
30	Nycteris 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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