

IUCN BAT SPECIALIST GROUP

NEWSLETTER

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EDUCATION FOR BAT CONSERVATION



Dear Readers,

It is with great pleasure that we present the second volume of the IUCN Bat Specialist Group Newsletter. Our aim is to inform the BSG community about important bat conservation strategies worldwide.

We hope you enjoy the reading,

Maria Sagot, Editor of the IUCN Bat Specialist Group Newsletter

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EDITORIAL

By Laura Navarro

Although we constantly hear about education as one of the most important tools to prevent environmental degradation and species extinction, and to rethink future Conservation scenarios, in Biology, generation and documentation of knowledge pertaining to severe environmental threats such as fragmentation, habitat degradation and pollution, have been carried out exclusively by scientists. Education is considered the best solution to our problems, as it provides better opportunities for future generations. Today, education is a fundamental right for all human beings, allowing acquisition of knowledge and fulfilment in our lives. However, education is not a magic wand. It is more a process that facilitates learning and enhances virtues, values, beliefs and habits. Thus, education is a long-term process and results are not seen although immediately; motivation and interest can be detected at early stages.

When it comes to bats, this process has been different because it has been the scientists, dedicated to research, that have considered education as one of the most important tools for chiropteran conservation. These scientists have recognized how essential it is that people learn why bats are important. But they have gone beyond education, they have been proactive and have formed multidisciplinary groups. These scientists have actively participated in the design and implementation of different educational strategies. This has been a great achievement, if we consider that most scientists are only dedicated to generate basic scientific knowledge and do not get involved in specific conservation actions, while people dedicated to the social aspects of conservation lack the scientific knowledge necessary to generate successful conservation strategies.

Twenty-five years ago, thinking that there were bat conservation programs with solid and operational educational components, was a dream. This issue of the IUCN-BSG newsletter shows that this is now possible. After reading this issue, you will learn about a great diversity of educational experiences in bat conservation around the world. Different continents have developed specific strategies that have seek to counteract the bat negative human influence on populations. The experiences shared here are remarkable examples of how, through organization, bat conservation social projects have improved the guality of life in local communities and have many established successful conservation plans for multiple bat species.

I am not sure if it is the bats or the people interested in them, but what I do know is that bats evoke passion to those who learn about them, and that is why there is a growing interest in protecting them. Although scientific knowledge and education are fundamental tools for bat conservation, it looks like the passion for bats is not learned, it is contagious.

Laura Navarro is the education, communication and community work coordinator for PCMM (Mexican Bat Conservation Program) and RELCOM (Red Latinoamericana para la Conservación de los Murciélagos. She has developed education and communication strategies for bat education and conservation in Latin America

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Report of Establishing an Intercessional Working Group on Education in UNEP/EUROBAT Advisory Committee

By Hossein Zohoori

Convener of IWG on Education and UNEP/EUROBATS Scientific focal point

Co-Chair of SCBAT (South Coast Bat Action Team, BC, CANADA

Assistant professor of Environmental Sc. Department, Natural Resources Faculty, IAU, Arak/Iran

Introduction

It needs no reminder that education is the basis of everything and as the requirement for expertise the grows, so does requirement education. for Many developing countries lack standard educational methods in relation to bats, especially at the elementary level, and the absence is sorely felt.

We have many scientific groups (such as EUROBATS¹) that have focused on particular areas of bat research but they are aimed at academic communities. We need to explain the results of these studies in a way that is accessible for all people. This is where we have a gap.

To partly fill this gap, as a scientific focal point of the advisory committee of EUROBATS, I suggested to them that a new intersessional working group (IWG) called EDUCATION be added to the list. This new IWG's mission will include collecting educational methods, cataloguing them, and pursuing education and improving the knowledge level of countries. Yearly activity reports of this IWG will be presented at the meeting of the advisory committee. It is worth emphasizing that the main focus of this IWG needs to be on education at the elementary level, especially in developing countries where the need is greatest.

Education Levels

1. Basic: For children and young adult age groups.

2. Middle: For the young and for amateur enthusiasts.

3. Advanced: For students in relevant fields and professionals.

Scope of Operation

 Basic level: kindergartens, preschools, elementary and middle schools.
Middle level: high schools, city, public and conference halls.

3. Advanced level: universities and colleges, workshops, museums and relevant organizations.

During the 18th EUROBATS Advisory Committee meeting in Heraklion/Greece, based on my suggestion, members agreed to

¹ EUROBATS have created for the Agreement on the Conservation of Populations of European Bats came into force in 1994 and until now a total of 36 out of 63 range states have acceded to the Agreement (some European, south west Asian and north African countries). Now it has 16 Intersessional Working Groups (IWG) with active members that they are

trying to conserve bat populations. A look at various IWGs of EUROBATS shows that all of them are based on education, but this education is mostly professional in nature.

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create a new intercessional working group entitled EDUCATION.

The aims of IWG are:

1. To provide Guidelines on bat education programs and awareness that consider different approaches, efforts and possibilities in education;

2. To provide training and adequate materials for educators.

After one year, we have collated references in some languages and are trying to review what resources we have available and identify what we need to develop.

Many countries don't fall under the EUROBATS mission, so it was good to talk with Dr. Tigga Kingston (Co-chair on

BGS/IUCN) about our new IWG and I suggested the creation of an Education working group within the IUCN Bat Specialist Group (BSG). This would expand our work on education to a truly international audience, and the BSG could use the IWG on Education's experiences.

Method of Implementation

Interested and expert parties across the world are officially invited to share their documented experiences with the working group.

Countries can be divided into a number of groups according to continent and each group can have a "point group", which would collect and collate the reports and present them to the working group for the final decisions.

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The goal here is to collect in one place the existing methods, along with ideas on new methods, based on existing experiences. Therefore, in addition to general education, pursuing "training for trainers" will be important.

Of course, this is a generic algorithm and parts of it that don't fall under the scope of operations can be omitted. We also need to finalize this proposal for action.

Conclusion

The education department can study and review the success rate of each method of education for each zone and country, to advise and and propose guidelines for BAT EDUCATION, and each country would then standardize its own educational programs based on this plan.

Clearly, this is a long term plan, but the hope is for it to revolutionize bat education and awareness.

AFRICA

Putting bats on the map in Malawi - Working to conserve bats and biodiversity through applied research, education and capacity building

By Emma Stone

Malawi is recognized by the International Union for the Conservation of Nature (IUCN) as being of key importance to bat conservation in Africa, due to its high species richness (57 species); corresponding to 30% of Malawi's mammalian diversity (Hutson et al. 2001). However little is known about the status, distribution and diversity of bats and the ecosystem services they provide.



African Bat Conservation (ABC) is a nonprofit project which aims to conserve bat populations in Africa through applied conservation research, education and capacity building. Based in Malawi, we conduct a number of research and conservation projects in partnership with the University of Bristol UK, the Department of National Parks and Wildlife Malawi (DNPWM) and Lilongwe Wildlife Trust (LWT). We beilgge aim to use conservation inform research to conservation management and create awareness to

conserve and secure bats populations in Africa.



Based in our research camp in Liwonde National Park, the ABC research team consists of two research assistants, one community outreach officer and numerous MSc students and volunteers. ABC conducts research on a variety of topics including bat roosting and foraging behavior, human-wildlife conflicts and pest control.

We are also developing a national bats and biodiversity monitoring programme, which will be extended throughout the country to ensure long term monitoring of bats and biodiversity in Malawi. Project results will be used to inform and update IUCN species status reports, as many of the species in Malawi have yet to be comprehensively assessed.

A key aspect of the project is increasing community understanding of bats and biodiversity and their importance for ecosystem services. We are developing community education programmes in collaboration with Lilongwe Wildlife Trust, to dispel myths and raise awareness about bats.

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ABC education activities are being integrated into the LWT Eco-Schools Programme which will be implemented nationwide within the Malawian National Curriculum. We are also conducting public awareness activities to reduce human-bat conflicts and to increase understanding of the importance of bats. In collaboration with the Bat Conservation Trust (UK) and LWT, we are launching a bat helpline to provide bat specific advice to the public who experience conflict with bats roosting and/or foraging in buildings, farms or trees in their communities. Through this programme we aim to reduce the number of colonies being destroyed, caused by the lack of understanding of non-lethal mitigation strategies.

ABC also conducts training workshops to build local capacity in bat research and monitoring techniques including harptrapping, acoustic surveys, mist netting and light sampling. Through our partnership with Lilongwe University of Natural Resources (LUANAR), students are affiliated to the ABC team to gain experience in conservation research and biodiversity conservation.

Find out more about ABC and their work at www.africanbatconservation.org.

Raising awareness for the conservation of Romanian horseshoe bats

by Szilárd Bücs¹

Getting the attention of the sometimes inert public is a constant activity for those involved in conservation. Educating new generations requires the update of old methods or the invention of new ones. Key messages need to be constantly repeated and must have high visibility.

Raising awareness and engaging the public is sometimes hard even in case of beloved species, like rhinos, lions and gorillas. It's even harder in case where legends and misconceptions cloud the judgment of the public. Bats are highly beneficial to our planet, as they offer significant ecosystem services, but seldom is the public aware of these facts. Under such circumstances it comes as no surprise that bats are often met with unfounded aggression, with cases of intentional destruction of colonies and roosts. The positive attitude of media outlets is ephemeral. All this results in a distorted view about bats, and can significantly hinder conservation efforts.

Although Romania has seen several campaigns aimed at raising awareness about bats, much work remains to be done in order to be truly effective. To strengthen the conservation of horseshoe bats in Romania, we implemented the project "Protecting the horseshoe bats in Romania" in the period of 2014-2015, with a significant part of our work aimed at education and awareness. Financed by the Conservation Leadership Programme and the in-kind contribution of the Romanian Bat Protection Association, the project received the Future Conservationist Award in 2014.



Figure 1. The project proved the constant presence of Méhely's horseshoe bat (*R. mehelyi*, left) in SW Romania, and also discovered one of the largest European colonies of the greater horseshoe bat (*R. ferrumequinum*, right).

Alongside our scientific (Fig. 1) and durable management objectives, we set out to positively influence the Romanian public's attitude regarding horseshoe bats and bats in general. During these activities we interest targeted several groups: elementary school children, high school teenagers, university students, caver organizations, but also the general public. Because of the existence of several target group types, we used a diverse array of methods to communicate our kev Repeated messages. frequently throughout the project, our messages focused on (1) countering myths and misconception with facts and attractive imagery, (2) the benefits of bats for humanity and (3) simple ways of public contribution to bat conservation.

Social media is a fast way to communicate news to audiences, so the first step was to set up the project's Facebook page (https://www.facebook.com/clp.rhinoloph us/). We regularly share national and worldwide news about bats, especially about the ecosystem services provided by bats. Every post is written in three languages (Romanian, Hungarian, and English) to maximize reach. Besides following the activities of the project, a core element in the content of the Facebook page is a photo gallery, entitled "Must know". The gallery contains attractive imagery combined with basic information about bats and their biology, quantified, easy-tounderstand facts about ecosystem services, as well as awareness about simple ways of public contribution to bat protection (Fig. 2). We emphasize the necessity not to disturb nursery and hibernation colonies and also draw attention to the continental importance of the Romanian bat fauna. Currently with over 2,500 Likes, the page has a considerable follower base, and has become, since project inception, one of the main information resources for bats in Romania.



Fig. 2. Key messages posted to the Facebook page of the project informed the public about proper behavior when meeting bats and bat colonies.

One of the most important parts of any education and awareness work is talking to young generations. In this sense, the project team held presentations about bats to children from elementary classes, teenagers from high schools, but also to university students. We created a visually captivating presentation that contained simple messages and call-to-action. Participants learned about the contribution of bats to the reproduction of more than 450 plant species worldwide, including bananas, mangoes and avocado. They also learned that by eating more than 2,000 mosquitoes per night, even the smallest Romanian bat (P. pipistrellus) is an obvious contributor to a carefree life. And by the example of the world's largest bat colony from Bracken Cave, participants realized the immense contribution of bats in controlling the size of harmful insect populations, thereby aiding agriculture and silviculture.

Presentations were consciously planned to be held during the "Other kind of School" open education week of Romanian Schools, in April 2015. After only 15 presentations, held in 9 cities (15 locations) for a total of 305 participants, the feedback of the audience is overwhelmingly positive (Fig. 3-4). Participants can easily recall key messages, like the fact that we need to protect bats, because they contribute to the production of chocolate (through the pollination of the cocoa tree). Based on questionnaires answered before and after presentations, the public's negative / wrong answers about bats decreased from an overall of 27% to 3% after presentations. In some cases, for example regarding the question about the entanglement of bats in our hair, wrong answers decreased from 95% to 0% after presentations.

In cases where key bat roosts are located in the vicinity of human settlements, or in case of anthropogenic bat roosts inside localities, informing the public is crucial for adequate protection of the site and the colony. During our project we encountered two such cases, and in consequence two of our educative presentations can have direct and immediate results for bat conservation.

In one case, we talked about bats to the young, receptive audience of Limanu village (Fig. 3, right), in South-Eastern Romania. The village is in the immediate vicinity (<500 m) of the single most important *R. mehelyi* roost of Romania, the Limanu cave. With only 150 adult *R. mehelyi* (out of an estimated former population of 5,000 bats) the site is under enormous anthropogenic pressure, with frequent cases of vandalism and repeated

destruction of the protective cave gate. To counter these factors and enhance passive protection, we partnered with the cave custodian, the GESS group, to raise awareness in the local community. Based on the great number of participants (55 children of the local elementary school), we positively influenced the most open minded 10% of the population with our bat presentation.



Fig. 3. Audiences at two key locations: Sasca Montană locality (left), and Limanu village, (right) during the education activities of the project. Local communities are crucial in the conservation of colonies located close to, or inside localities.

In the second case, we reinforced concrete conservation measures in Sasca Montană locality with an educative presentation about bats (Fig. 3, left). Inside this locality our team discovered during the project the largest *R. ferrumequinum* colony located in an anthropogenic roost from Romania. With two additional species present, the R. ferrumequinum colony (350 bats) makes up only half of the total colony size, which is well above 700 bats. The building was in degradation, with threats of immediate roof collapse, but in frame of a project funded by the EEA grants, our association reconstructed key elements of the building, without disturbing bats. However, for truly efficient conservation work, awareness needed to be raised in the local community.

The presentation held at the local school (Fig. 3, left), for the small, but enthusiastic audience transmitted key messages of bat protection and the benefits of such a large colony. The long term collaboration agreement signed with the school administration will ensure that bats continue to be present in the educative development of children, who will surely pass on their knowledge to their parents and friends. In addition, we published a short, awareness raising article in the small local newspaper, emphasizing again the role of bats and the need of protection.

In order to reach a larger, more widespread audience, our team has created an educative brochure about bats, containing arguments for the necessity of bat protection and details about target horseshoe bat species of the project. Printed in 1.000 copies, the brochure was distributed in key locations across Romania not only during presentations, but also in protected areas, at tourist attraction sites, for local authorities and caver associations.

To ensure the permanent nature of information about the importance of bats and to allow it to be shared with anyone, we used the most adequate method for information sharing, the internet. We wrote short, awareness raising articles for highly visited websites, for example to the Outside the popular Think Box (http://totb.ro/) webpage. Articles deal legends and misconceptions, with adequate behavior in case of human-bat contacts, and the benefits of bats worldwide. Written in Hungarian and Romanian, our educative articles reached a diverse audience.



Fig. 4. Left: elementary school children and their selfmade bat artwork, after a bat themed presentation in South-Eastern Romania. Right: Q&A session after an educative presentation in a school from Resita city, South-Western Romania.

Another visually attractive and high impact communication method is the distribution of stickers. With the possibility to display it on personal or professional belongings, key messages are constantly displayed and shared with no effort. Children are especially happy about stickers. Hence, we created a sticker series about the five Romanian horseshoe bat species, completed with a sixth, displaying a happy bat going to school (Fig. 5). The six part sticker series was mainly distributed during the educative presentation.



Fig. 5. Six out of the ten sticker types distributed throughout the project. The two colored stickers are part of the series about horseshoe bat species, while the black & white stickers contain key messages directed especially at cavers.

In addition to the stickers about horseshoe bat species, we wanted to influence also a very specific type of audience. Cavers can direct contributions for have bat conservation, either by discovering new colonies, or by consciously changing exploration plans in order to reduce disturbance. Their involvement is crucial for the protection of key underground sites. Besides the active inclusion of cavers into field work activities of the project and teaching them basic bat identification methods, we created a series of stickers that can be displayed directly on caver equipment (Fig. 5).

The two sticker series about horseshoe bat species and adequate cave behavior were distributed in more than 1.200 copies all over Romania, but also in a targeted manner, during education activities to schools, and important caver organizations of Romania. The success of the sticker series is confirmed by constantly receiving new requests to print and distribute more copies. Because it is a low cost output, we plan to continue printing (and adapting) these stickers for future activities.

Overall, our education and awareness activities in frame of the CLP funded project contributed in (1) clearing up misconceptions about bats, (2) capturing the attention of the public regarding the importance of bats in our ecosystems, (3) raising awareness about the need of urgent bat protection, and (4) informing the public about the simplest ways of bat protection.

We have reached out to a diverse audience, the project becoming in only a short period of time (1 year) one of the most important sources of information about Romanian bats. Our printed materials (brochure and sticker series) have reached key sites and key interest groups in Romania. Presentations made at important sites (ex. Sasca Montană, Limanu) complement and strengthen concrete on-site conservation actions. Through our education activities we have reached the objective to positively influence public opinion regarding bats in Romania.

In general terms, it is of little importance what part of the message audiences remember, as long as they remember the necessity of bat protection and they are provided with means of contributing to conservation. While older generations tend to remember that bats are essential in obtaining tequila, younger generations preferentially remember the relationship between bats and chocolate. Profitoriented companies involved in agriculture remember the massive effect bats are having on pest insects. Whatever the

format or the method used, the important aspect is that conservation messages answer the main question of the public: what's in it for me?

Rewards of education and awareness activities can sometimes be immediate, but usually come only with time. It is however of great importance to maintain a constant level of involvement in the education of the public, even if no funding is available. Social media and web presence can provide simple and cheap (even free) ways of constant communication. If our well phrased and placed messages are repeated long enough, bat conservation in Romania will reach a tipping point, where we no longer have to convince the silent majority, but have to find place in our activities for latecomers and laggards.

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Education and Communication for Bat Conservation in Latin American and the Caribbean

By Laura Navarro¹ Translated by Priscilla Alpízar

20 years ago, education and communication activities about bats in the Latin American and Caribbean region were scarce and difficult to access. Since then, the situation has changed drastically, especially in the last few years.

RELCOM (Latin American and Caribbean Network for Bat Conservation) has played a key role in this area. Today, each one of the 20 PCMs (Bat Conservation Programs) has robust and active components for education and communication. This has been influenced by the development and maturity of each group and by motivation and interest to participate in the network's activities.

One of our challenges has been to develop group activities. Thus, we planned to have simultaneous actions for all the countries that conforms the network. Our first initiative was to declare October 1st as the "Latin American Bat Day". Each country has accomplished very different strategies for its celebration, ranging from the emission of stamps, to talks, workshops, exhibitions, nocturnal races, festivals, and bat nights. This activity has been so successful that it has naturally transforming been into "October, Month of the Bats", with increasing quality and quantity of activities, participation, and diffusion about bats.

Due to the celebration of the Year of the Bat in 2011-2012, we organized the the murcimaleta ("Traveling Bat-Bag") initiative. It consists of a light suitcase that has a bat-notebook with white pages lined with a cloth bat called Marcelo, Mexico's mascot, where the initiative emerged. Marcelo is very restless and, since he is a migratory bat, he enjoys travelling and wants to meet other bat species, inviting children from all Latin American to participate in his activities. The "Traveling Bat-Bag" tours around **RELCOM's countries, performing different** educational activities. At the end, each country provides a four-page synthesis about the perception of bats, which is written in the bat-notebook.



The "Traveling Bat-Bag" left Mexico on April 20th 2011 and ended its tour over 19 Latin American and Caribbean countries in Ecuador on March 2014. The experience has been a success, with participation of over 5,000 children, and it has served as a motivation to create educational and artistic activities celebrating bats in RELCOM affiliated countries.

This program has been very successful, and it has served as an inspiration for other similar projects in several countries

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the *murcimochila* (bat-backpack) and the *murcimaleta* (bat-suitcase) in Mexico, *el cofre de los murciélagos* (the bat chest) in Bolivia; el *murcicuaderno* (bat-notebook) Argentina, el *murcimaletín* (bat-backpack) in Puerto Rico; *murcimaleta restauradora* (restorative bat-suitcase) in Venezuela; and *murcimochila* (bat-backpack) in Colombia.



Several countries have created stories and characters, which have strengthened affective bonds and encouraged imagination.

Reports and photographs about the activities have been uploaded in the bat blog

(http://reddemurcielagos.blogspot.mx),

allowing to share the pride we have because of our great bat diversity. To this day the blog has over 30,000 visits.

This has been an experience that allows us to tighten bonds between the network's members, and we have developed activities that promote a sense of belonging and the pride to live in Latin America and the Caribbean through the knowledge of bat species. On the other hand, each country designs and develops its own education and communication projects, which become more elaborated and involve more people year by year. Between 2011 and 2013, 40,000 people participated in activities organized by the PCMs.

Another tool used for communication that has evolved and grown in the last years is the RELCOM website. This new version developed by the PCME (Ecuador) has over 280,000 visits, and it contains diverse information about the bats in our region and segments like the bat of the month, the iNaturalist.org project, research activities, news and short communications. In the education area, the website has a section where people can see each PCM's mascot, educational activities, courses, workshops, and the murciteca (Bat-library), which has a set of free educational bat materials in Spanish, as well as stories, videos, posters, radio emissions, handbooks, etc., produced by the different PCMs.

In April 2010 the first RELCOM bulletin was published with the purpose of sharing education, research, and communication activities done in the region. Since then, the bulletin has been published three times per year and it is widely read. The bulletin can be directly downloaded from the RELCOM website.

One of the network's important objectives is the exchange, capacitation, and strengthening of the PCMs. Thus, a capacitation course-workshop called

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"Education and Communication for Bat Conservation" has been designed. The objective is to create groups of people that are interested in bat conservation, using environmental education and communication tools. The idea is for the participants to become familiarized with important concepts related working directly with people and bats, as well as for them to get acquainted with tools used design education to and communication projects, and to learn how to design educational activities for bat conservation. To this date, six workshops have been organized (El Salvador, Colombia, Puerto Rico, Brazil, Costa Rica, and Ecuador), and more than 150 people have participated.

Today, we can say that bats have earned a lot of terrain in the electronic and massive communication media and that educational activities from the PCMs are more and more frequent. We managed to accomplish successful group activities, such as the *murcimaleta*. The activities celebrating the day and month of the bat are increasing considerably year after year in all the countries. Finally, a free set of educational material in Spanish is available (the murciteca). This is all part of a dream that was impossible to glimpse 20 years ago, and that today is a reality that motivates us to continue working for bat conservation.

¹PCMM Programa para la Conservación de los murciélagos de México

A Community-Based Approach to Bat Conservation in British Columbia, Canada

By Juliet Craig, Purnima Govindarajulu and Cori Lausen

Over half the 20 bat species in Canada are considered to be "at risk" due to habitat intentional loss and degradation, extermination, wind turbines, pollution, climate change and White Nose Syndrome (WNS), a devastating disease that is decimating bat populations in North America. Sixteen of the Canadian bat species are found in British Columbia (B.C.), in the far west of Canada. British Columbia therefore is the most bat-diverse province Canada and shoulders a large in responsibility for bat conservation.

Current barriers to bat conservation include a general societal fear of bats, myths about bats and health issues, a lack of awareness about the need for bat conservation and a lack of knowledge about appropriate bat management in anthropogenic habitats such as buildings. From horror movies to health warnings, societal attitudes about bats are extremely negative. Many people view bats as being ugly, scary, nasty little creatures who are harmful pests. As people continue to exterminate bats from their houses, actively kill bats when they come across them (both actions are illegal under the Wildlife Act of B.C), or inadvertently destroy bat roost sites, many bat species remain vulnerable to population declines. Education and awareness are critical to changing attitudes and promoting the conservation of bat species.

The B.C. Community Bat Program was established in 2014 to address the need for education and community stewardship of



bats focusing on bats in buildings. It is a collaborative project between government (B.C. Ministry of Environment) and a number of non-governmental stewardship groups, funded by the Habitat Conservation Trust Foundation, Habitat Stewardship Program, Public Conservation Assistance Fund, Columbia Basin Trust and other regional partners. This province-wide program is modelled after the Kootenay Community Bat Project, the first community-based bat program in Canada that was established in south-eastern B.C. in 2004. The goals of B.C. Community Bat Program are to: 1) raise awareness about bat conservation issues in BC; 2) encourage residents with bats in buildings or other anthropogenic structures to report and steward their roost sites; 3) increase summer bat roosting habitat by promoting bat-house building and installation; and, 4) establish a citizen-science program to monitor bat populations.

1. General Outreach and Education

The B.C. Community Bat Program outreach, which is carried out through newspaper articles, website (<u>www.bcbats.ca</u>), Facebook page, and radio interviews, has reached thousands of residents in B.C.



promoting awareness about bats and the importance of conservation. Community presentations include information about bat biology and guidance on how private citizens can promote bat conservation. Display booths at community events such as fall fairs and markets feature hands-on items, handouts, and children's activities.

School programs are extremely popular, particularly in October when Halloween is approaching. For example, the Kootenay Community Bat Project had so many requests that in order to keep up with demand, additional Bat Ambassadors had to be trained. Twenty talented and educators enthusiastic attended an Educator Workshop on Bats, a two day training program where educators came together to learn about bats, share teaching techniques, and develop program ideas. Activities during the workshop included mist-netting, presentations, an emergence count, and a variety of games and teaching activities. Now these trained educators have become "Bat Ambassadors" and programs deliver school in their communities, reaching hundreds of school children every year.

2. Got Bats? Landowner Outreach

Although general outreach and education is extremely important, community-based social marketing (www.cbsm.com) advocates that specific audiences be targeted to promote behaviour change that will make the most significant contribution to achieving the outreach goal of any project. With the decline in natural roost features in Canada, such as large trees and rock structures, several bat species of conservation concern, including the Little Brown Myotis and Townsend's Big-eared Bat, have adapted to using attics, chimneys, walls and siding of houses, barns, and sheds. As a result, private landowners may have important maternity colonies of bats roosting on their property. Therefore, the target audiences for our community-based bat conservation program include landowners who have bats roosting in a building on their property, pest control companies, builders and roofers.

Through our outreach programs described in the previous section, landowners are asked to report their roost sites by using a toll-free telephone number or the online reporting system. In the two years since the establishment of the program, hundreds of phone calls and emails have been received. Landowners are encouraged to either protect their roost site or use bat friendly exclusion methods and installation of alternative roost structures. They are provided with information on appropriate bat exclusion techniques considering factors such as the type of roost site, time of year, and the particular issues they are having with bats.

Where possible, a biologist will visit the property to provide on-site guidance, identify the bat species present, distribute

booklets, and provide specific suggestions for roost conservation and enhancement. One-on-one landowner contact has proven to be extremely effective since landowners are provided with the opportunity to ask questions and are given specific information for their property. In many cases, their attitude shifts during the visits from one of fear or misunderstanding to one of concern about the bats. Not only does being on site further promote education and awareness, it allows the collection of inventory information to identify large maternity colonies of bats in B.C. Eight species of bats have been identified within building structures including many species at risk. Since access to bats is not always possible, DNA analysis of guano pellets and/or acoustic monitoring is also used to confirm the species.

The B.C. Community Bat Program also targets other important audiences including pest control companies, builders and roofers. These professionals may encounter bats during their work activities and can play an important role in bat conservation by not only using bat-safe practices in their work, but also by educating landowners who have bats on their property. Documents such as the BC Community Bat Program: Frequently Asked Questions and Seven Steps to Managing Bats in Buildings have been developed for both landowners and professionals. The B.C. Community Bat Program delivered a presentation and hosted a display booth at the annual B.C. pest management conference in 2015. In the winter, the focus is on the roofing and building industries to develop guidelines and information about what to do if bats are encountered in a building and how to safely and effectively carry out an eviction when required.

Bat-house Installation

Since natural roosting habitat has declined in human-altered environments (loss of old trees, disturbance to caves and crevice environments, disturbance to roost sites by light and noise, etc.), bat-houses may provide alternative summer roost sites. Bat-



house building workshops are regularly offered throughout the province where participants come armed with a drill and staple gun but all of the other supplies and materials are pre-cut and prepared. This fun family-oriented activity actively engages the general public in bat stewardship. The B.C. Community Bat Program has also partnered with high school students, woodworking shops, and incarceration facilities to build bat-houses that can be donated to landowners. As the best bat house design for B.C. is not yet known and there might be

regional and species difference in bat house



preference, where possible, several bathouse designs are installed at the same site to test differences in occupancy rates.

Citizen Science

As well as focusing on the reporting, protection and enhancement of bat roost sites, the B.C. Community Bat Program also promotes monitoring. In B.C., there is currently very little baseline data on the size or trends of bat populations. This lack of information has stymied the ability to understand bat population dynamics in response to emerging and ongoing threats, and the cumulative impact of multiple threats.

The B.C. Community Bat program initiated Bat Watch, an Annual Bat Count program to engage citizen scientists in monitoring bat populations over time. Once a bat roost site is identified, participants conduct emergence counts every year for a minimum of five years to estimate relative population size and changes over time. Two counts are conducted in early summer prior to pups being volant, and two are conducted once the pups are flying in late summer. These population data will provide the baseline for assessing White Nose Syndrome impacts, should the disease arrive in B.C. in 5 to 10 years as predicted. The species that will be counted most often in the Citizen Science "Bat Watch" are the Little Brown Myotis and Yuma Myotis, two species that are predicted to suffer declines with the emergence of White Nose Syndrome.

Bats and Cavers program in BC

In addition to the BC Community Bat program that targets private landowners, the threat of White Nose Syndrome has led to a specialized program aimed at recruiting cavers to help find where bats overwinter. BatCaver (http://www.batcaver.org/) is a Wildlife Conservation Society Canada program, funded in part by Environment Canada and TD Friends of the Environment, engaging cavers in bat conservation. Given that a large percentage of our western bat species thought hibernate are to



underground during winter, the season when bats are killed by White Nose Syndrome, locating caves and mines where bats roost may be critical in disease surveillance and implementation of potential strategies for lessening the mortality rate associated with the disease when it arrives in BC. The BatCaver Program networks with cavers to have

them deploy specialized equipment underground that detects bat ultrasound; promotes the use of decontamination protocols to prevent the inadvertent introduction of White Nose Syndrome in B.C.; and educates cavers to prevent disturbance to roosting bats and protecting bat habitat where possible.



For more information on the BC Community Bat Program, visit <u>www.bcbats.ca</u> or contact <u>info@bcbats.ca</u>.



Saving Fiji's Bats

By Nunia Thomas

Located in the South Pacific, the Fiji archipelago is home to six species of bats: three fruit bats, two insectivorous and one nectarivorous. The latter three are cave dwelling.

Bats are the only native mammals in Fiji. Out of the six species, five are threatened or critically endangered.

Prior to 2008, work on Fiji's bats was scarce and primarily research based, assessing their presence/ absence on 30 out of the over 300 Fiji islands. Some of the research also collected specimens for museums. Conservation actions were recommended but it wasn't until 2008 that some of these became a reality for Fiji's bats. Annette Scanlon (University of South Australia) began her research into Fiji's bats and their relationship with forest health in Fiji in 2008, opening up an opportunity to locally address issues relating to Fiji's bats.

In 2009 – just before the celebration of the International Year of Biodiversity, NatureFiji-MareqetiViti - Fiji's only local membership based organization, working solely for Fiji's biodiversity, rediscovered the archipelago's only endemic mammal – one of the rarest animals in the world – the **Critically Endangered** Fijian Flying Fox, *Mirimiri acrodonta*, through collaborative research effort with the University of South Australia, University of the South Pacific, National Trust of Fiji and the Critical Ecosystems Partnership Fund. After 40 days in harsh cloud forest conditions, Scanlon captured a pregnant female, and for the first time in history, released the captured individual back into the wild!



There is little known about this Fiji's endemic mammal. The only known records of this species were at the British Museum in 1978 and at the Australian Museum in 1990.

In the same year, 2009, NatureFiji-MareqetiViti completed a thorough survey of bat caves on Fiji's biodiversity hotspot and third largest island – Taveuni. This was the only second follow up to Gilbert's mapping of the limestone and volcanic caves of the Fiji islands (Gilbert 1984).

Progress since 2009

Since 2009, NatureFiji-MareqetiViti has been able to raise awareness on Fiji's bat species through strategic fund-raising, stakeholder

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engagement and on the ground species work:

- Cave inventory for cave-dwelling bats on five islands were documented in three months with reported ten active cave sites.
- With the Australia Tropical Research Foundation, discovered and documented an active cave of the Vulnerable Fiji Blossom Bat (*Notopteris* macdonaldi) on Viti Levu, adding to the five known active caves of this species on the island.
- Discovered and documented an active cave of the Critically Endangered Pacific Sheath-tail Bat (*Emballonura semicaudata*) on Ovalau, adding to two known sites of this species on the island.
- Production of awareness materials in iTaukei (indigenous Fijian) and English languages on the six species of Fijian bats as well as cave guidelines when visiting active bat caves.
- Species recovery plan for the Fiji Flying Fox.
- With Bat Conservation International, University of the South Pacific, conducted cave mapping, population monitoring, landowner and stakeholder engagement for Fiji's only known population of the Endangered Fiji freetailed bat, Tadarida bregullae.

Further action needed

Interested conservation organizations working with government and local communities to better understand and save Fiji's bats have dedicated 2016 as the year for Fiji's bats.

Fiji's bat caves all occur outside of Fiji's proposed terrestrial protected areas



Figure 1: An adult female free-tailed bat (*Tadarida bregullae*). Photograph source: Scanlon 2009.

network; and continue to face threats such as predation by introduced predators (cats and rats), unsustainable harvesting by local communities, road construction, logging (around the vicinity of the caves) and irresponsible human visitation.

Based on the technical capacity in Fiji, below are some of the immediate needs identified to help save Fiji's bats:

- Training to develop bat expertise in Fiji.
- Continuous monitoring, discovering new sites, assessing population size and documentation of findings. Available data will help researchers apply effective conservation actions.
- Funding to train students in dedicated research on bats ecology, habitats, diet and foraging habits, especially microbats.
- Protection of cave sites from continuous disturbance including fencing.
- Engaging landowners with awareness program.

NatureFiji-MareqetiViti, Bat Conservation International and their stakeholders are confident that with collaborative effort, we can make our landscapes better for our bats, and therefore save our forests and the



ecosystem services they provide. Fiji's bats are unique and special, and we hope that through our collaborative efforts, we can inspire more positive responses and attitudes towards our bats.

The Philippine Bats Conservation Programme

By Lisa J. Paguntalan¹

Philippines Biodiversity Conservation Programme Philippines Biodiversity Conservation Foundation Inc.

The Philippines supports an impressive diversity of bats. In the most recent review, Heaney et al. (2010; 2015) list a total of 78 species of which 28 (depending on taxonomic arrangement) or c.35% are endemic. The fruit bats (Pteropodidae) are especially well represented, with at least 25 species, of which 18 (72%) are endemic. This includes three recently discovered species from the Philippines; Mindoro striped-face fruit bat Styloctenium mindorensis, Mindoro Pallid flying fox Desmalopex microleucopterus and Rickart's Dayak fruit bat Dayacopterus rickarti, the latter being easily the smallest member of this genus. Unfortunately, both of the latter species are already threatened, as indeed are most of the other Philippine fruit bats - eight of which are included in the IUCN (2015) Red List and 9 in the Philippine List of Threatened Species (DENR 2004).

Increasing interest and concern about the decline of many Philippine fruit bats, which also play a vital role as pollinators and seed dispersers, was prompted by the results of various field studies and status surveys conducted by local and foreign biologists in the late 1980s up to present, leading to a number of separate conservation initiatives. The Philippines Bats Conservation Programme had undertaken wide-ranging and integrated research and conservation strategies. Many of these activities were conducted by or in collaboration with Department of Environment and Natural



The Philippines Tube-nosed Fruit Bat (*Nyctimene rabori*) is an endemic and endangered species of fruit bat found only in the islands of Negros, Cebu and Sibuyan Island.

Resources, local partners e.g. Negros Forest Ecological Foundation Inc. (NFEFI), Mindoro Biodiversity Conservation Foundation Inc., Cebu Technological University – Argao campus, Mindanao State University – Iligan Institute of Technology, Palawan Council for Sustainable Development Staff, Mambukal Resort Negros Occidental, Lear Corporation – Cebu, Grassroots Travel, Boracay Property Holdings Inc., local government units and private individuals.

Counting Bats

The Philippine Bats Conservation Programme documents and validates known and reported flying fox roosts in the country. Working closely with Biodiversity Management Bureau of the Department of Environment and Natural Resources (DENR), DENR regional

Table 1: Threatened Fruit Bats of the Philippines (N.B. table updated Oct 2015)

Species Name	IUCN Red List	
	Current	Proposed
Golden-capped flying fox, Acerodon jubatus	EN	CR
Palawan flying fox, Acerodon leucotis	VU	EN
Mindanao pygmy fruit bat, Alionycteris paucidentata	LC	LC
Philippine bare-backed fruit bat, Dobsonia chapmani	CR	CR
White-winged flying fox, Desmalopex leucopterus	LC	DD
Mindoro Pallid flying fox Desmalopex microleucopterus	Not listed	DD
Philippine tube-nosed fruit bat, Nyctimene rabori	EN	EN
Fischer's pygmy fruit bat, Haplonycteris fischeri	LC	NT
Luzon pygmy fruit bat, Otopteropus cartilagonodus	LC	LC
Ryukyu or wooly flying fox, Pteropus dasymallus	Nt	Nt
Little golden-mantled flying fox Pteropus pumilus	Nt	VU
Philippine Gray flying fox Pteropus speciosus	DD	DD
Dayak fruit bat Dyacopterus spadiceus	Nt	DD
Rickart's Dayak fruit bat Dyacopterus rickarti	Nt	DD
Mindoro striped-faced fruit bat Styloctenium mindorensis	DD	DD

N.B. Endemic species indicated in bold

offices, Palawan Council for Sustainable Development Staff (PCSDS), local government units and local communities, roosting sites were visited, presence of flying fox species were verified and roosting populations were estimated. A total of 99 roosting sites were reported of which 23 were visited. Only four roosting sites in Visayas have Goldencrowned flying fox.

Information generated was used in lobbying for roost site protection, priority roosting sites for conservation, monitoring and education and awareness activities as well as in lobbying for the inclusion of flying fox monitoring and conservation programme as an annual program of DENR.

Establishing Flying Fox Roosts Sanctuary

Mambukal Resort, Negros Island - Mambukal Resort is one of the few successfully managed government resort in the Philippines. It is host to at least four species of flying foxes including the endangered Philippine Endemic Golden-crowned flying fox, Acerodon jubatus and the Little Golden-mantled flying fox, Pteropus pumilus. The endemic Philippine tube-nosed fruit bat, Nyctimene rabori was also recorded in the area. On 20 June 2015, Mambukal Resort was formally declared as Flying Fox/Bat Sanctuary during the opening of Mudpack Festival.

The commitment of Mambukal Resort to protect the roosting colony will greatly benefit the roosting populations and in turn the many species of trees in our forests with flowers dependent on bats for pollination and seeds for dispersal. A great day for flying foxes and the forests of Negros Island Region!

Dalaguete Roost Sanctuary, Cebu Island - The flying fox roosting site in Dalaguete town in Cebu Island falls just outside the declared Local Conservation Area/ Wildlife Sanctuary. The Municipality of Dalaguete bought the land where the flying fox roosts was located and included this as part of the Local Conservation Area. This initiative was supported by Filipinos for Flying Foxes project of PBCFI and DENR with support from Bat Conservation International, Chester Zoo and Lear Corporation.

Integrating Flying Fox Roosts Protection and Monitoring at the National Level

The Philippine Government through the Biodiversity Management Bureau of Department of Environment and Natural Resources recognizes the importance of flying foxes in the Philippines. On 18 - 20 August 2015, BMB worked with Philippines **Biodiversity Conservation Foundation Inc. and** Dr. Tammy Mildenstein-Steir in developing a national flying fox conservation and management plan. The Bureau also seeks the integration of flying fox conservation in the regular conservation work plans of the DENR regional field offices.

A total of 30 technical personnel from the Conservation and Development Division/Unit of DENR Regional and/or Field Offices and two

(2) participants from the Ecology Center of Subic Bay Management Authority (SBMA) participated in the 3-day training-workshop. The significant outcome of the activity includes the following: 1) We identified 99 flying fox roosting sites in the Philippines where 26% of the sites had been surveyed with population estimates; 32% of the identified roosting sites are located either in Protected Areas (e.g. Northern Sierra Madre Natural Park, Sagay Marine Reserve, Northern Negros Natural Park) or areas managed by local government units (e.g. Bat Island in Honda Bay; Mambukal Resort; Tungawon, Zamboanga; Dalaguete Bird and bat Sanctuary, Cebu), or special bodies (i.e. Subic roost by SBMA and Bacon-Manito Roost by EDC Geothermal Power Plant). A few sites are within privately owned areas (e.g. Yapak, Boracay Island, Hermana Mayor Island, and Kalamansig, Sultan Kudarat). 2) We updated the distribution map of flying fox roosts in the Philippines. 3) We developed the Philippines Flying Fox action plan as an input to the Philippines Biodiversity Strategy and Action Plan (PBSAP) particularly under the "Preventing Species Extinction" where flying foxes were identified as among the priority species.

Bat Education and Awareness Campaigns

The Bat Education and Awareness programme implements diverse education activities (e.g. bat camps, mobile photo exhibits). We integrate bat awareness activities during conservation events, such as the Wildlife Month, and the Environment Week. These events have been conducted in areas with threatened, endemic and roosting bat colonies, particularly in the islands of Cebu, Negros, Mindanao, Bohol, Siguijor, Polillo Islands and Calamian Group of Islands. We focus on the ecological importance of bats, their conservation status, bat identification and Bat 101.

Support for undergraduate bat research studies had also been undertaken with at least 10 student papers on Philippine bats had been conducted and presented in the annual symposium of the Wildlife Conservation Society of the Philippines - now as Biodiversity Conservation Society of the Philippines.



This is a rescued Large Flying Fox *Pteropus vampyrus* from Mambukal resort in 2012. This 3-4 years old flying fox is recovering for its injuries together with other rescued flying fox species.

Future priorities for the Philippine Bat Conservation Programme include: 1) reorganisation and re-development of the programme, including formulation of new agreements (MOAs) with DENR, preferably involving several local and international partners willing and able to provide longerterm technical and financial assistance. 2) redevelopment and expansion of research and



The Mindoro striped-faced fruit bat *Styloctenium mindorensis* was discovered in 2006 in Mt Siburan and Sablayan Occidental Mindoro.

education projects, especially for the Endangered Golden flying fox, A. jubatus, Vulnerable Palawan flying fox, A. leucotis, Critically endangered Philippine Bare-backed fruit bat, Dobsonia chapmani, Endangered Philippine tube-nosed fruit bat, Nyctimene rabori, and Data deficient Gray-headed flying fox, Pteropus speciosus. 3) Expansion of community-based conservation education, awareness and protection (incl. antipoaching) campaigns, with the assistance of relevant local authorities. academic institutions and media. 4) Coordination of current and proposed field research and status surveys in Panay, Mindanao, Dinagat, Palawan, Mindoro, South Luzon, Negros, Cebu and other most critical areas, in light to enhance future protection of known surviving populations and habitats in these regions. 5) Adopting the Philippine National Flying Fox Action Plan.

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¹Philippines Biodiversity Conservation Programme Philippines Biodiversity Conservation Foundation Inc.