IUCN BAT SPECIALIST GROUP

NEWSLETTER

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STRATEGIES FOR BAT CONSERVATION

Dear Readers,

It is with great pleasure that we present the second issue 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

BSG EDITORIAL BOARD

Cover Photos: Orly Razgour, Rachael Cooper-Bohannon, Rob Mies, Colin O'Donell and Vu Dinh Thong.

CONTENT

1. Editorial

By Tigga Kingston

January 15th marked the start my appointment as IUCN BSG co-Chair for the Old World. I am honored to have taken over from Professor Paul Racey who served our community so well for nearly 30 years. I first met Paul when, as a final year undergraduate, I presented my first ever scientific paper (on bats of course) at the annual meeting of the (British) Mammal Society. At the conference dinner, my undergraduate mentor offered me an introduction to any of the prestigious British mammalogists gathered. Of course I chose to meet the famous Professor Racey, but I confess that I have absolutely no recall of our conversation, the details lost to my undergraduate nerves and the passage of twenty-odd years! I have no problem remembering the great source of support and encouragement Paul has been to me since that first meeting, and I know from conversations with bat researchers around the world that I am not alone. By way of an "exit interview" I asked Paul to reflect upon the three achievements he was most proud of from his time as Chair and co-Chair. He consulted with Tony Hutson, who joined Paul as co-Chair early in his tenure, before he retired and was succeeded by Rodrigo Medellin.

Both Paul and Tony highlighted the immense contribution to bat conservation that the Action Plans (Mickleburgh, Hutson & Racey 1992: Old World fruit bats. *An action plan for their conservation;* and Hutson & Mickleburgh 2001: *Microchiropteran bats: global status survey and conservation action plan*) have made. Both Plans have been cited hundreds of times in the published literature, and the pivotal role they have played in shaping research would be even more apparent if we could count the times they were used to support grant proposals! For the Old World fruit bats, the past 22 years have seen about a 19-fold increase in the number of conservation publications. I did a quick google scholar search on "Pteropodidae" and "Conservation" that returned 143 articles in the 22 years before the Action Plan, and 2690 for the 22 after!! Despite this amazing research effort, the major threats reported in 1992, habitat loss and hunting, have only intensified. New challenges have since arisen, most notably the consequences for the perceptions of fruit bats associated with their role in emerging infectious diseases. So further effort is needed, and Tammy Mildenstein is leading efforts to revise the Old World Fruit Bat Action Plan that will guide us through the next 20 years. Now of course we have more information available and better tools to access and coordinate it. Collating information on the world's bats for the Action Plans before email, search engines, and social networks was a phenomenal task and the products true landmarks.

Paul rightly took pride in widening the BSG membership, and making the group more accessible through public meetings at conferences. Sometimes it's tough to squeeze one more thing into a packed conference schedule, but participation broadens the expertise and opinions of the BSG and better represents our community in the IUCN. The growth of in-country capacity, from individuals to institutions, to

implement bat research and conservation is the third in Paul's list of BSG achievements, culminating in the establishment of the NGO network BatLife Europe in 2011. As we saw in Issue 1 (November 2014) of the Newsletter, there are now active networks of bat researchers and groups in many regions of the world. Moving forward, the BSG seeks a role in strengthening these networks, encouraging the establishment of new networks in regions lacking coverage, and ultimately connecting regional networks to provide global coverage.

Tony was the BSG's first Red List Authority and had the daunting task of pulling together the first complete assessment in 1996 – without doubt a major achievement of the BSG community! I had the pleasure of working with Tony as an assessor on the Southeast Asian component of the last major assessment, published in 2008, but mostly completed in 2004-2005. The BSG has been tasked with bringing these assessments up to date and the New World assessment has been progressing apace and is nearly complete. Now our focus turns to the Old World, and I'd like to make a plea for support and input over the coming year. For the vast majority of bat species, our knowledge base is very limited. If you have seen a species you are probably one of handful of people that have! Pick a bat you capture and ask yourself – how many people in the world have seen this species since the last assessment? How many people know as much as I do? So when assessments are available for public review, or if you are contacted directly for input, please remember that our knowledge is the sum of our parts and contribute!

I am greatly looking forward to working with BSG members, and of course with my co-Chair Rodrigo, but let me close with a sincere thank you on behalf of all of the BSG to both Paul and Tony for their many years of service.

2. Strengthening conservation of North American bats

Long-term, international, multiinstitutional, multiindividual true collaborative effort is finally bearing fruit. After over a decade of work, a new international agreement has been signed to promote and coordinate efforts to protect bats across North America. Charles Francis, Jeremy Coleman, Rodrigo Medellin (the three appointed points of contact for this agreement), Mylea Bayless, Rob Mies, and dozens more bat scientists and conservationists have succeeded in making bat conservation a priority for the governments of Canada, Mexico, and the United States.

In the news:
http://www.fws.gov/news/blog/index.cfm/2015/4/17/Strengthening-our-Conservation-of-North-American-Bats

http://www.cbc.ca/news/politics/canada-u-s-and-mexico-sign-deal-to-protect-migratory-bats-1.3047703

http://www.siempre.com.mx/2015/04/norteamerica-protege-sus-murcielagos/

Letter of intent related to efforts to promote conservation of bats in the United Mexican States, the United States of America, and Canada

Background

Bats are among the most diverse groups of mammals in North America, with more than 150 species known from the United Mexican States (Mexico), the United States of America (USA), and Canada. Unfortunately, North American bats are facing many threats, and several species are now considered threatened or endangered in one or more countries. Threats include loss of foraging and migration habitats; loss, disturbance and destruction of roost sites, especially in caves; risks of mortality due to wind turbines and other human-related causes; direct human disturbance and/or persecution; and mortality from invasive diseases. Of particular concern in the USA and Canada, is an unprecedented crisis posed by an invasive fungus, *Pseudogymnoascus destructans*, that causes an often fatal disease called White-Nose Syndrome.

Various efforts are already underway by government agencies, environmental non-government organizations, academia, industry, and others in Mexico, the USA, and Canada to address some of these threats. For example, Mexico participates in the Latin American Network for the Conservation of Bats (RELCOM), which has developed

a Strategy for the Conservation of Bats

in Latin America and the Caribbean. The USA has developed "*A National Plan for Assisting States, Federal Agencies, and Tribes in Managing White-Nose Syndrome in Bats*" to provide the framework for a broad collaboration across agencies, institutions, and organizations to address all manner of actions related to White-Nose Syndrome and conservation of affected bat species. Similarly, Canada has prepared "*A National Plan to Manage White Nose Syndrome in Bats in Canada*" and

convened an interagency working group to develop and implement work plans to address priority actions. In addition, several regional and local working groups have been formed to address bat conservation needs in their respective regions; various groups are working to develop recovery plans for federally listed endangered species; and other working groups have been developed to address particular threats such as mortality from wind turbines.

There is increasing recognition that these efforts and other similar activities would benefit from increased coordination and cooperation among the three countries. Many of the threats are shared across international boundaries, and strategies and approaches to address them in one country could be relevant in other regions. Cooperative efforts would result in synergies and improved

efficiencies to optimize conservation efforts. Furthermore, bats of several species regularly cross international boundaries. For example, populations of several species of bats breeding in

Canada migrate to the USA in winter, while other species move regularly between Mexico and the southern USA. Conservation efforts are needed in all three countries to protect these species.

This Letter of Intent seeks to strengthen cooperation among the three countries to enhance coordination of activities as well as gathering and sharing information related to conservation of bats in North America.

Purpose

The purpose of this Letter of Intent is to document that the Secretaría de Medio Ambiente y Recursos Naturales from the United Mexican States (SEMARNAT), with the expected participation of the Dirección General de Vida Silvestre (DGVS), the Comisión Nacional de Áreas Naturales Protegidas (CONANP), the Instituto Nacional de Ecología y Cambio Climático (INECC), the Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO) and the Procuraduría Federal de Protección al Ambiente (PROFEPA); the U.S. Fish and Wildlife Service (USFWS), the U.S. Geological Survey (USGS), the National Park Service (NPS), the Bureau of Land Management (BLM), the U.S. Forest Service (USFS), the

Animal and Plant Health Inspection Service, Wildlife Services (APHIS-WS), and the Department of Defense (DoD) from the USA; and Parks Canada and Environment Canada (EC) from Canada, hereinafter "the Agencies," have the intention to strengthen cooperation, coordination and information sharing related to the conservation and

management of all bat species in Canada, the USA, and Mexico.

Forms of cooperation

Desiring to promote cooperation in the conservation of bat populations in North America, the Agencies have reached the following understanding.

1. The Agencies intend to cooperate in bilateral and trilateral activities and, when appropriate, in regional activities

2. to promote monitoring, research, and environmentally sustainable policies and practices in support of the conservation of bats and the ecosystems upon which their survival depend.

The forms of cooperation may include, among others:

a. Strengthening institutional capacities to address conservation concerns that affect bats;
b. Exchanging information on environmental best practices;
a. Technological cooperation, including research and development, and the transfer of new technologies on mutually agreed terms;
b. Mechanisms of promotion to improve the protection of the

c. environment and natural resources, such as: endangered species conservation; incentives for conserving, restoring, or enhancing the environment; and public/private partnerships;
d. Improving natural resource management;
e. Environmental education and outreach; and
f. Fundraising and identification of

resources for conservation projects that will benefit bat populations.

3. The Agencies intend to promote improved coordination and planning in support of bat conservation in North America by appointing one person from each country to serve as a national point of contact for various activities of cooperation on bat conservation.

4. The Agencies intend to cooperate in the development of rigorous, coordinated population monitoring programs for bats that will allow for reliable inferences about the status, distribution, and population trends of bats at various spatial scales. These programs are to use methods and techniques that are most appropriate for each species in each region. In particular, the USA and Canada intend to continue developing and implementing protocols as part of a recently proposed North American Bat Monitoring Program (NABat), and working with Mexico to find ways that this can link with the Sistema Mexicano de Monitoreo Acústico (SIMMA).

5. In the development of specific cooperative activities to identify and to address conservation priorities at international, regional and national level, the Agencies may cooperate with other government agencies, educational and research institutions, non-government organizations with experience or interest in bat conservation, as well as any other stakeholders considered relevant and pertinent for the development of the referenced activities. This may be

achieved through participation in a North American Bat Conservation Alliance (NABCA),

6. All activities of cooperation are subject to the availability of funds and to the applicable laws and regulations of the respective governments, in the understanding that:

a. Each Agency is expected to provide for

its own expenses;

b. This Letter of Intent is not legally binding and cannot give rise to any liability or claim for damages by the Agencies or any third party;

c. This Letter of Intent does not obligate funding nor allocation of resources, assets or personnel from the Agencies; and,

There is no obligation on the Agencies to enter into any agreements or contracts.

7. The Agencies have the intention that all public domain technical information obtained through their cooperation be available to the public to the extent permissible under their respective laws and regulations.

8. Cooperation under this Letter of Intent is to commence upon signature by representatives of the Agencies and may continue indefinitely. Any Agency may discontinue its cooperation at any time by notification in writing to the other Agencies.

9. The Letter of Intent may be revised by joint determination of the Agencies in writing.

Signed in San Diego, California, United States of America, Thursday, the sixteenth day of the month of April of the year two thousand fifteen, in triplicate, in the Spanish and English languages.

For Environment Canada of Canada
Sue Milburn-Hopwood, Director General, Canadian Wildlife Service

For The Secretariat of Environment And Natural Resources of The United Mexican States
Jorge Maksabedian De La Roquette, Director General of Wildlife

For The Fish And Wildlife Service of The United States of America
Dan Ashe
Director, U.S. Fish And Wildlife Service.

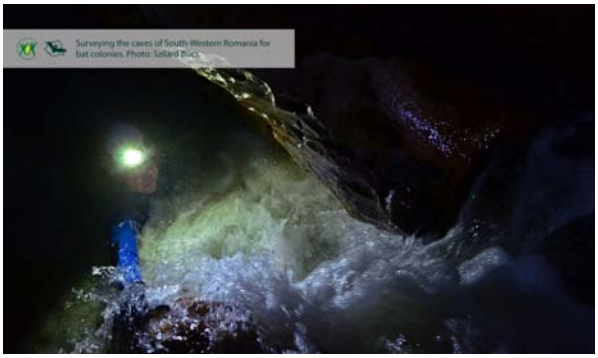
3. Horseshoe bat colony of continental importance discovered in Romania

In frame of the project "Protecting the horseshoe bats of Romania", bat researchers of the Romanian Bat Protection Association (www.aplr.ro) discovered what could possibly be one of the largest colonies of the greater horseshoe bat in Europe. Over 7.000 *R. ferrumequinum* bats hibernate in one of the most complex cave systems from South-Western Romania, located in the Mehedinți Mountains.

Further surveys are needed to clarify the exact status of this enormous colony, but even so, it is encouraging that colonies of this size and importance are still being discovered in such a widely studied area as Europe. Access to the site is highly limited, being under strict protection. As is the case of all Romanian caves, visiting requires permits both from Romanian authorities and protected area custodians.

Greater horseshoe bat (*R. ferrumequinum*) colony in South-Western Romania. Photo: Szilárd Bücs.

Spearheaded by the vulnerable Méhely's horseshoe bat, the project is working towards establishing key elements for the conservation of all five horseshoe bat species present in Southern Romania. With the local population of Méhely's horseshoe bat estimated to only 150 adult bats, it is very promising that the project's results indicate the presence of the species outside its currently accepted distribution range (North-Western Journal of Zoology, art. 152801). In addition, the project team has discovered sizable colonies of Blasius's horseshoe bat, a species that was thought to be absent from Romania.



Surveying the caves of South-Western Romania for bat colonies. Photo: Szilárd Bücs.

The project's objectives include updating scientific datasets about horseshoe bats in Southern Romania, changing the public's attitude towards bats, as well as establishing the active involvement of stakeholders from Southern Romania in the conservation of horseshoe bats.

For more information about activities and results, please go to the project's homepage (https://www.researchgate.net/profile/Szilard_Lehel_Buecs), or contact the

project coordinator: Szilárd Bücs, Romanian Bat Protection Association.

4. Working together to secure a future for bats in southern Africa

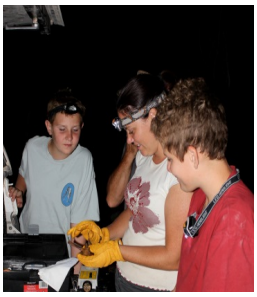
By Dr Orly Razgour (Board Member) and Rachael Cooper-Bohannon (Founder)

In 2011 Africa was described as largely being a bat conservation-void (Racey, Bat Conservation International Newsletter, April 2011). Since that time, several African and international bat researchers and conservationists decided to take up the challenge and address the knowledge gaps and conservation needs of this vast continent, which support around 20% of global bat diversity. In February 2013, Bat Conservation Africa (BCA) (www.batconafrica.net) was launched in Kenya with the aim of offering a forum for people involved in bat conservation throughout Africa, to communicate and share information. A few months later, Bats without Borders, which is dedicated to securing a future for bats in southern Africa through conservation action, research, capacity building and public engagement, was officially established as a charity, not-for-profit organisation.

Bats without Borders arouse from the PhD project of Zambian born and South African raised, Rachael Cooper-Bohannon, on the distribution and conservation of cave-dwelling bats in southern Africa. Rachael has been carrying out fieldwork in southern Africa since September 2010, in collaboration with South African, Botswana and Namibian researchers. When the 2011 BCI article came out, Rachael was well aware of the bat conservation gap in many parts of southern Africa, and she experienced first-hand, the prevailing negative attitudes towards bats. It has become evident to her that scientific research has to be combined with public engagement to change people's attitudes towards bats, capacity building and applied conservation action, if bats are to be conserved in southern Africa.

Following on from Rachael's PhD work, the first aim of Bats without Borders is to undertake applied conservation-driven research and support research partners. This will be done through establishing research strategies, priority areas for research, links with universities and conservation organisations interested in conducting bat research in southern Africa, fundraising in support of research and research equipment, and setting up a volunteer programme for experienced bat ecologists from the UK and other countries, to work on short-term research projects in southern Africa.

The second aim of Bats without Borders is to advocate for effective practical conservation measures in southern Africa. Beginning with stakeholder mapping, Bats without Borders will determine priority key stakeholders to establish a network to


help with campaigning and conservation action.

Working with collaborators across southern Africa, the UK and key stakeholders, the third aim of Bats without Borders is to facilitate capacity building in southern Africa. Scotland and the rest of the UK have over 100 bat interest groups with a huge skill set to provide knowledge exchange with southern African partners. In return, volunteers will benefit from the experience of visiting southern Africa, working with local bat ecologists and being able to advance their own skills and expertise and work on new bat species. South Africa is the only southern African country that is known to have active, long-term bat groups (Gauteng and Northern Regions Bat Interest Group - www.batsgauteng.org.za and The Bat Interest Group of KwaZulu-Natal - www.batskzn.co.za). Bats without Borders aims to work in collaboration with these bat groups, alongside UK bat groups and local wildlife groups to support the establishment of new bat groups across southern Africa, by attracting interest and providing resources, advice, training and when possible, funds to get started.

Finally, Bats without Borders aims to raise awareness of threats to bats and promote a positive attitude towards bats in southern Africa. Public engagement will include the provision of information on the Bats without Borders' website and links to other resources, writing articles in specialised and stakeholder specific magazines (e.g. farming magazines) to reach a wide audience, and the development of targeted educational resources for the general public and specific targeted user groups that will be made freely available and actively disseminated. As a new organization, the initial priorities of Bats without Borders are to raise its profile, to establish partnerships with key stakeholders and other organisations to work with, and develop strategies for education, capacity building and fundraising. So far Bats without Borders succeeded in securing funding from The Rufford Foundation (www.rufford.org) to support the salary of a part-time project manager that will focus on engaging key stakeholders, to develop strong working relationships/partnerships, establishing operational strategies and securing long-term funding to enable the organisation's engagement in its core activities. Further funding was generously donated by Echoes Ecology (www.echoesecology.co.uk) towards marketing. Titley Scientific (www.titley-scientific.com) and Magenta Electronics Ltd (www.magenta2000.co.uk) are refurbishing and servicing old SD1 Anabats and Magenta bat detectors donated by the South Lancashire bat group (www.slbg.org.uk) and Jacobs

Consulting. Bats without Borders has put out a pledge for old bat research and monitoring equipment for use in outreach programmes in southern Africa and Magenta Electronics, Titley Scientific and Wildcare (www.wildcareshop.com) are keen to sponsor equipment in the future.

On the fundraising front, some fun events have already been organized to raise Bats without Borders' profile, starting with a Halloween Party in October 2013, followed by a sponsored Manchester marathon run by Stuart Spray that took place in March 2014. Other events included kayaking across Lake Windemere in the Lake District, England (Daniel Boyd and Helen Taylor-Boyd) that took place in September 2014. Bats without Borders has begun recruiting volunteers to help with fundraising and creating educational resources. To 'meet' our current volunteer team visit: www.batswithoutborders.org/operational-team.

The key scientific research, education and capacity building strategies will be developed with the help of the Bats without Borders' board of trustees and advisory board members, who have a range of skills and extensive experience in bat conservation research, education, training, communication, advocacy and public engagement. Bats without Borders are delighted to have two inspiring bat ambassadors, Prof. Paul Racey and Prof. Gareth Jones, who bring with them extensive knowledge of bat ecology and conservation and vast experience in promoting bat conservation and applied conservation management (www.batswithoutborders.org/who-we-are).

It is Bats without Borders' policy to work in an inclusive and collaborative way. Therefore, Bats without Borders aims to work with local partners alongside Bat Conservation Africa and other international bat conservation organisations (e.g. the UK Bat Conservation Trust, Bat Conservation International and RELCOM), to develop resources and run pilot programmes that will be available to share with key stakeholders. It is hoped that these resources, partnerships and collaborations will ultimately contribute to development of long-term commitment, needed to secure the future of African bats.

Bats without Borders.org
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5. BatLife Europe

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By Julia Hanmer, Chair, BatLife Europe

There are 52 species of bats in Europe, a remarkable fifth of our mammals. Their populations suffered serious declines in the second half of the twentieth century, due to habitat loss, degradation and fragmentation, development and persecution. These rapid declines led to legislative protection for bats within many European countries. However, bats in Europe remain vulnerable and it is vital to build NGO capacity and influence at an international level and in each country.

In 2011, BatLife Europe was launched as a new international NGO to conserve bats and their habitats across Europe, built from a partnership of national bat conservation NGOs. We work through cooperation of partners (33 so far) and a small committee of volunteer trustees.

BatLife Europe works by facilitating international communication, cooperation and knowledge sharing. At a European level, we share information with our NGO partners and we work closely with the Eurobats inter-governmental agreement. We also influence European Union policy as a member of the European Habitat's Forum, a partnership of over 20 European environmental NGOs who work together to coordinate joint responses to EU consultations and working groups, giving a much stronger NGO voice. BatLife also works directly with the EU and recently took part in workshops and consultations for the development of a new EU bat action plan under the European Biodiversity Strategy. Internationally, BatLife aims to work alongside, exchange knowledge with and learn from other continental bat conservation networks. We spoke about our work and learnt from others at the 2013 International Bat Research Conference seminar on Networks, alongside networks from Africa, Australasia, South & Central America, North America and SE Asia.

BatLife also works to develop pan-European projects - a good example is the Pan European bat indicator. From an ecological perspective, bats are a good group for an ecological indicator since they respond to very slight changes in their environment. Such responses can be useful in revealing habitat fragmentation, ecosystem stress, intensification of agriculture or forestry as well as various human activities. In 2012, the European Environment Agency (EEA) commissioned development of a prototype pan-European biodiversity indicator using bat population data. This work was led by

Bat Conservation Trust, Dutch Mammal Society and Statistics Netherlands with the help of BatLife Europe, EUROBATS and data contributors from nine countries (UK, Netherlands, Latvia, Hungary, Germany (Bavaria, Thuringia), Austria, Slovenia, Slovakia and Portugal). The project gathered new information on European bat monitoring efforts and brought together ten long-term winter bat monitoring schemes, sharing data on 16 species and was a great opportunity to share and learn. For some countries, this enabled national population trends to be produced for the first time. EEA published the prototype European bat indicator in January 2014 http://www.eea.europa.eu/publications/european-bat-population-trends-2013 to widespread publicity. The indicator and European species trends provides context for interpretation of national trends and raises the profile of bats internationally. In the future, we hope the indicator will be expanded to include more countries and species.

BatLife works to assist with capacity building of national bat conservation NGOs. In 2012, the Rufford Foundation funded a BatLife Europe capacity building survey in which 25 national NGOs took part. The survey showed how our partners vary - some have staff, others are entirely run by expert volunteers, some focus just on bats, others on all mammals or on all species and habitats. Partners carry out a range of national activities from projects on bat research to conservation and education. Most are active in engaging people, carry out conservation activities, hold a database of bat records and monitor population trends (at varying levels) and are engaged in some political work.

The survey identified that the biggest barrier to bat conservation perceived by NGOs is lack of funding, followed by lack of people, the economic and political situation and lack of data. In terms of capacity building needs, the survey generated a large number of requests for help, but also offers of help in sharing expertise in: engaging new members and volunteers; increasing public awareness about bat conservation; fundraising techniques; setting up a national bat monitoring programmes; storing and handling bat data; bat reserve/roost creation and management; lobbying for change and investigation of bat crime and persecution. BatLife Europe is now working to share knowledge and experience. We plan to share guidance and documents between partners via websites, personal contacts and through twinning of NGOs. In the future, we hope to run capacity building workshops at existing international bat conservation and research events.

Overall, BatLife Europe has grown in influence and partners in our first 2.5 years. There is much more we aim to do to facilitate communication, cooperation and knowledge sharing and address the threats to bats in Europe.

6. Central American strategy for bat conservation

By Ragde Sánchez[1]

The Central American region is conformed by seven countries: Guatemala, Belice, Honduras, El Salvador, Nicaragua, Costa Rica and Panamá. Each of them has a small land area; the largest country is Nicaragua with 129,494 Km^2. The seven countries are in the megadiverse Neotropical region. This region has the largest number of bat genera in the world, and half of the region's mammal species are bats.

Bats are facing huge problems, not only because of habitat loss, but also from direct persecution due to cultural myths. Some large forest remnants, where bats inhabit overlap with the political boundaries of many countries, for example the Indio-Maíz Reserve, between Nicaragua and Costa Rica, and El Trifinio, between El Salvador, Honduras y Guatemala. This implies that conservation problems must be addressed jointly between countries, in order to preserve the natural richness for future generations.

Thus, to ensure perpetuity of bats, each the Central American country has created a Bat Conservation Program (PCM in Spanish). Nowadays, Latin America has 21 PCMs that work together through the Latin American Network for Bats Conservation (RELCOM in Spanish). Each PCM is autonomous in their priorities and objectives, but are part of a joint strategy defined by RELCOM. The model of the PCM is based on three major axis: Research, Environmental Education and specific activities for conservation.

In Central America there are five PCMs: Guatemala (PCMG), Honduras (PCMH), El Salvador (PCMES), Nicaragua (PCMN) and Costa Rica (PCMCR). From these programs, the Costa Rican PCM is one of the oldest (more than 10 years), whereas the Nicaraguan program (PCMN) was created in 2012.

In 2012, thanks to the Whitley Fund for Nature, the five PCM from the region, created a Central American Strategy for Bat Conservation. One of the priorities of this project is to motivate and train young students and researchers. Each PCM has received equipment, such as mist-nets, acoustic recorders, and environmental education books for children. Moreover, they have organized and two workshop. The first Central American Workshop in Biology, systematics and conservation of bats was held at Jardín Botánico Lancetilla, Honduras, with 29 participants. The goal was to train and update knowledge in bat biology, to share experiences and to promote collaboration between countries. As a result of this workshop, we created a Bat species list for the region (134 species, Belize and Panama not included). Moreover, we identified 38 endangered or threatened species for the region using the Risk assessment method of evaluation (MER in Spanish) proposed by Mexico. We also identified priority areas for Bats

conservation (AICOMs in Spanish) for each country and for the region. Some of those areas are shared between countries (Trifinio and Indio-Maíz Reserve).

The second workshop was on bat Environmental Education and outreach, held in El Salvador, with participation of 31 people. The goal was to increase capacity of the people in charge of the Environmental Education program in each country, improving their skills for project development.

This is the first Project in Central America that has the resources (knowledge and leadership) to establish and execute a joint conservation strategy for an entire order of Mammals. The contribution of this project is not limited to knowledge about the Biology and conservation of bats, but also a unique international collaborative experience.

This initiative is created, directed and performed by Central Americans for the Central America region. Together, we generate a major impact for bat conservation.

[1] Programa para la Conservación de los Murciélagos en Costa Rica and Asociación Theria.

7. Organization for bat conservation: a model for teaching conservation and raising public awareness about the importance of bats

By Rob Mies[1]

Bats are some of the most diverse, ecologically important, and unique mammals on Earth. There are nearly 1,300 different kinds of bats worldwide, making up roughly a quarter of all mammalian species. They are the primary predators of nighttime insects, pollinators of hundreds of plants, and seed dispersers of tropical fruit trees. Yet due to centuries of myths and misunderstandings, bat populations have been drastically declining and are in need of immediate conservation assistance. The Organization for Bat Conservation is dedicated to inspiring people to actively protect bats and conserve biodiversity. Humans are the major cause of the decline in bat populations, and humans are the key to their recovery. Our mission is to use our resources and collaborative partnerships to educate and excite people about bats and encourage people to actively protect bats. Education is the key to conservation.

The Organization for Bat Conservation (OBC) is a nonprofit environmental educator and wildlife sanctuary specializing in bats and other nocturnal animals. We connect kids and adults to nature through live animal programs and ongoing education, motivating people to become involved in conservation. Our animal care staff members are national experts in maintaining captive bat colonies and are consulted by other facilities caring for bats. Through our support of research and conservation efforts, we actively encourage the public to be involved in protecting bats and preserving the natural balance of our ecosystem. Each year, we teach upwards of 250,000 people about the importance of bats, creating a positive environmental education experience that leads to an increase in stewardship of our natural resources.

Founded in 1997, the Organization for Bat Conservation has the nation's largest bat education program. OBC, and our animal facility, the "Bat Zone," is headquartered at Cranbrook Institute of Science, the premier natural history museum in Michigan. Nearly 200 rescued animals are housed at the Bat Zone, providing an immersive learning experience for students, families, and

visiting researchers. We also share the importance and uniqueness of bats nationally through print and television appearances including The Tonight Show, The Ellen Degeneres Show, The Today Show, Live with Regis and Kelly, Late Night with Conan O'Brien, Fox & Friends, The Doctors, National Geographic TV, and Martha Stewart Living.

Most of OBC's program animals come from other zoos and facilities due to overpopulation or injury. The greater

portions of our animal population are individuals that have suffered permanent injuries that make it difficult or impossible for them to live in a traditional zoo environment. We pride ourselves in being a leader in bat husbandry. OBC's enclosures

are built for animals with special needs in mind, and our caring staff ensure the comfort of these unique creatures. It's because of these special accommodations that these extraordinary animals have the opportunity to continue to help educate and impact the people that they meet through our live animal programs.

Because bats live such long lives, and that we care for them daily, many of the animals become very familiar with keepers and educators. Over time, sometimes many years, our staff members develop relationships based on trust with the animals. These select few become wonderful wildlife ambassadors. In addition, since the Bat Zone houses the most diverse live bat collection in the United States, visiting researchers have the unique opportunity to study bat behavior up close.

Not only does the Organization for Bat Conservation offer a variety of live animal presentations to complement a school's curriculum and get kids excited about science, live animal encounters are provided direct to schools, nature centers, libraries, museums, clubs, and wildlife and nature events around the United States. Schools, groups, and families also visit the Bat Zone at Cranbrook Institute of Science in Bloomfield Hills, Michigan, and all of our programs are aligned with Michigan's Grade Level Content Expectations. The ongoing message of the presentations is about the unique wildlife biodiversity around the world and the importance of protecting it from extinction. Bats are shown in a way to interest, excite, and motivate audiences to learn more, take action in their backyard, and work globally to safeguard the earth's natural world.

Our live animal programs and live animal exhibit at the Bat Zone educate, excite, and stimulate people to actively participate in bat conservation. The Organization for Bat Conservation's current focus is on the large percentage of Americans who are typically not familiar with wildlife, environmental protection, or conservation. The goal of the live bat presentations is to provide the first step that most Americans take toward actively participating in the conservation of biodiversity. OBC has a range of resources for people (teachers, professionals,

families) to learn more and become involved.

OBC organizes and participates in many special "batty" events. The Annual Great Lakes Bat Festival, started in 2002, celebrates the unique role of bats in the Great Lakes ecosystem as insect eaters, while dispelling myths and misinformation that generate needless fears and threaten

bats and their habitats around the world. The goal of the festival is to help people understand the impact to natural ecosystems and human economies should bat populations continue to decline. The festival features activities for children, families, educators and conservation professionals. Presentations, speakers, live animals, hands-on activities, games for kids, and interactive exhibits provide fun and environmental education. Upon dusk, bat walks are lead in search of wild local bats in flight.

We also produce educational material including books, posters, and informational handouts for dissemination and provide important information to people around the world through on our website. We conduct surveys for public and private landowners to identify bat roosts for protection and learn how to safely and humanely remove bats from their home. In 2013, OBC created an educational DVD called *Science of Bats*. In this 53-minute video, the viewer learns about the importance of bats, how to build a bat house, how to plant a wildlife garden, and how to enjoy bats in their neighborhood.

The Organization for Bat Conservation is dedicated to protecting bats and their habitats by collecting and dispersing funds to support White-nose Syndrome research, providing roosting alternatives, and enhancing communication among researchers, agencies, environmental organizations, and the general public. In addition to funding research, OBC is sponsoring, participating in, and helping to organize local, state, and regional information-sharing meetings, such as the Michigan Bat Working Group, Midwest Bat Working Group, and the North American Symposium on Bat Research.

The Forest Service Urban Connection program and the Organization for Bat Conservation partners with the *Volt Goes Batty* project each year for National Public Lands Day. Volunteers of different ages, using safety equipment, hammers, and drills enjoy putting together green bat

houses, with materials donated by General Motors. The bat boxes are built of reutilized materials including packaging for the Chevy Volt battery and wood pallets. This hands-on experience promotes education of bat's habitat, White-nose Syndrome (WNS) disease and general characteristics of these unique mammals.

The Organization for Bat Conservation, along with other partners, won the US Forest Service *Wings Across the Americas* Bat Conservation Award in 2013. The awarded project was "BatsLIVE! A Distance Learning Adventure," a comprehensive education and outreach program that encourages innovative partnerships through a variety of events to teach more than 220,000 people with high-quality, engaging information on bat conservation.

As we travel the United States educating and inspiring people to preserve bats and biodiversity, we are now focused on providing the next steps in "active conservation." The key is not only to teach and motivate, but also to provide access and entry points to the general public to the programs and projects that allow them to be part of the solution to saving bats from extinction. Please join OBC as a partner and supporter to forge this next level of engaged and empowered conservation effort.

[1] Executive Director
Organization for Bat Conservation

8. Progress towards implementing the New Zealand Bat Recovery Programme

By Colin O'Donnell[1]

New Zealand bats

Bats, along with three species of seal, are the only native land-breeding mammals in New Zealand; all are endemic and have evolved in isolation from other land masses. In contrast to other countries, New Zealand only had three species, reflecting our long isolation. Two species belong to the Family Mystacinidae (short-tailed bats, genus *Mystacina*; the lesser short-tailed bat and the greater short-tailed bat). The third species is the long-tailed bat (*Chalinolobus tuberculatus*).

Short-tailed bats have evolved in isolation for so long that they possess characters not found in bats anywhere else in the world, e.g. ground foraging and the changes in body form to reflect that. They are among the most ancient bat lineages –with separation from other bat lineages estimated at

The New Zealand long-tailed bat (Critically endangered) has now disappeared from most of its former range Photo: Colin O'Donnell

51-41 million years ago. Because they are so ancient and specialised there is considerable interest in the family among bat researchers globally.

The ancient lineage *Mystacina* (short-tailed bat) from new Zealand is specifically adapted to foraging on the ground, making it vulnerable to predation by introduced mammals Photo: Colin O'Donnell

Threats

The range and numbers of bats in New Zealand have declined significantly and all subspecies are classed as endangered, vulnerable or declining.

Declines result from a combination of threats, namely predation and competition by introduced predators and browsers, habitat loss through

land clearance, habitat degradation through logging and fragmentation of forests, and disturbance at roost sites. Introduced predators - Rats, stoats, feral cats and possums have all been implicated in declines.

Recovery programme

The New Zealand Department of Conservation has led an active recovery programme for bats since 1995. The Recovery Plan, published in 1995, assessed the recovery potential of bat taxa,

developed recovery objectives, identified priorities and produced a general guide to management actions for the ten years 1995-2005. The overall goal of the Bat Recovery Programme was to "secure key populations of bat taxa from extinction, which represent the full genetic and distributional range".

During the initial 10 years of intensive research, studies of both short-tailed and long-tailed bats investigated habitat, home range and roosting requirements, population structure, breeding behaviour and conservation genetics. Intensive ecological studies clarified the importance of these threats and have led to the development of specific predator control prescriptions for implementation at bat sites. The studies identified 24 priority bat populations for active conservation management across 22 sites.

Our management includes a suite of tools including:

- legal mechanisms for protection
- general advocacy and education
- developing community-based conservation initiatives
- control of exotic pests, particularly introduced predators, at key sites
- active protection of roosts sites
- protection of aquatic and terrestrial foraging habitats and a raft of habitat restoration techniques
- translocations to predator free habitats

Bats are now beginning to be used as major indicators of the success of predator control operations. By 2014 intensive pest control programmes tailored to protecting bat populations have commenced at 16 (72%) of the priority sites covering 226,000 ha and 7 other sites not originally identified (62,000 ha). Management is planned to commence at a further sites 28 sites within 3-5 years as the Department implements management at representative Biodiversity Management Units throughout the country. In total, management is planned in at least 600,000 ha of bat habitat.

As a result of our using the best science to inform management there are several examples of pest control reversing declines. As these initiatives run their course we will be in a better position to determine overall if management is being effective at reversing declines.

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9. Bat research in Vietnam

By Vu Dinh Thong[1]

Vietnam is recognized as a key country in Asia for the study of biodiversity and conservation. It owns highly diverse landscapes with various ecosystems within offshore archipelagoes, costal realms, and continental regions. The offshore islands and continental regions generally contain different habitats, ranging from flatlands with urbanised and agricultural sectors, to mountainous and karstic areas with tropical forests. Particularly, thousands of cave systems within the karstic areas and other habitats of the country support a remarkably diverse bat fauna. Historically, the first record of bats from the country was published in 1869 with a brief description of *Pteropus condorensis* from Con Dao island.

Until 1996, there was no specific study on bats in Vietnam. Therefore, all records of bats from the country between 1869 and 1996 were obtained from general faunal surveys. Since 1997, with financial and technical support from Vietnam national institutions (Institute of Ecology and Biological Resources, Ministry of Education and Training, National Foundation for Science and Technology Development of

Vietnam), and international organisations (Conservation Leadership Programme [former BP Conservation Programme], Harrison Institute (England), University of Tuebingen (Germany), and Bat Conservation International (USA)), the bats of Vietnam have received more attention from scientists. The above institutions and organisations have played exceptional roles in capacity building, academic research, and conservation.

Since 2006, echolocation of bats in Vietnam has been studied by Vu Dinh Thong, the first bat specialist of the country. Results from these echolocation studies have contributed with important data to the discovery of new species, ecological studies and monitoring. Griffin's Leaf-nosed Bat (*Hipposideros griffini*) is one of the new species initially discovered by diagnoses in echolocation calls. In general, the results obtained over the past 17 years have showed a great potentiality of bat diversity in Vietnam. The number of bat species

discovered in Vietnam, including new records to Vietnam and new taxa to science, has increased rapidly, from 65 species in 1996 to 118 species by the end of 2013. At least one species with two subspecies (*Hipposideros alongensis alongensis* and *H. a. sungi*) is endemic to Vietnam. In fact, the bat fauna of Vietnam will be more diverse than the published data. Evidentially, a large number of specimens collected from Vietnam are still unclassified since they are different from all known bat species. Further taxonomical investigations of those specimens and surveyed areas are required for proper confirmations of bat diversity in the country. On the other hand, little is know about ecology and behaviour of bats in Vietnam. Therefore, ecological studies are clearly needed for practical conservation of the threatened species and their habitats.

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