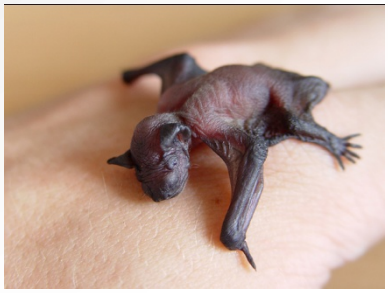
Bats

Bats are flying mammals in the order **Chiroptera** (which literally means Hand-Wing). The forelimbs of bats are webbed and developed as wings, making them the only mammals naturally capable of true and sustained flight. There are two traditionally recognized suborders of bats:

- **Megachiroptera**
  Fruit and nectar eating bats with good eyesight
- **Microchiroptera**
  Insect, fish/birds/mammals and blood eating bats, which use echolocation.

Sometimes they are mistakenly called "flying rodents". However bats are **more closely related to humans** and other primates than they are to rodents. Several studies indicate that the Old World fruit bats and flying foxes may actually be descended from early primates such as lemurs. There are about 1,240 bat species worldwide, which represent about **20% of all classified mammal species**. **About 22% of these species are ENDANGERED**. They range from the world's smallest mammal, the tiny bumblebee bat that weighs **less than a penny** to giant flying foxes with **six-foot wingspans**. Except for the most extreme desert and polar regions, bats have lived in almost every habitat on Earth since the age of the dinosaurs.

Importance of Bats



When it comes to bats, many people only know of unfair, fictional myths. Very few people are aware just how ecologically important these animals are. Most benefits come form their eating habits. Benefits such as:

Insect Control

- One study found that **one** colony of half a million bats ate **exactly 4465.049 of insects in one nigh**t. That is 4 tons in one night.
- Which is 1460 tons on insects in one year (the equivalent to **1460 small cars or 8 Blue Whales**).
- If you were to compare a human diet to bats, it is like a 68kg human consuming **45kg of food per day**! Which is 22 times more then the 2 Kg a human would normally eat.
- They consume: moths, gnats, crickets, locusts, mosquitoes, fruit flies, and other crop pests but not exclusively. However they do not predate on endangered insects such as Bees as bats are nocturnal.

- Without bats, there would be a need for much more (and more dangerous) **pesticides**. Which would cause many problems such as: pollution and loss of none pest insects. Diseases such **Malaria** and River Blindness would soar.

Agricultural –Seed Dispersal and Pollination

- Many of our most important foods come from bat-dependent plants. These include:

  Avocados, vanilla, bananas, plantain, breadfruit, peaches, guava, mangos, dates, almonds, figs, cashews, agave (from which tequila is made), giant saguaro cactus, kapok, Iroko timber, balsa wood, sisal and many more.

- In fact, in an average tropical food market, approximately **70% of the fruit** sold comes from trees or shrubs that **rely heavily on bats** in the wild.
- Some such as the famous Durian, still heavily rely on bat pollinators even in commercial orchards. This king of Asian fruits sells for a **billion dollars annually**, but could be lost without healthy populations of its bat pollinators.
- In East Africa nectar feeding bats are essential to fruit production of the Baobab tree, sometimes referred to as the **African Tree of Life** due to the exceptional variety of wildlife that depend on it for food and shelter.
- **Guano** is a highly prized fertiliser. It also supports many different types of invertebrates and fungus.
- Without this **pollination and seed dispersal** service provided by bats many people would loose jobs; **increasing poverty rates** and the wide range of natural diets. America would suffer agricultural losses estimated at more than $3.7 billion/year. This would also have a **great effect on ecosystems** all over.

Scientific Research

- Similar to the Canary down a mine, bats are **great indicators species** for measuring change in biodiversity and the health of ecosystems. This is because they are so sensitive to change and show signs of problems earlier. Some biologists consider bats a **"keystone"** component of ecosystems in parts of the tropics and deserts.
- An anticoagulant found in vampire bat saliva is used to **treat human cardiac patients** and **stroke victims**. The same stuff that keeps blood flowing from vampire bats'

prey, keeps blood flowing in human beings, too.
- Super **resistant to disease** such as Rabies. Even in dense roosts only 0.5% of bats may carry or suffer from rabies.
- Extremely complex acoustics and **echolocation,** which helped to develop navigational aid for the blind.

FACTS
- Bat related rabies bites, 25 in America in 50 years; lightning kills 38 in 10 years in America. People get rabies from bats is due the close contact bats can live with humans. Dogs are the largest source of Rabies in the world.
- With a population of around 20 million, Bracken Cave is home to the largest bat population in the world. For over 10,000 years, pregnant Mexican free-tailed bats *(tadarida brasiliensis*) to a cave just north of downtown San Antonio.
- Almost 40% of American bat species are having a **severe decline** in populations, for reasons including habitat loss.
- More than **50% decline in Golden-capped Fruit Bats** over the last three generations (thirty years in total), reduced to just 1% of its original population size. Causing many populations to become extinct.
- 90% of the Philippines original old-growth forest cover has been destroyed, causing a **major loss of habitat** for Macrochiroptera.
- Negros Naked-backed Fruit Bat, endemic to two islands in the Philippines , population **declined at least 80%** over three generations (15-20 years). Which is a 4% loss yearly with no growth. It is now Critically Endangered.
- Some bat species only have one population in one cave left. Like the Cuban Greater Funnel-eared Bat.

What's going wrong?

Habitat Loss and Disturbance

Habitat losses are the biggest factor in loss of bat populations in the world. Loss of trees used for nesting and safety leaves bat populations vulnerable. **Deforestation** can wipe out whole populations, especially because the bats are sleeping while the trees are being cut down. Cave populations suffer a lot when caves are **propagated** (for example in Philippines where cares are harvested for **Limestone**). Disturbances from **Guano**, Swallow nest harvesters prove to effect bats when they are breeding or have young. A lot of harvesters will **smoke the caves** to drive the bats out, causing them to have to find another Roost location. Some farmers in the USA have been found to light fires in the caves and kill the bats as they fly out, as they viewed the bats as pests (due to ill education).

Hunting

Bats are **hunted** mainly in Asia as a desirable food source. Some populations have been driven to extinction because of over hunting. The Chamorro tribe in Guam just could not stop. Now local bat populations have diminished. Bats Indonesia and the Philippines .

Asian Medicine

In Jakarta, fruit bats are sold to passers-by, not as exotic pets, but as a **cure for asthma**. The custom is to remove the heart while the mammal is alive, then cook and eat it. At US$3 apiece, the bats are a lot cheaper than inhalers.

Spread of Disease and Modern Technology

There are currently two very strong causes in the decline of bats, mainly happening in the USA. One is **Wind Turbines**. Killing thousands of Migratory bat species a year. Causing trauma to the bats fragile lung. Research suggests that turning the turbine off at night will only reduce energy production by 1% and reduce bat mortalities by 93%. Next is White Nose Syndrome, totally obliterating American Bat populations. Killing over **1,000,000 bats**. Since the winter of 2006-2007, bat populations plummeted from **80 to 97%** at surveyed bat-hibernation caves. The problem is spreading as people enter different caves without proper precautions taken. It has now started to spread to different countries.

Projects Enforcing Change

BAT CONSERVATION INTERNATIONAL

International with a large base in the **Philippines** . Also supplies bursaries and focuses on education

Lubee Bat Conservancy
Saving bats. Conserving ecosystems

International non-profit organization dedicated to protecting biological diversity through the conservation of

fruit bats. With projects in **Ghana**, and **South East Asia**

The Malaysian Bat Conservation Research Unit .

Malaysia based research group

WHAT WE CAN DO

There are possible Bat projects across our project bases. **We can** create project teams, which deepen collaborations with existing projects and/, or **we can** develop research programs to establish population dynamics from which we can develop education and conservation initiatives, building local project capacity in the process. There is a lot of potential to carry out none invasive simple bat area surveys with detectors Animals can be trapped for tagging and closer research. There is also a large potential to work with on restoration and protected areas, allowing for further community-based projects. The things **we can do** can really make a difference, for bats and humans alike.

Project areas

Sierra Leone and Ghana

There are 91 bat species in these two project areas.
The most endangered: **The Guinean Horseshoe Bat**.

Malaysia

There are 122 different bat species, including those in Eastern Malaysia (Borneo). 10 are critically Endangered, of which the population numbers are still decreasing.
The most endangered are: **Orbiculus Leaf-nosed Bat**

Vietnam

There are 89 species. Only the **Shield-nosed Leaf-nosed Bat** is Vulnerable.

Philippines

There are 5 very rare and endangered species of bats in the Philippines.

Palawan Flying Fox	- Vulnerable
White-collared Fruit Bat	- Vulnerable
Philippine Tube-nosed Fruit Bat	- Endangered
Golden-capped Fruit Bat	- Endangered
Philippine Bare-backed Fruit Bat	- **Critically Endangered**

Philippines is one of the most diverse places in the world. Made up of 7107 islands. The ICUN states that over 418 of the country's 52,177 species were listed as threatened; Including the Philippine Bold Eagle and Flying Lemurs. About 500 of the 800 known coral reef species in the world are found in Philippine waters. There is also a huge poverty problem, with many children suffering and living in slums or tribes, with high disease rate. So there is a real

opportunity to create a multifaceted project base with many different projects. Drawing many people from all over, with a focus being on Bats. There are 74 species of bats, all vastly different and some endemic to specific to certain islands.