

SCIENCE SPOTLIGHT



Buggy about Bats



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Canada





Buggy about Bats

Origin Story

Bark Beetles and Bats

Disturbances to forests can affect everything living in them. A major disturbance to British Columbia forests in the past twenty-three years has been bark beetles. Bark beetles are small, cylindrical insects that can attack and kill trees by boring through the bark and mining a tree's phloem (the layer between the bark and wood). The bark beetle has been thriving thanks to global warming. Summers are warmer, and winters do not get cold enough to kill off the beetles' offspring (the winter temperature needs to consistently reach -40°C !). This has encouraged the development and spread of the bark beetle across western North America. In B.C. alone, 18 million hectares of forest (180,000 square kilometers) have been killed by the bark beetle.

One animal that scientists believed stood to, in fact, benefit from the bark beetle's presence was the federally endangered Little Brown Myotis, or Little Brown Bat. This is because areas of forest more affected by the bark beetle provide better habitat for the bats in the form of less canopy cover. The little brown bat is a tiny bat that calls much of Canada home. Little brown bats eat all kinds of insects, such as moths, flies, mosquitoes, beetles, or other bugs that are available.

Testing the Hypothesis:

Recording Bat Sounds

The group of scientists decided to test their hypothesis on the little brown bat and see if it was positively affected by the beetle-killed areas. They started by going to federal crown land in the Thompson-Okanagan region of the southern interior of B.C. This region supports at least fourteen of the province's sixteen bat species.

From there, the scientists looked at forests that had been affected by beetle outbreaks in the last ten years that resulted in light beetle kill (1-10 percent of killed trees) and heavy beetle kill (around 30 percent of killed trees).

The scientists used bat sound recorders at sixteen sites (eight high beetle-kill and eight low beetle-kill) from August to October 2016. They put the microphones where they thought the direction of bat flybys would be. The recording equipment was programmed to pick up bat flybys during the bats' main feeding times: two hours after sunset and two hours before sunrise. The little brown bat had the highest number of passes of all the bat species they picked up on their recordings.

While the scientists expected the areas with higher beetle-kill to have higher bat activity and species richness, what they actually found was that there were no differences between high beetle-kill and low beetle-kill forest stands. At least six of the fourteen bat species in the southern interior of B.C. used both of these forests. This is a positive result, as it indicates measures can be made to control the spread of bark beetles damaging B.C.'s forests without harming population of the endangered little brown myotis. After all, we must do everything we can to help this little mosquito-eating mammal survive.



Try This at Home:

Build a Bat Box in Your Yard!

Bat houses are designed to provide bats with a warm, dry place to roost in the summer. They are usually wooden boxes placed high up on the sides of buildings, and sometimes on posts.

Some Bat House Tips from Bat Conservation International:

- It is best to place your bat house on a building or other large structure. The best types of buildings are ones with wood, brick, or stone siding.
- Mounting your bat house on a tree should be avoided. Bats are more vulnerable to predators there (like cats), and usually it is too shaded for the box to stay properly warm.
- There should be a nearby water supply.
- Bat houses should be at least three metres (ideally, four to six metres) off the ground. They should be three to four metres above any kind of vegetation and four to six metres from the nearest trees.
- They should get sun at least six hours of the day.
- Make sure all your seams are sealed. It helps trap the warm air.
- Roughen up the insides of the house – the roosting board and the landing board need to have something for the bats to grab onto. Do not use mesh, netting, or fabric.

Painting your house:

- Use only water-based paints.
- The temperature of your yard in summer will dictate the colour of your house.
- Less than 30°C, paint your bat house black.
- Between 30°C and 40°C, dark or medium colours like brown, grey or green.
- 40-50°C, paint your bat house medium to light colours.

Climate Action:

Building bat boxes can be a huge help to local bat species but there is more that we can do to help!

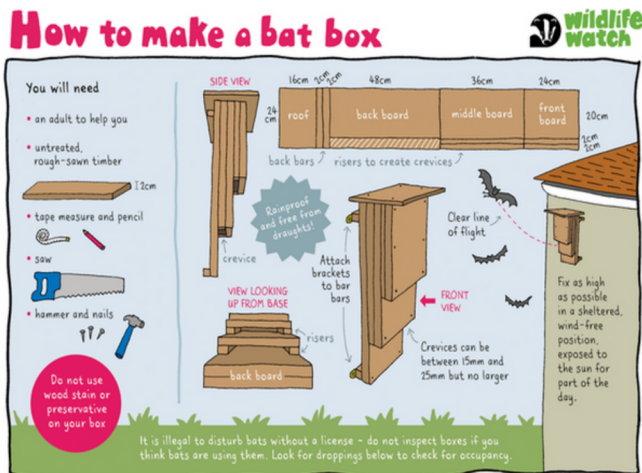
Bats are subject to the effects of habitat loss. Several caves that once housed numerous bats have become active tourist attractions that are harmful to the bat's population. Deforestation and other alterations to forests have also caused bat population to decrease.

We can of course combat this to some extent with garden bat boxes as they provide safety to bats without shelter, but we can also have an impact in other ways.

Reducing support of harmful tourist activities may seem like a small step but hopefully as more people become aware of the problem, this will become more common. This can be done by writing to your local government if you live in an area with such tourism, or by avoiding such attractions when travelling. Spreading the word to friends and family when they are travelling will help get the word out.

Additionally, cat owners with outdoor cats should look at keeping their cats inside during the hours of dawn and dusk. As these are the times of days that bats are most active, cats that hunt can have a negative impact on the bat population.

Separately, these actions may not seem like much, but together, they can help keep our bat population thriving!



www.wildlifewatch.org.uk

This design has been developed by Kent Bat Group



Climate Change

Past, Present, and Future

Earth is the only planet in the solar system known to support life. What makes our home so special? Earth has an atmosphere, a layer of gases between our planet and space. Some of these gases, like carbon dioxide, are called **greenhouse gases**. They are crucial parts of our atmosphere; they trap in the heat of the sun, similar to how heat is trapped in a greenhouse, or in a car on a hot day. This process, called the **greenhouse effect**, keeps Earth's temperature warm enough for living things to thrive.

The sun's rays hit our round, tilted planet unevenly. This uneven heating of Earth's surface leads to differences in temperature, which drives weather patterns. We call the patterns in temperature and weather over long periods of time **climate**. Different parts of the world have vastly different climates; it depends on how much heat they receive, as well as what landscape features are nearby. Water, mountains, ocean currents, and forests all impact our climate. In turn, living things around the world have adapted to the climate they live in.

Something, though, is changing. Over the past two hundred years, humans have been burning fossil fuels, such as coal and oil, to make energy to power our daily lives. Fossil fuels are made from decomposed plant matter and microscopic life millions of years old. This matter is full of carbon, and, burning it releases, or emits, billions of tonnes of **carbon dioxide** gas into the atmosphere every year. When too much carbon dioxide is emitted, the delicate balance of greenhouse gases maintaining

Earth's climate is upset. More and more heat is trapped, causing the planet to warm. Weather patterns change, water levels rise, storms get worse.

Climate has changed many times throughout Earth's history, from ice ages to periods much hotter than today. So why is this time any different? Scientists agree on two things. One, temperatures are rising faster than they ever have in documented climate history. Two, this climate change is driven by human activities, due primarily to greenhouse gas emissions. Climate change is already impacting people's ways of life all over the world. Powerful storms, droughts, forest fires, and floods are threatening people's access to food, water, and safe homes.

The most important step we can take to prevent serious climate change is to reduce greenhouse gas emissions. Incredibly brave and caring people around the world are finding new ways to reduce emissions and make our communities climate resilient every single day. And you can join them! These Science Spotlights are here to help us learn more about climate change and how you can take action.

Our Commitment to the Decolonization of Science

Institutions of GenAction initiative respect and affirm the inherent and Treaty Rights of all Indigenous Peoples across what we now know as Canada. We give thanks to the Indigenous Peoples who care for this land since time immemorial and pay respect to their traditions and ways of knowing. We acknowledge their many contributions to innovations in Science, Technology, Engineering, and Mathematics, past and present, and are committed to deepening engagement and collaborating with Indigenous Peoples as partners in order to advance truth and reconciliation and the decolonization of science.

