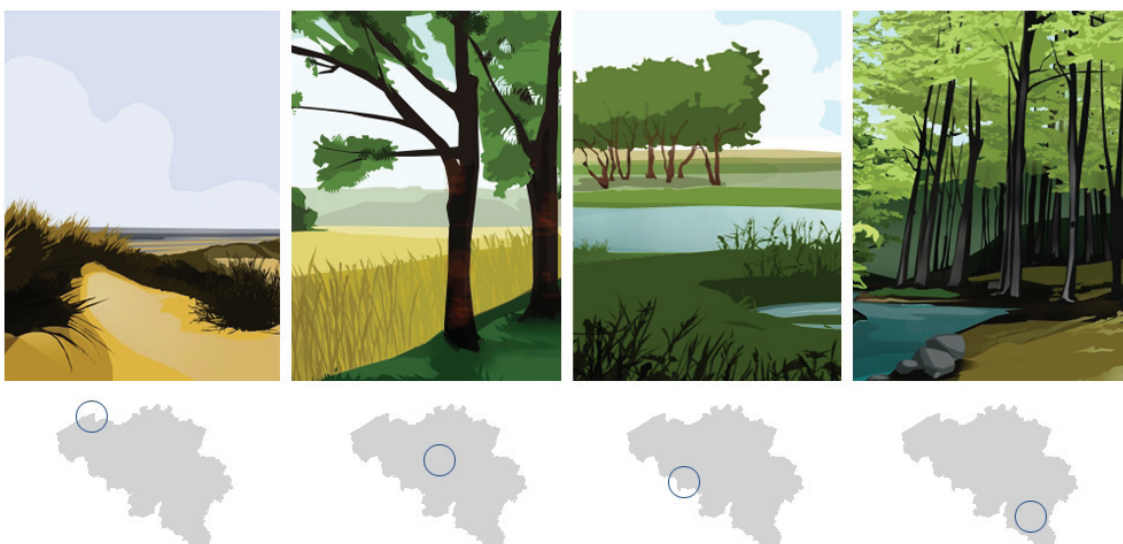




# Sheet 10 : Biodiversity in Belgium

## A / Description of the animation

Although the effects of climate change vary from one place to another, they are appearing everywhere. Certain phenomena are already being observed in Belgium: the rhythm of life of several species has been disrupted and "thermophile" species are beginning to appear in Belgium while other "cold-climate" species are migrating further north. These phenomena are directly linked to climate change and are the early signs of the long-term impacts of climate change yet to come.



# Sheet 10 : Biodiversity in Belgium

## B / Let's take a closer look...

### 1/ CLIMATE CHANGE IN BELGIUM

A major aspect of climate change is the average temperature rise on Earth. As a matter of fact, this is the central element from which other observable consequences of climate change around the globe stem: rising sea levels, melting pack ice, increase in climate-related natural disasters, etc. All of these consequences concern Belgium either directly or indirectly, even if they are not happening in Belgium itself.

Since the beginning of the 21st century, temperatures in Belgium have increased between 1.7 and 4.9°C during the winter and between 2.4 and 6.6°C in the summer.

Belgian biodiversity is changing in response to rising temperatures. This is in addition to the many changes that are being provoked by other factors such as pollution, invasive species, destruction of habitats, etc. Below you will find discussion of the complex causes of changing biodiversity in Belgium.

### 2/ THE IMPACTS OF CLIMATE CHANGE ON BIODIVERSITY IN BELGIUM

#### “Cold-climate” species

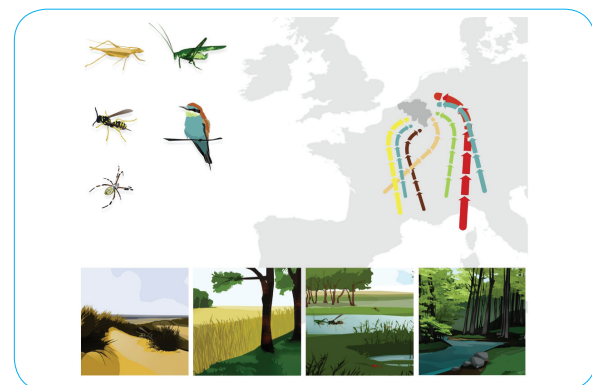
Cold-climate species are the first victims of rising temperatures, as you can see from the example of the common adder.

As a consequence of higher average temperatures, most of the adder's natural habitats are disappearing. in both upper and lower Belgium. The adder can now only survive in the few areas left that remain sufficiently “cold.”

Another factor threatening this cold species is human population density. By building roads, houses and

other infrastructures, human activity breaks up the snake's natural habitat – where it eats, finds shelter, reproduces.. This **fragmentation** constitutes one of the major pressures exerted on biodiversity in Belgium.

#### “Thermophile” species



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A number of thermophile (heat-loving) species have begun to appear in Belgium over the past few years. Their ability to thrive is possible thanks to particular features specific to each species, such as:

### - Transportation: **Ballooning**

The wasp spider produces a long thread of silk, allowing it to be carried away by the wind. This is called "ballooning," a technique that has enabled this particular spider to arrive in Belgium, where warmer temperatures now are allowing the spider to establish itself.

### - Adapting to urban environments

Although the European paper wasp (*Polistes dominulus*) was a rare species to come across in Belgium 15 years ago, it has now become quite common due to growing urbanisation. Unlike the local paper wasp (*Polistes biglumis*), which prefers using natural structures as a place to build its nest, the European paper wasp prefers nesting in artificial structures such as roofs.

### - Adapting to the movements of its prey

The bee-eater is a bird that comes from the Mediterranean region. For the past thirty years or so, it has started to nest further north as it has been following the geographic expansion of its prey (insects and other small invertebrates), which have also migrated northwards as a result of climate warming.

### What about tomorrow? The prospects

The arrival of new species may sound like a good thing, but it can also constitute a threat to local species. According to the International Union for the Conservation of Nature (IUCN), **41 species are currently under threat in Belgium.**

### Insects and destructive fungi

Even a minimal rise in temperature speeds up the pace at which insects reproduce. For example, when there is a 2°C temperature increase, some aphid species manage to produce up to 4 or 5 generations of offspring over the course of one year. This unrestrained reproduction threatens trees such as oaks, beeches and hornbeams, which are already weakened by the higher temperatures. Some types of fungi reproduce more quickly, too, such as the oidium, which appears as a white powdery mildew on the leaves of oak trees. Milder winters – which have been occurring more and more often – promote the development and spread of this disease.

Processionary caterpillars are another interesting example. Observed in Belgium for the first time in 2007, these caterpillars cause major damage to forests and are likely to become more widespread over the years to come.

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### C / Group activity to be conducted in the classroom

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#### «SOUTHERN INVASIVE SPECIES»

##### Aims

- Understanding what invasive species are and the risks associated with their development.
- Coming up with various hypotheses to explain changes in the geographical distribution of species as a result of climate warming.

##### Timing:

35 minutes

##### Equipment

- Attachments 1 and 2.

##### Step 1:

Procedure (10 minutes)

- Hand out attachment 1: "Short survey," "Spotting dragonflies" and "Look at that wasp's nest!"
- Ask the pupils to answer the questions by putting together the testimonial about the dragonfly and the diagram of observations of the wasp's nest, while presenting each animal.
- Have the children come up with ideas on how it can be related to climate warming.

##### Step 2:

Procedure b (10 minutes)

- Hand out attachment 2: "An invader!"
- Use the previous set of arguments to describe the influence of climate on an adverse species.
- Go into the basics of what an invasive species is.

##### Step 3:

Observations a and b (5 minutes)

- The northward march of invasive species from the south goes hand in hand with rising temperatures in Belgium. These species had previously not been observed.

##### Step 4:

Explanations and conclusions (10 min)

- It appears that climate warming is having an effect on biodiversity in Belgium: invasive species from the south are making their way up to our latitudes.
  - ➡ What can we do to prevent the advance of invasive species? There is a basic principle in sustainable development known as the "precaution principle." It means that as long as all the long-term effects of a particular environmental change are not known (such as the introduction of a new species), the environment should be left alone as a precaution!

# Sheet 10 : Biodiversity in Belgium

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## Recap:

We have just found out that:

- Species from more southerly regions are being observed more and more in Belgium: T/F?
- These species from the south are taking advantage of the temperature rise and reproducing more in our region: T/F?
- The new species coming to Belgium are harmless to nature: T/F?

## Other activities

- Find out about a pond's ecosystem at the WWF junior website: [www.wwf.be](http://www.wwf.be) > junior > documentation.
- The "Creating a natural pond" brochure published by the Walloon Region (free of charge, can be obtained by calling 081/33. 51.80). Observe the species that come to stay or live in Belgium. Identify the various species and differentiate the "Belgian" ones from the "southern" ones.

## D / Resources / references

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- The WWF educational file "The climate is us!"
- The brochure "Biodiversity in Belgium: an overview" from <http://www.sciencesnaturelles.be/biodiv> under the "Biodiversity in Belgium" section.  
See also:
- "SOS Invasions", a range of information sheets and games dealing with exotic species invading Belgium, developed by National Focus Point, the Biodiversity Platform and the Federal Department for Public Health, Safety in the Food Chain and the Environment.
- For information about southern dragonflies in Belgium, read the article by Philippe Goffart and Roland de Schaetzen at: <http://mrw.wallonie.be> in the DGRNE section.
- See also the blacklist and greylist of non-indigenous species in Belgium: <http://www.biodiversity.be>
- Greenpeace report: "Impacts of Climate Change in Belgium"  
<http://www.geo.ucl.ac.be/Pacte/Greenpeace.pdf>



# Attachment 1 :

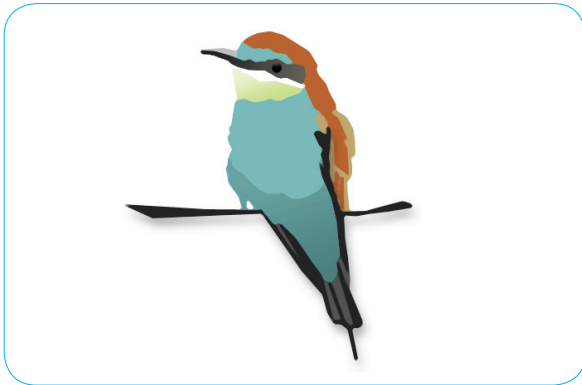
## From the Educational File:

### "The Climate is Us!"

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#### SHORT SURVEY...

Have you heard of these two fellows ?



The **European bee-eater** is a fine-looking bird with very colourful plumage. After having spent the winter in Africa, it returns to the Mediterranean countries to nest and have young. Unlike other birds, the bee-eater does not build its nest in trees but digs a burrow in the sand alongside rivers. How about that?



The **scarlet dragonfly** lives around the Mediterranean. Did you know that during the Middle Ages, these pretty little creatures were thought to be evil spirits? Funny when you think how much we admire them for their elegant looks these days!

Those two sure like being noticed for the moment! Can you figure out why?

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#### DRAGONFLIES IN THE SPOTLIGHT

**Did you know that dragonflies go through several stages before they become adults?**

Eggs laid by the female on aquatic plants hatch and produce larvae. In actual fact, before they become adults and fly off, the dragonfly **larvae** live in the water. They have a voracious appetite and love eating the larvae of other insects and young tadpoles!

We interviewed Philip, who just loves dragonflies and knows all about them:

"Since 1993, dragonfly-watchers have started being surprised and delighted to see more and more scarlet dragonflies in our region. It was a major event at the time because not only do these dragonflies have spectacular colours, they had previously only been seen in Belgium very occasionally. In principle,

# Attachment 1 :

## From the Educational File:

### "The Climate is Us!"

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the scarlet dragonfly was a species from southern Europe which, before, had only ever reached as far as the centre of France. They were observed for the first time at Virelles Lake in the summer of 1993, then again over the next few years. Now, though, we see them every season. We have even begun seeing freshly hatched individuals in the Harchies marshes, meaning that they are now capable of reproducing successfully over here."

Had Philip come across scarlet dragonflies often in Belgium before 1993?

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Do you know what the adjective 'southern' means?

If you don't, look it up in a dictionary and write down its definition:

.....

.....

What piece of important news about dragonflies did Philip tell us?

.....

.....

What does this mean about our Belgian climate?

.....

.....

There you are: you have just found out why this southern dragonfly is causing such a stir. First it comes to Belgium and then – due to climate warming – it reproduces just as though it were still living in southern Europe.

What about the bee-eater?

# Attachment 1 :

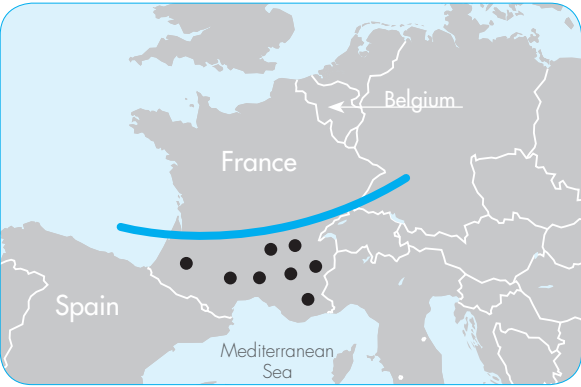
## From the Educational File:

### "The Climate is Us!

#### WHAT A BUZZ!

Do you remember where this bird is from .....  
 Look at the 2 maps below: the black dots indicate the various locations where the bee-eater has been seen.

In 1970



In 2005



	Was it seen in France ?	Was it seen in Belgium?
In 1970		
In 2005		

What do you think caused this difference between 1970 and 2005

.....

.....

Currently, scientists are pretty sure that the dragonfly and bee-eater are migrating up to Belgium because the climate is starting to be more ..... We are beginning to see all sorts of signs pointing to the fact that things are changing along these lines.

What do you think about the fact that we are now seeing increasing numbers of bee-eaters and southern dragonflies in Belgium?

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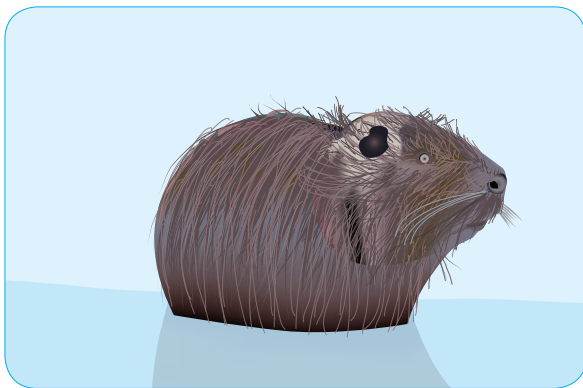
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# Attachment 2 :

## From the Educational File:

### "The Climate is Us!



#### AN INVADER!

The coypu is a big tropical rodent from South America. It does not pose a problem there because it is a prey to large carnivores, such as caimans and pumas.

Take a look at its long tail: it can reach as much as 40 cm long... Actually, the coypu does not like cold weather because, when the temperature drops below zero, it is unable to withstand the cold and freezes to death.

Such beautiful fur! Did you know that coypus were brought to Europe during the 19th century and bred to make fur coats?

Of course, some managed to escape and have managed to thrive in the wild here. Farmers are very unhappy about this because these critters are causing more and more damage to their wheat and cornfields.

And that's not all! Coypus also dig extensive vertical burrows along the banks of waterways, often destabilising dykes and roads and causing thousands of euros worth of damage!

Coypus are multiplying fast in Belgium.

Why do you think that is?

- ➡ Do you know any large carnivores living in Belgium? .....
- ➡ Is the climate the same as it was during the 19th and 20th centuries?.....

#### Did you know...

An "invasive species" is a species managing to survive somewhere that is not its natural environment. Worse still, it multiplies within its adopted habitat where there is nothing to stop it.

With no natural enemies, these "invaders" thrive and often compete with local species because they too need food to eat and a place to live. To cap it all off, they sometimes bring diseases with them against which our local species are defenceless.

Do you know someone who has a pet that comes from a country far away?

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# Attachment 2 :

From the Educational File:  
"The Climate is Us!

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In your opinion, do you think this animal might one day escape

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If it does, do you think it could cause any damage?

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.....

If you are unable to answer this question, do you think it would be best to take precautions to avoid the risk of this animal escaping, like the coypu?

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