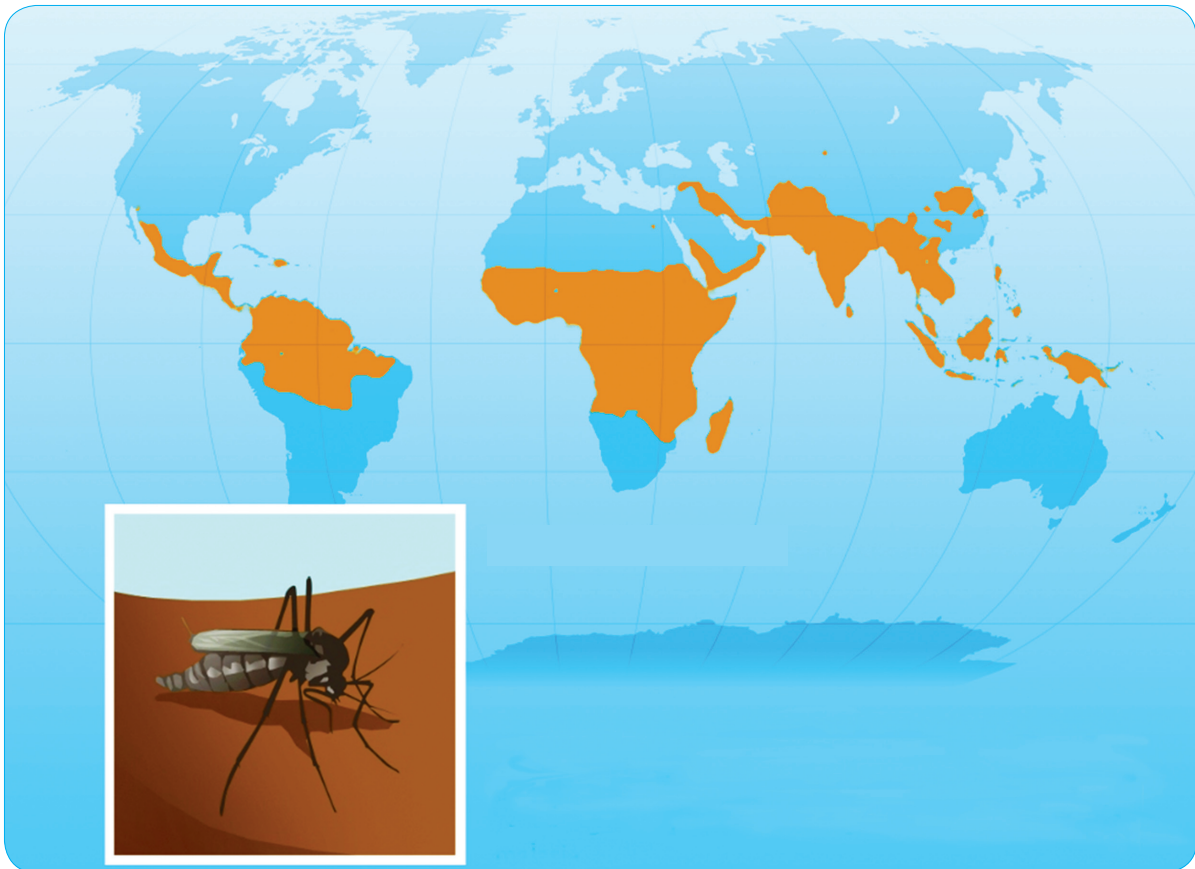




Sheet 5 : Invasive species

A / DESCRIPTION OF THE ANIMATION

This animation explains the interaction between climate warming and the invasion of new species. The first section explains how, by creating new climate conditions, climate change can provide a means for insect invasion into previously unaffected areas and help spread diseases these insects convey. The second section dwells more specifically on what are known as “invasive” species. These invasive species can present a danger to local ecosystems. In most cases, it is the absence of natural enemies in the new territory that makes these incoming species able to compete better for survival than the local counterparts. Invasive species are a serious threat to biodiversity, and their ability to settle new areas is being exacerbated by climate change.



Sheet 5 :

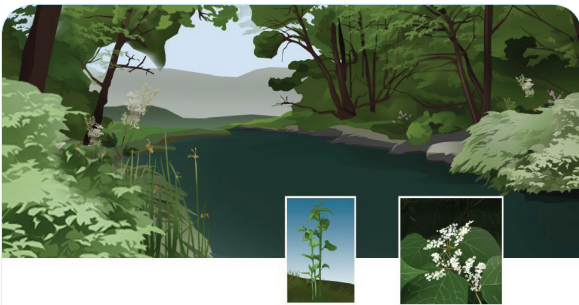
Invasive species

B) LET'S TAKE A CLOSER LOOK AT...

1/ INVASIVE SPECIES

Globalisation has created an explosion of transport facilities. The additional mobility of humans, however, also implies an increase in that of animals and plants which accompany humans on their trip. Travelling as stowaways in the ballast water of ships or in the cargo holds of aircrafts, they attach themselves to the soles of globetrotting travellers' shoes, or are imported as pets or ornamental plants to brighten up the gardens.

While this new-found mobility for various species may seem like science fiction, it is especially dangerous. As a matter of fact, invasive species can be considered to be **the second-biggest threat to biodiversity**, after the destruction of habitats. Each species is suited to a certain environment. An **eco-system** is a community of plants or animals that are interconnected by mutual relations (biotic factors), but also the relations that bind them together (abiotic factors, such as temperature). Any attack on one or more of the elements in this community has an effect on the entire system.



Lake Victoria provides an excellent example of this. Lake Victoria is the biggest freshwater lake in Africa. In the 1950s, the Nile perch was introduced in the lake to generate a source of revenue for the local people. Unfortunately, this voracious fish turned the lake's ecosystem upside down, decimating over 200 indigenous fish species and virtually destroying the local biodiversity. In addition to disrupting the ecosystem, the perch has become threatened in itself due to the spread of the water hyacinth, another invasive species, and to the resulting reduction in oxygen levels .

It is believed that one introduced species out of a thousand can be considered as being potentially invasive .

2/ DAMAGE CAUSED BY INVASIVE SPECIES

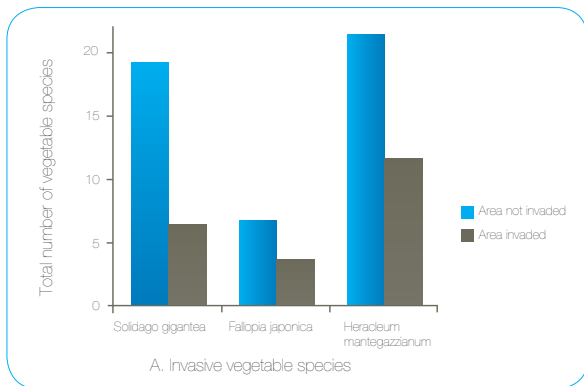
Ecological damage

Away from their natural enemies, some exotic species take full advantage of their new surroundings by developing wildly. The problem is that they could transmit diseases, devastate new territories and cause the extinction of certain indigenous species with which they are competing for survival.

A study conducted by the ULB has demonstrated the impact of a number of invasive exotic plants on the local flora. The study compares the plant diversity between several environments which have been colonised by a particular invasive species, the Japanese knotweed, and others which have not.

Sheet 5 :

Invasive species



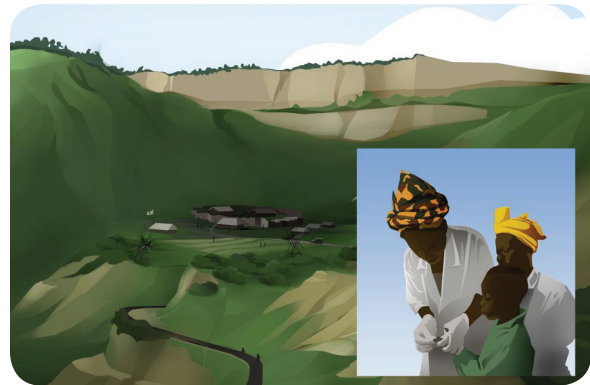
« L'érosion de la biodiversité : les espèces exotiques envahissantes »,
Vanderhoeven S, Branquart E., Gregoire J.C., Mahy, 2006

Economic damage

Invasive exotic species are responsible for major ecological and socio-environmental damage. This damage incurs costs associated with preventative measures that are taken to avoid these species from gaining a foothold and propagating. One study estimates the cost associated with the damage caused by invasive species at \$240 per year per person, which means the world economy is burdened with an extra 5% of costs!

Damage for health

Some species pose genuine public health problems. This is certainly the case with the Caucasian giant hogweed, a plant which can cause burns by simple contact with the skin when it is exposed to the sun. Another plant is the common ragweed, originally from North America, which grows along roadsides and the banks of our rivers. Ragweed pollen can cause serious allergies to over 10% of the population.



Other invasions

Another result of climate warming is that many disease-carrying insects will change their geographic distribution. The result of this will be the appearance of diseases and viruses in areas previously unaffected.

Researchers have produced a model for dengue fever, the most widespread viral illness in the world for which no effective treatment or vaccine exists yet. By 2085, as a result of changes which are predicted to affect both people and local climates, over half of the world's inhabitants – 5 or 6 billion people – will be exposed to the risk of dengue fever, compared with 35% if climate warming is kept stable.

3/ WHAT ABOUT BELGIUM?

- Invasive exotic species are considered to pose serious damage both to the environment and to health – to the point that they are on a blacklist of invasive species. More than 50 species of this type have been registered in Belgium, including the zebra mussel, the Asian ladybird beetle and the bullfrog.

There are other newcomers to have made the talk of the town, such as the racoon, a species well established in Belgium. Racoons are likely to pose

Sheet 5 :

Invasive species

problems in the long run , according to Etienne Branquart (Representative of the forum on invasive species in Belgium): *"They are having a particular impact on amphibians and ground-nesting birds, as well as – and this is more serious – on river pearl mussels, which are already an endangered species in Belgium. We can only imagine that the larger the racoon population becomes, the greater the level of predation will be. There is every indication that there will be major damage in the years to come."*

Sheet 5 :

Invasive species

C / GROUP ACTIVITY TO BE CARRIED OUT IN CLASS

DOWN WITH THE INVADERS!

Aims

- To read articles and remember the main items of information
- To boost the pupil's idea on what an invasive species is and on its associated risks
- To make the connection with everyday life and the choices we need to make on a daily basis if we are going to protect biodiversity.

Equipment

- The blacklist of invasive species in Belgium (cut into strips per species):
http://www.biodiversity.be/invasions/doc/SOS_Invasions_docs_-_Black_&_watch_list_Belgium_fr.pdf
- Access to the Internet
- Printer
- Cardboard for making memory cards
- Glue

Timing - Process

Preparation

Step 1

Each pupil then has to find for the species he or she has drawn:

- a photograph of the species
- where it comes from
- what its main characteristics are (description, habitat, food, special features)
- how it came to "arrive" in Belgium
- what impact it is having (+/-) on the local flora and fauna

Step 2

- Ask each pupil to make two identical cards representing the species he or she has selected. Important: all of the cards must be produced in the same way. All of the details and the photo must be on the same side of the card; the reverse side also has to be identical for all of the cards made by all the pupils in the class.
- **NB:** you can opt to create a giant "memory", which is then made up on the floor. The "species" cards can then be displayed in the classroom like posters when they are not being used.

Step 3

- Game: the cards are shuffled randomly and actually consist of as many pairs of cards as there are pupils in the class.
- The first player starts by turning over one card, and then a second card.
 - If they make a pair (i.e. 2 identical cards) the player removes them from the game and can then turn

Sheet 5 :

Invasive species

- over two other cards.
- On the other hand, if the cards are different, the player puts them back, face down, and remembers what they were and where they are. The next player then turns over two cards and so on, until all of the pairs have been revealed and placed together.
- The pupil with the most pairs of cards wins.

Step 4

- Ask each pupil whether he or she knows the species he/she has drawn, whether he/she has seen them close to the school, in a park, etc.
- Then ask each one what he/she could do to limit the list of invasive species. For example:
 - not release pets such as the Red-Eared Sliders (*Trachemys scripta*), the Ring-Necked Parakeets (*Psittacula krameri*) or the Siberian Chipmunks (*Tamias sibiricus*) into the wild.
 - not plant butterfly bushes (*Buddleja davidii*) in the garden or at school
 - tell family and friends about the risks presented by invasive species, make retailers, etc. aware (e.g. in garden centres, talk about the problems caused by Asian ladybird beetles (*Harmonia axyridis*) that were sold to eliminate greenfly).

Sheet 5 :

Invasive species

D) RESOURCES/ REFERENCES

The climate is us, WWF Belgium, 2008.

This file can be downloaded in pdf format from:

http://www.wwf.be/_media/BookWWFProf_fr_889149.pdf

Database of teaching tools provided by IDée Network:

<http://www.reseau-idee.be/outils-pedagogiques/>

SOS Invasions, developed by the National Focal Point and the Biodiversity Platform, funded by the Federal Department for Public Health, Food Chain Safety and the Environment, 2006 - Range of information sheets and games about invasive exotic species in Belgium. Can be downloaded in pdf format from:

<http://www.sciencesnaturelles.be/institute/structure/biodiv/biodiversity/treasures/pdf/waaierfr.pdf>

<http://biodiversite.wallonie.be/outils/methodo/predictionpourunespece.htm>

Darwin's Nightmare, documentary by Hubert Sauper, produced in 2004, running time 1h 50min.

http://www.biodiversity.be/invasions/FR/conference_FR.htm

The blacklist of invasive species:

http://www.biodiversity.be/invasions/doc/SOS_Invasions_docs_Black_&_watch_list_Belgium_fr.pdf

A study by Wallonia Environment

http://www.wallonie.be/eew/downloadfile.aspx?dwn=dossier_FFH_Vanderhoeven.pdf&dir=rap_dsci

<http://environnement.wallonie.be/eew/rapportDsci.aspx>

<http://www.fsagx.ac.be/ec/inplanbel/Tools-PDF/folderFRprojet.pdf.pdf>

Article about racoons:

http://www.lalibre.be/article.phtml?id=10&subid=90&art_id=363927

Survey into species of invasive mammals:

http://biodiversite.wallonie.be/offh/inventaires/enquete_invasif.html

