

# Squirrel Wars

## Squirrels in the UK

**Red squirrels** colonised Britain around 7,000 years ago. They were common throughout the whole of the UK and until around 150 years ago they were the only squirrel species in the UK.



However, in the 19th century **grey squirrels** were brought from the USA and released in the UK. **Grey squirrels** increased in number and spread rapidly - replacing **red squirrels** in the process.

There are now few regions in England and Wales where **red squirrels** can be seen. The majority of the UK's **red squirrels** can be found in Scotland.



### SQUIRREL FACT

Red squirrels collect mushrooms from the forest floor and hang them in trees to dry!



*So what can be done to protect the remaining reds?*



# Why do grey squirrels replace reds?

**Competition:** Greys compete with reds for resources (e.g. food). Greys squirrels prefer broadleaf trees (e.g. oak, beech) and are more successful than reds in these types of forest. This can lead to the extinction of reds in broadleaf forests when greys are present.



**Disease:** Greys carry a disease – squirrelpox – that is deadly to red squirrels but causes no harm to greys. Where the disease is present the replacement of reds by greys happens much more rapidly.

## Mathematics and Red Squirrel Conservation

The interaction between red and grey squirrels is complex – since it depends on the composition of the forest habitat, the way the forest is managed and the occurrence of disease.

It is hard to understand these complex processes in the wild and therefore it is difficult to predict where red squirrels will survive in the future.



This is where mathematics can play an important role. Mathematical models developed on a computer, combined with satellite maps of Scotland can represent the interaction between red and grey squirrels.

## How does mathematics help?

The mathematical models can be used to predict the expansion of grey squirrels and the spread of disease. This highlights the regions in which red squirrels are most likely to survive and therefore where best to target conservation efforts.

The squirrels have hidden words from Professor Andy's research in this puzzle. Can you help him by finding them?

Acorn

Bushy tail

Competition

Computers

Conservation

Drey

Ear tuft

Grey squirrel

Mathematics

Nuts

Red squirrel

Squirrelpox

C	F	C	O	M	P	U	T	E	R	S	S	D
A	C	O	R	N	E	I	K	H	E	X	T	N
J	X	N	W	N	Z	C	W	M	N	W	Z	L
W	D	S	Q	U	I	R	R	E	L	P	O	X
G	R	E	Y	S	Q	U	I	R	R	E	L	T
U	E	R	E	D	S	Q	U	I	R	R	E	L
E	Y	V	A	X	W	D	A	D	S	Y	F	H
A	M	A	T	H	E	M	A	T	I	C	S	G
R	P	T	O	M	M	K	U	Z	W	H	X	L
T	I	I	Z	H	V	N	N	G	W	Y	C	Q
U	C	O	M	P	E	T	I	T	I	O	N	U
F	E	N	B	U	S	H	Y	T	A	I	L	N
T	T	H	P	W	H	V	G	P	M	W	B	Z

## SQUIRREL FACT

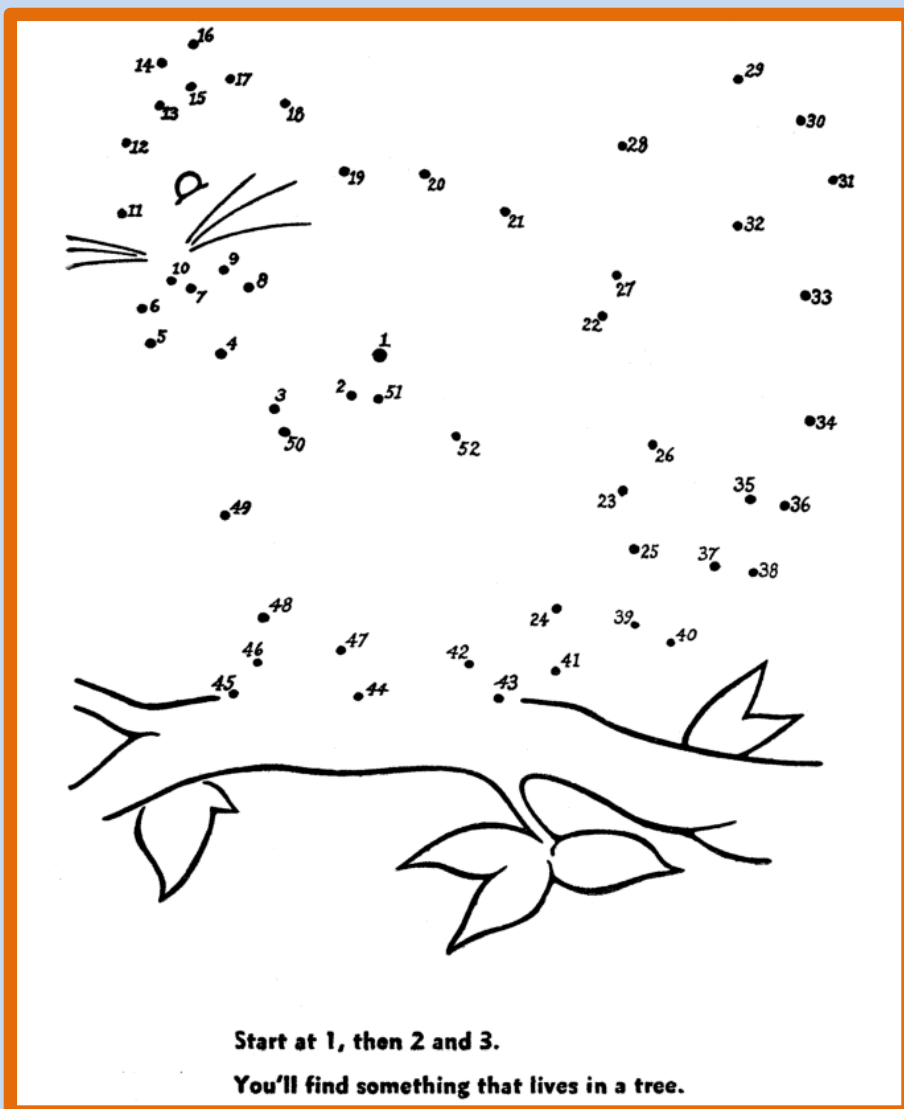
Squirrels have inbuilt sunglasses! The lenses in their eyes are tinted yellow to reduce glare and help them detect birds of prey in the sky



# Conservation of Red Squirrels

- Priority forest regions are managed to ensure long-term population survival of red squirrels.
- Measures are taken to limit the spread of disease to the remaining red squirrel populations.

The mathematical models are used to inform the best conservation strategies to achieve these goals.



*Can you work out  
what's hiding in  
the tree by joining  
the dots?*



Professor Andy works at Heriot-Watt University in Edinburgh. To find out more about his research visit his website: <http://www.macs.hw.ac.uk/~awhite/squirrels>