

The Role of The Great Trossachs Forest in Tackling Climate Change and Protecting Biodiversity

The Great Trossachs Forest (TGTF) lies at the heart of the Loch Lomond and The Trossachs National Park, and is a landscape-scale woodland conservation project covering an area roughly the size of Glasgow. In TGTF much of the original native woodland no longer exists, mainly due to deforestation and over-grazing (see 'Biodiversity and Sustainable Land Management in The Great Trossachs Forest' fact sheet for more information).

The remaining patches of ancient woodland have now been protected, however these patches are scattered across a large area, meaning that each patch is often located a long way from other patches. One of the important roles of this project will be to link up these important habitats through planting trees and promoting natural regeneration*. Extending existing woodlands and creating new woodlands can help to create 'habitat networks' so that species are able to move more easily across the landscape.

A habitat network is a series of separate areas of habitat that are connected enough for a particular species to move between the individual areas. Creating habitat networks can help species cope with climate changes and can also help improve biodiversity.



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Climate change

The Earth's climate is changing because human activities continue to release greenhouse gases such as carbon dioxide (CO₂) into the atmosphere. Scientists predict fairly major changes to our climate over time-spans of less than a hundred years, which is much quicker than most earlier changes in the earth's history. The exact changes that will happen in Scotland are not certain, but what is certain is that both humans and wildlife will need to adapt to new climates.

Our changing climate is likely to result in some plant and animal species becoming less suited to the areas in which they currently live. If steps are not taken to help, serious declines in biodiversity are likely.

An ecosystem is a biological environment consisting of all the organisms living in a particular area as well as all the non-living components of the environment that the organisms interact with, such as air, soil, water and sunlight.

Biodiversity is the variety of life forms within an ecosystem (or the entire planet). Biodiversity is a measure of the health of ecosystems. Greater biodiversity implies greater health.

Trees can be part of the solution

Experts predict that some changes in climate are now inevitable, but by reducing our use of carbon based fossil fuels, we can all do something to limit the worst extremes. Using wood from a sustainable* source as a fuel instead of coal is therefore one way to help prevent climate change.

Another practical way to help combat climate change is to lock up more carbon from the atmosphere through planting more trees and encouraging natural regeneration - as long as the right trees are planted in the right place. In TGTF only native trees suited to the environment will be planted. While they are

growing, trees absorb CO_2 from the atmosphere through photosynthesis and store it as carbon in the form of wood. In the UK, forest soils contain around four times as much carbon as the trees. Maintaining and expanding the forest area in TGTF will help ensure these stocks of carbon are protected and increase.

Adapting to climate change- protecting biodiversity

Helping to prevent climate change is extremely important, but equally we have to provide opportunities for wildlife to adapt to a changing climate. Trees can help us to adapt to a changing climate. They provide shade, reduce soil erosion, help prevent flooding, store carbon and create a valuable wildlife habitat, protecting biodiversity.

Many species of plants and animals may find themselves in an area where the climate has changed so it is no longer suitable for them - it might be too hot, too wet, too dry or a combination of these factors. Those species will either need to adapt quickly to that new climate, or move elsewhere to find a climate that is closer to the one that they need. In Scotland, warming temperatures is likely to mean that species need to move northwards or to a higher altitude. Good habitat networks will allow species to move more easily.

The weather can have a substantial effect on the breeding success of species like black grouse. Bog cotton is an important plant for insects on which black grouse chicks depend. Bog cotton, as the name suggests, likes growing in wet, boggy conditions. If climate change means summers are drier, bog cotton may only be able to grow further north and at higher altitudes. Less bog cotton would mean less insects and therefore less food for black grouse chicks.



Black grouse © FC Picture Library / Isobel Cameron

How habitat networks can be beneficial for biodiversity

Woodlands generally have less biodiversity in fragmented areas. **Habitat fragmentation** is where larger areas of habitat are split apart into smaller, separated areas of habitat (which is what has happened in TGTF). Fragmentation can leave the remaining population in each habitat patch very isolated and vulnerable. If there is a catastrophic event like a fire which wipes out a particular population, individuals from other patches may not be able to migrate in to replace the lost population. Populations in small, isolated habitat patches become extinct more easily. TGTF project aims to reverse the effects of fragmentation, ensuring that woodland biodiversity is protected.



Habitat networks - good for red squirrels!

Red squirrels live in woodland and don't travel across open habitats. They need at least 6 hectares of suitable habitat in order to survive and reproduce successfully. TGTF project will help this protected species by expanding woodland areas and creating habitat networks to join different areas of woodland together.



However, tree planting, natural regeneration and habitat networks aren't going to be the solution to all our climate change problems. Some habitats (like mature broadleaved woodland) take so long to develop that by the time an effective habitat network is in place, the species that need it may have already become extinct in the local area. It is therefore important to strengthen and enhance existing protected areas so that they can more effectively support vulnerable species, even in a changed climate.

TGTF is aiming to both enhance and extend the existing important habitats. The project will ensure that the existing forests are as diverse as possible, in terms of age structure and species, which will help to provide protection in the face of climate change and other impacts. This will be done by removing non-native species, such as Rhododendron, and planting native species that are not very common in the area.

We can't predict whether or not this will be enough to enable all species in TGTF to survive in a changed climate, but it should help to improve their chances.

More information and teaching resources on climate change and forestry can be found at www.forestry.gov.uk/forestry/INFD-7M8MZZ

Glossary

*Natural regeneration - when trees grow from seed spread naturally. Natural regeneration can benefit biodiversity as it creates a natural and irregular forest of mixed ages and species.

*Sustainable - can keep going on and on for ever. Sustainable forests produce timber as a renewable resource and are also managed carefully to prevent damage to ecosystems.