

UK – North Wales case study

Case study forest area: Clocaenog 5,662 ha, Gwydyr 5,839 ha

Ownership: 100% public

Forest goods and services:

Sustainable production of timber, paper pulp, biomass for energy
Recreation
Habitat protection and connectivity
Water

Special local conditions:

Gwydyr and Clocaenog represent contrasting forest types in north Wales, Gwydyr being relatively low lying and sheltered while Clocaenog is more typical of an exposed upland site. Both forests were largely created in their current form, through planting over a relatively short period of time.

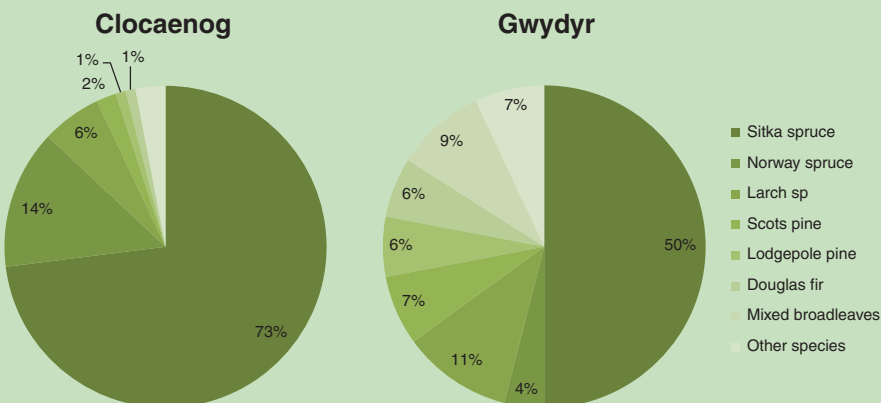
Stakeholders

Natural Resources Wales (formerly Forestry Commission Wales)

Management and governance issues

The forest is managed by Natural Resources Wales who practice sustainable forest management – balancing the needs of people and the environment, as well as generating income and providing jobs. It is following a policy of species diversification set out in a strategy document called 'Woodland for Wales'

Proportion of species of Wales

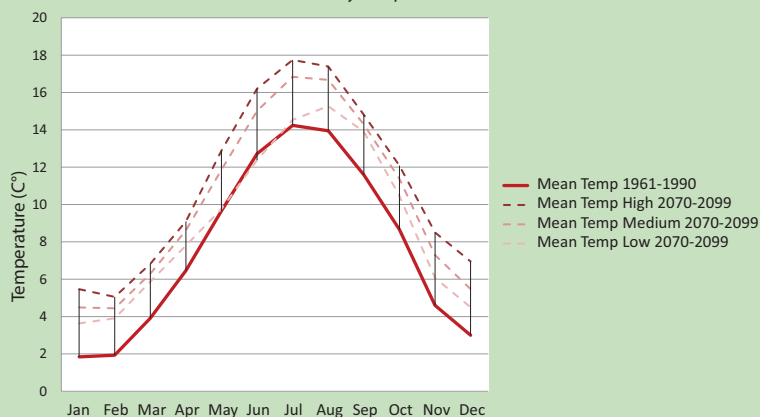




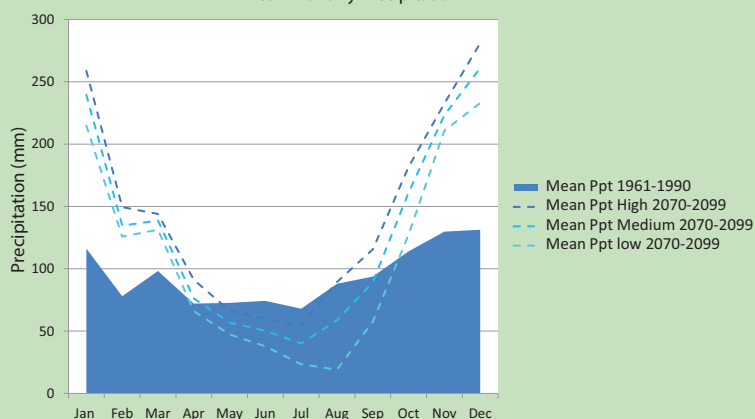
Climate change challenge

Climate change is expected to affect the growth and survival of forest trees through increased mean annual temperature and rainfall, while increasing the risks from storms, summer drought, pests and diseases. Towards the end of century some variants of the A1B scenario indicate much drier conditions in the region. This would be expected to cause previously high yielding sites to be constrained by drought, so yield would drop.

Mean Monthly Temperature



Mean Monthly Precipitation





Gwydyr forest



Clocaenog forest

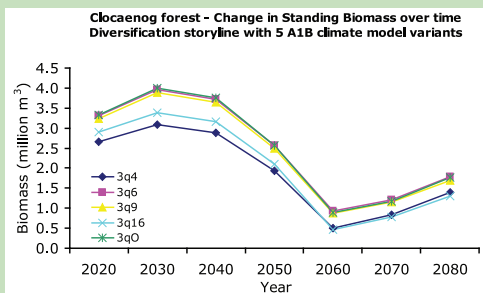
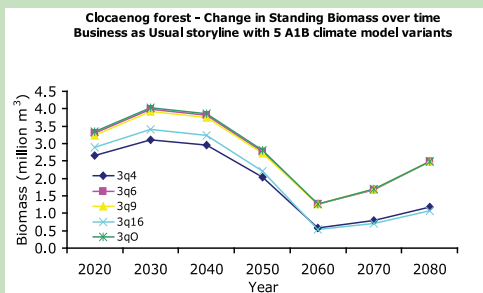
Photo: Crown Copyright
Forestry Commission.

Differences between the two forests

Clocaenog forest has a relatively high elevation and is dominated by Sitka spruce plantations. These are mostly managed as clearfell – replant stands, but where possible they are being converted to continuous cover to provide some structural diversity. Gwydyr is largely more sheltered, has a much greater diversity of tree species in the baseline and has much greater potential for continuous cover.

Case study

A suite of decision support tools and models were used to examine case study outcomes to 2080 based on differing management strategies: Business as Usual, Species Diversification, Short-rotation forestry and Low-impact silvicultural systems (LISS) that is essentially conversion to continuous cover. These were run with five variants of the HadRM3 A1B climate model.



The Diversification storyline resulted in much closer trajectories between climate model variants than Business as Usual (see line chart). In this modelling exercise the age structure is evident through large peaks and troughs associated with the felling and restocking cycles in forests that have low structural diversity.

Gwydyr forest can largely be converted to LISS which would allow standing biomass to be maintained through the century. Clocaenog, in contrast, is less suitable for LISS due to its exposure, and the peaks and troughs will have to be managed in practice by adjusting rotation lengths.



Conclusion

Diversification as an adaptation strategy led to less uncertainty, with projected standing biomass for all variants being between the highest and lowest projections for Business as Usual. Therefore although BAU has a possibility of higher returns, it also has a possibility of much lower returns, and the safer strategy in Wales would be to select a Diversification strategy. Where there are opportunities for improving structural diversity through converting forests to continuous cover (LISS), there are benefits of maintaining a more even standing biomass over time.