North Devon Biosphere Reserve Woodland Enterprise Zone: Forest Policy Framework 2017:2027

NORTH DEVON BIOSPHERE

Executive Summary

The woodlands of the North Devon Biosphere Reserve are extremely important asset to the area. Woodland accounts for 11.4% (26,400 Ha) of the terrestrial part of the Biosphere Reserve. Approximately 76% of the wooded area is under deciduous woodland.

On a production economy the woodlands and derived processing collectively are worth £16M per annum and 490 jobs which is much lower than the potential production given the low prop proportion of woodlands in active management. In terms of known ecosystem service values, the potential value are in the order of £58.5M (the timber component is based on standing values and is a minor component). A qualitative assessment of the condition and functionality of the woodlands for the range of ecosystem services by stakeholders in the Biosphere Reserve partnership suggests that the woodlands are under-performing and these values are not being reached.

This document proposes that the area is recognised as a Woodland Enterprise Zone where the commercial, wildlife and social benefits of the woodland resource can be developed and enhanced. The overall initiative addresses some of the key threats and opportunities presented in the Heart of the Southwest LEP Strategic Economic Plan, especially for the "northern peninsula area" and reflected in the recommendations from the SW Productivity Commission.

The programme is split into 4 areas that have mutual dependency:

- Woods for Business: safeguarding and expanding the current economic activity, expanding in to new markets
- Woods for Nature: Improving and safeguarding the woodland biodiversity
- Woods for People; Improving the social benefits provided by woodland and increasing a woodland culture in the area.
- Woods for Ever: Making our woodland resilient and dealing with climate change

The programme can be funded through a variety of measures public, private and third sector. It will have accountability through the UNESCO Biosphere Reserve Partnership.

Background

UNESCO World Biosphere Reserves are areas for testing approaches to sustainable development on a regional scale. The woodland cover of the North Devon Biosphere Reserve is 11.4%, which is slightly higher than the UK average. However, it was perceived in the recent ecosystem assessment of the Biosphere Reserve that the ecosystem services provided by the woodlands could be enhanced further through more management interventions, supporting the woodland owners and managers to get more economic gain from the full range of ecosystem services that they provide and of course planting more woodlands.

This policy framework is designed to set out how the woodlands of the North Devon Biosphere Reserve can deliver an optimum suite of services for the community of north Devon operating as a Woodland Enterprise Zone. For the purposes of this strategy, the resource assessments relate to the boundary of the Biosphere Reserve, however, the markets for the produce may extend outside.

Strategic Context

New opportunities for woodlands and forestry in the area include the Defra Landscape Pioneer, which seeks to demonstrate how to restore natural capital in the Biosphere but applying new tools and data, better integrated planning and decision making, scalable and replicable funding opportunities and sharing the lesson learnt from the above.

The Paris Agreement at COP21 for climate change has ratified the National Contributions for emission savings which strengthens the need for CO2 emission reductions.

The FC tree canopy recover report has raised implications for silvicultural practice to a degree but has greater implications for the need for more woodland creation.

State of the woodlands and related industry in the Biosphere Reserve

A more detailed appraisal of the state of the Biosphere Reserve woodlands and economy can be found in the Appendix.

The woodland in the Biosphere Reserve can be described as:

- Predominantly deciduous (76%),
- Quite fragmented both spatially and in terms of ownership,
- Only 22% of the woodland area are not managed
- Rich in biodiversity with a large proportion being ancient woodland sites
- Provides a very large value of ecosystem services to the communities in north Devon for climate mitigation, flood attenuation and access and amenity
- Potentially prone to outbreaks of disease and pests. (the area is prone to *Phytophthora ramorum* and there is the ever increasing presence of ash die back (*Chalara*) which threatens the traditional structure of woodlands).
- Has large areas of mature/over-mature woodland.

The woodland economy of the Biosphere Reserve is:

- Worth around £16M per annum to the area (ONS data)
- Employs around 490 people (ONS data) but made of largely older people
- Has reducing value-added activity taking place in the Biosphere Reserve but presents some interesting opportunities.

- Offers great potential for providing renewable heat for the community in north Devon

The key role for the Biosphere Reserve Partnership is to sustain and where possible enhance the woodland resource and its associated economy and improve the connections between woodland and people. This can best be achieved by using the Biosphere Reserve as Woodland Enterprise Zone.

This policy sets out programme areas for work under themes of economy, biodiversity, people and future proofing.

Policy Framework for woodlands in the Biosphere Reserve

Vision for the Biosphere Reserve Woodland

The woodlands in the Biosphere Reserve will be valued by all for the range of services they offer for biodiversity, community and the economy. The woodlands will be sustainable managed and harvested. The community of the Biosphere Reserve will have a stronger woodland culture with people who are better informed and more connected to their woodlands. The Biosphere Reserve will operate as demonstration for other areas in the south west, and will share knowledge of regional woodland management internationally. The Biosphere Reserve will be a Woodland Enterprise Zone that creates and promotes a strong woodland economy and culture.

Woods for Business

Key aims: To safeguard the current businesses and increase the employment opportunities in the sector through technology development and capacity building.

Establish a system of business support for the woodland and wood processing industry

Actions

1. Establish the Biosphere Reserve as a woodland enterprise zone that enables business support especially towards social enterprises.
2. Help woodland owner's access information about their woodlands and markets for the produce.
3. Provide a cost efficient advisory sector
4. Direct business support for woodland businesses for business skills, innovation support and access to new markets
5. Keep woodland directory up to date.

Build skills and knowledge and labour capacity in the forest industry

There are not enough people skilled in woodland management and labour in the within the area to meet the demand. Skills are required in woodland establishment, woodland management, harvesting and processing.

Actions

6. Skills audit for the workforce in the forest sector
7. Recruitment, training and are required to provide a suitable workforce

8. Training local entrepreneurs and contractors for woodland management and timber/non timber products.
9. Establish apprenticeship training programmes with local providers (Duchy College, Bicton and Petroc). Biosphere Reserve to seek to top up the national apprenticeship scheme to enable more forest entrants.
10. Training and information materials for landowners and farmers
11. Woodland champions for woodland communities to promote a deeper understanding of woodlands

Stimulate a wood fuel market:

Wood fuel is the easiest and currently most likely market to grow with oil prices increasing all the time. However although the demand is growing the provision of the resource is not. The solution can be linked to the management of woodlands as stated above. As demonstrated in various areas, energy from the hedgerows is going to be a huge potential contribution (outside the AONB). The woodland management for fuel wood must be accredited. This is necessary for RHI supported schemes. The Biosphere Reserve sustainable energy study and strategy promotes a switch to wood from oil as a means to reduce fuel poverty and reduce emissions. It will also boost local employment in the energy supply chain.

Actions

12. Develop the wood fuel market supply, possibly giving a guaranteed price to ensure that supply can meet demand and to stimulate the culture for woodland management and harvesting. Projects generating wood fuel should link to projects that will also improve the efficiency of homes and heating systems so that the wood is being used in the most efficient way. The development of efficient wood fuel heating that is either boiler based (for RHI) or burner based for conversion from oil should be part of the programme.
13. Community woodland Management for wood fuel. This project will get community volunteers to manage woodland for a firewood fee. This activity needs some coordination, management advice, community facilitation and “training”. Setting up community agreements, possibly through an interacting 3rd party such as the Biosphere Reserve or ward forester or similar.
14. Demonstrations need to be facilitated that use district heating systems based on wood heat technology.
15. Speed up the volume coming to market through rapid roll out of management advice and felling/marketing support.

Stimulating sustainable management of woodlands

There is a need to provide advisory services to engage woodland owners and provide cost effective advice and management measures by collaboration with neighbouring woodland owners. Well managed woodlands will be an added tourism attraction, biodiversity benefit and provide other ecosystem services. Thematic collaboration can also be explored. Management advice should be targeted towards multiple outcomes.

Action:

16. Support the engagement and production of management plans where they cannot be funded through NELMS. Fund to include the measures to formalise

the collaboration. These should be coordinated if not run together, with complementarity between the projects such as 0-3 Ha, or 1-5Ha, over 5Ha, and/or geographically. Operational or referral links should be made between the advisory work and the market work and to the whole farm conservation work and farm business development. (Potential projects from Biosphere Reserve/AONB/National Park/Silvanus/Trees and Land/Ward Forester). Advice given to the woodland owners should follow policy guidelines for multiple ecosystem service benefits and ideally comply with the spatial strategy.

Stimulate the supply chain for wood produce and timber markets:

The ultimate aim for foresters is to provide a quality product that is not necessarily for burning. The value added from timber used for a range of specialist or building based products is much greater than from firewood, due to the process chain. Market demand should be developed and stimulated through schemes that recognise the improving quality of timber in the Biosphere Reserve rather than round logs being shipped out of the area for processing elsewhere. This section of work can also look at the technology development of utilising timber produce of various qualities. For example, early thinning crops arising from the South West Forest supported planting to make bespoke or regular roof trusses.

Actions:

17. Improving our knowledge of the woodland resource in the Biosphere Reserve to help processors be fit for purpose for the range of materials and for the new markets for those materials.
18. Research on the resource and the technology development, processing capacity for the resources in the area.
19. Coach contractors, foresters and agents to identify and harvest correctly the produce to get the best price.
20. Engage builders, architects, planners and development control, to be aware of what is available in the area and how it can be incorporated in to design and build.
21. Engage furniture and cabinet makers on the availability of niche timber products.
22. Make landowners/foresters aware of the demand and keep updated constantly.
23. Establish processing hubs for woodland products shared by cooperative organisations and/or social enterprises.

Develop a market for non-timber forest products;

Developing the woodland tourism, the log based mushroom cultures, other plant (or animal-based)

Action:

24. Identify the non-timber produce and work with smaller enterprises to get them market ready and support the woodland enterprise development.

Woods for Nature

Mis-management can threaten woodland biodiversity. In addition, fragmentation and isolation of sites across the landscape can threaten ongoing woodland resilience.

Key Aims: The principle aim is to increase the woodland cover to improve connectivity between woodlands, improve the management of existing woodlands for biodiversity and ecosystem function into the future.

Safeguard the ancient woodland resource

Action

25. Promote the conversion of PAWS sites back to native broadleaf woodland cover supported with good technical advice and where appropriate still producing to reduce the costs of management.
26. Improve the management of ancient woodlands with techniques to support continuity of structure, age class and species choice suitable for expected climate conditions.

Increase the connectivity for biodiversity

Action

27. Create new native broadleaf woodlands in areas to improve the connectivity between sites of high conservation value including ancient woodland sites according to a well-defined spatial strategy.

Provide advice on the species choice to enable the continuity of woodlands

Action

28. Adopt, and promote as guidance, a climate-proofed species list for re-stocking that is appropriate for location and soil types, provides continuity for the associated tree species, is sensitive to tree disease and pests, and maximises biodiversity value.

Improve the management of all woodland for biodiversity

Action

29. Ensure that woodland advisory services within the Biosphere Reserve, including partners and the commercial sector, have access to good information for management of all woodlands for biodiversity (broadleaf and conifer, including County Wildlife Sites and other priority sites).
30. 'Develop and promote a standard woodland management plan format adapted with the FC national format that is tailored to the needs and challenges of woodland management in the Biosphere. This management plan format will encourage a strong environmental emphasis to all woodland management in the area, and ensure woodlands are considered in the context of a wider mosaic of habitats'

Woods for People:

Woodlands provide a great deal of community benefits from healthy activities, education areas, local small business activity, community energy schemes to name but a few. Woodlands provide the opportunity for a number of recreational activities. There are some significant public and private sector blocks that can be linked by the Tarka Trail and national cycle way routes to provide experiential tourism and recreation.

Projects should be developed that enable these opportunities to be exploited by small social enterprises so that community benefits can be derived.

Key Aims: To establish stronger social and economic outcomes from our woodlands through diversifying their use and encouraging a woodland culture within our communities and o increase the level of understanding and empathy for woodlands within the community.

Improve and extend the use of woodlands for a range of community benefits.

Actions:

31. Develop community woodlands for education, local fuel-wood, cultural connections, nurturing a wood culture, historic and cultural heritage,
32. Improve the provision of family learning activities for family cohesion and health, green gyms, green prescriptions (GPs prescribing walks and other woodland activities for some illnesses such as depression and obesity).
33. Set up community/social enterprise that links the communities with accessible private and public woodlands, provides a healthy activity service for people of all ages, for physical and mental wellbeing. It can also work with offenders on community service, rehabilitation, youth employment experience etc., for skills development and reduce re-offending.
34. Explore the potential of Cookworthy, Wembworthy and Eggesford Forests as activity areas for recreation, serving the north Devon community, its tourists and an alternative for the Exeter area citizens.
35. Explore the potential in other larger private woodland blocks to expand the inland offer for recreation and tourism.

Creating a wood culture in the Biosphere Reserve

It has been suggested that the lack of woodland management in the area stems from a lack of embedded woodland culture in the people living and working area. In other areas of the country, the concept of woodland hubs as education and training sites, focal points for woodland owner and manager meetings etc. have been promoted.

Action:

36. Explore the concept of developing a Woodland Hub for the Biosphere Reserve.

Woods for Ever:

There are many challenges facing the woodland and woodland businesses into the future. These include climate change in particular. But woodlands also need to be managed and considered long into the future with techniques that adaptive to the changing environment. A woodland extension programme is implicit within this to increase the carbon storage. Part of the sustainability of woodlands is to ensure that the community understanding of woodland grows from its present level.

Key aims: To ensure that our woodlands are resilient to the changes expected due to climate change and the shocks that might be placed due to disease and pest outbreaks.

Climate change adaptation and mitigation

Spatial planning for new woodlands

Land use models suggest that we should be putting more land under woodland to get the ecosystem service benefits from woodland such as flood attenuation, water quality, carbon sequestration, wood fibre supply and enhance the landscape. We seek to have a total woodland cover of 16% by 2030.

Actions:

1. Advisors to work with famers and promote woodland planting for a number of benefits. Woodland areas for planting have been identified by the Biosphere Reserve Partnership on a sub-field level for maximising ecosystem service benefits. The economic gain in the short term is through the grant aided planting/fencing done by local contractors.
2. Appropriate planting and management schemes that enhance the landscape.

Species choice for new woodlands and re-stocking

Action:

3. To have in place a resource for species recommended list that will be climate resilient and also provide the ecosystem services that local society needs long into the future.

Silvicultural Practices for Resource protection and ecosystem services

Historically various practices have been used such as coppicing that was driven by the tanning and smelting industries. Traditional systems such as coppice with standards will not give the desired tree cover that is currently deemed popular or appropriate in the area. Continuous cover forestry promotes only shade tolerant species, though there may be a place for its use in the area. The optimum markets will be around wood fuel initially and good quality timber with wood fuel ultimately. Furthermore, whilst tree-cover appears to be good, the age structure within the woodlands is perceived to be biased towards older trees, therefore a programme to recover good age structure is needed.

Action:

4. Support the application of silvicultural practices that go beyond the basic code of good practice for resource protection, such as continuous cover forestry, regeneration coup felling, etc.

Carbon sequestration and flood attenuation service payments:

Application of the Forest Carbon code and planting has proven to be problematic in the area since a minimum planting area of 10Ha is required. The code has applications in commercially established and felled woodlands. The carbon payments can support the internal rate of return for forest investments; therefore we will seek to identify how this can be applied legitimately. Similarly, if the woodland is specifically designed to attenuate flows, a payments system might be developed to account for this service.

Develop Ecosystem service payments scheme for climate adaptation and mitigation

Actions:

5. Seek to develop carbon sequestration payment and develop the market mechanisms using the gold standard.
6. Seek to develop a flood attenuation payment top-up for woodlands providing that function.

Woodland health:

Pests

Deer and grey squirrels are on the increase and making establishment/re-establishment of woodlands especially broadleaves problematic. Stalking syndicates are perceived to be not managing the deer for woodlands but managing a shoot so there are plenty deer for paying clients to kill.

Actions:

7. Support collaboration between landowners such as in a Deer Initiative, but also develop the market for the venison under an accredited (Biosphere Reserve endorsed?) scheme of management. Infrastructure is needed such as chillers, deer extraction equipment, marketing support for the full range of venison goods. Requires land owner engagement (for wood and non-woodland owners), public engagement, food and marketing links to supermarkets, and local food outlets. Food testing to make the hinds more marketable to support stalking the right gender, etc.
8. Research and roll out measures for grey squirrel control. These might be biological controls or mechanical controls avoiding non-target species. Needs some R&D and then a roll out.

Pathogens

Generally, disease outbreaks are managed at a national level with advice movement bans, etc. These should be adhered to and strictly applied. For many diseases, round wood can be moved under current licencing procedures which include a risk assessment. There is still an economic and disease risk involved. Therefore to extract

the local economic benefit from sanitation felling, on site processing can minimise the spread of any pathogens from the timber, especially if the pathogen is in the bark, phloem or cambium layers.

Build resilience in the woodland sector to disease outbreaks.

Action:

9. Develop more methods of on-site processing with mechanisms for chipping and transporting produce safely for local use. Having a more localised system can help establish disease control areas without having devastating economic impact.
10. Use citizen science programmes and projects to monitor disease and pest status.

Research

Based on the above strategic objectives, the following research themes have been identified.

Pest management:

- Controlling grey squirrels: identifying the factors for damage and the effective controls to minimise the damage
- *Chalara fraxinea* (*Hymenoscyphus pseudoalbidus)* resistance in the Biosphere Reserve: Understanding the genetic and phenotypic mix of ash in the Biosphere Reserve and its susceptibility to ash dieback infestation/impact.

Woodland management

- Silviculture systems for recovery of old coppice and managing windthrow risk: to identify good and successful practices for recovery of woodlands into good management and yield without unduly compromising other values.
- Woodland Inventory for the Biosphere Reserve: to have a better understanding of the structure and condition of the woodlands in the area and contribute to the National Forest Inventory.
- Use of remote sensing for cost effective access to data about the woodlands for managers and regulators.

Woodland economics

- Utilisation of early thinnings: what products can be made from the early thinning of planting (especially young Sitka spruce) within the area?
- Cost benefit refinement on ecosystem services from woodlands: improving our knowledge on the ecosystem service values from woodlands for flow attenuation, carbon, utility value, etc. to be set against other land-use scenarios.
- Understanding the value of the social dimension of woodland in the Biosphere Reserve:
- Urban forests/trees and their benefits in a north Devon context: What are the scope and extent of benefits from urban woodlands in northern Devon?
- Improving the economic value of removing Rhododendron: If rhododendron is the reservoir of Phytophthora

Funding Opportunities:

LEP Funding

Rural Growth Fund: for business advice and support

ESIF; funds for low carbon development, but requires specific carbon reduction targets attached outside of the forest gate.

The Rural Development Plan funds will be key to the delivery of some of the above actions.

The funds include:

- Countryside Stewardship
- LEADER5 funds: for business development and product development: Probably £150K available
- Countryside Productivity Scheme: to support capital purchases and business improvement/diversification by landowners and cooperatives.

Other EU funds:

- LIFE and Interreg offer programme strands that sympathetic to the proposals in this document. LIFE does not necessarily require an international partner to work with.
- Horizon 2020 is the new research fund which also encourages the inclusion of NGOs, SMEs and Local Authorities as well as universities.

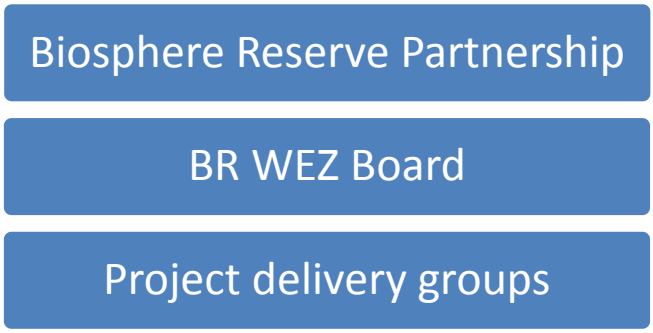
Lottery:

- Heritage Lottery Funds for PAWS restoration work. The Woodland Trust has a project operating across the northern part of the Biosphere Reserve.
- Big Lottery Funds; for social outcomes

Private Investment

Available as direct investment or through Green Bonds and Social Bonds, particularly for poverty alleviation and climate change related actions. There is also the opportunity to use Woodland Carbon Code as a lever for investment into new woodlands especially those for biodiversity and other ecosystem services.

Governance of the Biosphere Reserve WEZ



The proposed governance model is designed to fit in with the emerging governance of the Biosphere Reserve generally. The WEZ will have a status of a specific theme group in the Biosphere Reserve and will lead on this theme. Groups will come together and develop their projects which will be coordinated by the WEZ Board.

Biosphere Reserve Partnership:

- Overall responsibility for the whole of the Biosphere Reserve Strategy and its development.
- Approves the WEZ strategy
- Champions and supports the WEZ work with external funders and agencies.
- Ensure coordination between the other working groups in particular the Nature Improvement Area and the Catchment Planning Group and the Sustainable Energy Group.

The WEZ Board:

- Reports to the Biosphere Reserve Partnership on the progress of the strategy.
- Coordinates the delivery of the woodland strategy
- Draws together funds for its work and commissions work and projects accordingly
- Coordinates and serves as clearing house for woodland related projects in the Biosphere Reserve and seeks to get synergies and good value from delivery of the projects

Project Delivery groups;

- Report to the WEZ board, submit proposals and deliver projects.

Appendix

Current State of Woodlands

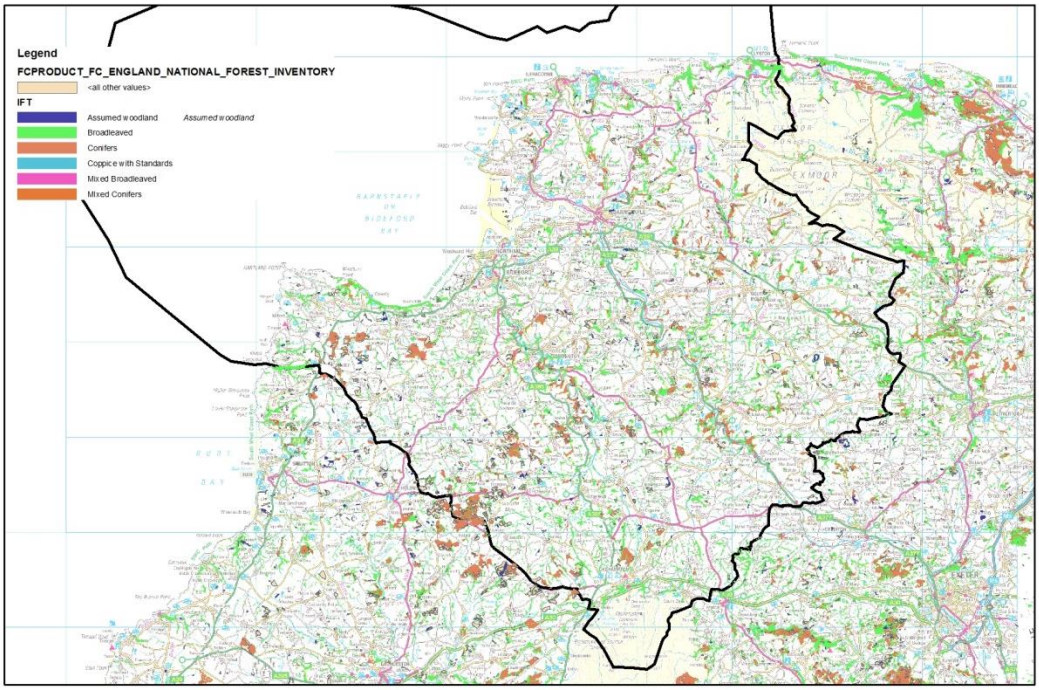


Figure 1 Woodlands in the BR (source NFI, 2015)

The woodland stock over the Biosphere Reserve is Ha; this represents 11.4% of land cover.

The report output on volumes from the Forestry Commission National Forest Inventory for the Biosphere Reserve has the following highlights:

- There is a total of 26,400Ha of planting in the Biosphere Reserve of which only 6,200 Ha is conifer.
- Approximately half of the conifer crop is Sitka spruce.
- Of the remaining confers (11% of the total area), Douglas fir accounts for 45% and Larch about 30% of that 11%. These offer some considerable opportunities on one hand and major risks on the other.
- Ash accounts for 9% of the total woodland cover, Oak 17%, Willow 12%
- The remaining mix of broadleaves is around 33% of total woodland cover.

Standing Volumes

Selected species	FC volume (000 m^3 obs)	Private sector volume (000 m^3 obs)	SE%	Total volume (000 m^3 obs)
North Devon Biosphere Reserve				
All conifers	**384**	**1,302**	***15***	**1,686**
Sitka spruce	216	681	*27*	**898**
Other conifers	168	620	*24*	**788**
All broadleaves	**41**	**4,609**	***15***	**4,650**
Oak	5	1,946	*23*	**1,951**
Beech	5	593	*57*	**598**
Ash	1	594	*26*	**594**
Willow	0	408	*25*	**408**
Other broadleaves	31	1,033	*15*	**1,064**
All species	**426**	**5,913**	***12***	**6,339**

Age class distribution of the crops suggests that there may be significant volumes of timber that will be felled in the coming 10 years.

Age class	FC area (000 ha)	Private sector area (000 ha)	SE%	Total area (000 ha)
All conifers				
0-40 years	1.3	2.6	*20*	**3.9**
41+ years	0.5	1.8	*25*	**2.3**
Total	**1.8**	**4.4**	***10***	**6.2**
All broadleaves				
0-20 years	0.1	5.1	*14*	**5.1**
21-40 years	0.1	5.9	*12*	**6.0**
41-60 years	0.1	4.5	*16*	**4.6**
61-80 years	0.0	1.4	*24*	**1.5**
81+ years	0.1	2.8	*21*	**2.8**
Total	**0.4**	**19.7**	***6***	**20.1**
All species				
0-20 years	0.6	6.5	*12*	**7.1**
21-40 years	0.9	7.1	*12*	**8.0**
41-60 years	0.5	6.1	*14*	**6.7**
61-80 years	0.1	1.6	*23*	**1.6**
81+ years	0.1	2.8	*21*	**2.9**
Total	**2.2**	**24.2**	***4***	**26.4**

The clear felled area as at 31 March 2012 was 379.8 Ha, this accounts for approximately a seventieth of the woodland area. The low prices for timber over the recent years have meant that trees (particularly conifers) have been left to stand and increase in volume. These will be difficult to harvest and process but may provide some niche produce. Over maturing stands may lead to higher risks of windthrow.

Management Status:

The criteria for deciding if woodland is being managed are: 1. covered by WGS3 scheme, 2. Felling Licence applications (there is no data whether they have been executed), 3. SSSI coverage (assumed that a management plan statement exists), 4. Forest plan approved by the FC has been agreed over the area and 5. Owned by Forest Enterprise.

These data are provided by FC with the exception of the SSSI unit data (where woodland is the habitat of the unit) which is provided by NE. There may be woodland blocks that are being "managed" where schemes have lapsed and interim management is going on such as scrub management etc. There may also be woodlands that are being managed through non-intervention. Similarly, they may be sites with management plans that are not being implemented and therefore not truly under management.

(NB the slight difference in the areas covered in the stats from the FC and the Biosphere Reserves is due to the GIS selection methodology, and rounding of figures by the FC. The differences are not significant for the purposes of this report)

The results are featured in the map below and in Graph 1.

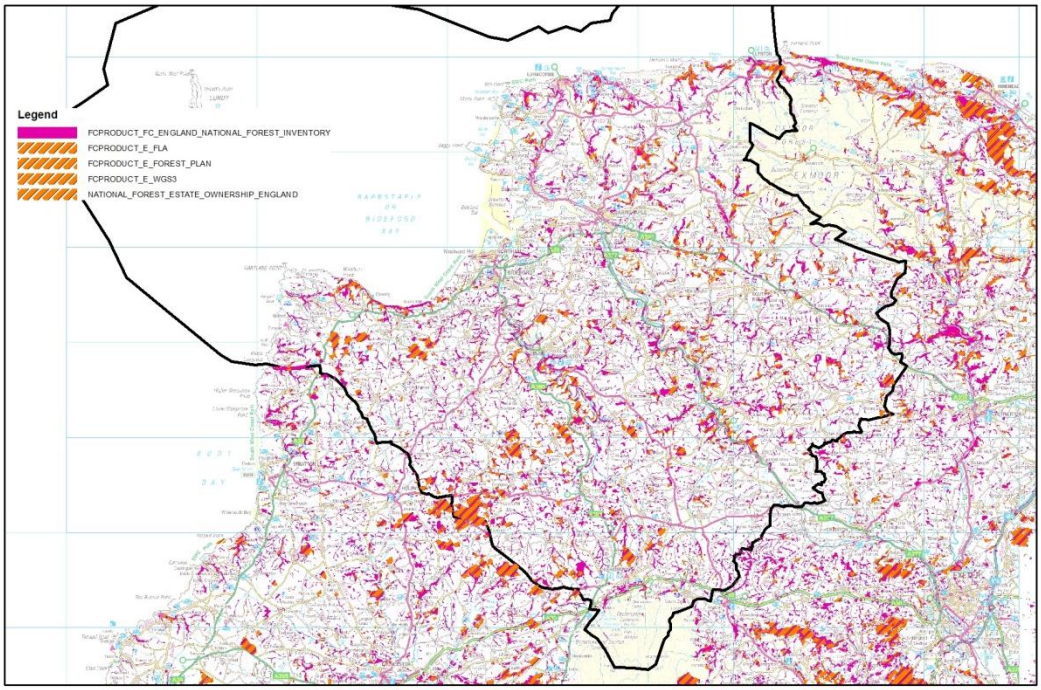
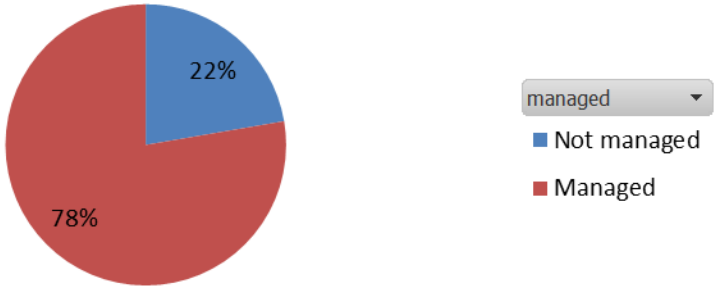
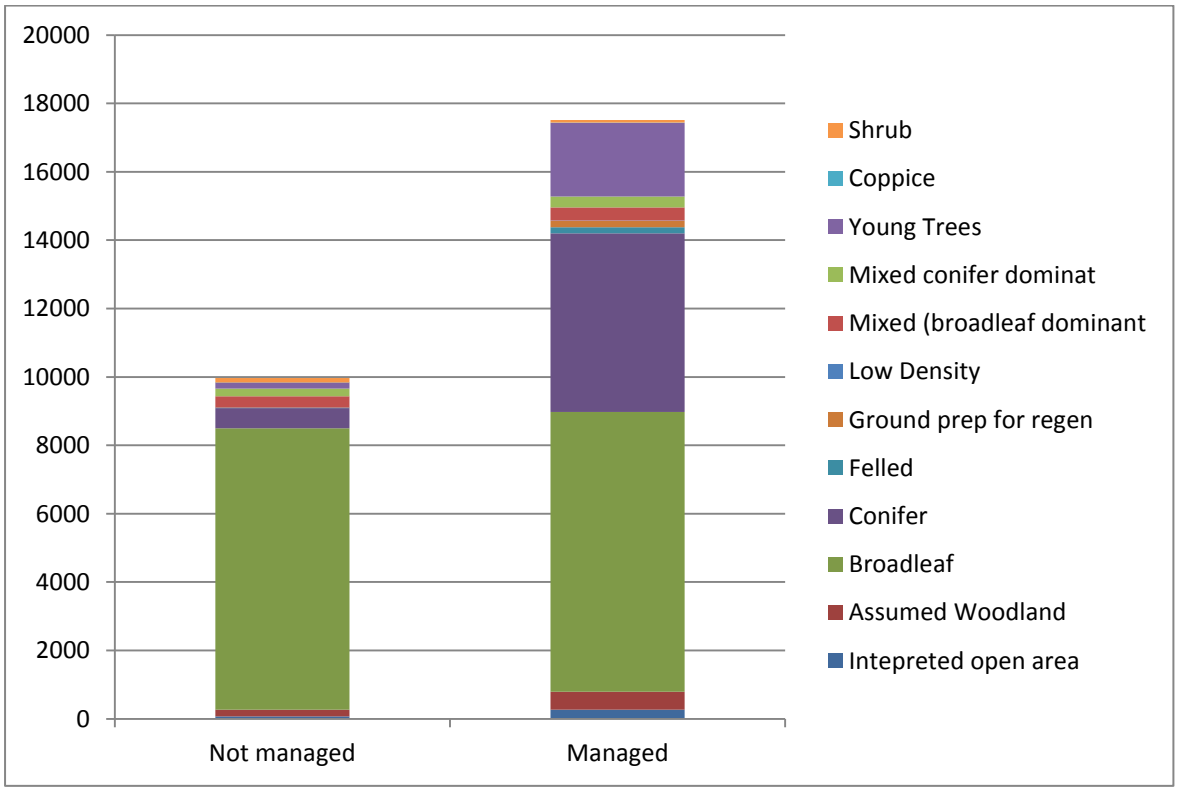
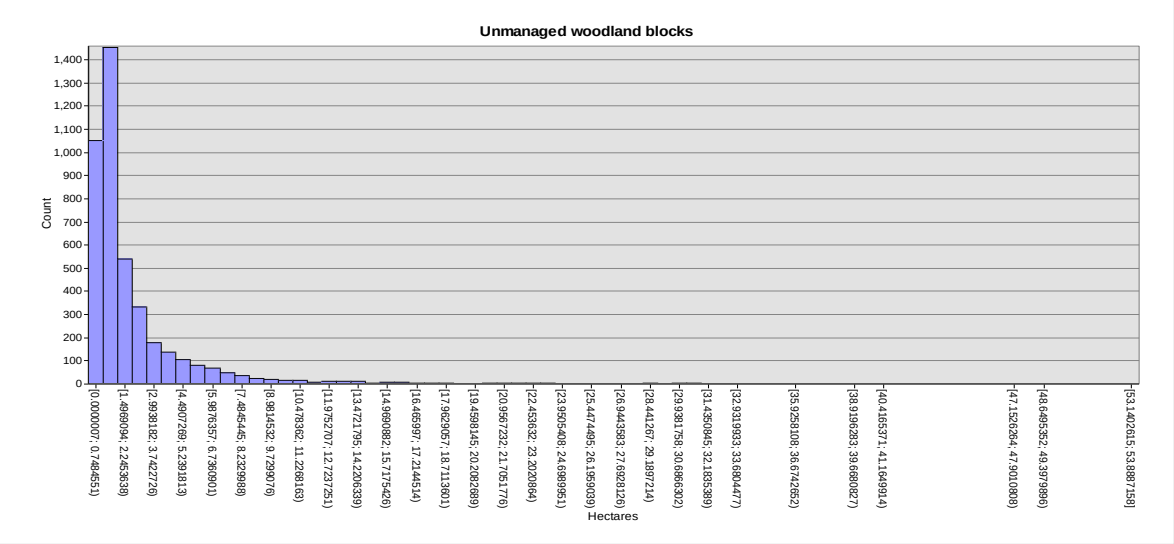


Figure 2 Managed and un-managed woodlands in the Biosphere Reserve



The percentage under management therefore does not appear to be too low under this selection method. However, again under the selection method used in the GIS system, this may tend to overestimate the areas being managed.





As can be seen from this histogram, the majority of woodland blocks not in management are in the small size bands. It should be pointed out that these are blocks of woodland with contiguous leaf type; they may be independent unconnected blocks or compartments within a larger woodland unit. However, it can be assumed that bringing this resource into management is going to be labour intensive in identifying and engaging the landowners and building collaboration to reach economies of scale for viable woodland operations. As one might expect, the majority of the unmanaged woodland is under broadleaves.

Woodland Biodiversity

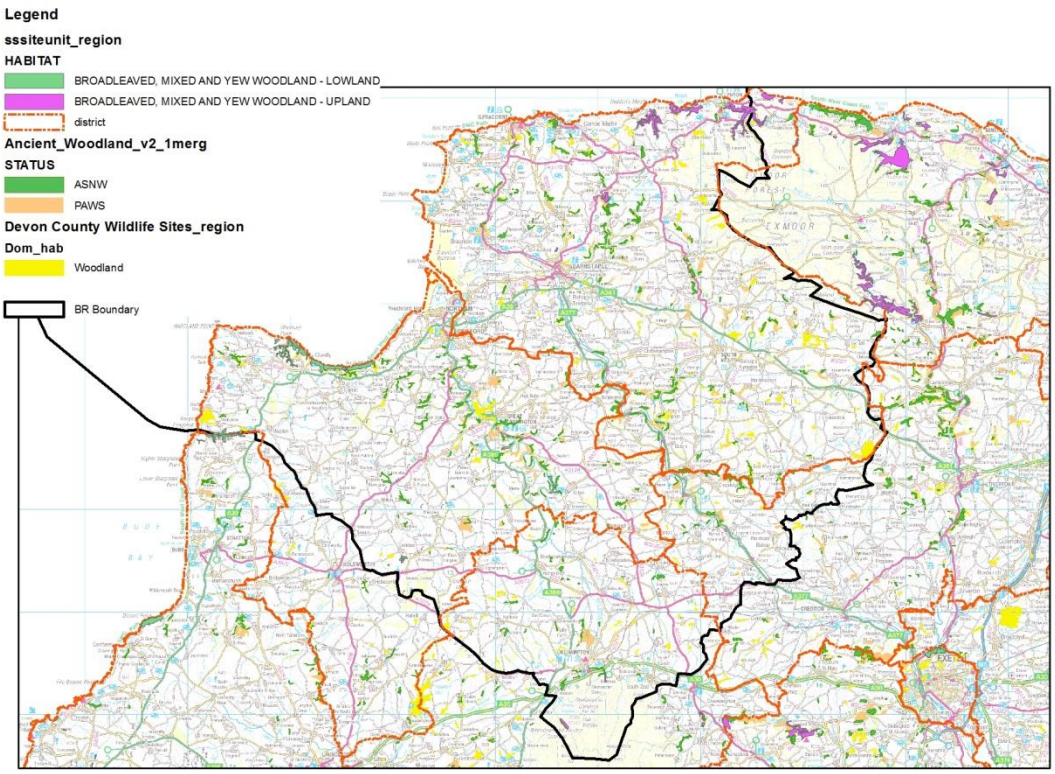


Figure 3 Woodland sites known to be of biodiversity interest

The Woodlands of north Devon are best exemplified as western oak woodlands, wet woodland and lowland oak woodland. Over 5500 Ha are classified as Ancient Semi Natural woodland, of which 2590 are Plantation on Ancient Woodland Sites (PAWS). The ancient woodlands are notably characterised by lichen communities on the mature trees indicating the clean air, humid climate and structural stability.

The woodlands have low connectivity, and therefore could be supported by more planting that will enable the free movement of species between them. Therefore restoring PAWS sites should be a priority and building resilience around all ancient woodland sites to enlarge them and connect them.

As part of an investment strategy into woodlands from biodiversity offsetting, a set of targeting areas have been identified where the planting will add effectively to the connectivity of the woodlands and also provide other ecosystem services such as flood attenuation and water quality improvement, as well as carbon sequestration.

It is believed that the lack of regeneration of trees due to pest damage such as squirrels and deer is creating an age structure that is biased towards the very old trees. This effectively means that the woodlands are at risk of dying out in a slow and insidious way. A key part of sustaining the connectivity of woodlands is for the connections not only between sites but age and species structures within and between sites. Management measures are definitely needed to address this, and silvicultural systems applied that will promote the diversity and connectivity.

Current State of the woodland economy

It is very challenging to get any data on the woodland economy, other than the perception from the forestry stakeholders are that there has been a decline in local processing. A report on the forest economy, produced when South West Forest was in operation, stated that timber and fibre products only accounted for a sixth of the total forest economy.

2012 ONS data						
SIC2007		Enterprise Count	Enterprise Employment	Enterprise Turnover £1000s	Local Unit Count	Local Unit Employment
02 Forestry and Logging	4 Districts	35	50	1,880	45	51
	Biosphere Reserve (1)	15	22	827	20	22
16 Wood processing	4 Districts	75	398	24,551	80	739
	Biosphere Reserve (2)	50	270	16,000	55	490

(1)Biosphere Reserve estimate (based on pro-rata split of managed woodland area) (2) Biosphere Reserve estimate (based on pro-rata split of processing enterprises)

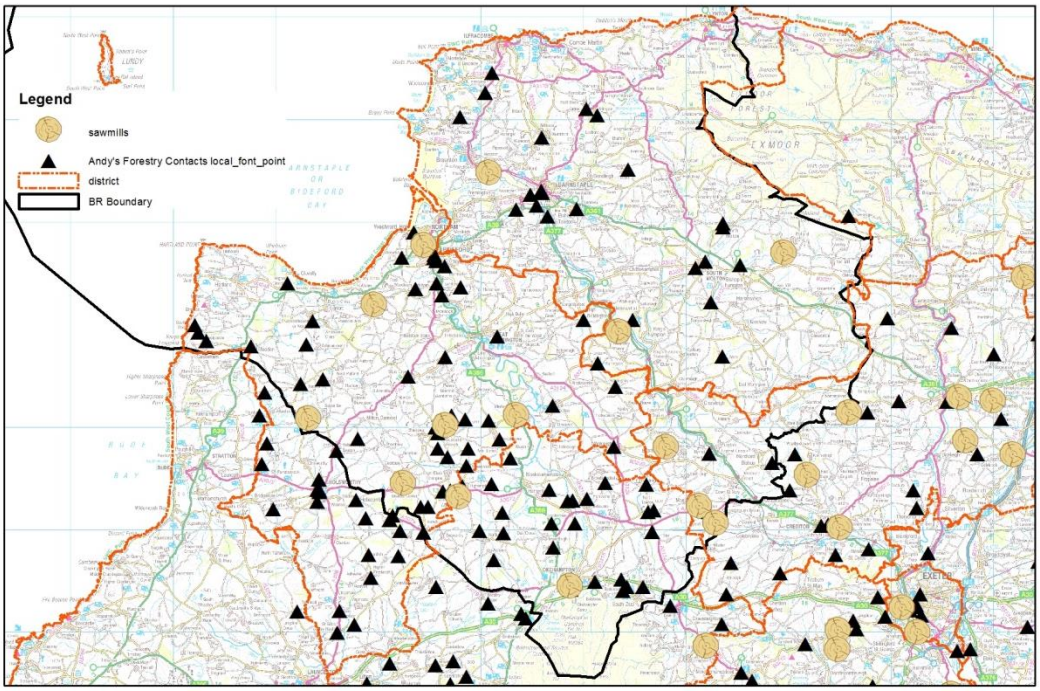


Figure 4 Businesses associated with woodlands in the Biosphere Reserve. Source: SWF database

A breakdown of Office of National Statistics information by district indicates the following for the 4 districts that intersect with the Biosphere Reserve.

Currently, economies of scale for harvesting and marketing are provided by companies out of the area who harvest from several sites and then export the wood. For example, recently large spruce roundwood is exported to Germany.

The sawmills in the area are mainly small or moderate in capacity, though are believed to be capable of handling the larger timber. There are a number of mobile sawmills and therefore have limited capacity. The following map indicates the location of known sawmills and other businesses that have direct links to woodland produce.

Recent investigations have been carried out regarding the feasibility of a larger processing plant within the region, for example near Tiverton. The recent announcement of the investment and enlargement of the former Giddings mill in the New Forest make it unlikely that a processing plant will be developed in the south west. Therefore any woodland economy strategy must concentrate on supporting the existing infrastructure and supporting their market development and timber supply.

The firewood market has picked up very rapidly due to the increased costs of heating oil, and people seeking alternative fuels. Other new markets are emerging in the wood chip and wood pellet sector. The price of energy, especially oil has created a market for wood fuel. The Renewable Heat Incentive (RHI) (commercial and now also domestic) is going to create a demand. Wood fuel can also help alleviate fuel poverty especially if the homes are treated for energy efficiency. RHI take up is not going to be likely in the low income sector, therefore a log market assisted by a market for efficient log burners and energy efficiency measures in the homes will provide new markets.

Switching from imported oil, gas and electricity to locally grown and processed logs, chips or pellets will keep money in the local economy.

The glut in wood fuel supply that may happen through the intervention into that market as a tool to bring woodlands into management, may result in a subsequent shortage in supply, if not managed correctly. Buffering the supply from hedgerows can be a mutually beneficial practice.

The local supply of processed timber seems to be moderately small, yet there is also a lot of timber imported into the area for construction and indeed for firewood. The timber due to be felled in the coming years could be marketed for local processing and use but also supported to access markets within the region as processed goods. It is unlikely that the Biosphere Reserve will be able to produce all of the stress graded timber needed to satisfy local or regional need but could make a reasonable contribution to that market and may be supported by a UNESCO Biosphere Reserve related brand. The Biosphere Reserve lends itself to being a woodland enterprise zone linked to the values of the Biosphere Reserve for sustainable woodland management practices.

Pests and diseases

During a qualitative ecosystem assessment of the area, the participants felt that the timber production from the woodlands is lower than it might be and the state of the woodlands was impaired by pressures from pests and diseases. Chalara and Phytophthora diseases are posing a real challenge to how we manage the existing stands of ash and larch respectively, and the implications these have on the market and utilisation of these timbers and a restriction on the choice of species to use in the future.

Deer

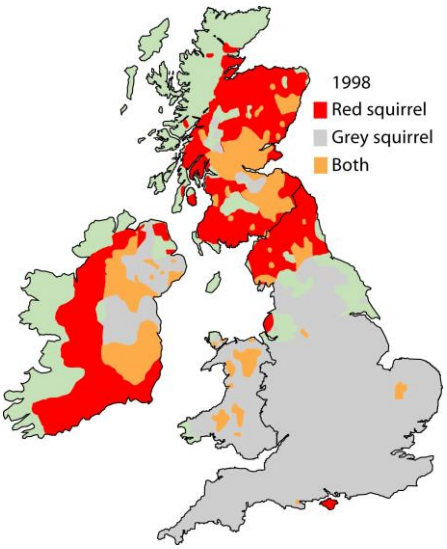
The high presence of roe deer, red deer are preventing successful establishment of new and replanted woodlands unless expensive measures are applied such as tubes or deer fencing. Exmoor District Deer Society carries out a regular census of the red deer and notes a steady population (app. 2-3% variation), though getting younger in age structure due to stalking the older and larger stags and hinds. Elsewhere in the Biosphere Reserve it is perceived that the red deer are hefting in areas where they are not disturbed and the point impact of the deer is increasing.

It is universally agreed that the red deer are part of the natural system in the Biosphere Reserve and that numbers need to be controlled effectively and humanely. A number of tools are available such as Deer Initiatives with landowners cooperating over smaller impacted areas, and the potential for using a market approach for rewarding with better prices venison arising from properly managed herds.

Muntjac are known to be in the Biosphere Reserve with numbers likely to increase.

Grey squirrel

The Grey Squirrel is present throughout the Biosphere Reserve and is critical threat to broadleaf trees being established and reaching maturity. Management in the last has been through warfarin which is scheduled for withdrawal from approved use in September 2015. Problems with this method include hitting non-target species, seldom applied rigorously for best practice to be effective and concerns over acquiring resistance to the poison. National moves are now towards researching the benefits of immune-contraception or humane trapping as used in New Zealand for invasive mammals there. Other methods under discussion informally include the "re-enforcement" of pine martens as a biological control. The potential conflicts between game shooting, non-target species need to be investigated such as the native dormouse, etc.



Squirrel spp distribution 1998

Spruce bark beetle (*Dentroctanus micans*),

The high volumes of Sitka planted in the area may be a reservoir for infection especially in the older stands. The timber can still be harvested; though the premature death of the trees and deformities will lead to an economic impact.

Ash die back (*Hymenoscyphus pseudoalbidus*)

9% of the planted area is attributed to ash. The immediate short to medium term impact of losing the trees as one of the more valuable hardwoods and significant in the landscape may be severe if the disease takes hold. The other challenge is the replacement of ash trees and or plantations as they are felled.

Hymenoscyphus fraxineus distribution as at 21/06/17

Sudden Oak death (*Phytopthora ramorum*),

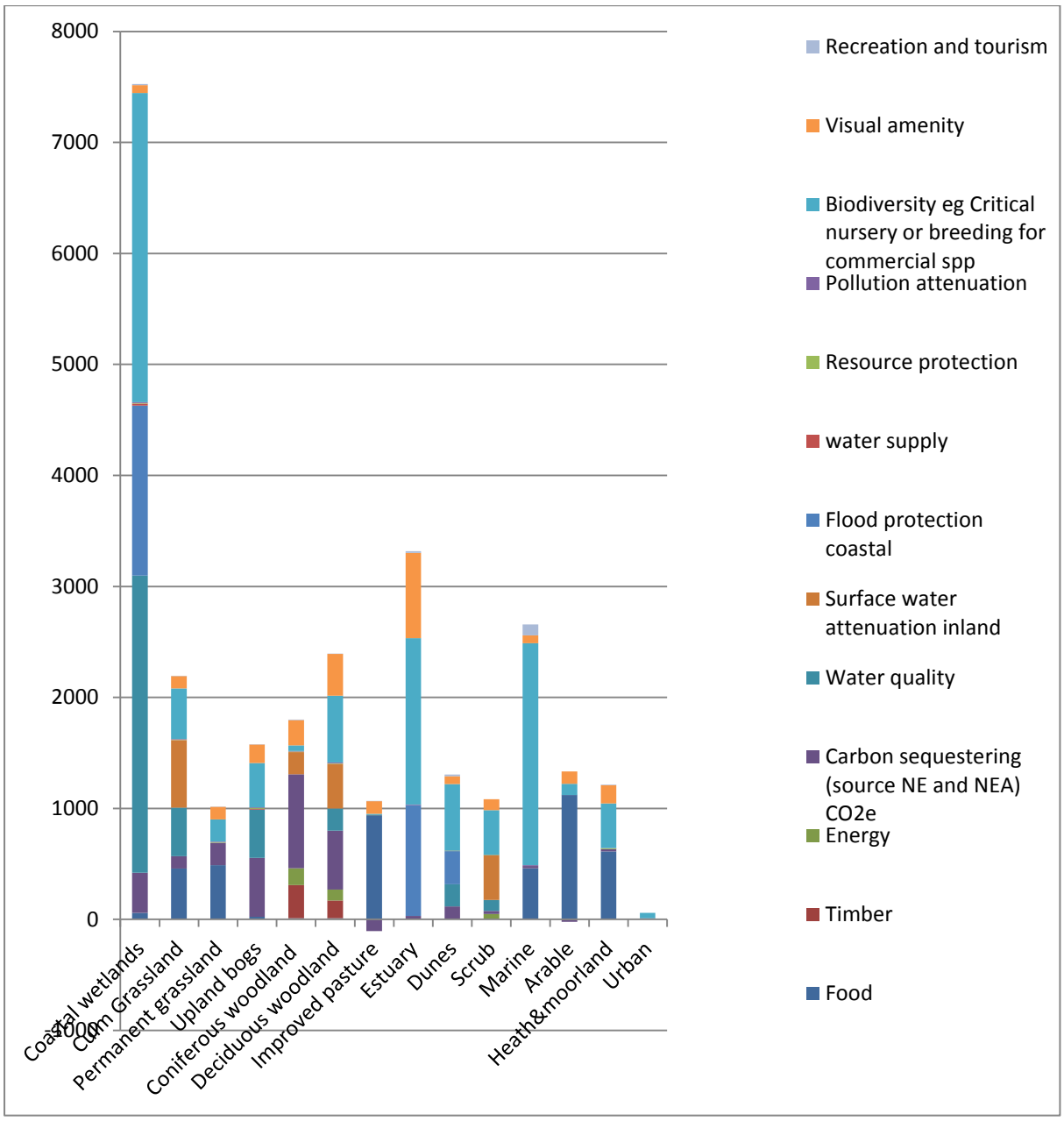
There are still significant areas of larch plantation within the Biosphere Reserve, (c3.5% of the total wooded area). The ongoing felling of the larch areas is having an economic impact due to the low value recovered from the logs. Even after the larch are felled, the southwest region due to its moist climate and the prevalence of Rhododendron as the alternative host means that this disease will still be active in the area. This, in turn, will have ramifications for the longer term health of the oak woodlands.

Red band needle blight (*Dothistroma*)

The low volumes of pine planted in the area do not make this a serious pest of the Biosphere Reserve at the moment. Silvicultural options of keeping the woodland more open with more air circulation appears to reduce the disease.

Ecosystem services

An ecosystem service assessment was carried out using the National Ecosystem Assessment data for known values and qualitative values were also attributed to the habitats. The mapping of the ecosystem services was implemented at a 25m resolution. The key services provided by woodland are: timber provision, carbon sequestration, visual amenity, surface water attenuation, water quality improvement and recreation and access. The total potential value from known services is in the order of £58.5M. Roughly, the potential from standing sales of timber per annum is around £6.3M. The value expected from the flood attenuation service of woodlands is £12.9M. (NB. These are using figures from the National Ecosystem Assessment)



It is compliant with the Biosphere Reserves strategy to improve all of these services and therefore there is a need for more and better managed woodland and more woodland.

A spatial strategy has been prepared where these services can be effectively provided by extra woodland planting. The barrier to such woodland expansion is the relatively poor market economics, based on timber and/ or wood fuel alone. The land is also excluded from single farm payment which reduces other income; therefore even the capital value of the land is reduced by over £5K per Ha. Assessments on the hydrology and land-use of the catchment suggest that land-use change towards woodland is essential to adapt to climate change and therefore better economic return is needed to achieve this.

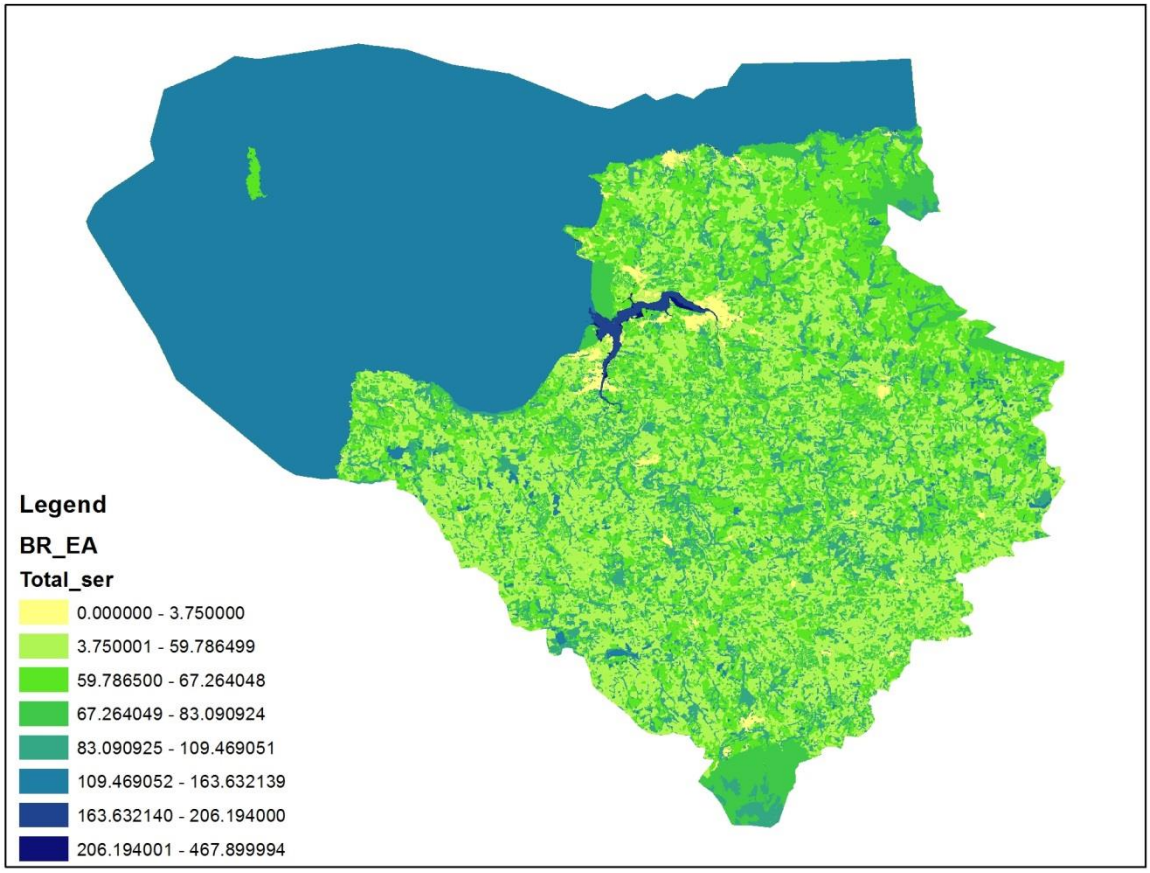


Figure 5 Total costed ecosystem services in the BR (£ per 1/16 Ha)

When considering climate change adaptation and mitigation various ecosystem services are likely to increase in value, especially carbon sequestration and hydrology modification. Therefore woodlands will have a larger role to play in securing a healthy status for society.

Due to climate change, the woodland themselves will be under pressure and change, these include species suitability, different diseases, different soil moisture regimes and phonology changes such as insect lifecycles, leaf opening which can impact on ecological functions.

SWOT analysis of Woodlands in the Biosphere Reserve

Strengths	• Woodland contribution to high quality landscape • Diverse spp • Good growing region • Lot of mature woodland • Well invested contractor base • Ward Forester programme established • Biosphere Reserve partnership providing influence, leadership • Good small timber and fencing markets • Woodland education • Good entrepreneurial and business development seen within the sector • Historic funding through South west Forest • Several large landowner/estates and agencies.
Weaknesses	• Fragmentation of ownership and management of small woodlands • Poor access to woodlands for management • Poor access to markets • Venison is an under used/managed resource • Tree diseases transmit easily • No large sawmills • Fragmented woodlands within the landscape. • Reduction in choice of native spp • No local woodland training facility • Much of the timber is not of engineering quality
Opportunities	• Biosphere Reserve is a test bed for resilience in the ecosystems for choice of spp. • Test bed for new and range of silvicultural systems • Promotion of alternative woodland use (tourism, etc.) • Ecosystem services as a tool for economic development • Adding value locally • Link woodland education and woodland management • Aging population for voluntary community woodland work • Good body of knowledge locally • Grow the contractor resource for current unmanaged woods • Innovation funds in LEADER • Carbon and wood-fuel funding such as RHI • Hedgerows as wood-fuel source to help meet demand in the long-run.
Threats	• Climate change • Squirrels • Deer (if unchecked) • Diseases current and imminent through low biosecurity • Aging contractor base • A lot of oversized timber still standing • Windthrow time-bomb for unmanaged stands • Sudden glut of fuel wood being put on the market may lead to reduced supply in subsequent years. • RHI ending soon • Global market forces • Reduction in woodland support mechanisms