ROBINWOOD

SWOT analysis of the forestry sector in Wales

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Abbreviations

ASNW	Ancient semi-natural woodland
BAP	Biodiversity action plan
BWW	Better Woodlands for Wales
CAR	Corrective action requests
CBO	Community based organisation
CCF	Continuous cover forestry
CCW	Countryside Council for Wales
CEI-Bois	European Confederation of Woodworking Industries
CoC	Chain of custody
CROW	Countryside and Rights of Way Act 2000
cSAC	Candidate special area of conservation site
DEFRA	Department for Environment, Food and Rural Affairs
FC	Forestry Commission (GB or pre-devolution)
FCS	Forestry Commission Scotland
FCW	Forestry Commission Wales
FEI	Forest Education Initiative
FLR	Forest landscape restoration
FSC	Forest Stewardship Council
FTN	Forest Trade Network
HAP	Habitat action plan
LBAP	Local Biodiversity Action Plan
LISS	Low impact silvicultural systems
MTB	Mountain biking
NGO	Non-governmental organisation
PAW	Partnership for Action on wildlife crime
PAWS	Plantations on ancient woodland sites
PEFC	Programme for Endorsement of Forest Certification
SAC	Special area of conservation
SAFS	School of Agricultural and Forest Sciences
SAP	Species action plan
SWOT	strengths, weaknesses, opportunities and threats
UKWAS	UK Woodland Assurance Scheme
UWB	University of Wales Bangor
WAG	Welsh Assembly Government
WDA	Welsh Development Agency
WGS	Woodland Grant Scheme
WRME	Wood raw material equivalent
WWF	Worldwide Fund for Nature

Introduction

This report is one of three commissioned by the Robinwood Interreg IIIc project in June 2005. This is the report for Component 3: Forest Management of the overall project. The other components deal with Hydrogeology and Wood Energy and have separate reports.

The brief was to produce a SWOT (SWOT = strengths, weaknesses, opportunities and threats) analysis of the forestry sector under five headings:

1. Biodiversity,
2. Certification,
3. Timber Industry,
4. Non-Timber products
5. and Forest Planning and Management.

Useful SWOT analysis depends on a good understanding of the action, process and context of current operations. With the input of many people a SWOT will be an objective analysis of the situation triangulated by inputs from many perspectives. This report represents the analysis possible after only a few days of desk work with limited interaction with a restricted group of actors in Welsh Forestry and is therefore a personal response to the information gathered on the part of the author. It should perhaps be seen as a starting point for a more comprehensive and participatory analysis of the sector.

For the purposes of this study the author took a broad view of the forestry sector and attempted to include issues relevant to all trees within the Welsh rural landscape which are impacted by the WAG 'Woodlands for Wales' strategy. The history of the Welsh landscape and the statutory relationships between policy, stakeholders and actors are not comprehensively described or reviewed in this document. Material related to Biodiversity is contained within the Hydrogeology report; and that related to Biomass in the Wood Energy report and are not repeated here.

The report is divided into two sections.
Part 1 presents a summary of findings under each heading together with the SWOT tables and some overall conclusions and key recommendations.
Part 2 is a compilation and preliminary analysis of the information collected during the desk review.

PART 1: SWOT analysis and recommendations

The forestry sector in Wales is a palimpsest of different forest types, purposes, history and cultures. Continual erosion of the native broadleaf forests reduced forest cover to around 3% by 1871 and further compromised by the demands of war in the early 20th century. The advent of the Forestry Commission in 1919 initiated a concerted effort to create a strategic reserve of timber and planting of fast-growing exotic conifers on large blocks of the uplands. By 1997 forest cover was up to 14% of the land area of Wales. The forest estate at the beginning of the 21st century is roughly divided into commercial conifer plantations which are largely publicly owned and small, privately owned broadleaved woodlands. There are also large numbers of trees, mostly broadleaves within the rural landscape which contribute to wood supply, biodiversity and amenity values. It is these dichotomies which lie at the heart of the different perspectives of Welsh forestry and each has its own SWOTs.

As society changes, it demands different things from its forests. Increasing urbanisation, leisure time and disposable incomes increases demand for leisure and recreation from forests in effect extending the peri-urban sphere of influence. At the same time, the rural economy finds itself under stress from falling prices for commodities, be they timber or wool, particularly from the marginal uplands. Forestry and agriculture are moving into a post-production milieu where an imperative to maximise yields is giving way to one which seeks to balance a range of outputs including biodiversity and social benefits. This is reflected in new policy, programmes and a move away from conifers towards Native Broadleaves.

The forest sector in Wales is presently in a state of flux and coming to terms with fundamental changes in policy, financing and continuing public interest in woodland management. Generally the various actors (FCW, CCW, private owners, WDA etc.) have responded positively to new opportunities and there has been substantial investment in public benefits and biodiversity. However, funding and staffing shortages continue to impede implementation of policy and for the less favoured parts of the estate, basic forest operations.

Funding problems ultimately stem from a reliance on timber revenues to fund forest operations. Softwood timber prices have fallen dramatically and can no longer (if it ever could) fund basic silviculture and the multiple public benefits required by the policy. The public and NGO(Non-governmental organisation) sectors have been able to utilise EU funds for projects intended to deliver public benefits in line with the 'Woodlands for Wales' strategy.

The situation for private owners is mixed, prices remain good for high quality timber and many owners are willing to invest often with the support of grant schemes but many small woods are under-managed.

Perhaps the most positive change in FCW is the acceptance of the importance of public involvement in forestry and the moves towards transparency which will hopefully be followed by accountability.

The key points from which recommendations are derived are presented in the overall Forest sector SWOT presented below.

SWOT – Forest sector

Strengths	**Weaknesses**
Commitment to public accountability (certification and Corporate plan + Annual Plans and Actions)	Insecure financing of public forest management
Strong public support for woodlands	FCW retrenching to statutory obligations through lack of funding and staff
Active partnerships between different actors	Lack of clear policy on sales and non-forest use of public estate
Delivery on social objectives especially education and active recreation	Public involvement in forest management only extends as far as consultation
Capture of EU funds	Lack of personnel especially with forest planning skills in public and private sector
Good resource information – mapping of ASNW and PAWS etc.	Poor engagement with timber markets
Opportunities	**Threats**
Policy review due in 2006	Loss of countryside management skills
Introduction of Wales forest strategy	Loss of credibility if public demands for biodiverse and accessible forests not met
Changes in legislation to permit FCW to participate in commercial ventures and public/private partnerships	Low levels of recruitment into forestry education

Key recommendations

This report makes two key recommendations related to funding and governance of the forestry sector as a whole and the public estate in particular.

1. **Prepare a protocol for deriving social and environmental accounts for inclusion into the annual accounts of FCW and national environmental accounts**

This would involve a consultancy to prepare a cost-effective protocol for deriving the monetary value of those benefits that the public are prepared to see funded from the public purse. Part of the consultancy would be negotiations with relevant departments in WAG to investigate the inclusion of the results of valuation in FCW's annual accounts. Further negotiations on the level of return required on investment in public benefits would then be required to determine the appropriate level of funding for activities targeted at specific types of benefit (including maintenance of the public estate). A programme of activities should then be prepared based on delivery of priority benefits and basic management of the public estate against the new budget. Revisions would be required to WAG grants for forestry in order to provide an effective incentive for private sector provision of public benefits.

2. **Undertake a review of policy and procedures for public participation and local partnership in forest policy, planning and operations**

FCW has put in place a number of initiatives to increase the level of public consultation in forest policy and planning. This is to be commended as *transparency* (letting the public see what you are doing) and *accountability* (being open to public scrutiny of what you have achieved – against agreed plans) are important. This is particularly so when the role of the Commission is to provide public benefits, infrastructure and products as a basis for urban regeneration and rural employment. At the policy level, the National Committee and Woodland Strategy Advisory Panel[1] should be made more inclusive and the operational style might benefit from becoming more problem-focussed.

Public accountability only really works when there are interested and engaged people to ask questions and at present it is not clear who these people might be. Nevertheless, it would be a useful first step to prepare objective and independent audits (as done for certification) of achievements against the forest policy and strategy and to invite a response from the formal consultees - if not the general public.

Experience with public consultation at the Forest Design Plan level should be reviewed with the aim of identifying constraints and opportunities. In particular, there is a need to engage with local stakeholders especially those who use the forest and the general public; and not just the Community Council though a good Council can facilitate contact and negotiations with the wider community. Staffing difficulties within FCW has been a constraint on the development of public consultation in FDPs. If this continues to be the case there may be a need to consider alternative arrangements, perhaps through consultancy or NGO initiatives.

Although forestry is undoubtedly a part of the rural economy, this role could be enhanced by encouraging a greater level of integration between forestry, agriculture and other rural enterprises such as tourism. The proposed *Regulatory Reform (Forestry) Order 2006* should permit FCW to enter into a wider range of partnerships. The opportunity this presents for local involvement in forestry and forest-based enterprises should be examined and incorporated into participatory procedures. Participation means making stakeholders partners in forest management rather than clients who are consulted. There are a lot of issues that will arise from opening up the forests for partnerships and these will need to be addressed as they arise.

Scotland and England are both undertaking quinquennial reviews of their forest strategies. It may be prudent to consider whether such a review is necessary in Wales. Consultation and publication of clear policies on use and sale of public forest land and funding for the forestry sector as a whole would do much to win public support for forestry and allay concerns with the future of forestry in Wales.

1 Biodiversity

The habitats, plants, fungi and animals which make up the biodiversity of Welsh forests are relatively well known. There are two BAP (Biodiversity Action Plan) priority woodland habitats in Wales along with a range of priority BAP species. Progress with the preparation of LBAPs (Local Biodiversity Action Plan) and selection of candidate SACs (Special Area of Conservation) has been good and most of the plans required by the Habitat and Species Directive and Wild Birds Directive are in place. There is concern that the BAPs are too prescriptive and reporting against BAP targets may not reflect the processes affecting biodiversity. In particular weaknesses in BAP monitoring requirement mean that it is difficult to evaluate ecological dynamics with relation to pollution, climate change and management shifts such as those promoted by agri-environment schemes.

There are two EU-supported biodiversity projects run by FCW. One is concerned with improving the favourable status of the Atlantic Oakwoods which is the most important priority woodland BAP habitat in Wales which has been given its own cSAC ("*Meirionnydd Oakwoods*"). A further project is concerned with restoration of PAWS sites (Plantations on Ancient Woodland Sites) that have been converted to conifer. Coed Cymru reports that it advises on the management of 11,000 ha of ASNW (Ancient Semi-Natural Woodland) and a further 12,000 ha of broadleaves. The NGOs (Wildlife Trusts, Woodland Trust, National Trust, RSPB etc.) and private estates also manage significant woodland biodiversity.

The countryside is not static, but responds to even subtle shifts in management. The present time is one in which there are many changes in forest management, conservation management and agriculture. These are directed by a combination of market economics, government incentives and societal pressures. Unfortunately, policies and incentives from the forestry and agricultural sectors are not well co-ordinated and often work against each other. This needs to be resolved to permit the development of new landscapes with a greater element of naturalistic woodland and vegetation patterns.

CCW and FCW have initiated the use of landscape ecology techniques to analyse woodland habitat networks in Wales with the intention of targeting interventions to improve landscape connectivity. An important element of this is the recognition of the biodiversity value of hedgerows, small groups of trees and wood pasture in providing forest functions and connectivity across the farmland matrix.

SWOT 1 - Biodiversity

Strengths	Weaknesses
ASNW/PAWS mapping complete and found to be robust and diverse	Commercial forestry remains heavily dependent on exotic conifers
Good knowledge of species and ecology	Poor knowledge of species dispersal, information which is needed to support the habitat network development plans
Owners of Native Woodlands willing to manage them constructively	Use of monocultures
Strong support for biodiversity from public	Lack of skilled forest management planners
Good grants for woodland biodiversity enhancement	Loss of countryside management skills
	Over reliance on BAP monitoring which inadequately quantifies site biodiversity and change
Opportunities	**Threats**
Growth in voluntary conservation activities	Intractable change: climate change, acid deposition etc.
Recognition of value of wood pasture and trees within the agricultural landscape	Tractable issues: inappropriate grazing regimes, lack of thinning, invasive species etc.
Habitat network analysis complete	Failure to market commodities and services from biodiverse woodland

Recommendations

- Better monitoring systems to identify trends in biodiversity and to determine if possible the processes behind them.
- FCW, CCW and NGOs should work on development of standardised protocols for monitoring biodiversity
- Maintenance of healthy ecological processes able to accommodate change should be the goal of biodiversity conservation

2 Certification

Wales has five years of experience with FSC certification and it has been firmly embraced by FCW, NGOs and the larger private forestry companies. Few smaller, private forests are certified from a lack of interest, because they can sell their products to uncertified markets or because costs are too high. 2The introduction of the Better Woodlands for Wales grants and

streamlining of FSC procedures may induce more private owners to certify their forests.

The main motivation for public and corporate investment in certification was driven by demand for credible labelling by large retailers in anticipation of consumer demand which has to a larger extent not materialised. Nevertheless, certification serves as an effective and impartial vehicle for public accountability. However, for certified forest management to remain politically credible, it has to deliver on public benefits and policy aspirations. Because FCW represents 90% of the certified forests, the success of certification will likely be judged on its delivery against popular policies such as increased diversity in terms of age structure and species. It is important to ensure that the operations required to deliver these changes are properly resourced or there is a risk that forest management may again be discredited.

For those involved, certification has improved management procedures and acted as a catalyst for implementation of new policy and aspirations embodied in the "*Woodlands for Wales*" strategy. There is significant FCW investment in facilitation of private sector certification. This makes sense for those in receipt of grant aid especially if certification helps to deliver, report and monitor the quality of management being funded and promotes the delivery of public benefits. It remains to be seen if changes to grant aid schemes (i.e. the introduction of BWW) and FSC procedures undertaken or sponsored by FCW will serve to increase the levels of compliance with UKWAS standards.

Certification is increasingly being viewed by the forestry and timber industries as a tool for marketing wood as a green product with the label acting as a means of attaching 'green' values to the product. Credible labelling of wood and other forest products with other values, such as local production i.e. as 'Welsh' may also have a role to play in securing market share for local producers.

SWOT 2 - Certification

Strengths	Weaknesses
Creditable public quality assurance for forest management to agreed standards	Costs especially for small scale, private producers
Incentive for revitalisation of management planning process and tightening of procedures	Increased bureaucracy

Catalyst for action on increasing management for biodiversity and public participation in planning	Price premium particularly for commodities not available
	Bulk of certified wood produced by WAG which could cause market splits between public/private and large/smaller scale producers
	Market incentive only works for woodland owners with mature stands who want to sell into small wood commodity markets
Opportunities	**Threats**
Endorsement of wood as a green/sustainable product over other materials e.g. uPVC	Vested interests – e.g. certification used by larger enterprises as a barrier against entry by smaller competitors
Government and large corporate purchasing requirement for certified timber	Improvements in management operations not evident
BWW intended to assist private owners with preparation of management plans to UKWAS standard	

Recommendations

- Consolidation of monitoring of FCW grants and operations with UKWAS audits
- Review of potential benefits of Welsh regional labelling for wood and other forest products
- Continue to work with Welsh Procurement Initiative to implement government procurement policy on FSC certified wood
- Ensure that operational changes required to deliver public aspirations for forest services are properly resourced

3 Timber sector development

The further development of primary wood processing industries in Wales will depend on future raw material supplies and the resolution of transport problems. Over the next 15 years wood supply is forecast to increase by approx 200,000 m^3 but this is likely to fall as forecast models are revised and timber is held back in long retention and LISS conversion which may reduce current production forecasts by about 20%. The wood based industries will need to adjust their development plans to take account of anticipated changes resulting from introduction of new silvicultural

systems though there will still be a glut of softwoods as the plantations established in the middle of the twentieth century mature. Over the longer term the transition to LISS should provide a less periodic supply of higher quality, larger logs with a greater proportion of native hardwoods.

The sector possesses some important strengths. It is based on a renewable resource, wood products generally require lower energy inputs in processing than competitive materials, they store carbon and can be recycled at the end of their life. Much of the production from Welsh forests is certified. Wood based energy systems can contribute to the UK's renewable energy target. However the sector faces a number of constraints such as high transport costs, traditional over reliance on high volume: low value commodity markets for softwoods and these need to be addressed if the wood-using sector is to realise its full potential. The WAG should play an active role is addressing these issues and use its considerable purchasing power to promote the use of Welsh-grown timber.

SWOT 3 – Timber sector development

Strengths	**Weaknesses**
Vibrant manufacturing sector	Poor silviculture (producing low grade timber)
Adaptable processing sector	High costs particularly on harvesting and transport
Value addition in commodities sector	Poor margins
Opportunities	**Threats**
Hardwood products	Price and quality competitive imports
Timber modification	Lack of supply of quality timber of any species

Recommendations

- More emphasis needs to be placed on wood quality by the growing sector and this requires a change in mindset in forest management
- There is a need to 'reconnect' forest growing and primary wood processing with secondary wood processing (joinery, furniture, timber framed housing). This will require research and development to enable domestic timber to compete with imported products.
- Cohesion along the wood chain needs strengthening in terms of wood and information flows and cooperation between the main parts in the chain.
- The proposed establishment of a Centre of Excellence for the wood producing and using industries based at UWB would be a suitable

hub for a Welsh industry cluster and provide the necessary innovation, support and training necessary to create a forward-looking Welsh forest industry.

- Profitability of harvesting contractors and hauliers (the parts of the wood chain with the lowest margins) needs strengthening.
- A public sector procurement policy favouring Welsh manufactured wood products (additional to FSC labels) would help to support market growth.

4 Non timber business opportunities within forests

Forests are a source of many products other than timber; these can be "C*ommodities"* such as fruit, mushrooms and berries, "S*ervices"* such as recreation and the "*opportunity value of land"* under the trees for non-forestry uses. These all contribute *values* to the forest and can be exploited to provide *revenue* streams for the forest owner.

The non-timber enterprise sector is very diverse but can be identified as those activities which provide forest-dependant cash flow, incomes or enterprise opportunities. Recreation has long been acknowledged as a key public benefit of forestry but there are also many other opportunities. Many of these are not formally recognised and are consequently not represented in management plans or operational procedures. Nevertheless, prompted by the need to provide local employment opportunities or for the purposes of certification there are instances of collection licenses being issued in commercial conifer plantation for activities such as moss harvesting or mushroom cultivation. In the past few years there has been growth in demand for wild products and this could be exploited to provide opportunities for rural income diversification. Key to this would be the extension of FSC labels to non wood products and labelling as Welsh.

Amenity values of wooded landscapes is increasingly being capitalised in property price differentials and is recognised by private owners but not by FCW. Methodologies for determining the cash injections that can flow from more dispersed public benefits (the green infrastructure effect) have been developed and these could be developed for use in FCW accounts.

There is increasing interest in the use of forest land for alternative land uses such as wind farms and social housing. There is a need for a policy to guide the use and development of public land in Wales.

Legislative changes to permit FCW to establish commercial enterprises should permit new forms of partnerships between the public and private sectors.

SWOT 4 – Non timber business opportunities within forests

Strengths	Weaknesses
Additional to timber revenues	Varied and esoteric products require niche marketing which can be prone to saturation
Many 'products' are services not commodities	No source identification for traditional products or those derived from native species
Forest Education Initiative and Forest Schools	Labour supply limited especially in remote areas
	No market place for non timber harvesting rights
Opportunities	**Threats**
Niche marketing of 'wild' local products	Fickle markets
Scope for increased forest-based active recreation	Imports nearly always cheaper than home grown
Capitalisation of amenity values	Successful launch of new products likely to stimulate demand which is larger than Welsh supply
Valuation of green infrastructure	
FCW able to enter into commercial partnerships	

Recommendations

- Develop Welsh label (also see recommendation for wood products)
- Undertake study to value green infrastructural values across Wales
- Revise Forest Bylaws to permit picking for personal use where this would not be detrimental to the forest
- Develop equitable procedures for licensed commercial collection and third party use of public woodlands
- Development of a National Land Policy to guide the development and sale of the public estate for non-forestry land uses

5 Forest planning and management

Forest planning in Wales was revitalised when FSC certification was introduced. There are several schemes for grant aiding the development of forest management plans to UKWAS standards available for the private sector. However, in both the public and private sectors there is a lack of people and skills to develop plans to meet aspirations in terms of the introduction of new silvicultural systems and public participation in forest management. University level education needs to be refocused on the new needs of the forestry sector and new courses are required but funding for this is not currently available. Recruitment rates into higher forestry education and into the profession are falling at a time when high skill levels are required. This could become a constraint on the development of the sector if it is not addressed.

FCW have made an impressive commitment to public consultation and transparency. More is required to apply these ideas and make them effective at the District and forest levels where they could really yield benefits. Representation on consultative and advisory panels needs to be more inclusive and flexible. Consultation at forest level is a requirement of the Forest Design Plan revision process. In many areas, particularly where there are motivated stakeholders the opportunity to extend this to real partnership should be pursued.

The financing of forestry is predicated on cash income from timber being able to fund maintenance of the estate. The downturn in timber prices means that this is an insecure basis on which to fund maintenance of the public estate.

SWOT 5 – Forest planning and management

Strengths	**Weaknesses**
Statutory protection for forest land use through felling licenses and planning regulations	Low levels of technical expertise and practical skills in silviculture and forest operations
FCW corporate plan backed up by annual action plans and progress reports	FDP revision understaffed and lacking LISS design skills and remit to negotiate fully on inclusion of local interests derived from consultation
Opportunities	**Threats**
Greater public participation in forest management	Insecure financing for forest management
Increasing emphasis on integrated landscape management	Declining skills base due to lack of recruitment of able young people into forestry

Dedicated training for private sector agent planners	Demoralised work force

Recommendations

- Increase levels of public involvement in forest planning and operations
- Improve focus of forestry training in Wales to meet new aspirations in forest policy
- Work to improve understanding of forestry and its role in rural development, biodiversity conservation etc. among the public to attract young people into the profession
- Increase security and levels of funding for FCW

PART 2: Situation analysis

There are a number of publications which deal with the present status of forest land in Wales. The FC publish forestry statistics and the Forestry Facts and Figures every year and a national inventory at 15-20 year intervals the latest being the National Inventory of Woodland and Trees (NIWT) in the late 1990's (FC 2002). Linnard (2000) provides a comprehensive history of Welsh forests and forestry up to 2000. However, there are certain facts which are required as background to this report and these are briefly presented here.

Table 1 illustrates the total area of woodland cover in Wales in 1997. **Table 2** indicates the significance of trees outside woodlands and the variety they bring to the landscape (Section 1.3). **Table 3** breaks down the ownership of woodlands greater than 2 ha in extent. Most of the smaller features are part of boundaries and belong to a great number of owners most of whom are farmers though many are highways authorities, individuals, NGOs etc.. **Table 4** gives the breakdown of the woodlands by gross type as recognised by the FC while Figure 1 gives the age structure of these woodlands.

The most significant distinction in Wales is between exotic conifer plantations which are most often visualised as being young, large, monocultures of little biodiversity value producing high volume, low quality softwoods; and broadleaved woodland which are often smaller, older plantations of native species with higher biodiversity values that produce low volumes of hardwoods.

However as seen in Table 4 - the total areas of conifer and broadleaves are roughly equal, though it is also apparent that much of the conifer plantations are publicly-owned and managed by FCW, whilst most of the broadleaved estate is private. These basic dichotomies are behind the myriad of opinions about the status and nature of Welsh forestry. There are various bodies which represent different interest groups - some are NGO's, while others are industry groups (e.g. the Forestry Contractors Association). One which is uniquely Welsh, that purports to represent the perspectives of farm woodland owners is "Coed Cymru"[2], a charitable company which maintains a network of advisors based in County Councils and National Park offices across Wales. There were real attempts to capture these different perspectives during the participatory process that resulted in the Woodlands for Wales strategy prepared for the WAG by FCW in 2001 and the present report attempts to reflect this diversity in the SWOT analysis.

Table 1: Woodland cover

Land	Area (ha)
Wales	2 076 620
Woodland > 2 ha	270 035
New planting	2 000
Total area of woodland cover	289 000
% woodland land cover	13.8

Table 2: NIWT results for trees in areas less than 2 ha in extent

Type of feature	Numbers		Tree density across landscape (ha^{-1})	Length (km)	Area (ha)
	Features	Trees			
Groups	771,800	5,848,300	282	-	-
Narrow linear features	171,200	8,568,300	413	14,502	-
Individual trees	917,400	917,400	44	-	-
Small woods < 2 ha	22,582	-	-	-	16,602
Wide linear features	823	-	-	66	823

Table 3: Woodland ownership

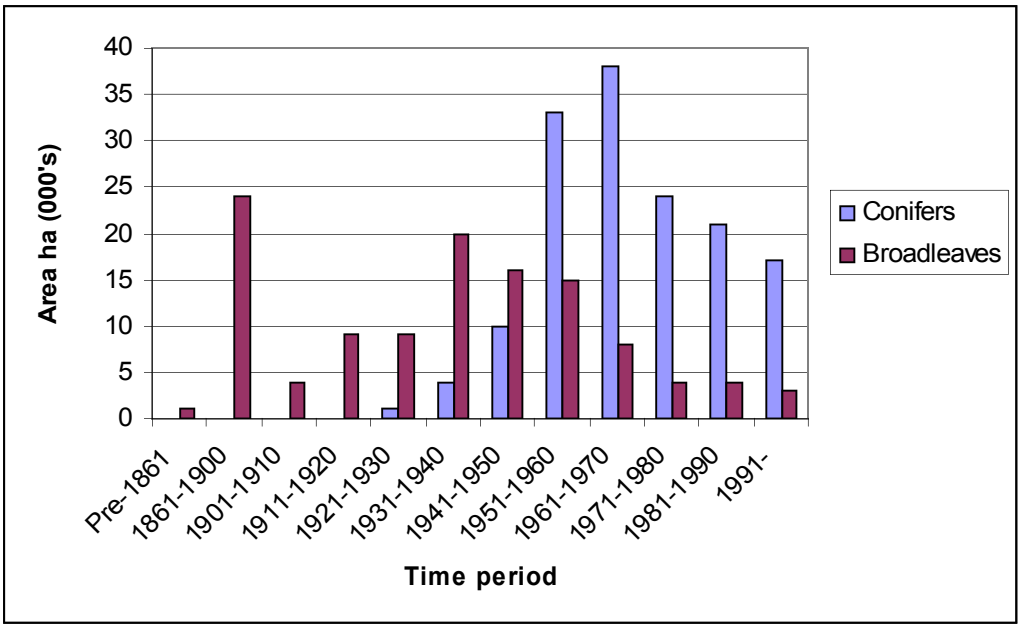
Ownership	Area (ha)	%	Categories	Area (ha)	%
Personal	95,500	35.4	Private	127,595	47.3
Business	26,089	9.7			
Forestry or timber business	6,006	2.2			
Local authority	7,925	2.9	Public	132,608	49.0
Other public land	4,704	1.7			
FC	119,979	44.4			
Charity	7,784	2.9	NGO	7,784	2.9
Community or common land	652	0.2	Other	2,048	0.7
Unidentified	1,396	0.5			

Table 4: Forest types

	Area (ha)		
Forest type	**FCW**	**Other**	**Total**
Conifer (exotic commercial plantation)	88,287	45,957	137,476
Broadleaves (commercial plantation and ASNW)	10,365	83,603	106,855
Mixed (including PAWS)	8,089	13,416	21,505
Coppice (actively managed)	0	489	489
Clear felled (mostly conifer)	6,305	2,656	8,961
Open space (within woodland)	6,933	3,888	10,821
New planting (mostly broadleaves)	0	2,000	2,000
Total	119,979	152,056	288,107

Source for all tables: NIWT – reference date 1997

Figure 1: Age structure of Welsh woodlands



Source: Forestry Facts and Figures 2005

1 Biodiversity

Millennia of deforestation in Wales reduced the cover of woodland to just less than 3% of the land area in 1870. There is almost no 'natural' or 'virgin' woodland in Wales but there is important woodland biodiversity retained in the fragments of Ancient Semi-Natural Woodland[3] (ASNW). There has been intense interest in the protection of ASNW sites and most of the recognised sites are afforded some degree of protection under national, EU or local conservation designations. The EU Habitats Directive[4] recognises two priority woodland habitats in Wales that require the designation of special areas of conservation (SAC); 91A0 '**Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles**' and 91J0 '***Taxus baccata* woods of the British Isles**' (Table 5). The most important woodland habitat in Wales is the former which is more commonly known in the UK as 'Atlantic Oakwoods'. These woodlands experience very high rainfall and mild climate and represent what is left of the western European temperate rainforests. Although fragmented, ANSW woodlands of this type contain high diversity in Ferns, Bryophytes, Lichens and Fungi as well as species only found in these habitats. There are a range of initiatives to protect and manage BAP priority woodland habitats (Table 6).

Table 5: Woodland types within cSAC sites in Wales

Woodland type		**Representation in cSAC sites**	
English name	**EU name**	**Number of sites**	**Area (ha)**
Western acidic oak woodland 'Atlantic oakwoods'	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	23	3,365
Alder woodland on floodplains	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)	10	664
Beech on acid soils	Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrub layer (Quercion robori-petraeae or Ilici-Fagenion)	2	6
Beech on neutral to rich soils	Asperulo-Fagetum beech forests	6	101
Bog woodland	Bog woodland	7	90
Mixed woodland on base-rich soils associated with rocky slopes	Tilio-Acerion forests of slopes, screes and ravines	15	711
Yew-dominated woodland	*Taxus baccata* woods of the British Isles	2	7
Total		**43**	**4,945**

Source: http://www.jncc.gov.uk/page-1461

Although it is conceptually straightforward to base biodiversity management on maintenance of priority habitats, in reality this is perceived by many practitioners as being rather too static and prescriptive to truly maximise biodiversity value within the landscape. Despite huge efforts to record woodland habitats in the CCW Phase I and 2 surveys and the FC woodland inventories the classifications used and level of detail in terms of species representation means that they are not a reliable guide to the actual biodiversity value of individual habitat patches so the data on which to base a conservation gap analysis is incomplete.

The BAP system is based on the assumption that biodiversity i.e. species of plants, birds, insects and animals are confined to specific woodland habitats. In fact they all vary in their degree of woodland dependence and are to be found in a wide range of habitats and often move with more or less ease between woodland patches perhaps using isolated trees as stepping stones. Even plantations of exotics and grazed pasture can harbour priority BAP species more normally associated with woodland. Biodiversity values are not limited to conservation grade woodlands – they are also represented in mixed woodlands, commercial plantations (even of exotics), isolated trees, farm woodlands and traditional wood pasture[5] systems which together make up the cultural landscapes of rural Wales. It is increasingly recognised that spatial habitat networks recognised at the landscape scale (i.e. across a valley or catchment) are important in conservation planning especially in the face of climate change[6].

One of the few sources of information on the size and complexity of the dispersed tree resource is that provided by the NIWT results for trees occurring in patches of less than 2ha as given in Table 2. The overwhelming majority of these features (93%) are made up of broadleaves with the main species being Oak, Ash and Willow. At present wood pasture is generally under-recognised within Wales and there are no figures for its extent or status, although it seems likely that many of the ~1 million isolated trees (Table 2) are components of wood pasture systems.

The idea of landscape level, holistic management of ecological processes, production of commodities and social values are very much in vogue as being more inclusive and pragmatic approach to biodiversity conservation. This is reflected in the CBD (forest) ecosystem approach which:

"… *Is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. An ecosystem approach is based on the application of appropriate scientific methodologies focussed on levels of biological organisation, which encompasses the essential structures, processes, functions and interactions among organisms and their environment. It recognises that*

humans, with their cultural diversity are an integral component of many ecosystems."[7] The principles of the "Ecosystem Approach" have been applied to anthropogentic mosaics of forestry and agriculture and termed Forest Landscape Restoration (FLR-"a process that aims to regain ecological integrity and enhance human well-being in deforested or degraded forest landscape"[8]). FLR may be a useful framework for conceptualising (and planning for) future Welsh landscapes which contain higher levels of forest functionality (e.g. woodland connectivity, hydrology, social benefits etc.). Within this framework there is a role for all trees within the landscape including commercial, exotic plantations[9]. The use of landscape concepts is currently being explored in Wales by CCW and FCW through the woodland habitat network analysis and projects such as the National Trust Nant Gwynant Integrated Land Management Project[10] which seeks to restore the natural treeline on Snowdon by ecological succession. Landscape level approaches are also crucial to the success of programmes intended to control the spread of invasive species such as *Rhododendron ponticum*[11] which is noted as a significant threat to biodiversity particularly in native woodlands and upland heaths in Snowdonia.

Climate change is a topical issue[12] and evidence is building that it is taking place though the consequences of this for both the climate and biodiversity of Wales are far from certain. What is certain is that animals and plants will need to be mobile in order to keep pace with spatial changes in climate in order to avoid extinction. Landscape ecology suggests that landscapes which contain linked habitats i.e. woodland networks or contain sufficient trees which can act as stepping stones will be better able to maintain biodiversity in the face of climate change. However, mobility also means that new species will enter an area while traditional ones may leave. This suggests that the concepts of 'Native = Good', 'Invasive = Bad' and 'Local Extirpation = Failure in Management' needs to be re-examined and dynamism incorporated into conservation policy, particularly those derived from the Habitats Directive, as well as RAMSAR, other international conventions and reflected in Agri-Environment schemes[13]. Determining which changes are inevitable and which are conducive to management and appropriate responses to change has been the subject of the long running MONARCH programme[14].

At the opposite end of the scale is the need to conserve intra-specific genetic diversity i.e. the genetic integrity of local provenances of native species. This is particularly important for species such as Hawthorn and Hazel for which there is large demand from Tir Gofal agreements for Hedgerow Restoration. It is believed that some of these species have not previously been imported[15] on a large scale into Wales and the native populations are presumed to be relatively 'pure' or 'Welsh' in character. Action is required to supply the large quantities required of these species

from Welsh sources to protect the locally adapted varieties valued by the farmers and at least one project has been initiated to increase supply[16]. Unfortunately a supporting proposal to Interreg IIIa designed to define 'local' on the basis of robust genetic evidence so it can be used to source label seedlings for local planting[17] has not been funded. This suggests that it will be some time before it will be possible to refine the existing provenance map which divides Wales into two zones, east and west of A470 which is both somewhat broad brush and arbitrary. Climate change also has implications for policy concerning provenance for plantings of native (and non-native) species as it may be advisable to select provenances suited to predicted future conditions[18] (generally assumed to be warmer) rather than those of the past which further confounds a biodiversity management policy based on preservation of static conditions.

1.1 Legislation and policy

The basis for conservation planning has shifted from being wholly based on UK designations (National Nature Reserves and Sites of Special Scientific Interest) to one based on EU Directives. At the present time conservation legislation in the UK is defined by:

- Wildlife and Countryside Act 1981
- Protection of Badgers Act 1992
- Conservation (Natural Habitats) Regulations 1994
- Countryside and Rights of Way Act (CROW) 2000

and informed by the EU Habitats and Species Directive and the Wild Birds Directive (see the Hydrogeology report for details of national designations and historical development of conservation in Wales). The Directives lay out a strategy for biodiversity conservation which emphases protection of priority habitats and species and requires that they are maintained in 'favourable' condition. Habitat and Species Action Plans (HAPs and SAPs) are prepared within Biodiversity Action Plans (BAP) and implemented through local Biodiversity Action Plans (LBAPs)[19]. The LBAPs are intended to represent partnerships of local actors such as a county council, NGOs, farmers, FCW etc.. LBAPs in Wales have between 9 and 50 partners. Funding is usually provided by a small number of partners and led by the local unitary authority (i.e. County Council). Wales is covered in a patchwork of LBAPs which strive to maintain and enhance the area of priority habitat coverage and stablise species population distributions and sizes.

Within Wales, the recognition of the Western Atlantic Oakwoods as a priority habitat has certainly resulted in the successful capture of Objective 1 funding for example - the Meirionnydd Oakwoods cSAC project[20]. The HAP requirement to increase the area of oak woodland and to restore it on PAWS (Plantations on Ancient Woodland Sites) has also led

to a new survey of PAWS[21] in 2004 and the establishment of the project '*Restoring our Natural Heritage'* on FCW land.

Nevertheless, the present policy towards biodiversity is one which is essentially preservationist in intent[22]. A further caveat on policy is that it is as much an expression of societal aspirations as scientific advice. As such, preserving the status quo is politically beguiling as it seeks to maintain habitats and species which people (i.e. the electorate) find attractive as they appear now (frozen in time). This even extends to a desire to recreate some halcyon past with constant efforts to restore lost habitats and reintroduce species. However, nature is dynamic and it is generally accepted by ecologists that a better policy would be to accept that change, to monitor what is going on and to maintain uninhibited ecological processes. This is not to say that all change should be accepted and management becomes 'do nothing'. There would still be a role for pro-active management for example to prevent species from extinction by ensuring it can respond to change by emigrating to more favourable locations. Unfortunately, it is felt by many directors of conservation bodies in Wales that such changes would be politically dangerous and could lead to a loss in confidence and hence funding.

Although it does not ask specifically about biodiversity and conservation, the UK results for the 2005 F.C. Public opinion survey shows that the public care about wildlife and recognise the role of woodlands in providing habitats for them to live in[23] and 67% are prepared to see public money used to manage woodlands. At present, this sympathy for woodlands and wildlife is mostly captured by NGOs such as the Woodland Trust. The NGOs (and FC in England but not yet in Wales[24]) have in turn mobilised this good will to undertake practical site management (volunteer labour) and national scale monitoring (e.g. the RSPB Garden Birds survey). People are prepared to get involved for a complex of reasons most of which are probably for some indefinable 'feel-good' factor which can be equated with cultural, aesthetic and spiritual values. Tapping into such values and engaging with the public could potentially deliver a broader sweep of public benefits and help justify and secure the funding which seems to be in such short supply.

More narrowly, within the forestry sector, on devolution, a Wales-specific 'Woodlands for Wales'[25] policy was prepared with extensive consultation among stakeholders (though not the general public). Central to the biodiversity element of the WAG vision for forests in Wales is the policy to convert 50% of the conifer monocultures managed by FCW to low impact silvicultural systems[26] (LISS) with a presumption for natural regeneration of native broadleaves where feasible. Less obvious are the intentions with regards to safeguarding biodiversity within the remaining 50% of the public estate which is governed largely by the demands of certification. Not withstanding the caveats above, certification standards and BAP

targets have served to strengthen resolve to deliver on biodiversity and FCW is an active partner in LBAPs and promotes the biodiversity objectives of the WAG forestry policy in the private sector through grant incentives. The conservation and agricultural sectors also provide incentives for biodiversity management particularly by farmers.

There is a strong presumption that trees planted for amenity or landscape should be native species and furthermore of local provenance. This is strongly represented in public policies and not least in the WAG Trunk Road Estate BAP[27]. Unfortunately there are critical problems with volume production of the local provenance material to supply the landscape industry and this has in turn been recognised as a growth opportunity in the horticulture sector development strategy[28].

1.2 Current levels of protection

It is only possible to judge the success of current levels of protection from monitoring. Given the complexity of the ecology of these habitats, data for selected indicators[29] of condition are collected and evaluated against some pre-determined targets. The HAP and SAP management objectives are translated into quantitative, time bound targets[30] which are monitored at two year intervals. Since success is tied to achievement of these targets and is rewarded with recognition and funding, there is a strong incentive for managers to manage *for* the target which may be what is intended but may not (and is unlikely, in isolation, to) deliver a more holistic interpretation of ecosystem status, quality or health[31]. Furthermore, monitoring is also focussed on population status (often as a static target number of individuals) of BAP priority species. Even if it is accepted that population levels of single or small groups of species can be a useful indicator, many of the BAP species are rare and some are migratory and are not likely to be good indicators of biodiversity quality[32] in a particular habitat patch. Lastly, there is a strong temptation to report only good news stories (these are also politically expedient) and this diverts attention and funding from tackling the threats that would be highlighted by more balanced and objective reporting. This means that BAP monitoring may provide some data on a few habitats and species but cannot be used to track biodiversity status as a whole – it is therefore difficult to quantitatively evaluate whether current protection is adequate. Furthermore, change is an inescapable feature of the environment and vegetation communities and species are constantly responding to changes in climate, pollution levels and management practices e.g. sheep stocking rates. Change is not always bad and oftentimes cannot be avoided, and static biodiversity policy and targets will inevitably fail. Better measures of biodiversity quality and monitoring systems are required to provide a reliable assessment of the status of habitats, trends and threats as a basis for effective and pragmatic conservation management.

A recent review of the favourable status of conservation sites in Wales by CCW found that 70% of the SSSIs[33] were of unfavourable status with the biggest threats being under-grazing, over-grazing, invasive species and lack of remedial action. To this list can also be added climate change, acid deposition and poor delivery of biodiversity benefits by Tir Gofal[34]. The inescapable conclusion is that there is no way of assessing current levels of protection but it is likely to be poor and many practitioners report that biodiversity values are declining across Wales. This is not to say there are no areas of success but these need to be put into context. This is particularly pertinent when considering landscape ecology and the move towards integrated landscape management[35] e.g. through habitat network and FLR. The ideal would be to establish a standardised national-level, statistically rigorous monitoring system with a broad set of indicators sensitive to different forms of threat or change for all habitat types as is done for the Quality of Life indicators[36]. This would permit reporting of biodiversity status and also its response and sensitivity to different threats which would help identify any remedial actions required.

Restoration of narrow linear features (mostly hedges) is included as a key requirement of Tir Gofal and their number is likely to increase[37]. However, the results of the CS2000 survey of species richness of hedgerows indicated that, behind the increases in habitat extent, that biodiversity (measured as species richness per 10 m of hedge) is still being lost[38]. Nevertheless there is at least some provision for maintenance of these features. There is no provision for the maintenance of other types of small or more dispersed tree features under present Tir Gofal or other incentive arrangements. The trees in small features are under serious threat; comparison of the NIWT with earlier inventories suggests that 2-5% of these features are being lost every year[39] with losses greatest for the isolated trees many of which are ancient and support important biodiversity.

On a completely different level, DEFRA has established the Partnership for Action against Wildlife Crime (PAW)[40]. In Wales, this is represented by the secondment of a police officer specialising in wildlife crime to CCW headquarters. This has greatly increased the profile of wildlife crime and resulted in several successful prosecutions.

1.3 Management opportunities

Management of forest-dependent biodiversity both within and without the FCW estate is changing and, notwithstanding the policy-level problems mentioned above, is improving at a range of scales. There is a great variety of projects supporting woodland biodiversity conservation in Wales (Table 5 lists some examples). There are many successes and there are many more opportunities for partnerships and projects to enhance and enrich Welsh biodiversity.

Table 6: Biodiversity conservation management actions and opportunities

Scale or Focus	Target	Project Lead institution	Description
National	Woodland diversity	WAG	Convert 50% of WAG estate to CCF with a presumption for broadleaves where possible.
National priority habitat	cSAC Atlantic oakwoods priority habitat	Meirionnydd oakwoods project FCW (Dolgellau)	Commenced 2005, main objective is to bring the woods back into a natural condition. Action includes grant assistance for woodland management for private owners including NGO partners (Woodland Trust etc.) http://www.meirionnyddoakwoods.org.uk/
Privately owned native woodland	ASNW and PAWS	Native woodland plans FCW	Private sector grant to prepare management plan. Plans are required for woodlands > 1 ha on entry into Tir Gofal agri-environment scheme. http://www.forestry.gov.uk/forestry/INFD-644LZB
Privately owned small scale native wood-lands	Private native wood-lands	Coed Cymru Charitable company	Gives free help and advice on the sensitive management of woodlands and the sustainable use of woodland products. Commissions and manages research and development of hardwood products and markets. http://www.coedcymru.org.uk
Local habitats	Woodland habitat networks	FCW / CCW	Research project intended to inform a strategic plan for the maintenance, improvement and restoration of woodland and associated habitats with the aim of combating the effects of habitat fragmentation. Watts *et al* (2005) http://www.forestry.gov.uk/website/forestresearch.nsf/ByUnique/INFD-69PF5C
Species	Red squirrel	Friends of the Anglesey Red Squirrels	Control of grey squirrel, management and reintroduction of Red squirrels. Funded by Menter Mon (Leader Group) with thought that it will create a leading wildlife tourism attraction. http://www.redsquirrels.info
Species	Black poplar	Environment Agency	Protect, propagate and plant this category 5 BAP species which grows as specimen trees in riparian zones Thorpe (2004)
Species	Black grouse	FCW	Habitat management and reintroduction http://www.forestry.gov.uk/forestry/infd-5mjlhv

In terms of grasping management opportunities the examples in Table 6 can be classified into four models.

1. ***Direct action by FCW***

So far, lack of LISS design skills, personnel (Section 5.4), funding[41] and planting stock[42] has limited the ability of FCW to increase the areas under LISS or broadleaves[43]. So this opportunity will only be realised once these constraints have been overcome. The Tyfiant Coed[44] project is intended to provide guidance and training in LISS and it should be possible to stimulate production of native species for re-stocking, if not from the FC nursery at Delamere as a diversification option for farmers or the private

horticultural sector. The real problem is financing. This is needed to increase staffing, provide for skills development and provide the funds necessary to implement conversion plans. Where such funds are available through a special project, FCW is able to deliver significant biodiversity benefits at habitat and species level (Table 6 gives some examples). The new PAWS conversion project has secured funding for restoration of conifer forest and will likewise require silvicultural plans and local provenance planting stock.

2. ***Government incentives for the private sector***

Both the forestry and agricuture sectors operate incentive schemes aimed at influencing farm woodland management. Unfortunately, at the present time these are not well co-ordinated when it comes to the development of new woodlands on farm land. Both Tir Gofal prescriptions and the introduction of the single farm payments are resulting in significant de-stocking of marginal land especially in the uplands[45]. As land is de-stocked natural succession will tend to result in 'scrubbing up' and reversion to woodland which would have great biodiversity benefits. However, farmers may be relucant to permit this to happen as such land would no longer be eligible for single farm payments and if the stocking of trees did not reach the threshold for WGS or Farm Premium Scheme (which itself has an uncertain future) then it will also not be eligible for forestry payments.

Within Tir Gofal, forestry incentives are well integrated with the requirement for Native Woodland Plans which are funded by FCW. However, although these are supposed to be implemented the plans are not formally monitored and many farmers ignore them.

Funds to support private sector grants are not limitless and the intention is to use the results of the habitat network analysis to focus grants on improvements and extension to core networks. This is sensible however, operational procedures to do this have yet to be worked out.

3. ***Biodiversity-related income generation***

The success of Coed Cymru in raising the profile of the hardwood sourced from small woodlands indicates that supporting management for income can be effective as a means of encouraging management improvements (and certification). Coed Cymru reports that there is scope for further development in this area as in general owners respond positively to supportive grants (75% under WGS) and improving prices and markets for hardwoods[46]. There is a range of other ways of generating income from native woodland from the sale of non-timber commodities or services, and these need to be developed especially in immature forests where there will be no timber production (see Section 3 below).

4. Direct action by the public

Self-motivated action by NGOs is a norm in Wales and there are large projects operated principally for wildlife conservation and public enjoyment by the likes of the RSPB and the Woodland Trust. However, CBO (community based organisation) action where local communities e.g. Friends of the Anglesey Red Squirrels take action over local issues are serendipitous in that they often spontaneously arise and little can be done to form a CBO in an unreceptive community. However, community woodland initiatives such as Cydcoed and Tir Coed are able to support CBO action on woodland biodiversity though this appears to be a secondary concern to social benefits.

Perhaps the biggest biodiversity management weakness in Wales is the lack of an effective monitoring system for woodland biodiversity. Monitoring of processes as well as condition is required in order to identify causality which would help target remedial action on critical threats and also permit an understanding of ecosystem response to change. Elements of a monitoring system are implemented across a range of organisation and purposes.

FC has undertaken surveys of biodiversity in planted forests for UKWAS monitoring purposes[47] but no plots were sited in Wales. Based on this work, general protocols for monitoring biodiversity are being developed for general use[48] along with decision-support for biodiversity[49] in planted forests by FC. The indicators selected for this study are structural e.g. the amount of deadwood, as the best way of assessing habitat suitability for a range a woodland specialist taxa[50]. These protocols should be integrated as much as possible with other requirements for monitoring, e.g. BAP, and if at all possible a coherent protocol developed for application across all forms of wooded landscape. The monitoring should be linked to management planning according to adaptive management principles as envisioned by the guidelines for Native Woodland Plans but apparently not applied elsewhere. Tapping into public interest in wildlife and woodlands for monitoring[51] would provide an opportunity for greater local participation in woodland management as well as permitting more intense observations such as the collection of fine-scale time series data[52].

2 Certification

The reasoning behind certification is that consumer demand for timber sourced from well-managed forests would provide a market based incentive for improvements in forest management. Demand for certified products would create a barrier around a market segment that would be prepared to pay a premium price for greater environmental benefits.

The UK has been a leader in forest certification since its inception (early 1990's) by WWF-UK in response to concerns with the level of deforestation in the tropics which lead to the establishment of the Forest Stewardship Council (FSC) in 1993. After much debate concerning suitable standards for sustainable forestry in the UK context the UK Woodland Assurance Scheme (UKWAS) was launched in 1998. UKWAS is independent of any specific certification body or label and is recognised as the basic standard by a number of certification schemes e.g. FSC, PEFC (Programme for the Endorsement of Forest Certification). Over the last year the UKWAS standard has been under review and a revised standard is due to be published in the near future.

2.1 Operational certification systems in Wales

Certificates are issued on a successful audit of forest plans and activities against the UKWAS standard and the specific requirements of the programme operated by the certifying body (third party, independent assessors). In Wales there are two active certifying bodies accredited by the FSC: Qualifor (SGS) and Woodmark (Soil Association). Certification accredited by PEFC is also possible but has not yet been taken up in Wales. The FC entered the SGS-Qualifor programme to become certified under the FSC label in 1999[53]. The FSC label was chosen "*because it is recognised by more consumers and is supported by most environmental groups".* The former asertion is supported by the 2005 Public opinion survey which found that 38% of the populace that had recently bought timber products recognised the FSC label.

Central to the production-to-consumption approach implicit in certification is source assurance and this is provided for through Chain-of-Custody certification. Chain of custody certification is also accredited through the FSC and PEFC by BM Trada Certification Ltd., SGS-Qualifor and ForestCheck. Chain of custody (CoC) certificates are issued to the timber industry and trade, and permit source identification back to certified forests. There are two systems for tracking certified wood through to retail; by physically segregating wood throughout the production process or the percentage model which relies on accounting for wood and material

flow to facilitate the identification of the proportion of a product which is derived from certified inputs.

In the UK there are standards for FSC-style certification of non-timber forest products such as venison, honey and berries, through Woodmark (Soil Association). From January 2005 it has also been possible to include farm woodlands in organic farm certification to permit the sale of organic-labelled wood, berries, mushrooms etc., and also to permit grazing of organic livestock in woodlands. However, there have not yet been any certificates of this type issued.

2.2 Levels of compliance

According to FSC records there are 13 certificate holders in Wales covering 143,273 ha of woodland[54]. This represents 50% of the area of woodlands greater than 2 ha which is a little higher than the level (40%) for the UK as a whole.

In 1999 the FC made a commitment to have its proportion of the publicly-owned forest estate certified under the FSC label and this has been largely implemented. FCW are now the leading managers of certified forest and the publicly-owned forest estate comprises 91% of all certified forest in Wales. A further 3% is owned by NGOs such as the National Trust and Woodland Trust and is managed principally for public and environmental benefits. Only 6% of the certified forest is privately owned which points to a rather low uptake by the private sector as these accounts for 47% of the forested land in Wales (Table 3).

Compliance is more than just the number of certificates issued - it is also necessary to consider the actions required to pass the audits. This is generally assessed by the Frequency, Type and Response to Corrective Action Requests (CARs) raised by the certifying body after an initial audit. The general impression from reviews of CARs raised from the first round of audits in Wales[55] and confirmed from observations in the UK as a whole[56] is that certification has had a significant impact on forestry planning and practice. Previously, compliance with voluntary standards embodied in codes of practice and advisory notes had been rather low, third party scrutiny has served to motivate managers to implement best practice particularly in procedures such as health and safety, use of chemicals and management of contractors. The UKWAS standards also embodied aspirations for social inclusion and integration with local economies, silviculture[57] and biodiversity conservation, and this has served to catalyse action in these areas.

The CoC records that are easily accessible (PEFC and FSC websites) indicate that there are at least 515 holders of CoC certificates in the UK. Unfortunately the records do not permit easy dissociation of certificates

issued to Welsh enterprises or the quantity of tracked produce sourced from Wales. A breakdown for the UK of PEFC certified enterprises indicates that most are traders/retailers or primary timber users[58].

2.3 Benefits and incentives for certification

There was an expectation of a price premium when certification was first introduced but it quickly became apparent that this was not going to materialise except for a few niche products. In the absence of a price premium certification serves principally as a barrier to markets wishing to source certified products. Whether access to these markets is a sufficient incentive to take on the additional costs of certification will depend on the scale of production (economies of scale operate on the cost of registration and audit) and the availability of alternative markets. Since larger buyers of commodity softwoods (for fencing and pulp) demand certified wood there is an incentive for larger-scale private owners to certify mature forests but not ones that are not yet in production nor for those with low volumes to sell as the margins would not justify the additional costs. On the other hand, mixed hardwood estates in Wales can sell most timber on the basis of quality and local production, so certification to gain access to larger or more distant markets remains largely irrelevant. This suggests that regional labelling may be more appropriate than management labels to secure markets for smaller producers, an idea that has been identified several times[59].

Labelling has certainly generated market segmentation for certified products. Large potential markets for certified wood and products have been generated by the members of the WWF-UK Forest Trade Network[60], public[61] and corporate procurement policies. Access to these markets has probably been a motivating factor for the adoption of chain of custody certification by the timber industry.

The WAG has implemented a Welsh Procurement Initiative[62] which is the first specialist public sector body in Europe uniquely established to address procurement activity of a country. It is likely that this body will in time address the issue of procurement of certified timber and negotiations on how this will be achieved are underway. At the UK government level, a Central Point of Expertise on Timber which will advise Government procurement officials is due to be established in the near future.

An interesting development that the UKWAS notes as an important incentive for certification is that it "provides an opportunity to positively promote the use of wood as an environmental material. Timber has always been susceptible to negative campaigning, but now it has a strong tool with which to attract support, recognition and investment." This is an interesting turn around – rather than FSC certification being used by consumers to affect change in forest management it is now being

appropriated by the industry as a way of influencing consumer choices. Many of the standards for sustainable building[63], business practice etc. incorporate credits for the use of certified wood and it is hoped that this will maintain and enhance markets for wood products across Europe as proposed by CEI-Bois[64].

2.4 Barriers to further certification

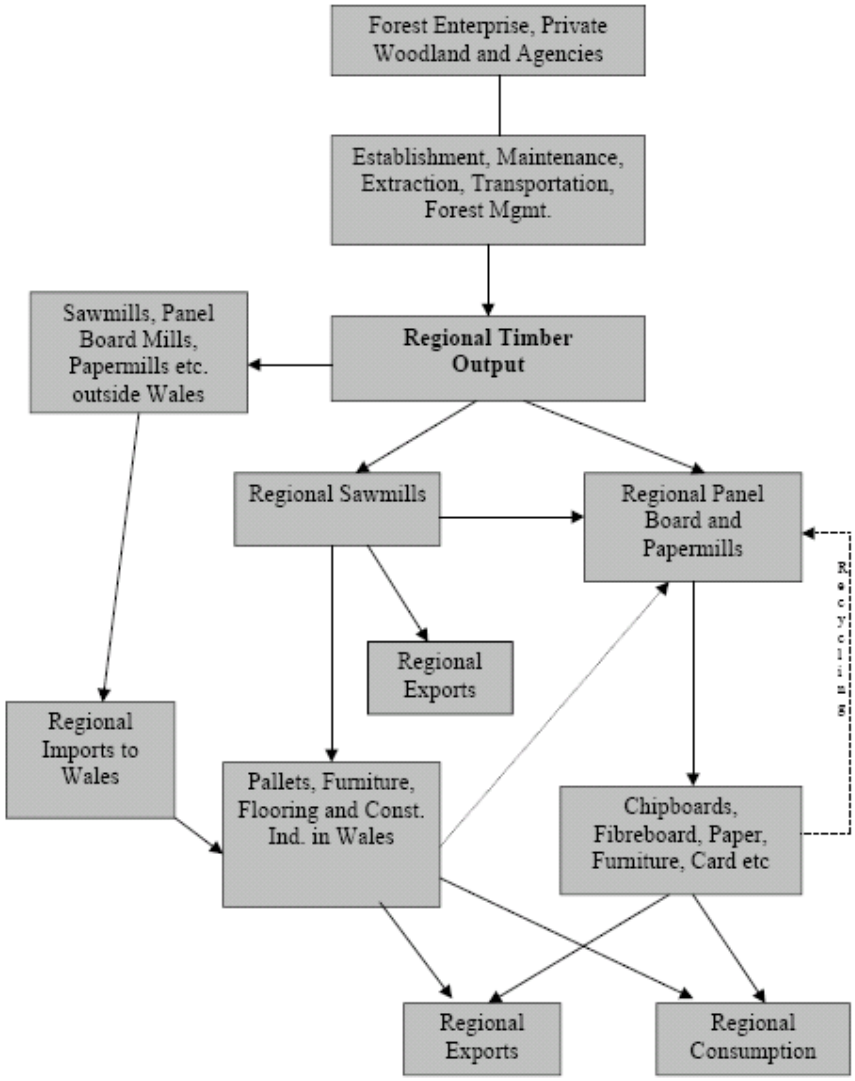
Cost is often quoted as the single biggest barrier to certification especially for smaller-scale private owners. Certification typically increases management costs by 5-20% without clear financial returns. Costs are a combination of the direct costs of registration and audit and indirect costs related to additional management inputs to prepare for audit. The new government grant support to private sector forestry scheme Better Woodlands for Wales (BWW), which is due to be introduced by the end of 2005, is structured to provide grant aid for the preparation of management plans to UKWAS standards to help overcome some of the indirect costs of certification, but the direct costs remain the responsibility of the owner.

There are a number of group certification schemes such, as those offered by Coed Cymru and all of the larger private forest management enterprises (Tilhill, Fountain, Scottish Woodlands etc.) which are intended to spread the cost of certification among a number of owners of smaller woodlands. However, the individual owners still have to enter their woodlands into the scheme and pay the additional costs, and few have elected to do so.

An alternative approach which reduces the organisational and infrastructural aspects of group certification was launched in January 2005. This is a reduced set of procedures for FSC certification for small (< 100 ha), low-intensity management forests (SLIMF). This, together with the assistance in management planning to be provided under BWW, may reduce the direct and indirect costs of certification sufficiently to encourage uptake by private and small-scale owners but it will be some time before this can be evaluated.

3 Timber sector development

The Welsh forest-based industries need to be seen in the context of UK and world markets. Although the following review concentrates on the state of the industry in Wales its present and future development must be considered in this wider framework. This is illustrated in Figure 2 which identifies the key components of the sector and shows the main linkages between the industries in the wood chain and emphasises the dependence on imports from, and exports to, the rest of the UK and overseas.



Source: Cardiff Business School 1999

Figure 2: Key components of the Welsh wood chain

3.1 Raw material supply

Wales has the lowest home-grown timber supply of the three nations within the GB and this is trivial compared to imports[65]. Table 7 gives an overview of Welsh sales since 2002 which illustrates the generally low production which, coupled with high hauling costs over narrow roads puts Wales at a disadvantage in UK let alone European markets.

Table 7: Timber sales volumes in Wales (m^3 x 1000 overbark)

Year	Softwood				Hardwood			
	Direct	Standing	Total	% of GB	Direct	Stand-ing	Total	% of GB
2002-3	565	435	1,000	18.5	-	6.0	6.0	5.0
2003-4	600	400	1,000	18.4	2.0	6.0	8.0	5.5
2004-5	500	420	920	17.3	2.0	6.0	8.0	6.2
2005-6	240	560	800	15.4	2.0	6.0	8.0	7.2

Source: http://www.forestry.gov.uk/forestry/hcou-4u8n8y

Softwood production is strongly tied to the age structure of the stands with the timing of thinnings based on yield models and final crop fellings dictated by decisions based on maximising volume yield and constrained by long-term contracts of guaranteed supply to the few high volume markets for home-grown softwood. On the positive side it should mean that forecasting and concomitant planning for the sale and use of future timber production should be possible. ***Figure 3*** gives the current forecast of softwood production from the commercial conifer estate in Wales, assuming the continuation of current clear-felling regimes. However, there are increasing numbers of changes to the assumptions behind the 2000 timber production forecasts as yield is foregone during the process of restructuring, conversion to LISS and PAWS sites are cleared of conifers as a precursor to restoration to native woodland. It is also apparent that existing yield forecasts may be over-optimistic with regards to growth as well as changes in silvicultural regime and Forest Research is currently re-writing the Production Forecast models for the UK. Besides impacting on the volumes and grades of timber being produced these changes also have an impact on revenue flows both in terms of income foregone and the transitional costs and investment in research and training for the introduction of new silvicultural systems. However, available production and revenue figures for established LISS sites suggest that the changes in species and grades of timber that will be produced in the future should ensure good economic returns and provide revenues over and above the cost of management.

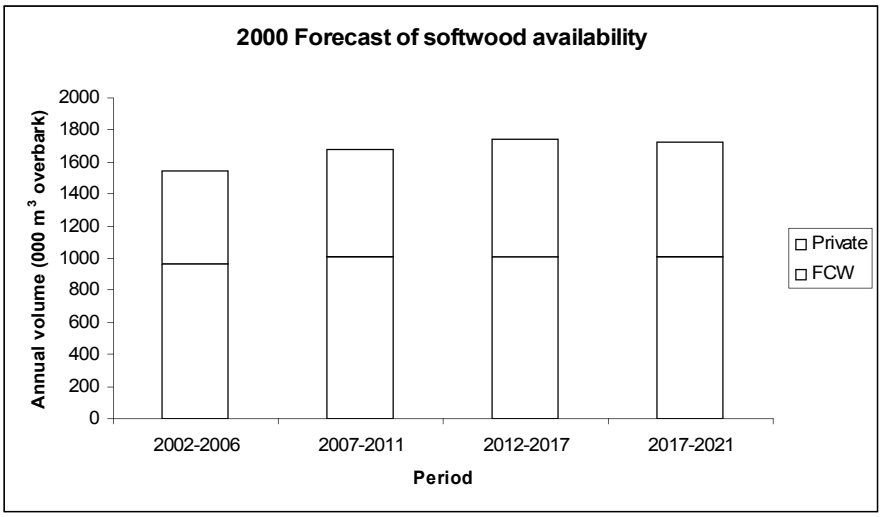


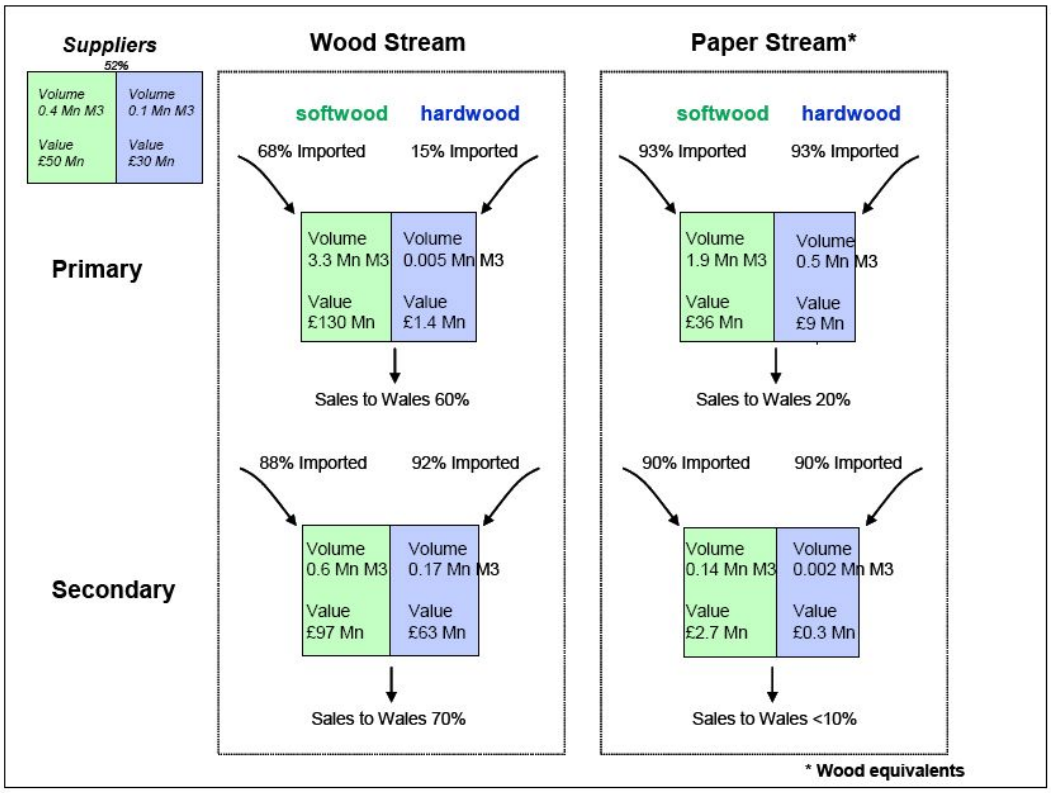
Figure 3: Forecast of softwood availability from Wales

As shown in Table 7, hardwood sales are low and represent around 5% of the total GB home-grown production. Most of this is produced from small woodlands with much felling done in an opportunistic manner rather than from active long-term silvicultural plans[66]. Sales are often local, small-scale and into informal markets which means that the figures given in Table 7 are little more than guesses.

3.2 Industry profile

Figure 4 summarises the aggregated wood and fibre flows and their value in the Welsh wood chain. Wood volumes are expressed in millions of m^3 in Wood Raw Material Equivalent (WRME) and include the wood volume equivalents of recycled wood and paper. The main sectors identified are:

1. 'suppliers' -timber importers and merchants supplying processed wood products, mainly from overseas,
2. 'primary wood and paper' - sawmills, board mills, pulp and paper mills,
3. 'secondary wood and paper' – joinery, carpentry, wooden buildings, paper conversion.



Source: Jaakko Pöyry Consulting 2004

Figure 4: Aggregated wood and fibre flows in Wales

In the sector as a whole the wood products stream accounts for 64% of wood and fibre flows (7.13 million m^3 WRME) and 88% of the sector's value (£419million).
The **Wood Stream** is characterised by:

- a high import dependence (from the rest of the UK and overseas)
- the dominance of softwoods, accounting for 90% of volume flows and 75% of value
- a high percentage of sales in Wales i.e. high dependence on the Welsh market.

In comparison the **Paper Stream** has:

- an even higher import dependence
- a stronger softwood dominance
- but a much lower dependence on the Welsh market.

3.3 Business structures, performance and strategies

A recent mapping exercise (JPC 2005) of the sector revealed the following key characteristics:

- the sector is dominated by small businesses (turnover of £0-0.1 million and 0-5 employees);
- only 36% of businesses were incorporated;

- the sector has low profit margins (76% of businesses reported net margins of 15% or less);
- the least profitable enterprises were those closest to the forest, i.e. forest owners, harvesting and transport;
- rates of change in terms of introduction of new products and services, or adoption of e business methods were low;
- markets were not seen as a major barrier to business development ;
- most businesses, particularly the smallest rely on the Welsh market and often very local markets.

One major constraint on the timber industry is transport difficulties and costs over narrow, unclassified roads. Supply from one private forest has been halted because a crucial bridge is not strong enough to take the weight of timber lorries. Although the rail network is limited, there has been a successful trial of freight multiple units for timber along the Heart of Wales line from Aberystwyth to the Kronospan mill at Chirk. It is hoped that this will be attractive enough for commercial operation by a rail freight company and help ease some of the transport problems.

There has been much criticism of the way in which FCW sells its timber without regard for quality, size grading or profitability and in particular loss of competion for sawlogs. There are plans to increase the proportion of standing sales and to introduce more long term contracts.

3.4 Market profile and prospects

Sawnwood

Wales has 22 sawmills which produced 400,000 m^3 of sawn softwood and 10,000 m^3 of hardwood in 2004. The main markets are in fencing and garden products, pallets, packaging and structural timber for the building industry. The construction market offers the best growth prospects because it is currently supplied primarily from imported timber. However, the falling average quality of logs from Wales is inhibiting development of the market, and sawmillers are diversifying into the manufacture of engineered wood products to overcome these limitations.

The hardwood sawmills are small and do not have the facilities to take in small consignments of different species and log grades/sizes. This together with with high transport costs and difficulty are a key constraint on the ability of small woodland owners to acheive much of the potential value of their timber assets. There are some initiatives to use mobile equipment to process some of this material and provision under Farming Connect for investment by farmers in small scale timber processing. Nevertheless, the main challenge is to develop products, production systems and markets based on relatively poor quality, small diameter wood. Coed Cymru is very active (with some success) in this field.

Wood-based panels and paper

These industries are part of multinational companies and their future development will depend crucially on the international competitiveness of manufacturing in Wales particularly in comparison with countries with lower wood and labour costs. The industries are likely to place increasing emphasis on added-value products to remain profitable.

Value-addition and wood product promotion

There are a number of initiatives such as the WDA/FCW Wales Forest Business Partnership[67] which seeks to develop new high-value wood products and markets based on Welsh timber. This initiative is in part a response to falling timber prices but also expresses a desire to modernise and secure the future of the Welsh timber industry. There are also smaller projects which seek to address particular markets such as the GATE[68] project which seeks to promote wood as a building material and the POWAXIS[69] project which seeks to develop innovation and efficiency in the Powys timber sector so it can compete with imports to supply the Welsh social housing sector.

There are also innovative ideas that require research and development for new uses of wood such as the use of wood hemi-cellulose as a chemical feedstock, heat treatment as a chemical-free alternative to tanalisation, extractives for use as a pesticide and wood chip as animal bedding. There is also a lot of interest in cradle-to-the-grave sustainability which has prompted work on composting of wood wastes. Wales is fortunate in having at UWB the facilities to undertake research of this type though this has not yet been fully exploited.

3.5 Employment and economic characteristics

A multiplier study published in 2000 (Cardiff Business School) assessed the contribution of the sector to the Welsh economy. The following figures show the gross value of output and average wage per FTE in the different parts of the industry. Values are in £1996.

	Gross output £ million	**Average wage £ per FTE**
Private estates	16.5	10.4
Harvesting and contracting	43.5	19.6
Sawmills	47.2	13.6
Panel and board mills	286.8	24.4
Haulage	9.4	15.1
Total	**403.4**	**17.6**

The significance of the panels and paper industries to the sector (all multinationals) is evident. The potential contribution of the expansion of the forest sector to overall Welsh output, income and employment can be seen from the following multipliers.

	Multipliers		
Sub-sector	**Output**	**Income**	**Employment**
Private estates	1.77	1.49	1.34
Harvesting	1.51	1.33	1.49
Sawmills	1.94	2.90	2.65
Panel products and paper	1.25	1.76	2.29
Haulage	1.48	1.40	1.37

Expansion of the sawmilling sector is predicted to have a greater impact on the Welsh economy compared with other sectors.

4 Non timber business opportunities within forests

This section contains a disparate set of issues and these have been organised under three conceptual headings:

- commodities – e.g. fruit, mushrooms and charcoal,
- services – e.g. recreation and education and
- opportunity value for alternative land uses – e.g. housing development.

All of these add values to the forest and have the potential to be exploited as business opportunities to generate revenue streams for forest owners. There is a lot of overlap between these classes; the value of many products may derive as much from their cultural associations as they do as commodities. The third category is not really forest-based as it depends on the value of a particular geographical location rather than the presence of trees – indeed in many instances realising these values means removing the trees. Again there are overlaps as recreational values attributed to a forest lake are also dependant on the presence of the lake which is a locational value.

4.1 Commodities

The use of wood as a fuel is a cross-cutting issue with the Biofuel SWOT report. What is dealt with in this section is charcoal and informal gathering of fallen wood.

Other commodities produced from woodland are a mixed bag of anything and everything that can be collected from or cultivated within a forest for human consumption. The value of many of the products derives from its association with cultural or locational values i.e. bilberry wine from a particular mountain sold to tourists as a souvenir of a place and time, likewise with natural hand-made products such as baskets. Labelling of such products to reinforce these values is a common marketing instrument and is being developed for north-east Wales by Coetir Clwyd[70] and this is also something that offers potential to strengthen this sector across Wales. Although there are a few notable exceptions, most opportunities are limited, sales are often low volume and niche markets can easily become saturated.

4.1.1 Green and Small Woods

There are a range of traditional crafts which make use of small dimension green wood to fashion rustic furniture, farm implements and baskets. The making and sale of such items is experiencing a resurgence as a livelihood and often as an associated life-style choice, especially as urban interior

design fashion moves towards natural artefacts. The willow project implemented by Glasu is an example of a project based around basketry[71].

As described in Section 2, commodity markets for small hardwood can be difficult to access and developing local markets would act as an incentive for thinning and coppicing. Small-dimension hardwood can be used as a substrate for growing saprophytic fungi[72]. This offers potential both for markets for thinnings and coppice wood but also an opportunity for use of woodlands for cultivation of native mushrooms on inoculated logs. Opening up FCW land under lease/rental agreements for mushroom cultivation on logs may also be one way in which forestry could be integrated into the farm economy.

4.1.2 Charcoal

From the Iron Age until the advent of large-scale anthracite workings charcoal was a major product of Welsh forests for industrial (smelting) and domestic use. In recent years with the growing popularity of charcoal for cooking (e.g. barbeques) charcoal markets are again growing. There are few figures on charcoal consumption in Wales but it is mostly seasonal (summer) and sales are through garden centres and garage forecourts. Hardwood charcoal is the best quality and much of the lower cost produce is imported and made from tropical timber. The casual nature of sales provides opportunities for small-scale manufacture of charcoal from local hardwood but margins are very low and cost is often the only consideration for many retailers and consumers. Strong cost-competition from imports means that new micro-enterprises rarely last more than two years.

There are a couple of larger scale enterprises associated with Bioregional Charcoal[73] which has an agreement to supply B&Q. B&Q is part of the FTN and prefers products to be FSC certified which means that these larger kilns are increasingly requesting only certified, high grade (in terms of standard lengths, diameters and straightness) hardwood. As outlined in Section 2 and 4 there is a limited supply of this type of material. Although Bioregional Charcoal supports local and small scale enterprises, from a Welsh perspective their scale is rather larger than the one-man operations that are proving ephemeral. Nevertheless, this is an area that continues to generate interest and there are potential markets for charcoal makers especially if they co-operate to generate a local identity for their produce.

4.1.3 Non wood products

There are a great range of biological (i.e. wild) products harvested from the forest such as moss, berries, herbs, foliage, mushrooms and game. Generally the picking of wild plants is governed by the *Wildlife and Countryside Act 1981* which prohibits damage and uprooting of any plant

without the owners' consent. However, except for specially protected plants listed in the Wildlife and Countryside Act, the collection of the three 'F's - Foliage, Flowers and Fungi are common and free rights ('everyman's right') for non-commercial use as long as the picker does not trespass[74]. Traditionally this has meant that most informal picking is from boundary features such as hedgerows and road verges. However, the *CROW Act* changes this on private land by providing for the extension of public rights of access and the dedication of open access land which confers a 'right to roam' for walkers and presumably, by extension, the right to collect wild products for personal use.

The Forestry Act 1967 (consolidation of previous Acts in 1919 and 1963) makes all state forest land an open access resource subject to Forest Byelaws and the bulk of the public estate has recently been registered under the CROW Act. However, it would appear is not clear quite what this means for informal picking of forest products as the Forest Bylaws (1982) negate common wild harvesting rights[75]. Nevertheless, recent results from the Scottish Omnibus survey revealed that around 25% of a sample of 944 people had taken home products from a forest for personal use[76] while the 2005 Public Opinion survey showed that 27% of woodland visitors gathered products to take home from their walks. This amply demonstrates the desire of the public for cultural interaction with woodlands and a desire to 'touch the wild'[77]. Furthermore, it seems likely that these activities have minimal impact on the resources themselves (though for some products e.g. mushrooms - this should be checked). There seems little need to completely prohibit such activities and it is perhaps time to review the Bylaws and consider developing Codes of Conduct for wild gathering along the lines of those for mushrooms in Scotland and England[78] and the Natural History Museum for wild plants[79].

Although it is not strictly a common right, the collection of fallen wood from a forest for personal use as firewood is perceived by many as such ("*Estovers*" is the ancient right of tenants to firewood and timber for building repairs). However, gleaning for firewood is also an activity that has cultural resonance and within limits could form part of a forest experience for use outside the forest or at barbecue sites as at Newborough.

Commercial collection of any product is prohibited under all current legislation without the consent of the landowner. However, it can be difficult to distinguish personal from commercial use and it is often only larger scale enterprises which seek permission. There are a few instances of licenses being issued for commercial collection and these are for Moss, Foliage and for Wildings (e.g. live trees used to create bonsai). The price of permits is set at cost recovery as the activities are seen to be contributing to the local economy and to achievement of the UKWAS social criteria and certification. However, there can be fierce competition in the

foliage and mossing sectors for access to good collection sites and there is a need for equitable distribution of licenses.

Commercial collection of wild products from woodlands forms the basis of a number of enterprises across Wales (with the permission of the owner)[80]. A recent review of the types and development potential of these enterprises[81] has identified opportunities for further enterprise development in the following areas:

- collection of tree and wildflower seed for use in production of local provenance planting material;
- collection of foliage, especially of *Rhododendron ponticum* for sale to UK and EU wholesalers;
- collection of moss for horticultural use (hanging basket liners and in floral and foliage wreathes).

Project proposals have been submitted to develop the first two opportunities (unfortunately neither has been funded) and a proposal for the third is in the early stages of development.

Other products which could be developed to help diversify rural incomes are: oak tan bark, berries, nuts and herbs. Products can be FSC and organic labelled by Woodmark and this could help secure niche markets; labelling as 'Welsh' could also help market products locally and to tourists. In particular there is strong growth in the wild foods markets and this could be promoted under the WDA 'Taste of Wales' label.

4.1.4 Hunting

Hunting is a very emotive issue in the UK with the recent ban on hunting foxes with hounds. However, it is still legal to hunt wild birds (snipe and woodcock) in woodlands and also to rear game birds (pheasants) for shooting. Pheasant shoots are perhaps the most lucrative use of woodland and Wales has both suitable topography and the type of woodland/farmland mosaics which favour this type of activity. However, woods containing shoots can be poor for wildlife, timber production and public access although ones that adhere to the voluntary codes of practice can successfully combine pheasant shoots with many other values. Many managers of shoots fear that their future is insecure and they may be faced with restrictions on the use of pesticides though this may have the effect of decreasing the intensity of pheasant-rearing which may provide income opportunities for more woodlands. However, restrictions on hunting such as that imposed for foxes may reduce opportunities or revenues.

Culling of pest animals such as Squirrels, feral Goats and Deer is an increasingly important concern in Wales. Grey squirrels both displace the

native Red squirrel and cause extensive damage to hardwood trees which compromises future timber quality. On Anglesey there is a successful programme to eradicate the Grey squirrel and restore populations of Red squirrels. This programme is supported by Ynys Môn Council on the grounds that it will stimulate the local economy by providing for nature tourism. There are relatively small numbers of feral goats in north Wales which are seen as a threat to native woodlands. These have been subjected to intermittent culls though only the Rhinogydd has a formal long-term goat management plan. Deer are present in Wales in a few areas at relatively low population densities and the FCW annual cull only amounts to around 1,000 animals compared with the annual cull of 20,000 animals in England. It is anticipated that numbers of goats will increase as the hills are de-stocked with sheep and that deer numbers will increase as they move into Wales from England. Although there are markets for goat and venison, in line with experience in Scotland and England it is likely that exploitation of the animals as a resource will take second place to pest management.

4.2 Services

Services are less tangible than commodities but are probably more universally valued and many provide opportunities for business development though not often to the benefit of the owner.

4.2.1 Tourism

One of the big forestry success stories in Wales has been the development of mountain biking (MTB)[82]. Starting from a few trails set out in Coed y Brenin in 1990 the MTB scene has grown very rapidly to the point where Wales is internationally acknowledged as one of the best MTB sites in Europe. Trails are now under development across Wales in both public and private forests. This is stimulating forest-based tourism and contributing significant injections of cash into the local economies. However, free access to top quality trails at FCW sites means that private owners are not able to compete or charge for the use of the trails. The only way they can capitalise on MTB development is by also operating tourist facilities such as accommodation or cafés on site. People are attempting to do this but it takes a lot of commitment as grant assistance to build trails and visitor facilities can be difficult to obtain and has to come from a range of agencies. Despite grant assistance seven years for returns on private investment in these type of facilities is to be expected. Obtaining planning consent from local Authorities can also be problematic.

Forests are an ideal environment for hiding tourist accommodation and this can be a lucrative proposition for a woodland owner. However, there is a general presumption against housing within woodland and it is difficult to obtain planning permission for ventures of this type. There is also a potential conflict of interest between public and private provision of in-

forest holiday accommodation. However, the Regulatory Reform (Forestry) Order 2006[83] is intended to enable the FC to enter into joint ventures with the private sector to provide recreational facilities (holiday cottages) within publicly owned forests and to charge the public for use of such facilities.

The roads within the forests are an asset in their own right and are widely used for horse riding, cycling, walking etc.. More noisily they are also used for motor sports with around 13 car rally events per year with stages in Welsh forests. However, it can be difficult to turn events such as rallies into revenue generating ventures for forest owners with revenue flows dependant on operating on-site catering and retail franchises. Woods are also used for other recreational use such as paint-balling, Go ape trails and target shooting and these can provide more regular use and revenue flows.

4.2.2 Recreation and health

Woodlands are in high demand for informal recreation – e.g. walking the dog. The Public Opinion survey 2005 reveals that around 65% of the UK populace had visited a woodland in the past year, the biggest draw being woodlands close to towns as they often provide the most readily accessible public spaces in the countryside. Of these visitors, 60% made regular visits (once a month) in the summer and 30% also regularly visited through the winter months. Regular outdoor exercise has health benefits and this is promoted through the 'Woodlands for health' programme[84] in Wales as part of the WAG Healthy and active lifestyles plan.

4.2.3 Education

Forest based education is just beginning to take off in Wales with the establishment of the Forest Education Initiative (FEI)[85] which has the FC as its lead partner. Under the initiative a series of county-level 'cluster' groups of interested individuals, schools, NGOs and statutory bodies have been established. These groups, with funding from the FEI grant scheme have organised many successful educational events in support of biodiversity, environmental, literacy and arts events.

The concept of Forest Schools was recently introduced from Scandinavia (particularly Denmark). With the support of the WAG, Wales leads the UK in the development of forest-based education with an exemplar at Duffryn school in Newport and at least 11 other Forest School initiatives across Wales. The Forest School model of woodland-based education has many benefits besides teaching children about woodlands and wildlife, particularly for disadvantaged and excluded children.

FCW have also engaged Forest Education Rangers with WAG support to provide free woodland education activities in a forest for every school in Wales[86].

There is a lot of useful synergy between these various initiatives and Wales leads the UK in the use of woodlands by schools and the provision of forest education.

4.2.4 Green infrastructure

As described above, the introduction of MTB facilities in woodland can create significant cash injections into the local economy. Many tourist facilities use local woodlands whether for MTB or walking in their marketing and there is a sense in which woodlands provide services in the form of pretty views, easy walks, solitude, access to wild fruit and mushrooms, clean streams, wildlife and the many other things for which people value forests and trees. These services have been termed 'green infrastructure' and there is increasing interest in their valuation. Slee *et al* (2003), in a report for the FC, developed a methodology to measure the size and cash value of the 'halo' effect of trees and woodlands within the landscape on the local economy. The Welsh component of this study was not particularly successful but subsequent refinements of the methodology were able to measure the cash flows into the economy that could be attributed to the presence of woodland and trees[87]. These data revealed that wood production was in both case studies, the smallest contribution to net revenue flows but the only one that that came directly to the forest owner and therefore could potentially be used to fund forest management. The other cash flows could be 24 times greater than timber production – it is only by tapping into this and returning cash to the forest owner that the diverse, wildlife-rich and accessible woodlands can be provided for the enjoyment of all.

A slightly different expression of the value of green infrastructure is the increase in demand and hence price of small woodlands. For the past few years Tilhill and Savills (2005 a and b) have prepared market reports of woodland sales for potential investors. The latest reports for 2004 prices indicate that demand for all woodland is increasing and buyer confidence is high despite relatively low timber prices. The highest growth in demand and consequently prices[88] is for small woods (Tilhill class these as being < 25ha) with the price per ha being strongly tied to location with highest prices close to London[89]. Nevertheless, even in Wales, prices for 2004 averaged £8,200 per/ha (compared to £1,817 for larger commercial conifer blocks).
Potential buyers indicate that the main reasons given for wishing to purchase a small wood were:

- quiet recreation, with amenity and conservation
- investment performance and, possibly, tax benefits

- sporting rights benefits
- "I have always wanted to own woodland"
- for the extras – water and, very occasionally, building and/or camping
- ownership of a nearby property

Demand is such that one owner (in England) was able to generate a profit of £175,000 by sub-dividing a woodland into 5 acre parcels for re-sale. In Wales there has been less experience with the break-up of woods into parcels for re-sale but it is of concern to the general public because of fears that it may lead to poorer management, caravans appearing on the plots and a proliferation of new boundary fences. However, these all require standard planning consent and should not present a real problem. On balance FCW is ambivalent about multiple ownership of this type and even suggests that "it might be argued that wider woodland ownership could lead to a better understanding of the wider public benefits delivered by woodlands and over time help with (WAG woodland) Strategy development"[90]. There are also other forms of multiple ownership emerging such as the multiple shareholding of Taldrum Wood[91] through to ownership by CBOs. Much of the motivation for CBO involvement in woodlands is to ensure that they are protected from from the uncertainties of private ownership and this is behind the Taldrum initiative. Stakeholder participation and local partnership in public forest management would confer these benefits to the public who jointly own the WAG estate and may serve to protect them from privatisation through FCW land sales.

It is also the case that larger private owners are prepared to invest in their woods to enhance their amenity features with a return in the form of an increase in capital value. Of course these values are highest in honey-pot sites with an attractive view, with good access or within a National Park. Nevertheless, Tilhill suggest that year on year price increases mean that a resale market (as for houses bought for capital return on resale) may be about to emerge for small woodlands.

Private owners also benefit from tax benefits and this is in effect an unseen subsidy for forestry and represents income to the owner.

4.2.5 Cultural and spiritual values

It is widely acknowledged that the Celts revered trees and their calendar and Ogham alphabet were named for trees such as the Rowan, Holly, Ash etc.. Rowan in particular was attributed with magical properties and hung above doorways to protect against the 'evil eye' while oak and mistletoe are associated with the Druids, at least in popular mythology. Many places in Wales are also named after trees and woodlands. These ancient associations are increasingly being tapped as a marketing tool[92] and may

serve to strengthen cultural values attached to native species and woodland. However, although there is no doubting that modern Welsh people retain cultural links to *trees* and native species in general, it is probably fair to say that much of their *forest* culture was lost sometime over the past 700 years[93]. Until recently, many farmers had little regard for their woodlands and limited inherited knowledge of how to manage them. Such knowledge is still extant in the

Many of the larger-scale commercial forests were imposed on the landscape often to the detriment of indigenous tenant farmers by essentially external interests such as owners of large estates, the Water Boards or the Forestry Commission. The depth of antipathy on the part of farmers for the rapid pace of change (as recently as the 1950's and 60's) and loss of traditional sheep farming on the uplands is clearly illustrated by Linnard[94] who also observes that despite the rapid rise in employment in forestry it was never a popular career choice in Wales.

One consequence of the loss of control over land use, perceived and literal by local people is that they are largely alienated from forests or at least from pro-active involvement in forest management. Changing this is something that is recognised by Coed Cymru who visualise their mission as "*a sustained campaign to ingrain a woodland tradition into the social and commercial life of Wales*."[95] Forest education is another means of re-creating a forest culture among the youth. One way of re-vitalising an ancient woodland culture is to restore historic landscapes and this is surely part of the enthusiasm for PAWS restoration[96] along with the biodiversity and landscape benefits this will confer. However, it remains to be seen what the response to the much maligned coniferous forests will be, especially those areas which are not amenable to LISS. There is a sentiment which says "*much of this publicly-owned woodland is not of any value and would be better used for*" … something else[97]. Now, after the devolution of public forests and forestry policy to WAG which places the future of the forests in Welsh hands, the challenge is to create a modern forest culture that includes all of the inherited elements, more recent ones as well those that are ancient.

Spiritual values are ones which can be very difficult to define and certainly to quantify. But there is a sense in which they lie at the heart of why people want to visit woodlands, collect things to handle and use, and seek solitude under the trees. One way in which this is expressed is the growth in green funerals which use wicker (basketry) or cardboard coffins for burial in a woodland to be marked by planting a tree[98].

4.3 Opportunity value of forest land

This is basically the development of activities on forest land which are incompatible with the presence of trees i.e. alternative uses yielding a

higher return or perceived value than forestry. Given that much of this land is marginal for agriculture, alternatives are really only significant in particularly favoured locations and there is a presumption that the area cleared of trees should be kept to a minimum.

The Woodlands for Wales strategy has little to say on the development of forest land for alternative land uses. However, this land is one of the biggest assets at the disposal of the WAG and there are increasing calls for portions of it to be used to achieve other government objectives, at the present time particularly for wind energy and social housing. Although there are significant developments along these lines this is not explicitly addressed in current policy. In Scotland similar issues have been subjected to public consultation which resulted in a review of land managed by FCS[99] and the National Forest Land Scheme[100]. A similar process and clear expression of policy would also be appropriate for Wales[101].

4.3.1 Minerals

In Wales there is a separation of ownership rights into freehold (usefruct), water (abstraction), sporting (hunting and fishing – as separate rights) and minerals (below ground resources). A land owner cannot take advantage of minerals on their land unless they also own the mineral rights, likewise exploitation of mineral rights usually requires that the exploiter owns or leases the land concerned. The presence of minerals is not a function of land use but of location in relation to the underlying geology and therefore is not usually considered as a forest benefit. Nevertheless, in cases where the mineral rights are held by the freeholder then they can provide a useful asset and revenue stream to the owner.

The WAG own all the rights associated with the public forest estate and for many years there has been a presumption that mineral extraction should be permitted where it is economically viable. In the past there were as many as 60 drift coal mines operated as franchises within the Coed y Cymoedd Distict (South Wales). With the general decline in the coal industry this has all but ceased but at one time it provided employment for more than 600 miners and a significant income to the FC. At the present time the mineral resources within the forest estate are exploited to provide what is required within the forest, for example borrowings for road spoil. This does not take place on a large or commercial scale but saves the cost of buying and transporting road aggregate.

4.3.2 Wind energy

Wales has significant wind energy generation potential and renting land for wind turbines can be a profitable enterprise. However, this is only possible on windy sites where there will be few objections from local

people (which is increasingly the main constraint on wind farm establishment) and preferably one without trees (the ideal location would have no trees within a 5 km radius). Thus wind generation is not really compatible with forestry though it is probably possible to create pragmatic compromises around re-structuring given that a wind farm only has a useful life of around 20 years. Nevertheless, the basic incompatibility of wind energy and forestry means it should be considered a location-dependant opportunity value rather than forest-dependant.

In July 2005, after considerable delays, ***Technical Advice Note 8*** (TAN8) was issued by the Planning Department of the WAG[102]. This document lays out guidance to unitary authorities on potential sites for wind farms. TAN8 used a sieve mapping approach to identify potential onshore wind farm sites; many of the filters related to topography and wind speed but the one related to existing land use identified conifer plantations as suitable for development[103] presumably the 'low sensitivity' sites identified in a 2002 report to the Forestry Commissioners. It is therefore not surprising that of the seven sites identified in TAN8, six contain an estimated 30-80% forest cover. Furthermore, TAN8 suggests that between 25-50% of the identified forest area will become available over 5 years through clear-felling as outlined in the design plans.

FCW have not prepared any specific guidance on the development of wind farms in forests but the FCS advice notes are probably relevant to Wales[104]. FCS advice suggests that wind farms are likely to displace forestry rather than being sited within a forest matrix. However, they go on to note that an EIA will probably be required for developments of more than five turbines, that site amelioration plans after the 20-25 year life of the wind farm should be agreed in advance and that this may present an opportunity for forest re-structuring. In the final analysis planning consent for larger wind farms rests with the Secretary of State for Trade and Industry (Westminster). Of two previous proposals for wind farms on forest sites one was approved (Cefn Croes) and one rejected (Camdwr). The approved wind farm at Cefn Croes was commissioned in February 2005 and under direction from the FCW contracts team has been judged a success in terms of landscape and planned site amelioration[105].

4.3.3 Communications infrastructure

Rental of small parcels of land for mobile phone masts is, like wind turbines and minerals a function of topography and location. However, they also can provide a useful income on suitable sites (with lines of sight up a valley containing a village or over a ridge). Around 40% of Wales has little or no mobile coverage and so phone masts are likely to proliferate. The masts are not really compatible with the presence of trees and they need to be sited in clearings with unobstructed lines of sight to the horizon. Sites are rented with price dependent on the quality of the site

and also on contractual arrangements for sub-letting to multiple network operators which can be complex. FCW has a number of mobile phone masts from which it makes a useful income.

4.3.4 Housing development

Provision of affordable housing is a concern in rural areas of Wales. Early in 2004 the WAG announced that a desk study had identified around 70 forest sites for development of mini-villages composed of a mix of houses for sale and rental with the stipulation that they must stay low-cost for at least 15 years. So far, 16 of these sites have been investigated further and it is anticipated that planning applications will be made by the end of 2005 for some candidate sites in Gwynedd. The information available suggests that the land will be sold to local developers with the proceeds to be used to fund half of the houses so they can be made available for rent, the other half to be sold by the developer.

The intention is to use exemplar low-energy designs, executed in brick and including some Welsh timber in their construction. Similar proposals have been put forward in Scotland but with the land offered for sale at reduced cost to housing associations under the National Forest Land Scheme which also encourages the use of timber and timber products in the construction and cladding of houses. Indeed social housing on former forestry land would seem to be an ideal opportunity to provide a showcase for the work of the POWAXIS and GATE projects as well as to fulfil aspirations for sustainable housing[106].

5 Forest sector planning and management

Devolution of public forest land to the WAG, has initiated a cascade of changes within the Welsh forest sector starting from the promulgation of a new forest strategy 'Woodlands for Wales' in 2001. The strategy lays out a 50-year vision which sees Wales being known for "its high-quality woodlands that enhance the landscape, are appropriate to local conditions and have a diverse mixture of species and habitats".
The forests are intended to:

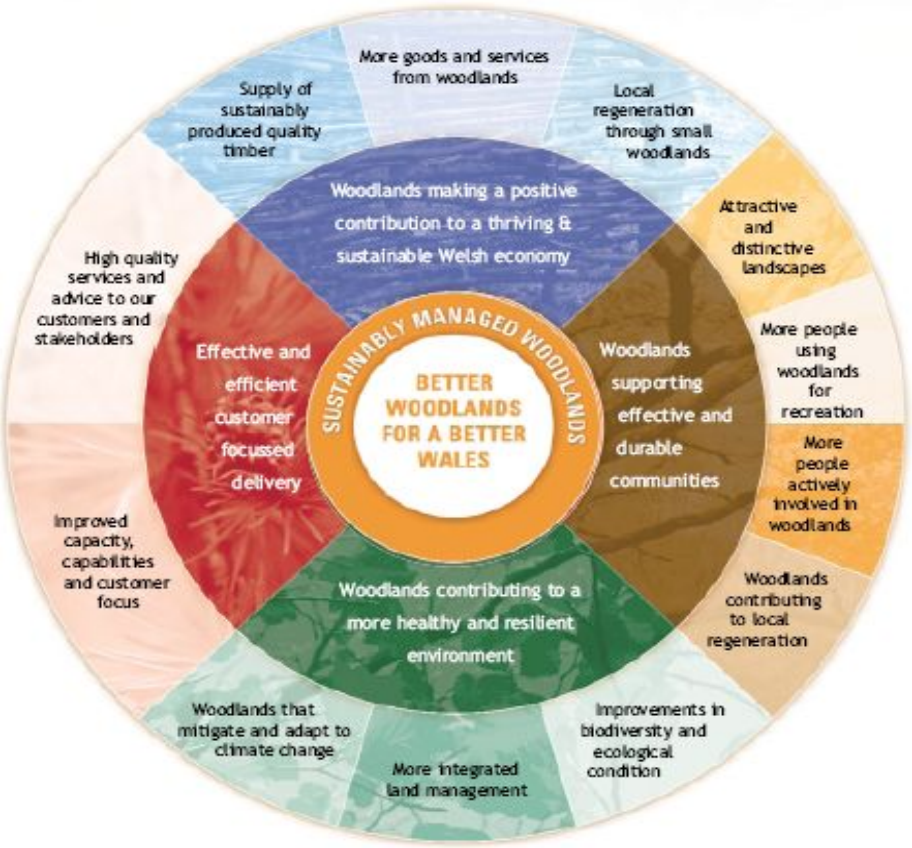
- provide real social and community benefits, both locally and nationally;
- support thriving woodland-based industries; and
- contribute to a better quality environment throughout Wales.

FCW manages the forest land owned by the WAG (about 5.6% of the total land area) and also manages incentives in the form of grants as the main agent of the policy in the private sector. FCW have established five programmes of work to deliver the policy:

- woodlands for people,
- a new emphasis on woodland management,
- Wales as a location for world-class forest industries,
- a diverse and healthy environment and
- tourism, recreation and health.

Under each of these programmes there are many new policy directives and strategies that need to be incorporated into forest management planning and operations. The introduction of UKWAS and FSC certification also has to be accommodated. Fortunately there is considerable synergy generated by the serendipity of these two drivers of change happening at the same time. Nevertheless, change, especially institutional change if it is allowed to create uncertainty, can be a traumatic process.

FCW have responded positively to the challenges presented by changing policy and have developed a new corporate plan which is more public and accountable than previously[107]. The corporate plan has been formulated as a vision wheel (Figure 5) which, starting from the central vision moves out to specific actions through a series of steps Vision > Objective > Outcome > Outputs > Actions. A set of 13 indicators have been established which will be monitored to ensure that actions are delivering the required outputs. Positive effects will cascade back towards the centre to achieve the vision. Derived from the corporate plan are annual plans and shortly after the end of every year a report of progress against the actions is produced[108]. These documents clearly lay out the response of FCW to the vision endorsed by WAG in the Woodlands for Wales strategy.



Source: FCW (undated)

Figure 5: FCW vision wheel

It is encouraging that FCW have established a mechanism for publicly committing to specific actions and then reporting on them. Although the progress reports are not third-party audits they still permit and indeed encourage public scrutiny of FCW actions, which is perhaps the best way to generate dialogue and engage the support of interested stakeholders. Repeating this process at different scales will do even more to build operational partnerships with local stakeholders, e.g. the forest level would be appropriate for engaging local communities in management operations.

The WAG forest strategy makes provision for "*periodic public review to respond to people's concerns and expectations*" but without stipulating a time scale for this. Scotland has commenced a five year public consultation of their strategy[109] and there are plans for England to do likewise. If Wales were to follow suit then a public consultation exercise should commence in 2006 with a revised policy in 2007. Such a review would be an ideal opportunity to make deeper connections between forestry, conservation, farming, urban needs and sustainable forest-based

industries to create integrated and economically viable wooded landscapes.

5.1 Management and economics of production by forest type

As explained in Section 1 most of the woodland in Wales is not natural and the important economic distinctions in forest type are not ecological but related to ownership and type as shown in Table 4. Most woodland is planted though changing fashions for broadleaves and conifers has resulted in rather different age structures (Figure 1).

The management and economics of the coniferous and broadleaved woodlands are somewhat different for reasons other than the silvicultural treatments and timber value. The conifer plantations are mainly large, single-species blocks and even aged (exceptions are self-thinning and nutritional mixtures). As explained in Section 3 most plantations are supposed to be thinned and clear-felled according to a strict timetable dictated by a silvicultural regime designed to maximise timber production in as short a time as possible. The downturn in timber prices from 1990 (see below) as well as the ending of the Shotton paper mill's use of large volumes of small-diameter softwood means that thinnings are often done at a loss for silvicultural gains or to increase stability[110]. Final crops may also be clear-felled with low margins that often do not cover the cost of site clearance and re-stocking. The general economic viability of conifers is poor under current marketing and price regimes. There are a few estates in Wales which produce high quality hardwoods over long rotations, presumably profitably.

Much of the broadleaved woodland is owned by local authorities and NGOs such as the National Trust and Woodland Trust. Here management is for conservation and other public benefits. Income from fellings represents a windfall as management costs are covered by FCW grants – some providing up to 75% of total costs. In the case of the NGOs management costs are sometimes directly subsidised by the general public in the form of voluntary labour which can also be used as match funding for EU projects.

One of the biggest concerns is that part of the broadleaved woodland which is contained in farm woodlands. The area of such woodlands is stable and stands at 36,500 ha but there is some clearance of mature woodland[111] and the establishment of new woodlands under a range of incentive schemes. Many of the farm woodlands have little or no management and are used mainly as stock shelter and grazing, and are effectively derelict (with significant loss of past, and potential, biodiversity value). Besides the grant incentives offered by FCW to manage these woodlands, the idea that they could be revitalised by realising an income from the trees is increasingly promoted and Coed Cymru reports that over

100 small mills have been established since 1990 most without grant assistance. This is behind the provision of the Timber Processing Capital Grant available within Farming Connect to encourage farmers to process and add value to their woodlands. The Grazing Animals Project (GAP)[112] is looking at ways to graze within newly planted woodlands to provide some income as the trees grow. It may also be possible to encourage the use of woodlands as an environment for growing alternative crops such as mushrooms, forest berries or shade-bearing herbs but this has not as yet been explored.

5.2 Forest management plans

Since FSC certification made management plans mandatory, the number of forests with current and active management plans has greatly increased. Within FCW, each District prepares a Forest District strategic plan with a Forest Design Plan (FDP) for each forest block. The plans run for 10 years with revision in year 5 and contain proposals for felling and restocking. The plans are drawn up with the intention of protecting and managing sensitive features, stands and landscapes and to achieve objectives such as the linking and possible extension of open space, the protection and enhancement of semi-natural woodland and the re-structuring of the forests to increase diversity in age and species. The implications of these requirements to the FDP revision process have been recognised[113] and change is being managed as a discrete project under the civil service PRINCE 2 methodology. Once draft plans have been prepared they are presented to the local communities (as represented by the Community Council rather than the general public). Any comments are considered and the designs amended to the satisfaction of all stakeholders. The plans are then passed to the Grants and Licences division of FCW and placed on the public register[114] for four weeks. If there are no objections to the plans from the public whilst they are on the register they are approved and implemented. It takes around six months to prepare a FDP for a forest block. Community consultation is a relatively new venture for FCW and they have appointed Community Rangers at District level to assist area staff in consultations[115].

The new BWW scheme[116] that is due to be introduced by FCW later this year will replace the Woodland Grant Scheme. The BWW grants will be paid against long-term management plans, the preparation of which will also be grant aided. The preparation of BWW management plans will be assisted by specialists in PAWS conversion, CCF planning and specialist assessments of social issues and biodiversity surveys.

FCW already provides grant assistance for the development of Native Woodland Plans which form part of the Tir Gofal scheme. The procedures for the development of these plans are somewhat different from that for BWW and were prepared in partnership with CCW. Since these plans are

intended for mature, broadleaved woodland biodiversity is well to the fore. The biodiversity value of the site is first established and then plans drawn up to meet aspirations including those of the owner. Monitoring of indicators of success in achieving aspirations is integral to the plan in a manner that borrows from 'adaptive management' approaches[117].

Implementation of WAG forest policy implies that forest management in the future will need to increasingly incorporate LISS and more multi-functional management for biodiversity, green infrastructure, recreation and production of other commodities than timber and to involve local communities. For this to be effective the FDP will need to move away from the extant rather prescriptive approach which gives greatest prominence to the timing of felling and re-stocking. The ideal would be to move towards a more process oriented or 'adaptive' approach. Central to these types of systems is monitoring of the impact of prescribed actions followed by modification of the prescriptions. This moves management towards its goals in incremental steps, learning along the way. This raises similar issues to those discussed for biodiversity monitoring in Section 1. This suggests that the design of monitoring systems is a key skill for woodland management planning from several perspectives.

5.3 Social interaction

Social interactions between FCW and local stakeholders can take many forms from simple consultation through partnerships to self-motivated engagement on the part of the community. Existing mechanisms for engaging with the public include all these types of interactions.

The Woodland for Wales strategy involved face-to-face consultation events as well as the usual, written submissions. The inputs from this process[118] were used to prepare the final text of the policy. Consultation of a type on policy matters is provided for by two bodies: the Woodland Strategy Advisory Panel[119] and the National Committee. There are also a number of other subsidiary panels to advise on specialist topics. The membership of these bodies appears rather conservative with few women or representatives of socially excluded groups, CBOs, NGOs, SMEs, MTB clubs etc.. A more flexible approach with invitations to wider groups of people on topics of particular interest to them would help generate fresh ideas and set the tone for consultation for the rest of the forestry sector. These need not be regular events or closed lists of people but put together as required.

Public consultation has long been a part of the management process in the UK but in the distant and all-but-inaccessible form of public registers as described above. The 2005 public opinion survey showed that 42% of the populace would like to be consulted about woodland management plans so there is certainly a demand for consultation.

However, being able to consult a public register is probably not what the people who expressed an interest in consultation have in mind. Consultation with the Community Councils goes a little further but can still be limited in terms of gathering a broad-based perspective of local interest in a woodland. It may be that there is a role for FCW to assist Community Councils or local interest groups to gather information from the wider community perhaps utilising some of the tools in the Community Toolbox[120]. There has been some success with manned displays in a consultation yurt at public events. However, there do not appear to be any protocols of what is done with the inputs and comments from the public generated by these events. If the intent in making the effort to meet people is to accomodate their needs within the FDPs then a dialogue is required. This will normally require further meetings which over time can evolve into some form of woodland interest group who come to 'represent' the community. Eventually these groups could become partners in the management plan and perhaps undertake voluntary work or undertake projects within the forest to provide facilities that are additional to the FDP. This would make consultation more participatory and move towards *partnership*[121]. There are a few CBOs[122] in Wales who are actively seeking involvement in the management of their local WAG woodlands and this is provided for in local partnership agreements, but this is a new concept and FCW district managers need more guidance on how to facilitate these types of interactions.

In Scotland there are an increasing numbers of CBOs which are leasing forests as a source of materials and land for commercial enterprises. There are very few examples of this type of activity in Wales[123]. If a group can lease a block of woodland then there is little reason why individuals or SMEs cannot be licenced to harvest or use woodland commercially to the benefit of the rural economy. There needs to be a review and rationalisation of whether FCW should allow access to woodland for commercial enterprises, e.g. for production of moss or mushrooms, and if so how this can be done in an equitable manner. The powers to enter into commercial partnerships confered by the Regulatory Reform (Forestry) Order 2006 could presumably provide a mechanism to develop such enterprises on WAG land. FCW has been successful in attracting funding (Rural Recovery and ERDF) for investment in integrated rural development but this has mostly been used to fund public events, access and tourist facilities. Allowing locally-based economic activity within the forest as a direct contribution to rural livelihoods and income diversification would do much to integrate forestry into the rural economy and generate support for wider processes such as FLR.

Community woodland in Wales is delivered by at least two public agencies; Tir Coed[124] funded by WAG and Cydcoed[125] which is an Objective 1 project administered by FCW. Of these two Cydcoed seems very driven by hard targets (numbers of ha planted etc.) and funding can only be

given as part of a 'project' rather than as small amounts of money to facilitate CBO establishment. It seems that many Cydcoed projects are mediated by unitary authorities (County Councils) who wish to develop a parcel of land they own as a commuity woodland or to alleviate problems with vandalism. Most of the projects are therefore peri-urban in nature and follow the models established by the Community Woodlands in England. Cydcoed's funding comes from Objective 1 and there are concerns that the initiative is not sustainable. There is also the risk that having become acustomed to 100% funding the receipients may find it difficult to adjust to finding multiple funding bodies for projects and having to supply match funding[126]. In the future more attention should be paid to sustainability and integration of CBO activities in 'normal' funding arrangements and grants.

5.4 Employment in forest management

In 1998/9 Welsh forestry and the primary wood-processing industries employed just over 4000 full time equivalent (FTE) employees broken down as follows:

Forestry Commission	567
Private woodland management	987
Forestry companies and contractors	298
Wood processing industries	2,130
Others	117
Total	**4,009**

Source: Multipler study (Cardiff Business School 2000)

Employment in the sector across GB fell by 25% between 1985/6 and 1998/9 with greater than average falls in forest establishment and maintenance (reflecting the decline in afforestation) and harvesting and haulage (largely due to increased mechanisation). These trends also affected Wales[127].

Since 1998/9 when the figures above were generated, it seems likely that employment in this sector has continued to fall. There are complaints from many quarters that there is a shortage of woodland agents in Wales and that this is acting as a constraint on the implementation of woodland management improvements[128]. Established agents also lack the skills required to implement the new ideas being introduced and require training and specialist support. In recognition of this FCW have undertaken to recruit, train and contract Management Planners and Specialist Assessors under the BWW grant scheme[129].

Applicants have to register their expertise under five different skill sets; these being:

- forest management planners,
- PAWS,
- CCF,
- ecological assessment and
- social interactions.

Registration as an agent under BWW has just closed with 200 applicants but this included Assessors as well as Planners; many were also from outside Wales. During the BWW trial period, training was organised by FCW. Now that procedures have been formalised there should be some co-ordination with Colleges and University so that they can include the required skills into their curricula including short and distance-learning courses which should help build capacity in the private sector.

Within the public sector there are also complaints of chronic staff shortages but this is caused not so much by unavailability, as by downsizing and cost cutting as part of the institutional reforms following on from devolution. By mid 2005 FCW staffing was down to 409 a reduction of 28% from 1999 with further cuts imminent. This has been a hard blow to the morale of the remaining staff who find themselves overworked, under-resourced and their positions insecure.

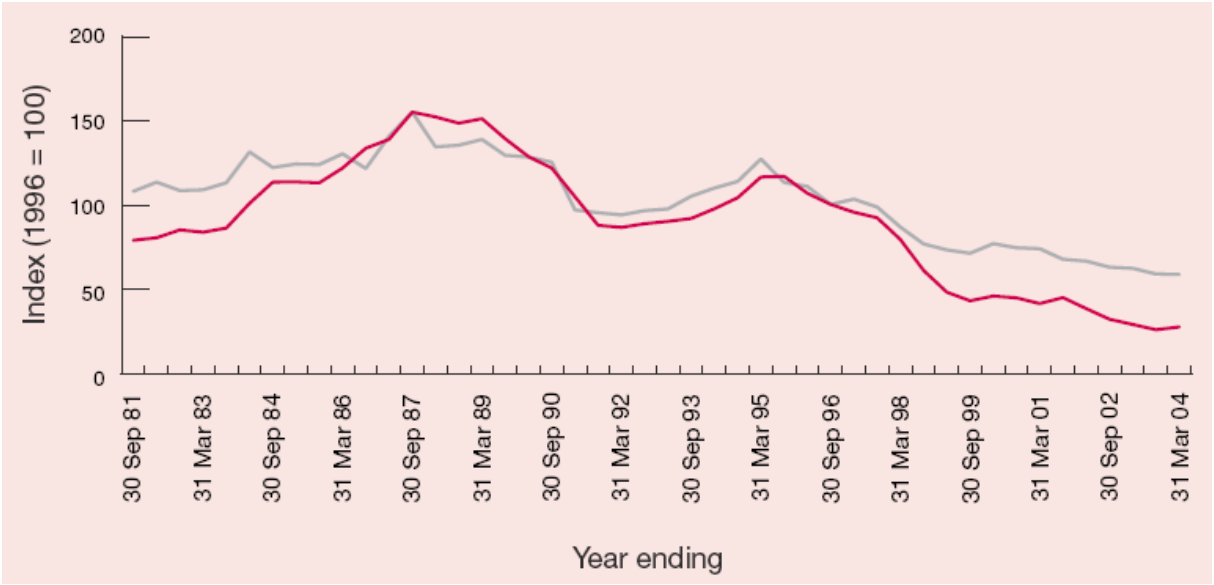
There are also personnel and skill shortages in the contracting sector. This is probably a symptom of continuing labour shortages in rural areas and a lack of profitability in this sector. The continuing loss of traditional management knowledge and skills is also an increasing concern.

It is ironic that at the time when forest management is at its most dynamic for a generation and increasingly complex that there are fewer than ever skilled foresters available to turn these aspirations into reality. To really progress - Wales needs a cadre of young, highly skilled forest managers but unfortunately they are not there, not even in education or training. The School of Agricultural and Forest Sciences of the University of Wales, Bangor (UWB) reports that recruitment levels for forestry degrees continue to fall despite a good availability of graduate-level jobs. It appears that neither forestry nor wood science is popular among young people as a career choice. This is surprising given the level of enthusiasm for voluntary involvement in countryside management. However, it would appear that these difficulties are perhaps confined to the more traditional i.e. conifer sector as Coed Cymru report that they had 30 applicants suitable for short-listing for a recent position and that they appointed a Marine Science graduate. This perhaps suggests that conservation is attractive to young people but that this is not perceived as being associated with forestry. This could be because ***(a)*** forestry education does not in fact cater to the interests or needs of people attracted to

conservation careers or ***(b)*** forestry has an image problem and is perceived as only being relevant to commercial plantations. To some extent both assertions are probably true and need to be addressed. The content of education and training courses also needs to be examined to ensure they provide the raft of social, planning and quantitative skills as well as the silvicultural and ecological knowledge that is needed to successfully manage multi-purpose forests, and that they are packaged to be attractive to young people and to their potential employers. If recruitment rates into forestry courses in Wales remain static, and steps are not taken to ensure that the curricula offered contain the skill sets required, then Wales will have to compete for foresters from elsewhere and probably from the traditional forestry countries in Europe[130]. If Wales can rise to the challenges posed by changes in the forestry sector then it has the potential to become a centre of excellence in forestry and export forestry and wood science skills as the UWB contains one of the last tertiary forestry education facilities in the UK.

5.5 Financing forest management

When much of the FCW forests were planted (see Figure 1), it was done with the expectation that there would be a return on the investment (judged by the internal rate of return). Over recent years there has been a major decline in the price of round timber. Measured in pounds in real terms, prices remain at the lowest levels ever encountered (Figure 6) although prices for 2005 have shown a modest recovery. Factors such as the strength of sterling and high sawn timber production levels in Sweden and the Baltic States have contributed to the fall in prices.



Source: Forestry Statistics 2004

Figure 6: Coniferous standing sales (**red**) and sawlog price indices (**grey**) in real terms (Sept 1996 = 100)

The reduction in timber prices means that the capital value of the WAG estate is also falling and the latest quinquennial valuation (31 March 2003) valued the estate at £131.6 million a fall of 40% since the previous valuation in 1998.

Removals from Wales have been roughly constant at 920,000 m^3 per year, though this can be expected to fall over the next few years (Section 3.6). Although prices have risen by 31% over 2004-5 prices are still a fraction of the levels pre-1990 and FC plans assume that prices will continue at their depressed level. It is not possible to hold back production on many stands, particularly those with high wind hazard rating, until prices improve and it seems unlikely that realised income on much clear-felling will represent a return on the initial investments made in the 1960's. Furthermore, the introduction of certification changed the basis of decisions on the timing of thinning away from economics (i.e. felling when it would generate a profit) to silvicultural ones even if this means felling at a loss. The need to fulfil contracts at pre-arranged prices also risks stands being felled at a loss on harvesting costs. The closure of Shotton to large volumes of home-grown logs (it now only takes paper for re-cycling though logs are still used to burn excess pulp) means that much of the production of thinnings does not have a ready market. All of this means that forestry in its inherited form in Wales (i.e. coniferous monoculture on upland sites), looks increasingly marginal in purely financial terms unless the initiatives to increase the value of Welsh timber outlined in Section 3 are successful. It is also worth bearing in mind that much land under coniferous plantation was low grade agricultural land and would also be marginal for livestock production.

Despite this, the FCW annual report in 2004 stated that :

"*Cash funding for activities in Wales comes from the Welsh Assembly Government, from the European Union and from income from the public forest estate managed by FCW. Timber sales represent the main source of income for FCW and its financial performance is closely linked to the strength of the round timber market.*" This means that financing of FCW is inherently insecure as it is dependant on fluctuating and declining timber prices and has been over-reliant on end of year flexibility which is no longer available[131]. In real terms income is falling at a time when considerable (and not yet properly quantified) investments are required to meet the WAG objectives of introducing LISS and development of public benefits.

The private sector producing softwoods is also impacted by falling timber revenues and suffers shortfalls in funding. FCW does provide some

support to the private sector in exchange for public benefits but the amounts dispersed are relatively small (£4.9 million in 2003-4). Coed Cymru report that the hardwood sector is buoyant and do not seem concerned with funding broadleaved woodlands though much of this is supported by grant income from a range of sources. Most NGO and many other non-FCW owners have already made the transition to viewing public or private biodiversity and amenity values as sufficient return on their investments in management. As described in the previous Section funding in the NGO sector is not dependent on timber prices anyway.

Table 8 gives figures for the financing of FCW for the two years 2002-3 and 2003-4. Timber sales accounted for 37% and 28% of the total running costs in 2002-3 and 2003-4 respectively. Other forest income is between 25% and 38% of timber sales and recreation (campsites, car parks etc.) is small but significant. There is certainly no net profit and around 50% of operational costs (around £20 million) comes from WAG.

Table 8: FCW financing (£ 000s)

Income	**2002-3**	**2003-4**
Timber sales	15,882	13,023
Other forest income	4,034	5,011
Recreation income	1,735	1,819
EU income (for planting grants)	649	716
WAG	18,653	24,370
Total (cost of running FCW)	42,955	46,942

Source: Annual reports and accounts

Given that the FCW is charged to deliver public benefits it is instructive to examine the financial outturn for these activities (Table 9). It is clear that income is trivial compared with expenditure. However, the value of the benefits generated by the relatively modest investments cannot be measured as cash income – they are non-monetary in nature.

Table 9: FCW expenditure against aims and objectives 2003-4 (£ 000s)

Objective	**Expenditure**	**Income**
Woodlands for people	8,993	518
A new emphasis on woodland management	8,031	372
Wales as a location for world-class forest industries	6,284	641
A diverse and healthy environment	2,431	227
Tourism, recreation and health	4,023	310

Source: Annual reports and accounts

FCW is under pressure to generate income to meet the cash shortfalls shown in Table 9. In 2004 a decision (supported by WAG[132]) was made to sell "Woodlands which currently produce low levels of public benefit or have low environmental value have been identified through a strict selection process and will be placed on the market in a programme of sales which FC Wales expects to raise a total of £1.8 m. Income derived from the sales will be used to maintain public benefits on other parts of the Assembly's woodlands"[133] (13 Sept 2004 Press release 6634). Paradoxically, at the same time FCW put in place a sponsorship scheme which recognises that "*many public and private bodies have a genuine interest in acquiring particular areas of land having conservation, recreation or amenity interest. Also local communities might well have an interest in acquiring Forestry Commission property for their social and economic development.*" For such land, a 'private' sale at full market value will be offered if sponsored by either CCW or WDA. This suggests that some, at least of the land offered for sale is anticiapted as having public benefits. Furthermore, land sales realised a net income of £387,000 between 2000-1 and 2003-4 from the sale of 2,584ha of land, and for three of those years sales were apparently cost more than they realised[134].

Even if the anticipated £1.8 million can be realised it will hardly cover the deficits shown in Table 9, even as match funding for EU grants. Nevertheless, the pressure for FCW to balance its books with the proceeds of land sales continues and forward financial planning up to 2008 relies on around sales of £900,000 per year[135]. Since devolution the basis for routine sales by FCW requires a formal legal basis which does not as yet exist. However, negotiations to form an Agreement under Section 41[136] of the Government of Wales Act (1998) have been underway since 2000. The proposed Agreement would permit the routine purchase and sale of up to £1 million of assets per year by FCW without recourse to the WAG.

Continuing funding difficulties means that FCW is having to look at other mechanisms to cut costs and it is anticipated that there will be further reductions in manpower and cessation of large scale programmes not related to statutory obligations or do not contribute directly to certification[137]. This is likely to compromise delivery of the Woodland Strategy particularly those elements related to public participation as this requires substantial staff invovement at Area level.

Across the forestry sector as a whole, between 2002 and 2005 at least 34 EU-funded projects were initiated (Table 10). Together these projects are worth around £113m with £42m cash inputs from the EU. There are at least a further 12 projects which will have some impact on the forestry sector which are worth an additional £20m with £10m of this from the EU.

There are two things that are apparent from Table 10. The first is that there are considerable public funds going into the forestry sector beyond that delivered through FCW. The second is that much of the current activity in the forestry and timber sectors is supported by some form of EU grant assistance. Some of these programmes are longer-term (e.g. Leader) but some are time-bound (e.g. Objective 1). There is a need to consider how such projects will be funded without EU grants. Of course the intention is that the projects will provide sustainable long-term benefits that will not require grant-aid but there are likely to be some that will need more support.

Since timber revenues cannot cover the cost of operations (in the medium term at least) and public benefits there has to be some other way of justifying investment in forestry. Sections 1, 3 and 4 of this report and the Hydrogeology report all detail numerous public benefits that accrue from woodlands and wooded landscapes. It is also clear that the public very much appreciate these non-monetary values and are prepared to see public money being used to pay for them (see Section 1.1). However, it is difficult to see how much of a subsidy is required or justified without some means of valuing the benefits that accrue. It is therefore recommended that social and environmental accounts are prepared for forestry public benefits and these accounts are incorporated into the FCW accounts to show in a realistic manner the full returns on investment in forestry for both - the public, private and NGO sectors. Such accounts would be in line with Agenda 21[138] and sustainability goals.

Table 10: EU funded projects in the forestry sector 2002-2005

Programme	Year	Sponsor	Project title	Project cost	Grant
Interreg IIIa	2004	FR	Sustainable Management of Forest Insect Pests	431,363	194,112
Interreg IIIc	2005	FCW	Robinwood		
	2005	FCW	GATE – Gaining added value from timber		
Leader	2005	Adventa	Adventa - Woodland Revival	370,700	176,082
	2002	CEA	Woodlands and Water	144,637	68,800
	2004	CEA	Forest Wood Energy Chain for the production of Biomass for Energy Production	172,512	81,943
	2004	CEA	Greenman phase II	225,000	106,875
	2005	Glasu	Developing Local Provenance Tree Nurseries in Powys	218,860	103,959
Objective 1	2002	FC	Shelterwoods	884,702	224,742
	2002	FC	Cyd Coed	4,573,500	1,714,500
	2003	FC	Cydcoed - Woods for all - Phase 2	13,800,520	4,241,905
	2003	FC	Managing the Assembly Forest Estate for Public Benefit	7,864,958	3,451,183
	2004	FC	South Wales Valleys Forest Improvements Phase 2	1,154,945	400,000
	2004	FC	The Meirionnydd Oakwoods Habitat Management Project	2,240,974	1,111,673
	2005	FC	Reclaiming our forgotten inheritance - the race to save Wales's hidden woodland treasures	2,370,267	1,059,586
	2005	FC	Better Woodlands for Wales	2,152,056	856,949
	2002	FC	Forestry Commission - ERDF Technical Assistance	82,585	41,292
	2002	FC	Forestry, Countryside and Coastal Management	681,781	340,890
	2004	FC	Wood Energy Business Scheme	11,012,977	4,248,297
	2002	UWB	Tyfiant Coed	419,101	159,258
	2002	WDA	TIMBER	1,414,100	275,700
	2002	FCA	Wales Forestry Future	793,979	317,600
	2002	WT	Restoration and sustainable management of degraded ancient woodlands	650,872	249,607
	2002	FR	South Wales Valleys Forest Improvements	352,500	120,000
	2002	SWA	Coed Lleol	232,621	92,872
	2002	Conwy CBC	Coed Conwy	39,000	14,001
	2002	Torfaen CBC	Torfaen Community Woodlands	337,213	131,985
Objective 2	2004	FC	Wood Energy Business Scheme	2,226,586	432,066
	2003	Powys CC	Coed Cymru – Powys	380,621	166,920
	2003	Cardiff U.	Willow for Renewable Energy and Crafts	290,057	88,900
	2003	FR	Woodland Tourism	624,605	279,759

Programme	Year	Sponsor	Project title	Project cost	Grant
Objective 3	2002	Siren	Welsh Woodlands and Woodworking	241,080	106,985
	2002	FCA	Powys Forestry Training Network	181,305	81,063
	2003	Coleg Gwent	Monmouthshire Forest School	35,310	15,734
	2003	WFIG	JD13 (Training)	403,005	138,720
	2004	Siren	Wood Work Shop - Phase 2	119,676	53,854
Total				**112,744,879**	**41,706,694**

CEA – Conwy Energy Agency; WFIG – Welsh Forest Industries Group; CC – County Council; CBC – County Borough Council; FCA – Forestry Contractors Association; SWA – Small Woods Association; WT – Woodland Trust

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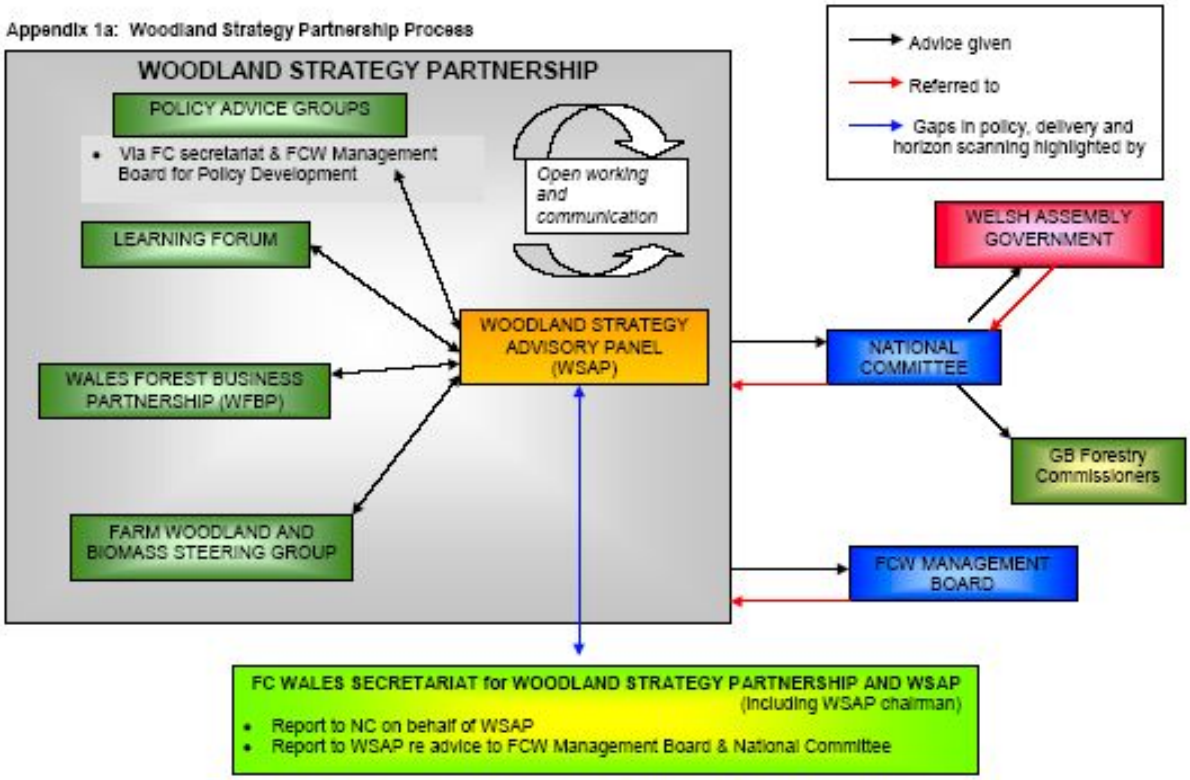
End Notes

[1] The relationship between these bodies, WAG and FCW is:



The National Committee has the following terms of reference:

- approving corporate plans and annual reports for the FC in Wales
- setting targets for, and managing the performance of, the Forest Management Agency in Wales
- grant-aiding and regulating woodland owners
- identifying the necessary resources required to meet objectives and monitor financial performance
- ensuring the safeguarding of resources through internal control systems
- drawing to the attention of the Commissioners any issues of which they need to be aware for the proper discharge of their GB duties
- to receive and consider advice from the Woodland Strategy Advisory Panel, on behalf of the Minister, concerning all aspects of the implementation of the Welsh Assembly Government's Woodland Strategy.

http://www.forestry.gov.uk/website/meetings.nsf/LUOutByUNID/25A18E4A39678B2B80256E5300528C84

The Woodland Strategy Advisory Unit has the following terms of reference:
Advising on the implementation of the Wales Woodland Strategy by all partner organisations based on a thorough understanding of current activity and policies

- Monitoring and reporting to the National Committee, the implementation of the Wales Woodland Strategy by all partner organisations via regular consideration of progress towards objectives as defined in the finalised 'Targets and Indicators' monitoring framework

- Advising on specific issues that the National Committee assigns to the Panel
- Horizon scanning to enable the Strategy (and FC Wales as the government department responsible for forestry policy development and the organisation with the primary responsibility for strategy delivery) to respond to new issues and agendas
- To develop networking opportunities across organisational positions and sectors with the ambition of promoting the benefits of forestry for the people of Wales
- To adjudicate in disputed applications for grant aid or felling licences and in disputes by the statutory bodies arising from Forestry Commission design plans

http://www.forestry.gov.uk/website/meetings.nsf/byunique/FCE2E97FA68DB775802570060036D518

[2] Coed Cymru began as a campaigning body to heighten awareness of native woodlands, particularly among the farming community who own most of these woodlands. In 1986 a network of woodland advisors was established, based in County Council and National Park offices. The Coed Cymru Central office at Tregynon provides the communication, technical and administrative support necessary to maintain the cohesion of the organisation.
http://www.coedcymru.org.uk/objectives.htm

[3] Land for which there is documentary evidence of a continuous cover of native woodland since before 1600 AD.

[4] Directive on the conservation of natural habitats and of wild fauna and flora 1992 (92/43/EEC)

[5] Holl and Smith (2002) describe wood pasture as "*Ancient wood pasture is defined by the presence of open grown, old or "veteran" trees in a habitat which is kept open by grazing animals. Ancient wood pastures occur where the woodland and its grazing system have evolved in parallel over historical time to produce a grazing-maintained habitat with elements of both woodland and pasture. These dynamic processes have resulted in an open woodland structure with open-grown trees, which can attain a great age, over a range of semi-natural ground vegetation.*" They have also developed a classification and management recomendations for several classes of ancient wood pasture for Scotland.

There has been little systematic work or recognition of these systems in Wales but the landscapes do not appear to differ much from those in Scotland. The wood pasture types found in Wales are: Ash, Slope Alder, Upland Oak and Hawthorne Savanna.

[6] This is a topical issue in Wales and the second Welsh Conservation Management Conference planned for June 2006 takes 'Managing Change' as its theme with an emphasis on planning for climate change.

[7] There are twelve principles which embody the ecosystem approach:

1. The objectives of management of land, water and living resources are a matter of societal choice.

2. Management should be decentralized to the lowest appropriate level.
3. Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems.
4. Recognizing potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context. Any such ecosystem-management programme should:
   (a) reduce those market distortions that adversely affect biological diversity;
   (b) align incentives to promote biodiversity conservation and sustainable use;
   (c) internalize costs and benefits in the given ecosystem to the extent feasible.
5. Conservation of ecosystem structure and functioning, in order to maintain ecosystem services, should be a priority target of the ecosystem approach.
6. Ecosystems must be managed within the limits of their functioning.
7. The ecosystem approach should be undertaken at the appropriate spatial and temporal scales.
8. Recognizing the varying temporal scales and lag-effects that characterize ecosystem processes, objectives for ecosystem management should be set for the long term.
9. Management must recognize that change is inevitable.
10. The ecosystem approach should seek the appropriate balance between, and integration of, conservation and use of biological diversity.
11. The ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices.
12. The ecosystem approach should involve all relevant sectors of society and scientific disciplines.

WWF and IUCN (2004)
http://www.iucn.org/themes/fcp/publications/arborvitae/avspecials/avspecial_changing_realities.pdf

[8] This is a global IUCN initiative in line with the CBD Ecosystem approach which reports to the UNFF. The GB FC is a lead partner in the initiative and is presently seeking Welsh examples of the benefits of this type of landscape-level holistic approaches to forest management.
http://www.iucn.org/themes/fcp/experience_lessons/flr_about.htm

[9] See Maginnis and Jackson (2003)

[10] This project aims to control invasive species, provide landscape restoration, footpath creation and enhancement, provide a sustainable means of controlling *Rhododendron ponticum* (an invasive exotic shrub) in the long term, and sustain and create jobs within the environmental and tourism sectors.

[11] Clearance of *Rhododendron* can only be effective if it is done systematically across all ownerships within a valley. See

http://www.forestresearch.gov.uk/fr/INFD-6D5HKK for the proceedings of a European workshop on Rhododendron clearance held in May 2005.

[12] Information on current research on climate change in the UK is held on the http://www.ukcip.org.uk website.

[13] The need for policy to become more dynamic to accomodate climate change preditions was outlined by Hossell *et al* (2000). Unfortunately, it appears that the recommended policy reforms have not yet been implemented.

[14] CCW is a partner in the MONARCH project. Phase 1 investigated the impacts of climate change on the nature conservation resources of Britain and Ireland. MONARCH 2 is building on this by developing generic methodologies for capturing changes in species' distribution, incorporating additional factors, such as land use/cover and dispersal capability. It is also exploring the consequences of such changes for ecosystem functioning. The methodology is being tested in four case study areas which includes one on Snowdon.
http://www.ukcip.org.uk/resources/sector/default.asp?sector=3
For possible impacts on planting of native species for timber production see:
http://www.forestry.gov.uk/website/forestresearch.nsf/ByUnique/INFD-5ZYFEX

[15] This is particulary the case for species such as Rowan, Holly and perhaps Hazel. There have already been large scale planting of imported eastern European provenances of hawthorne for roadside planting during the past twenty years. These provenances are often markedly different from local trees e.g. have larger, earlier flowers.

[16] The Glasu (Powys Leader+ Group) project to develop small scale local provenance tree nurseries http://www.wefo.wales.gov.uk/default.asp?action=projectdetail&ID=86&ProjectID=56845

[17] Interreg IIIa proposal on the genetics and labelling of local provenance trees in Wales and Ireland.

[18] Forest Research has examined the implications of climtae change on provenance selection for timber production from Ash and Oak which advises the use of provenances from northern France to the Balkans to ensure optimal growth and form in warmer, drier climates. However, if the objectives of planting are purely for biodiversity conservation then the considerations may be to avoid selection of any sort and plant as wide a range of local phenotypes as possible to allow natural processes to select those best adapted to emerging conditions. However, predicted time scales for climate change may not allow time for natural adaptation especially of long-lived species. Nevertheless uncertainty about the extent of warming or indeed if Wales will instead become sub-artic means that maintenance of heterogentity and natural processes may well be the best option.
http://www.forestry.gov.uk/pdf/cchg_bihip_ash_beech.pdf/$FILE/cchg_bihip_ash_beech.pdf

[19] All current BAPs are listed on http://www.ukbap.org.uk/

[20] A partnership project led by FCW with the objective: 'Combine a healthy, well-managed environment with economic productivity and viability by

managing the special, unique and threatened character of Meirionnydd's internationally important oakwoods sustainably for the benefit of the public, the local economy, biodiversity, and the landscape'
http://www.meirionnyddoakwoods.org.uk/english/projectaims.asp

[21] Laing & Tucker 2004 surveyed and mapped PAWS sites within the FCW estate and found 18,247 ha of ancient woodland which represents 29% of the estate. Of this 2,176 is ASNW and 18,257 PAWS.

[22] Much of this section is drawn from a keynote presentation made by Mike Alexander of CCW at the Wales Countryside Conference in April 2005. The views expressed are based on the personal opinions and experience of key people in a number of public conservation bodies and NGOs. See Alexander (2005) for further details.

[23] In response to the question of whether public benefits are a good reason to support forestry with public money 89% of respondents selected at least one public benefit as a good reason to support forestry with public money. As in previous years the four top reasons to support forestry were to provide places for wildlife to live (67%), to provide places to visit and walk in (57%), to help prevent the 'greenhouse effect' and global warming (55%), and to improve the countryside landscape (53%).

[24] See http://www.forestry.gov.uk/forestry/infd-6ead6c

[25] WAG 2001 http://www.forestry.gov.uk/forestry/infd-5nlkt7

[26] Often interpreted as continuous cover forestry but this is actually just one of a range of silvicultural options for creating more varied and sensitively managed woodlands.

[27] This is one of few sector-based BAPs in Wales and has done much to promote management of the WAG roadside estate for conservation and encouraged unitary authorities to do likewise on minor roads. TREBAP, WAG 2004 http://www.wales.gov.uk/subitransport/content/trebap/index-e.htm

[28] WDA 2003 http://www.wda.co.uk/resources/AP%20Action%20Plan%20-%20Horticulture1.pdf

[29] However, the informed scientific literature is generally withering about the value and consistency of any of the easily measured indicators of biodiversity that have been used (e.g. Lindenmayer, DB & Franklin, JF (2002) Conserving Forest Biodiversity: A comprehensive Multiscale Approach. Island Press).

[30] The HAP targets for upland oakwood are:

- Maintain the current extent (70,000 - 100,000 ha) and distribution of the upland oakwood system.
- Improve the condition of the existing upland oakwood resource, using a mixture of management for timber (predominantly as low intensity high forest), as sheltered grazing, and minimum intervention.
- Avoiding other habitats of high nature conservation value, expand the area of upland oakwood by 7,000 – 10,000 ha (about 10%) by planting or natural regeneration on currently open ground, and by conversion from non-native plantations, by 2005.

- Complete the restoration to site-native species of 7,000–10,000 ha (10% of the total resource) of former upland oakwood that has been converted to non-native plantation on Ancient Woodland Sites.

[31] Putting up nest boxes for Pied flycatchers may ensure that population levels are maintained but it says little about the state and dynamics of the rest of the woodland ecosystem or indeed the ecosystems spread across Europe on which the bird depends.

[32] In fact, it is sedentary, common species that are better indicators of habitat quality because they occur in numbers large enough to statistically sample which makes it possible to detect small changes and they are dependant on local habitats.

[33] Basic national-level conservation site designation – see Hydrogeology report for a fuller explaination.

[34] The Welsh agri-environment scheme administered by CCW.

[35] This is particularly pointed in the case of the Meirionnydd oakwoods project led by FCW which is paying out grants to clear invasives (particularly *Rhododendron ponticum*) and providing incentives for restoration of PAWS on private land while at the same time leaving dense stands of *Rhododendron* in neighbouring FCW woodland some of which could qualify as PAWS.

[36] The Countryside Survey which is undertaken every 5 years on a sample of 1x1 km grid squares in which a range of indicators are recorded. Many of these indicators are relevant to biodiversity, for example those related to the length, species richness and ground flora of hedgerows. See Haines-Young *et al* (2000) and http://www.cs2000.org.uk/

[37] Indeed, demand for hedge planting material dominates the local provenance supply chain in Wales with the principal species being hawthorn, blackthorn and hazel.

[38] www.cs2000.org.uk

[39] Wong (2002) gives the following figures for England – the situation in Wales may not be so bad as the landscape is more pastoral but losses will still be occuring.

Feature type19801998Change (%) Boundary tree6 0103 868-34Middle tree8 3311 165-85Groups23 46112 998-45Linear features24 60131 35127

[40] http://www.defra.gov.uk/paw/ Although it does not impact on Wales very much, in 2002 a National Wildlife Crime Intelligence Unit was established within the Police force to combat organised, international wildlife crime.

[41] For conversion of non-PAWS land which is a lower priority than PAWS land. PAWS conversion is bieng funded through the 'Retoring our natural heritage' ERDF funded project and if support is needed for this then it seems unlikely that funds for conversion of non-PAWS land is going to be available.

[42] Most planting material for the Restock Unit in Wales comes from the FC Delamere tree nursery where the main species produced is Stika spruce and only relatively small numbers of native species let alone local Welsh provenance stock are produced. Planting up a felling coupe with native species

requires stock in numbers beyond the present capacity of local provenance nurseries in Wales. A medum-term plan for production of native species in the numbers required would need to precede restocking and it is not evident that such a plan is yet in place.

[43] Despite the policy directive to plant more broadleaves FEW is still mostly restocking with conifers (with Sitka spruce probably still dominating). The figures below show that much greater success is being achieved by the private sector using FCW grants than FCW itself.

Planted areas (ha) in 2004

ConifersBroadleavesTotalFCW1,1332621,395Grant aided248641889**Total1,3819032,284**

Annual management grants (000 ha)

Year (to 31/3)ConifersBroadleaves20000.91.020010.41.420020.51.020030.50.8200 40.40.7

These figures are for areas approved for Standard, Special and Annual Management Grant under
the Woodland Grant Scheme. Excludes Woodland Improvement Grant (WIG).
Source: Forestry Facts and Figures 2004

[44] This is a UWB/FC research project intended to develop decision-support and yield models for CCF in Wales. http://tyfcoed.bangor.ac.uk/

[45] For example, in Nant Gwynant stocking levels have fallen by up to 60% with changes in the balance between cattle, sheep and feral goats.

[46] Coed Cymru report that there are 400 business in Wales that use native hardwoods.

[47] Humphrey *et al* (2003) sampled 52 plots for a range of biodiversity indicators such as dead wood and snags. None of the plots were in Wales.

[48] http://www.forestry.gov.uk/forestry/kirn-5ldj69

[49] http://www.forestry.gov.uk/forestry/kirn-5ldj87

[50] Of course such measures cannot reveal if they are in fact present but they are certainly not present if there is no suitable habitat available.

[51] The use of volunteers drawn from the general public has proven to be widely supported and with the right protocols can be very effective as has been amply demonstrated by RSPB for birds and insects. Over the past few years there have been UK-wide volunteer recording schemes for birds, insects, butterflies, hedgehogs, bluebells etc. and also for phenology such as first flowering and arrival of migrant birds. Records are often sparce for Wales because of the low population density but there is perhaps scope for a uniquely Welsh initiative to engage with farmers and the rural population.

[52] If willing, an observer living next to a wood could record bird activity on a weekly basis rather than the once per year that might be possible otherwise.

[53] The public forest estate was certified for a number of reasons (Garforth & Thornber 2002):

- desire to demonstrate sector leadership and create good political will;
- to change internal and external perceptions of FC management;
- to demonstrate that certification is possible in the UK; and to
- to secure government support for the FC and the sector as a whole.

[54] Area of FSC certified forest in Wales

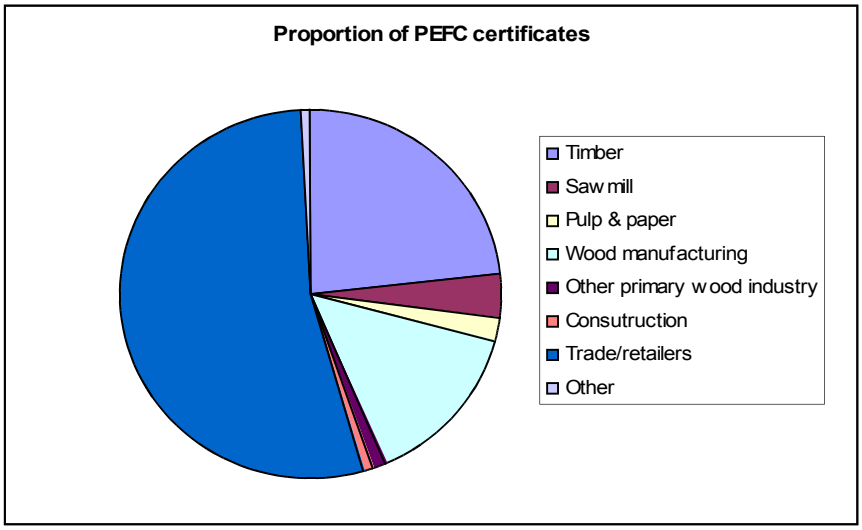
Owner / ManagerArea (ha)Type of forestType of schemeOwnership Coed Cymru257Native hardwoodsGroupPrivateCrown Estates40OwnerPrivateDavid Goss & Associates40Conifer & hardwoodGroupPrivateForest Enterprise127,561Conifer plantationOwnerPublicFountain519Conifer plantationResource managerPrivateHM Prison Prescoed65Native hardwoodsOwnerPublicIndfor UK1,858Semi-Natural and Mixed Plantation & Natural ForestResource managerPrivateNational Trust1,905Mainly for conservation; some seasonal harvesting.OwnerNGORSPB858Mixed conifer & broadleaved including ancient semi-natural broadleaved woodland and recent conifer plantation.OwnerNGOScottish Woodlands481Commercial conifer plantations and estate woodlandsGroupPrivateSelectFor818Mixed hardwoods and softwoodsGroupPrivateTilhill3,810Conifer and hardwood plantationsResource managerPrivateWoodland Trust1,493Mixed woodland, mostly native broadleaves for amenity, landscape, wildlife and cultural heritage conservation.OwnerNGOTotal139,705Source: FSCUK-FS-401: FSC Certified Forestry in the UK (downloaded June 2005)

[55] SGS (2001)

[56] Jeffreys (2002), Garforth & Thornber (2002)

[57] Particularly thinning, consideration of alternatives to clearfell and greater variation in species on re-stocking.

[58] Breakdown of chain of custody certification by sector



Source: http://www.pefc.cz/register/

[59] Of course this will not directly promote 'sustainability' but there are other uses for 'certification' as a marketing tool – protecting markets for smaller-scale producers will undoubtedly deliver significant benefits to the forestry sector in Wales. The development of labelling of this type is supported by the Welsh Landscape and Forest Industries Study (1999) and, under Coed Cymru has developed to a limited extent for Welsh hardwoods and oak in particular.

[60] The WWF-UK Forest Trade Network is a network of 53 enterprises most of which are retailers (e.g. B&Q, Marks and Spencer), end users (e.g. FC (as a corporate user of wood), BBC), traders (e.g. Timbmet Silverman, Ecotimber) and manufacturers (e.g. Wallis Joinery, Moores Furniture Group) which has developed from the WWF-95 plus group established in 1991 to generate demand for certified timber. The box below gives a summary of what is expected from members and it is clear that the original emphasis on demonstration of sustainable forest management through FSC certification is less evident. In its place is an emphasis on source identification and legality. This is in line with the EU Forest Law Enforceent and Trade inititaive on legality in global timber trade and is probably a more realistic global goal than full certification. However, many of the FTN members have purchasing policies which still require FSC certification – the most prominent of these being B&Q one of the largest DIY retailers. WWF also has a programme to assist local authorities to write and implement policies on responsible timber procurement.

[61] UK government policy adopted in 2000 is 'actively to seek to buy timber and timber products from sources independently validated as legal and sustainably managed, for example, those identified under independent certification schemes such as that operated by the Forest Stewardship Council'. (FC 2004)

[62] Including the market places represented by www.buy4wales.co.uk for public sector procurers and www.sell2wales.co.uk for suppliers.

[63] For example, the BREEAM system for assessing the 'greenness' of a building. http://www.breeam.org/index.html

[64] The CEI-Bois Roadmap 2010 European aim is to: 'Create an environmental agenda for the woodworking industry with "environment/sustainability" as supporting argument'. The plan is to 'forge alliances with NGO's and other pressure groups to promote wood on the basis of environmental and energy benchmarking'. NGO support and credibility with benchmarking will probably only be possible by adoption and promotion of certification by wood producers and users.

[65] 2003 timber use figures for the UK from Forest facts and figures

	WRME
m^3 x 10^6	
Imports	49.7
UK Production	7.9
Exports	12.6
Apparent consumption	45.0
Wales production	1.0

[66] Although much of the felling is done as part of WGS and WIG grants this does not necessarily mean that there is an active *silvicultural* plan which is different from defining management objetcives for a woodland.

[67] This is a joint project of the WDA and FCW which seeks to emulate timber industries clusters in Scotland and England. It was launched in May 2005 and is currently developing an operational infrastructure and priorities for further action.
http://www.wda.co.uk/index.cfm/working_with_your_community/wales_forest_business_partnership/en8600

[68] "Gaining added-value from timber in Europe" Interreg IIIc multi-country project designed to increase the use of timber as a high quality building material. http://www.gate-project.org

[69] This is a project under the Welsh Forest Industries Group.
http://www.powaxis.org.uk

[70] This is a Leader+ supported inititave which supports charcoaling, a local sawmill and is developing a grren leaf label which carries the message 'A hertitage woodland product: In buying this product you are helping manage and protect the ancient woodlands of North East Wales.'

http://www.coetirclwyd.co.uk/english/heritage.htm

[71] The success of such projects is often from promotion of crafts as an *activity* (e.g. as a hobby) rather than the mass sale of products as these markets are either already or can easily be swamped by imports from low wage economies.

[72] See http://www.humungus-fungus.co.uk/. This development is being supported by Glasu (Powys Leader Group).

[73] http://www.bioregional.com/programme_projects/forestry_prog/charcoal/char_hmpg.htm

[74] Under English law (applicable to Wales) entry to land is restricted to public rights of way unless otherwise provided for.

[75] Forestry Commission Bylaws 1982 (Statutory Instrument 1982 No. 648) revised in 1994. Bylaw 5 states that no person shall in or on the land of the Commissioners: (vii) dig up, remove, cut or injure any tree, shrub or plant, whether living or not, or remove the seeds therefrom, or dig up or remove any soil, turf, leafmould, moss, peat, gravel, slag, sands or minerals of any kind.
http://www.forestry.gov.uk/pdf/fcbyelaws1982.pdf/$FILE/fcbyelaws1982.pdf

[76] For the Scottish omnibus survey (questionnaire survey of public opinion on forestry) conducted in 2003 a few questions where added on the collection of NTFPs. This revealed that 24% of the 944 people in the survey had collected some tree or plant material within the last five years. This proportion was remarkably constant across gender, age, income class area and working status. The only differences that there was more collection among rural people though even 20% of urban dwellers had collected NTFPs at some time. The types of products collected reflected British tastes with a strong preference (54%) for wild berries, leaves, cones, seeds, bark etc. and relatively little collection of mushrooms (16%). Firewood was collected by only 14% of respondents and flowers, herbs, moss, ferns and lichens by 25%. The relatively high level of collection among part-time workers (42%) suggests that they may be using the products to supplement their incomes or as a substitute for bought products. However, most of the products collected were probably

for domestic use and represent the extraction of cultural and perhaps social value from the forest.

[77] Interest in this is rising with the popularisation of bushcraft by Ray Mears' television programmes.

[78] These have been produced for England by English Nature (http://www.english-nature.org.uk/science/botany/plant9-5.htm) and for Scotland by the Scottish Wild Mushroom Forum (http://www.forestharvest.org.uk/).

[79] Code of conduct for the conservation and enjoyment of wild plants. http://www.nhm.ac.uk/hosted_sites/bps/Code%20of%20Conduct.htm

[80] It is interesting to note that access to moss and foliage collection in particular has apparently been protected by certification because of the need to demonstrate social benefits. However, despite the licencing of commercial collection under UKWAS the products themselves cannot be FSC labelled (although this would confer a distinct market advantage) and the UKWAS guidelines are weak on what constitutes sustainable harvesting of non-timber products.

[81] Wong and Dickinson (2003)

[82] See Slee *et al* (2005) for an account of MTB development in Wales.

[83] These proposals were laid before Parliment on the 19th July 2005 and is expected to be passed by Parliment in 2006. http://www.forestry.gov.uk/forestry/infd-69fk3g

"Articles 2 and 6(3) provide the Commissioners with incidental powers to form and, subject to Treasury approval, invest in bodies corporate, to make loans (also subject to Treasury approval), to establish charitable trusts and to act (and to appoint persons to act) as officers of bodies corporate or as trustees of charitable trusts for the purpose of their functions under the Act or under the 1968 Act so far as relating to land in England and Wales."

"Section 23(2) of the 1968 Act allows the Commissioners to provide or arrange for or assist in the provision of facilities for tourism, recreation or sport on land placed at their disposal, in England, by the Secretary of State, and, in Wales, by the National Assembly for Wales, and to charge in connection with those facilities. Article 6 amends section 23(2) to permit the Commissioners to delegate their power to charge and makes any arrangements entered into between the Commissioners and another person under section 23(2) that provide for the sharing of profit subject to Treasury approval."

http://www.forestry.gov.uk/pdf/reformdoc.pdf/$FILE/reformdoc.pdf

[84] See http://www.forestry.gov.uk/forestry/infd-5utfkt

[85] See http://www.foresteducation.org/ for the types of activities offered by the FEI partnership. The http://www.forestschoolwales.org.uk/ is a voluntary group formed of trained forest school leaders to support the establishment of forest schools in Wales.

[86] See http://www.forestry.gov.uk/forestry/infd-4zvkks. This provision is unique to Wales and is funded by WAG.

[87] Figures from Slee *et al* (2003) for regional forestry-based incomes (£ millions per year)

Income derived from forest dependant:Mid-BedfordshireBreckland Production (wood only)0.643.32Tourism 3.0420.45Residential values8.33-24.996.1-18.3Non-market informal recreation1.2-2.461.04-1.87Carbon0.04-0.110.54-1.61

[88] Supply and demand curves actually working!

[89] The average price for small woods in East Anglia in 2004 was £15,300 ha^{-1} while it averaged £7,600 ha^{-1} in northern England.

[90] Briefing to Wales National Committee 27 May 2005. This is a telling indication of the extent to which public forests are alienated from its owners: the public – the widest possible ownership of all. http://www.forestry.gov.uk/pdf/WNC18.05.pdf/$FILE/WNC18.05.pdf

[91] An interesting example of changing ownership is the story of Taldrum Wood a 12 acre native woodland in Camarthenshire. This was sold by the FC as being surplus to requirements in 1996 to a private owner who wished to protect it for the enjoyment of his decendants. However, realising that this would not guarantee that his heirs would protect it the woods passed to Woods for All. This is a company which seeks multiple ownership by selling shares (valued at £50 each) in woodland so that a concensus of all shareholders is required to sell on or damage the woods. The proceeds of the sale of shares is to be used to purchase other woodlands. http://www.woodsforall.org

[92] For an example see http://www.tree2mydoor.com/ancientwisdom.asp which sells by mail order seedlings of trees featured in the Ogham alphabet at £14 each (when they cost around £12.50 for 25 from a tree nursery).

[93] There was considerable clearance of Welsh forests as part of military campagns by the Anglo-Normans against the Welsh leading up to the conquest of Wales by Edward I in 1295. The process of assimilation into English law was consolidated in 1536 with the Act of Union with Wales. The loss of the forests together with the loss of automony resulting from conquest spelt the end of the indigenous forest culture.

[94] " there was an ambivalent attitude in Wales to the Forestry Commission buying up land from willing sellers. Forestry was changing the old way of life in the Welsh mountains. It was felt that 'dark trees by the million could never compare with good mountain lamb: six or ten woodmen drawing regular pay packets could never equal one sheperd. It meant change and that was wrong'"

"The depth of feeling against 'the forestry', and the sadness at the passing of the traditional way of life and abrupt alternation of the environment were poignantly expressed by Gwenallt (David James Jones, 1899-1968) who in Rhydcymerau lamented the planting of trees on bare Welsh hillsides by the Forestry Commission, regarded as an alien London-based authority." Linnard (2000)

[95] http://www.coedcymru.org.uk/objectives.htm

[96] The 'Restoring our forgotten heritage' project will spend £2.3 million to restore 5,400 ha of ancient woodland on sites planted to conifers in 1950's and 60's and return them 'to the rich, diverse habitats they were more than 400

years ago'. This project should create 81 jobs and provide for biodiversity conservation and through tourism, income to nearby communities. http://www.forestry.gov.uk/newsrele.nsf/AllByUNID/D516A2ED2F75ECA280257035003E03BA

[97] Ascribed to Carwyn Jones in report by Hywel Trewyn, Daily Post Apr 26 2004. http://icnorthwales.icnetwork.co.uk/news/regionalnews/tm_objectid=14182608%26method=full%26siteid=50142-name_page.html

[98] See http://www.all4one.com/woodland-burial-location.htm

[99] Review of land managed by FCS http://www.forestry.gov.uk/forestry/infd-6b2d7u

[100] National forest land scheme http://www.forestry.gov.uk/forestry/infd-66re5j

[101] A policy brief has already been prepared which outlines a possible policy on land sales and acquisitions. http://www.forestry.gov.uk/website/meetings.nsf/LUOutByUNID/82AC4D21D5AE88B280256F4F00335950

[102] WAG (2005) and http://www.wales.gov.uk/subiplanning/content/tans/tan08/newtan8/tan8-e.htm

[103] Along with improved and un-improved moorland. Given that relatively little of the uplands is FCW conifer forest and this is less than ideal for wind farm development there must be some underlying policy that has targeted this land for this form of development. Perhaps this is related to opportunities presented by re-structuring or the fact that this is WAG land and therefore will provide government revenue or where rental agreements can be assured.

[104] FSC Guidance note 21. http://www.forestry.gov.uk/pdf/fcsgn21.pdf/$FILE/fcsgn21.pdf

[105] Directors report to National Committee December 2004.
"Cefn Croes windfarm – The £34 million windfarm development at Cefn Croes is now nearing completion with 39 turbines generating 59 Megawatts of electricity, sufficient to power 40,000 homes. The project has not been without its critics, although with painstaking attention to detail by both our Civil Engineers, Landscape Architect and FD staff during the construction phase, the project has been closely monitored to ensure that environmental and landscape standards have been maintained. £250k has been secured as part of the contract for further environmental works over the 25 years of the operation of the windfarm. We have hosted several visits to the site, including several Assembly Members, all of whom have been complimentary about the outcome in terms of landscaping and restoration works overseen by the FCW led contract management team."
http://www.forestry.gov.uk/pdf/WNC40.04DirectorsReportDecember2004.pdf/$FILE/WNC40.04DirectorsReportDecember2004.pdf

[106] Jones and Flint (2005)
http://www.wwf.org.uk/core/about/cymru_0000001473.asp

[107] See FCW (2005) http://www.forestry.gov.uk/forestry/INFD-5LFJYD

[108] For Plans and Actions since 2002 see http://www.forestry.gov.uk/forestry/INFD-62LJZJ .

[109] Scottish Forest Strategy Review 2005 http://www.forestry.gov.uk/forestry/INFD-6C3D4G

[110] Windblow is a serious constraint on forestry in exposed areas on the hills and the west of the country.

[111] Clearance of broadleaved woodland is often for road construction or mineral extraction and is monitored by the Woodland Trust. http://www.woodsunderthreat.info/

[112] http://www.grazinganimalsproject.info/

[113] "There are currently 39 staff employed on design planning in the Forest Management Agency, managing the development, review and amendment of approximately 350 design plans across Wales. Each plan takes approximately 6 months to review and receive final approval. To review all the plans will therefore take approximately 175 man-years or 4.5 to 5 years using all of the staff currently involved. There is additional complexity here as we will have to ensure that we retain sufficient opportunity at any one time to allow the agency to deliver its agreed volume. This work is currently undertaken at District level, with little co-ordination of effort across Wales." FEW 2003 http://www.forestry.gov.uk/forestry/INFD-5VGDUK

[114] http://www.forestry.gov.uk/forestry/infd-5z8m8j. The register is based on plans overlaid on topographic maps with hyperlinks to details of planned activities. The GIS behind the system is maintained by FCW in Aberystwyth. Once plans are approved the details for FCW Design plans are entered into the sub-compartment database.

[115] Though these have been withdrawn following staff reductions because of financial problems.

[116] This scheme has taken two years to prepare using four working groups made up of FCW staff, consultants, woodland agents and invited experts. These groups prepared a draft protocol for management plan preparation which was tested in 20 pilot studies representing a range of contexts. http://www.fcwales-planning.co.uk/home.htm

[117] An approach where management prescriptions are based on the precautionary principle and the best available data with monitoring of the response to interventions. Regular review of acheivements against objetcives is used modify prescriptions and improve on understanding of the dynamics of the ecosystem being managed. These principles are incorporated into the reserve system developed by CCW but not yet into BAPs.

[118] http://www.forestry.gov.uk/forestry/hcou-4u4jrh

[119] Formerly the Wales woodland forum and FC advisory committee for Wales

[120] Toolsheets available at http://www.forestry.gov.uk/forestry/infd-5xmds8

[121] In effect moving up Arnstein's 'ladder of participation' towards empowerment of local actors in forest management. Involvement or Partnership as defined by Hislop, Twery and Vihemäki (2004) which would give the sense of ownership

which at present is only apparently provided by purchasing land, participating in CBO ownership or buying shares in woodland. There is strong demand for this as described in Section 3.2.

[122] Coetir Mynydd is a group of residents in a village next to a block of FEW woodland near Bethesda who have asked to be involved in the preparation of the FDP for amenity rather than commercial reasons.

[123] The Nanteos Group near Aberystwyth is a group of people who own woods, bodge (green wood furniture) and make charcoal etc. who are leasing a FEW block as a source of small wood for crafts and as the site for a Forest School.

[124] Tir Coed was set up in 1999 by an alliance of countryside organisations to promote the benefits of creating new woodland, and to provide countryside organisations in Wales with a strategic and holistic framework for their treeplanting schemes. Its target for Wales is 27,000 hectares of new woodland over ten years including at least one large area exceeding 2,000 hectares. http://www.tircoed.org.uk

[125] Cydcoed has £12 million to 100% grant aid projects proposed by formally constituted CBOs. http://www.forestry.gov.uk/forestry/INFD-5KSFAT

[126] Although, Coed Cymru reports that many CBOs only use Cydcoed as a last restort because other sources of funding are easier to access.

[127] Although it is contended that these figures are inaccurate as they do not correlate with census data or industry cash flows. This may be a consequence of the figures being derived from either the conifer or large scale industries. It is only relatively recently that the Landscape sector (countryside service contractors) which undertakes work on smaller, broadleaved woodland has been formally recognised. It is now represented by Fforum Tirlun in Wales.

[128] Training sessions for agents for BWW are rarely attended by more than the same 40 people. The more active agents cover increasingly large areas with one agent in Powys covering an area with a radius of 80 miles. There are also very few agents who are first-language Welsh speakers.

[129] See http://www.forestry.gov.uk/forestry/infd-5z8jqk for the application forms for the registration of planners and assessors for the BWW scheme.

[130] This is already happening and is facilitated by more and more European universities offering MSc and some BSc degrees in the medium of English (e.g. Wageningen, Joensuu, Gottingen, Freiburg and also universities in the accession countries, e.g. Estonia). The ideal would be for UWB to join the club of elite European forestry training institutes but this will not happen without external investment given the present financial insecurity of the University and the weakness of forestry within in given the low rates of student recruitment.

[131] The Directors report to the National Committee 18th Dec 2004 stated that there is "a shortfall in income of at least £6.5 million per annum caused by an over-reliance on end of year flexibility (EYF) funding (which is no longer available), continuing reductions in the value of timber, a reduction in annual forecast volume of at least 20% and a year on year increase in cost base" http://www.forestry.gov.uk/pdf/WNC40.04DirectorsReportDecember2004.pdf/$FILE/WNC40.04DirectorsReportDecember2004.pdf

[132] "The Forestry Commission may sell land, including forests, which has development potential, where its sale will release significant capital that can be re-invested to produce greater public benefits." Christine Gwyther, written answers 4-11 Nov 1999

"Forest Enterprise can, however, continue to sell agricultural land, land associated with houses and other buildings, unplantable land and relatively small and isolated blocks of forest land that do not make a significant contribution to its objectives and are surplus to its requirements." Michael German, written answers 25 July – 1 Aug 2002

[133] 13 Sept 2004 FC Press release 6634.

[134] Proceeds of sales of FCW property (£000's)

2000/12001/22002/32003/4 Area sold (ha)1,76341759354Income2,40760428610Book value-1,6256592488782-55382Disposal costsExternal costs11957119Administrative expenses434457401621016849Surplus620-156-30-47Source: FCW Annual accounts

The guide prices quoted on the FC website for forest land in Wales gives an average valuation of £3,750 per ha for woods under 25 ha and £2,525 for woods over 25 ha. Tilhill and Savills average prices for woodland in Wales in 2004 were £8,200 and £1,817 respectively. It would appear that FCW valuers are getting a good price for larger woods but are probably underestimating the value of smaller ones.

It has been noted that the shortfall in sales revenue is a result of the need to resolve the legal position regarding FCW authority to sell land.

[135] Business plan update presented to the National Committee 27th May 2005. "At the Environment, Planning and Countryside Committee on 25th May 2005 FCW's funding appears to have been an issue with calls for less expenditure on forestry."

Budget deficits of £1.1m for FY06/07 and £0.9m for FY07/08 are anticipated which leaves FCW faced with a dependency on woodland sales at circa. £0.9m

per year.
http://www.forestry.gov.uk/pdf/WNC13.05BPUpdate.pdf/$FILE/WNC13.05BPUpdate.pdf

[136] See minutes of the meetings of the National Committee. It seems that preparation of a legal administrative agreement between WAG and FCW has been underway since 2000. The intention is that this will provide FCW with powers to buy and sell property to the value of £1m annually without recourse to WAG. The proposals are presently being scrutinised by the Directorate of Legal Services of WAG and DEFRA to ensure that the Agreement is safe from legal challenge. There are also concerns that the £1m ceiling gives too much latitude to FCW.
http://www.forestry.gov.uk/website/meetings.nsf/LUCommittees/National%20Committee%20for%20Wales?OpenDocument&Year=Other

Government of Wales Act (1998)
40. The Assembly may do anything (including the acquisition or disposal of any property or rights) which is calculated to facilitate, or is conducive or incidental to, the exercise of any of its functions.

41. (1) Arrangements may be made between the Assembly and any relevant authority for-

(a) any functions of one of them to be exercised by, or by members of staff of, the other, or

(b) the provision of administrative, professional or technical services by one of them for the other.

(2) Any arrangements under subsection (1)(a) for the exercise of any functions of the Assembly shall not affect the responsibility of the Assembly; and such arrangements for the exercise of any functions of a relevant authority shall not affect the responsibility of the relevant authority.

(3) The references in subsections (1)(a) and (2) to functions do not include functions of making, confirming or approving subordinate legislation.

(4) In this section "relevant authority" means any government department, any local or other public authority or the holder of any public office.

[137] Business plan update presented to the National Committee 27th May 2005.

"Our Business Plan already provides for reductions in manpower costs through natural wastage and a 100% moratorium on replacement. As part of the FY06/07 – FY08/09 internal Business Planning exercise we will look at large scale programmes such as the remedial work on tips and slips in South Wales as well as all other programmes that are non-statutory or do not contribute to Certification to again determine the scope for savings."
http://www.forestry.gov.uk/pdf/WNC13.05BPUpdate.pdf/$FILE/WNC13.05BPUpdate.pdf

[138] Agenda 21: Chapter 10 Integrated Approach to the Planning and Management of Land Resources

Clause 10.8 "Governments at the appropriate level, with the support of national and international organizations, should promote the improvement,

further development and widespread application of planning and management tools that facilitate an integrated and sustainable approach to land and resources. To do this, they should:

(b) Systematically apply techniques and procedures for assessing the environmental, social and economic impacts, risks, costs and benefits of specific actions;

(c) Analyse and test methods to include land and ecosystem functions and land resources values in national accounts.”