



Comisiwn Coedwigaeth Cymru
Forestry Commission Wales

Voluntary Strategic Environmental
Assessment (SEA) of the Welsh Assembly
Government's *Woodlands for Wales*
Strategy

Environmental Report

Forestry Commission Wales

March 2009



Llywodraeth Cynulliad Cymru
Welsh Assembly Government

| SEA Environmental Report –Cover Note Section 1 | |
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| An environmental report is attached for the Welsh Assembly Government's <i>Woodlands for Wales</i> strategy (2009 revision). This has been prepared as part of a voluntary SEA. | |
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Non-technical summary

The aim of Strategic Environmental Assessment (SEA) is promote sustainable development by ensuring that the environment is considered when a government policy, plan or programme for action is developed. This document is the SEA report for the Welsh Assembly Government's *Woodlands for Wales Strategy*.

The *Woodlands for Wales* strategy (WfWS) sets out Welsh Assembly Government forestry priorities until 2051. Woodlands and trees in Wales have the potential to contribute (positively or negatively) to the overall quality of the environment at a national level. An important challenge is to strike a good balance between the economic benefits of forestry, while maintaining a high quality environment and contributing to the quality of life of the Welsh population. Bad forestry practices can create environmental issues such as soil erosion and unsuitable drainage. Conversely good forestry practice and well-planned forestry policy can contribute significantly to environmental improvement, by providing habitats for biodiversity, renewable timber products and energy; recreation opportunities and landscapes for health and well-being, and by contributing to good water quality and quantity management.

The WfWS was first published in 2001 and is now being revised. This Environmental Report sets out an assessment of the likely environmental impact of the revised strategy.

The main goals of *Woodlands for Wales*

The ultimate goal of the revised strategy is that:

“Wales will be known for its high-quality woodlands that enhance the landscape, are appropriate to local conditions and have a diverse mixture of species and habitats. These will:

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

The foundation theme of the strategy is:

- **Welsh woodlands and trees** – making changes to our stock of woodlands and trees so that they deliver the best benefits for Wales

Upon this, four further themes are built:

- **Responding to climate change** – coping with climate change, and helping to reduce our carbon footprint
- **Woodlands for people** - serving local needs for health, education, and jobs
- **A competitive and integrated forest sector** – supporting innovative, skilled woodland industries supplying renewable products from Wales
- **Environmental quality** - making a positive contribution to biodiversity, landscapes and heritage, and reducing other environmental pressures

Under these themes, the strategy goes into detail on exactly what needs to be achieved, and what actions need to be taken.

Environmental issues in Wales

The Welsh Assembly Government has identified and described important environmental issues facing Wales in its *Wales Environment Strategy*. This environmental report examines how woodlands and woodland management might influence these issues in a positive or negative way. Here is a summary of the findings:

(a) Biodiversity, flora and fauna

The Welsh Assembly is committed to halting the decline of biodiversity. Our assessment showed that there are many woodland species in decline or under threat in Wales. It seems unlikely that Wales will meet its UK Biodiversity Action Plan for expanding the area of native woodland in Wales, protecting ancient woodlands and ensuring that native woods (and other non-woodland habitats within woods) are in good condition. There are also a number of threats to woodland habitats and species that need to be dealt with, such as rhododendron, grey squirrel and deer, pests and diseases, habitat fragmentation and climate change.

(b) Soil, water and air

The Welsh Assembly Government is committed to getting Wales' groundwater, rivers, lakes and coastal waters into good chemical and ecological condition, and to protecting the soil resource. Badly executed forestry operations (such as felling and track-building) can lead to soil disturbance and erosion, damaging stocks of carbon stored in soils and causing water quality problems. Forests can also sometimes exacerbate problems with acidification of soils and freshwater streams in the uplands. However, wide application of best-practice forestry guidelines should minimise the risk of environmental damage. Well-designed and managed woodland in the right places can also help to prevent pollution, for example by using buffer strips to stop agricultural run-off from flowing into streams. Woodlands also have a small but important role to play in reducing flood risk, which currently costs the country £70 million per year.

Urban trees in Wales absorb large quantities of particulate and sulphur dioxide pollution helping in delaying deaths and preventing hospital admissions from poor air quality. These benefits could be enhanced through further urban tree planting.

The main issue for forestry is to ensure that forestry operations meet best practice standards; and to find ways of encouraging landowners to use trees to improve water quality, reduce flood risk, and improve urban air quality.

(c) Climatic factors

Wales has challenging targets for reducing greenhouse gas emissions, and woodlands have a small but important role to play. They can help in two ways, firstly by soaking up carbon in plants, soils and wood products, and secondly by producing woodfuel (which is almost carbon-neutral) or wood products that replace energy-intensive materials. The use of 'home-grown' timber products in place of imported products also mitigates against

inappropriate forest exploitation outside the UK and EU, and reduces the distance that timber travels from source to point of use.

Whatever our actions now to reduce greenhouse gas emissions, the climate in Wales is going to change over the coming years. The Welsh Assembly Government is committed to ensuring that Wales has appropriate measures in place to deal with the impacts. One of the most important issues for forestry is to take steps to improve the chances of existing woodlands and trees surviving the likely weather changes and increases in pests and diseases. This is important for maintaining the integrity of the resource, and also important for helping woodland biodiversity to withstand climate change– if the woodlands die back or suffer significant changes, then the biodiversity it contains will be vulnerable. Ensuring the resilience of woodlands is also important for woodland recreation, landscape, and woodland businesses.

Secondly, woodlands and trees have a role to play in reducing the impacts on the human population. Woodlands and trees can provide shaded recreation, cool urban areas in summers, and play a part in reducing flood risk.

(d) Population and human health

Human health in Wales, in general, is worse than in England, and the situation is substantially worse in the Valleys and North Wales coast than the rest of the country. The Welsh Assembly Government is committed to addressing health inequalities. Good quality access to green space, such as woodlands, can help people to improve their health through recreation, sport and relaxation.

Many woodlands are already open to the public, but the Government's goal for 2020 is to enable 95% of people to have a footpath or cycle path within a ten-minute walk, and to get 60% of people using the natural environment for outdoor activities. Forestry has a role to play in achieving this, by creating appropriate access and pleasant surroundings.

(e) Landscape and cultural heritage

There are many important cultural heritage features, such as archaeological sites, within and close to woodlands throughout Wales, and these need to be protected. Woodlands, hedgerows and trees also contribute to different landscapes across the country. Woodland design in should aim to contribute positively to the views and character of Wales, in a way which reflects the distinctive character of different parts of the country. Ancient woodlands and individual trees, which may have cultural significance themselves, also need better protection and management.

(f) Material assets

Woodlands and trees provide an important source of renewable material and we must protect this resource against threats of over-exploitation and woodland loss, and damage from invasive species, pests and diseases, and climate change. We need to maintain woodland cover, and increase area of sustainably managed woodland, promote timber as a renewable resource, and promote efficient use of fuel and chemicals in forestry operations, timber transport, and forest businesses. We can make particular gains by encouraging the

use of timber in the construction industry. As mentioned above, greater use of 'home-grown' timber products in place of imported products also mitigates against inappropriate forest exploitation outside the UK and EU, and reduces the distance that timber travels from source to point of use.

Alternatives to *Woodlands for Wales*

We looked at the likely environmental impacts of four alternatives to the proposed WfWS. The provisos were that these alternative scenarios must conform to the UK Forest Standard of sustainable forestry, the EU Forest Strategy and the Ministerial Conference on the protection of Forests in Europe, must be affordable, and must deliver at least some Welsh Assembly Government policy priorities. The alternative scenarios considered were as follows:

- *Scenario 1: Maximising protection and enhancement of natural and cultural heritage:* In this scenario, Welsh Assembly Government policy has a strong emphasis on enhancing biodiversity and cultural heritage, with major expansion of native woodland. Other activities in woodlands, such as recreation or timber harvest are only permitted where environmental sensitivities allow. Our assessment found that this scenario would deliver well on biodiversity, soil, water and air priorities, but would fail to deliver on Government goals to reduce greenhouse gas emissions and to increase accessibility to greenspace. It would also fail to deliver on Government economic and rural development priorities (not considered within the SEA).
- *Scenario 2: Maximising community involvement and local economic development:* In this scenario, woodland owners are only required to meet minimum environmental standards. Instead Welsh Assembly Government policy has a strong emphasis on enhancing recreation, landscape, community involvement and the use of woods by local businesses, and Government support for growing timber is withdrawn. Our assessment found that this scenario represented a major risk to biodiversity, and failed to deliver on Government goals to reduce greenhouse gas emissions. There would likely be a neutral impact on the water environment, and a moderate positive impact on the soil environment due to a reduction in clearfelling.
- *Scenario 3: Maximising timber production and climate change mitigation:* In this scenario, woodland owners are again required only to meet minimum environmental standards. Welsh Assembly Government policy places a strong emphasis instead on timber production and reducing greenhouse gas emissions. Our assessment found that this scenario represented moderate risks to biodiversity, and moderate risks to the soil and water environment. There would also be some risks to accessible greenspace, landscape and cultural heritage.
- *Scenario 4: The existing 2001 WfWS:* Our assessment showed that this scenario would provide benefits across several issues but represented a risk to biodiversity since climate change was not considered. It also failed to deliver on Government goals to improve water and air quality and reduce the risk of flooding.

Lessons learned from the alternative scenarios

Examination of the alternatives to the proposed WfWS underlined the importance of taking a balanced approach, avoiding promoting one specific policy aim to the significant detriment of others. It was also clear that a revision of the existing WfWS was necessary in order to address issues such as climate change, flood risk, and water quality.

Summary of the likely significant effects of the WfWS

The SEA was carried out by assessing each component part of the WfWS against a list of environmental objectives to see whether the WfWS proposal in question was likely to have a positive, neutral or negative impact. These environmental objectives are largely drawn from the *Wales Environment Strategy*.

As shown in the body of this Environmental Report, our assessment has found that the WfWS will have a largely positive impact on the environmental objectives. However several issues were highlighted that need to be well-managed to ensure that any risk of environmental damage is kept to a minimum. The findings under each of the broad SEA headings are shown below:

Summary of the findings of the strategic environmental assessment:

| | Main findings |
|-----------------------------------|--|
| (a) Biodiversity, fauna and flora | The proposed WfWS has the potential to make an important contribution to protecting and enhancing woodland biodiversity in Wales. It prioritises sustainable woodland management to ensure that biodiversity is considered during woodland management planning. Native woodland expansion through planting and conversion from conifers is also a priority including expansion to improve habitat connectivity. It also includes actions to address threats to the health and integrity of native woodlands. The likely benefit of the strategy for biodiversity is tempered only moderately by objectives to increase visitor traffic. There is a potential risk of damage from poor standards of forestry practice (i.e. those not meeting UKFS). However all objectives relating to timber production are framed within the proviso that this management is to the UKFS and therefore considers biodiversity. Indeed, in many cases, some degree of management for timber will be beneficial. Overall we could expect the proposals to make a significant positive contribution to Welsh biodiversity. In addition, greater use of home-grown timber in place of imported timber could mitigate against biodiversity losses due to inappropriate forest exploitation outside the UK and EU. |
| (b) Soil, water and air | The proposed WfWS has high standards of environmental stewardship as a priority, and includes using woodlands and trees as solutions to soil, water and air problems. We anticipate that the strategy will result in modest gains in soil protection and water quality in Wales (not major gains, since forestry is already a comparatively low-impact land use). It also offers potential for helping to reduce flood risk and improving urban air quality. Risks of environmental damage from poor standards of forestry operations should be minimised by ensuring wide application of the UKFS and associated guidelines. |



| | |
|----------------------------|---|
| (c) Climatic factors | The proposals in the WfWS should help in small but important way to reduce greenhouse gas emissions in Wales. It encourages the production of timber and woodfuel where this would not conflict with other goals such as the protection of soil carbon stocks, woodland health, biodiversity and recreation. Because timber production is necessarily ‘tempered’ by other environmental and social goals the contribution to emissions reduction is somewhat smaller than it might otherwise have been. The strategy however does includes important actions to mitigate the impacts of climate change on woodland habitats and species, to manage flood risk, and to cool urban temperatures. In addition, greater use of ‘home-grown’ timber products in place of imported products also mitigates against inappropriate forest exploitation outside the UK and EU, and reduces the distance that timber travels from source to point of use. |
| (d) Human health | The proposed WfWS does not contain any proposals that represent a risk to human health, and contains proposals to enhance the quantity and quality of access to woodlands to enable recreation, sport and relaxation. The strategy encourages a focus on areas of health deprivation, and on urban areas where better access could encourage people to walk or cycle to work. We expect it to make a modest contribution to addressing health issues in Wales. |
| (e) Landscape and heritage | The proposed WfWS has the protection and enhancement of both landscape and heritage features as a high priority, including the protection of ancient woodland and individual and veteran trees. There are few, if any, outcomes that would be likely to adversely affect landscape and heritage, particularly due to the commitment to reduce reliance on clearfell in areas of productive forestry. We expect it to make an important contribution to these issues. |
| (f) Material assets | The proposed WfWS has sustainable management of woodlands and trees as an essential precursor to strategy delivery. It also significantly encourages greater harvesting of Welsh timber as an outcome. While this implies greater resource (fuel) use, the use of this timber as a sustainable (and local rather than imported) renewable resource would be an important net benefit to Wales. This is particularly the case if this timber is used in construction in place of more energy-intensive non-renewable resources such as concrete and steel. |

Required mitigation measures

No major negative impacts were identified in the assessment of the WfWS. However, the assessment did raise a number of issues that should be given high priority during the implementation of the strategy in order to minimise any risk of damage and enhance the environment:

- Ensure as far as possible that forest operations in Wales comply to the UK Forest Standard and its accompanying guidelines (particularly the guidelines relating to biodiversity, soil, water, heritage and climate change).
- Increase the area of woodland managed to the UK Forest Standard and the area certified to the UK Woodland Assurance Standard.
- Take significant action to limit the impact of climate change on both native woodland, woodland species and non-native woodland habitats. This to include significant native woodland expansion, and in particular to deal with the high degree of fragmentation in

the native woodland resource, to expand the area of well-managed native woodland and to improve the adaptive capacity of native woodland to accommodate climate change.

- Take significant steps to ensure that forest cover and its management contributes to improving water quality and does not exacerbate acidification in the uplands.
- Deal adequately with the threats to woodlands including deer, invasive species and pests and diseases.
- Ensure adequate zonation so that visitor traffic or forest operations do not damage sites of international, Welsh or local importance for biodiversity or damage vulnerable soils.
- Focus access improvements on areas that will help people walk or cycle to work.
- Review existing procedures for assessing the environmental impacts of Forest Design Plans (for the Assembly Woodland Estate) and Woodland Management Plans (for other woodlands receiving public money) to ensure that these are adequate. Particular care should be taken to assess all plans for woodlands within or adjacent to European sites (SACs, SPAs and Ramsar sites).

Monitoring environmental impacts of the strategy

The proposed WfWS contains within it an outline of a monitoring framework, and more detail is given in Appendix E. This assessment found that this monitoring framework was adequate, but makes the following suggestions:

- Ensure that acidification is adequately represented in the Water Quality indicator.
- Ensure that the patch size of native woodlands is adequately covered in the Woodlands and Trees indicator.
- Ensure that damage due to squirrels, deer and rhododendron is included in the Tree Health and Resilience indicator.
- Ensure that FCW corporate monitoring records instances of environmental damage due to poor forestry practice.
- Ensure that the Accessibility or Recreation indicators looks also at *walkability* in woodlands and/or number of woodland visitors using woodland to get to work.

Further development of *Woodlands for Wales*

Following the publication of the revised WfWS, FCW will, on behalf of WAG, be developing a number of forestry policy positions to develop the detail of the strategy further. The proposed mitigation and enhancement measures will be incorporated into these.

We would welcome your comments on this Environmental Report. Please contact us at the address on the inside cover. This Environmental Report and the finalised *Woodlands for Wales* strategy can be found at www.forestry.gov.uk/website/fchomepages.nsf/hp/Wales

Section 1: Strategic Environmental Assessment

Strategic Environmental Assessment (SEA) is required under the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004. The ultimate aim of SEA is to help protect the environment and promote sustainable development. SEA promotes sustainability via the integration of environmental considerations into strategic decision-making:

"SEA is a systematic process for evaluating the environmental consequences of proposed policy, plan or programme initiatives in order to ensure they are fully included and appropriately addressed at the earliest appropriate stage of decision making on par with economic and social considerations" (Sadler and Verheem, 1996).

The SEA process

For a given policy, plan or programme that requires SEA, the "responsible authority" carries out the following general SEA process:

- identify the current baseline conditions and problems in the area, including relevant biodiversity objectives and other relevant policies, plans and programmes;
- identify and assess the likely impacts of the policy/plan/programme on the environment, including on biodiversity;
- consider relevant alternatives to the policy/plan/programme;
- reduce or avoid any significant negative impacts ("mitigation") and enhance positive benefits where possible;
- produce an environmental report;
- involve the public and other organisations;
- take the environmental information and public/organisation comments into account in decision-making;
- publish information about the decision;
- monitor the impacts of implementing the policy/plan/programme.

Forestry Commission Wales, after consultation with Countryside Council for Wales, Environment Agency Wales, Cadw and the Welsh Assembly, determined that a full SEA was not necessary, but that they would undertake a voluntary SEA of the strategy instead. The assessment of the WfWS and a number of alternative strategies was progressed, culminating in the preparation a draft environmental report. FC Wales circulated the draft to CCW, EA, Cadw and WAG for their expert opinion, and this final version incorporates amendments made in light of their comments.

The purpose of this environmental report is to: -

- identify, describe and evaluate the likely positive or negative effects of the WfWS for the environment and sustainable development in Wales;
- evaluate the likely impacts of the WfWS compared to several reasonable alternatives to the strategy; and
- identify measures to mitigate against potential negative impacts and enhance positive impacts, along with an appropriate monitoring programme.

The scope of this SEA

The scope of this SEA is defined by the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004, which requires that SEA looks at the likely significant effects on biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors.

These issues are covered by the *Wales Environment Strategy* which also identifies on page 59 the key areas where forestry can have an influence. In slightly different language, the WES areas relevant to forestry include: climate change adaptation and mitigation, sustainable resource use (including use of timber and other woodland products, soils, fuel and chemicals), biodiversity, landscapes, cultural heritage, access to greenspace and 'walkability' in urban and rural areas, and flood risk.

This SEA does not therefore examine the impact of the WfWS on wider sustainable development issues, such as social inclusion or social justice, the economy, education, housing or skills. This is standard SEA practice.

Section 2: The Woodlands for Wales strategy and its context

2.1 Outline and objectives of the WfWS

The first *Woodlands for Wales* strategy (WfWS) was published in 2001. After a consultation in 2008 which received over 200 responses, a revised WfWS is due for publication in early 2009. Both are underpinned by the same vision:

“Wales will be known for its high-quality woodlands that enhance the landscape, are appropriate to local conditions and have a diverse mixture of species and habitats. These will:

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

The focus of the original version of the strategy was people, woodland management, biodiversity, and jobs. The revised version still has these as priorities, but also is more explicit about how the woodland resource as a whole in Wales needs to be adapted particularly in the face of climate change. It looks at the role of trees outside woodland, and it makes the case for an increase in the area of woodland. It sets out proposals for increasing the diversity of woodlands and their management, and strengthens its proposals for protecting biodiversity, veteran trees and ancient woodland. It promotes the harvesting of timber and woodfuel for climate change mitigation and the use of woodlands to protect and enhance soils and water quality.

The revised WfWS is framed around **Welsh woodlands and trees** as a foundation from which to deliver four strategic themes:

- **Responding to climate change** - coping with climate change, and helping to reduce our carbon footprint
- **Woodlands for people** - serving local needs for health, education, and jobs
- **A competitive and integrated forest sector** - innovative, skilled industries supplying renewable products from Wales
- **Environmental quality** - making a positive contribution to biodiversity, landscapes and heritage, and reducing other environmental pressures

Under each of these five themes, a set of 20 high-level outcomes have been developed, as shown in Table 2.1.

Table 2.1: Themes and desired outcomes of the revised strategy.

| | OUTCOME | DETAIL |
|------------------------------|--|--|
| Welsh woodlands and trees | 1. More woodlands and trees are managed sustainably | <ul style="list-style-type: none"> - More woodlands are managed to the UK Forestry Standard and are capable of producing useable timber and other services. - More woodlands are certificated to the UK Woodland Assurance Standard. - More of the usable timber grown in Welsh woodlands is harvested, and greater value is added to it during processing. |
| | 2. Woodland ecosystems are healthy and resilient | <ul style="list-style-type: none"> - There is appropriate diversification of the age structure and tree species and the genetic base of woodlands, particularly non-native woodlands, at a range of scales and using mechanisms suited to the site and the woodland management objectives. - Priority is given to native woodland species when restoring ancient woodlands. - The negative impacts on woodlands of species such as deer and grey squirrels are addressed. |
| | 3. Woodlands are better adapted to deliver a full range of benefits | <ul style="list-style-type: none"> - Woodlands and individual trees in Wales are valued by their owners and society for the whole range of goods and services provided including timber, fuel, water quality and water management, climate regulation, biodiversity, and improvement of landscapes and access opportunities. - Clearfelling is avoided where alternative management systems would make a better contribution to ecosystem services. - Decisions about woodland creation and management take full account of all the ecosystem services the woodland could provide, not just the potential for timber production. |
| | 4. Woodland cover in Wales increases | <ul style="list-style-type: none"> - Woodland cover in Wales increases to meet strategy priorities and to maintain the overall production potential from Welsh woodlands. - Priority is given to creating both new native and new mixed woodlands that can deliver multiple benefits. - Woodland creation is guided by the objectives of this strategy and by the need to protect semi-natural habitats, historic features and characteristic landscapes - There is a strong presumption against the permanent removal of woodland except for the restoration of high priority open habitats and where this is necessary it is balanced by woodland creation at a national level; landscape improvement and habitat restoration are preferably achieved through modifying management systems rather than by removing woodland. - When permanent removal of woodland is permitted for development, the losses in public benefit are offset by compensatory planting. |
| | 5. The management of woodland and trees is more closely related to other land uses | <ul style="list-style-type: none"> - Farmers have better support in managing their woodlands and trees to provide ecosystem services and diversify their businesses. - There is better protection for existing individual trees, particularly veteran trees, and more trees are planted in recognition of their contribution to ecosystem services and quality of life. - Farmers, rural businesses and communities have more incentives to use timber and woodfuel. |
| | 6. Urban woodlands and trees deliver a full range of benefits | <ul style="list-style-type: none"> - Woodlands and trees are used more creatively in new development and in the restoration of industrial sites to provide people with better quality, easily accessible green space. |
| Responding to climate change | 7. Welsh woodlands contribute to reducing the carbon footprint of Wales | <ul style="list-style-type: none"> - New woodlands are created and existing woodlands are managed in a way which balances the achievement of other objectives of this strategy and the yield of usable timber and wood products, whilst also helping to sequester carbon in living biomass. - Where short rotation forestry is grown with the objective of maximising woodfuel for energy purposes, then this site-based objective is pursued within a wider sustainable forest management framework that conforms to the UK Forestry Standard. - The carbon storage capacity of woodlands is protected by balancing the potential damage from operational management against the carbon benefits of both the harvested material and the biomass which remains (above ground and in the soil). |
| Woodlands for people | 8. More communities benefit from woodlands and trees | <ul style="list-style-type: none"> - More communities are involved in the decision making and management of woodlands so that woodlands deliver greater benefits at a community level. |
| | 9. More people enjoy the life long learning benefits of woodlands and their products | <ul style="list-style-type: none"> - More people of all ages benefit from the use of woodland as a setting for learning and play, leading to an improved understanding of woodlands and trees and the wider benefits which they provide in terms of the economy, society, environment and employment opportunities. |
| | 10. More people live healthier lives as a result of their use and enjoyment of woodlands | <ul style="list-style-type: none"> - More people lead healthier lives because they take advantage of opportunities to use and enjoy woodlands. |
| | 11. More people benefit from woodland related enterprises | <ul style="list-style-type: none"> - More people operate businesses, develop skills and create jobs in enterprises associated with woodland and timber. |



| OUTCOME | | DETAIL |
|--|---|---|
| A competitive and integrated forest sector | 12. More Welsh-grown timber is used in Wales | <ul style="list-style-type: none"> - The forest sector is helped to seize the opportunities and overcome the challenges of the changes needed to implement this strategy, and the different segments of the sector have a better understanding of how this can be achieved. - When diversifying woodlands, owners choose species with timber properties that future markets are likely to utilise (e.g. for construction, fuel, fencing or packaging). - The demand for woodfuel acts as a catalyst to bring more woodland into active management. |
| | 13. The forest sector is better integrated and more competitive, supporting the Welsh economy | <ul style="list-style-type: none"> - Existing and emerging enterprises flourish at many different scales, using home-grown timber and contributing to the Welsh economy. - The whole supply chain is much better integrated, involving owners and growers, managers and contractors, primary, secondary, tertiary processors and the end user, with the private sector providing leadership and direction. - The private sector engages with and informs the debate about choice of species to diversify woodlands. |
| | 14. Increased use of timber as a key renewable resource | <ul style="list-style-type: none"> - There is a much better 'pull' for wood and timber products from Wales, as sustainable, renewable building and construction materials. - Local procurement of timber materials and processing services increases. |
| | 15. A thriving, skilled workforce in the forestry sector | <ul style="list-style-type: none"> - People recognise that a job in the forest sector makes a valuable contribution to the sustainability agenda. - More people with the right skills enter all levels of the supply chain. - There are more robust and reliable career paths. - More opportunities are created for local people to be involved with woodlands. |
| Environmental quality | 16. Woodland management achieves high standards of environmental stewardship | <ul style="list-style-type: none"> - All woodlands are managed to high standards of environmental stewardship, safeguarding and enhancing biodiversity, water quality & resources, soil resources & function, landscape and the historic environment. - Woodland managers use the most appropriate management techniques to achieve site-specific objectives. - There is a woodland management culture of sharing successes and learning from problems, which leads to higher standards of environmental stewardship. |
| | 17. Woodlands and trees of special conservation value are in favourable management | <ul style="list-style-type: none"> - Woodland sites of international, national and local importance are in favourable ecological management, and are able to adapt to climate change. - We have more information about Ancient Woodland and veteran trees in Wales, so that we can improve mapping and monitoring of their extent and condition. - In our parks, gardens, towns and countryside, individual trees, and particularly veteran trees, are better managed for their biodiversity, landscape, heritage and cultural value. - All PAWS on our own woodland estate are prioritised for restoration, after considering the remnant evidence and wider ecological, landscape and cultural factors; and are gradually restored to a more natural state with ongoing management to improve condition and, where appropriate, produce timber. - Other woodland owners are encouraged and supported to restore their PAWS. |
| | 18. Woodland biodiversity is supported and native woodland is in favourable management | <ul style="list-style-type: none"> - The published BAP targets for native woodland to 2010 and beyond are met, including those for maintaining the net extent of native woodland; achieving favourable or recovering condition; and restoring and expanding a proportion of the native woodland resource. - There is better support for decision-making and management to improve the condition of priority native woodland habitats, and of woodlands that support priority species. - Where there is a clear ecosystem service benefit, existing non-native woodlands are restored to priority open habitats. - The woodland network is strengthened in key areas of Wales, by improved management of existing woodland, creation of new woodland, or by making the intervening spaces more friendly to woodland species (without harming priority species that rely on open habitats). |
| | 19. Woodlands and trees make a positive contribution to the special landscape character of Wales and to sites of heritage and cultural importance | <ul style="list-style-type: none"> - Woodlands and trees make a positive contribution to the special landscape character of Wales, its historic environment and cultural heritage. - Current and historic wooded landscapes are protected, taking account of changing cultural values and preferences and their influence on working landscape. - Individual trees and wood are protected for their cultural significance, aesthetic quality & heritage value. - In managing existing woodlands and trees, the value of archaeology within the woodland is respected, as well as the archaeology of the woodland; in creating new woodland, existing heritage sites are protected from damage and the integrity of historic landscapes is preserved. - Visitors can experience the cultural history of woodlands and their historic features, in particular Ancient Woodland Sites. - More use is made of Welsh wood products in the restoration of historic buildings. |
| | 20. New and existing woodlands and trees contribute to water and soil management | <ul style="list-style-type: none"> - The management of existing woodlands fully contributes to the protection & conservation of water & soil. - There is a more strategic and integrated approach to land use decisions and land management actions, so that woodlands can play their full role in improving environmental quality and particularly water and soil resources in Wales. - Woodlands and trees are used, where appropriate, to reduce surface water run-off from the upper catchments of our rivers. - Woodlands are managed or created as part of the measures to deal with the increased flood risk in the lower reaches of rivers. - People recognise the importance of individual trees in both rural and urban areas. |

2.2 Relationship with other plans, programmes, and environmental objectives

The way in which the WfWS affects and is affected by, other relevant plans, programmes and environmental objectives was assessed at an early stage in revision of the strategy. [Appendix A](#) highlights some of the most relevant plans and programmes.

Key points arising from this analysis are as follows:

- The forestry sector already has a range of policies and programmes which set out an agenda for sustainable forestry management. The UK Forest Standard and its accompanying Forest Guidelines are key amongst these. Together these policies aim to maximise the benefits which woodlands provide, partly through additional planting, but also by achieving sustainable management practices. They also detail ways in which the risk of environmental damage from forestry operations can be minimised.
- Sustainable development underpins most national level policies across the full range of sectors, with an emphasis not only on environmental objectives, but also economic growth, and social and environmental justice.
- Numerous environmentally-focused plans and programmes provide both a statutory requirement and non statutory guidance of relevance to the forestry sector in Wales. This includes the need to protect sites which have been designated under national and international legislation, to protect species designated under the Countryside and Rights of Way legislation, and the importance of recognising and supporting the *Wales Environment Strategy*.
- Contextual analysis shows that there remain policy concerns that some environmental resources are continuing to be degraded, including water, soil and some habitats. This suggests that a more proactive approach to environmental protection and enhancement is required across all land uses, including forestry.
- Biodiversity policies also emphasise the importance of not only protecting and enhancing Priority habitats but also adequately preparing for the impacts of climate change, and seeking to create more complete forest habitat networks.
- Rural development is an important policy priority in Wales, with diversification, and economic development (including through tourism) being important aims which sit alongside environmental protection and community development.
- Forestry should be considered within the wider context of rural land use and decision making. Woodlands can contribute to, and be supported by, farming practice.
- The forestry sector has an important role as a steward of the historic environment, and should also reflect on the cultural heritage significance of trees and woodlands in their own right.
- Climate change adaptation and mitigation provide both a challenge and an opportunity for the forestry sector. A top priority is to work to ensure that Welsh woodlands are resilient enough to withstand future climate change. There is also a need to ensure that the sector contributes as far as possible towards mitigation targets. This can be

done through carbon sequestration, carbon offset through wood fuel and timber products, and through helping to mitigate climate change impacts such as increased flood risk and high urban summer temperatures. This reflects the importance of balancing different mitigation strategies –for example, long-term carbon fixing compared to relatively short-term high gain projects such as renewable energy schemes.

2.3 Current state of the environment and relevant sustainability issues

The current state of the environmental issues in Wales that are relevant to forestry are discussed in paragraphs below under the headings used by the *Wales Environment Strategy*. These are:

- *Addressing climate change*: covering mitigation and adaptation;
- *Sustainable resource use*: covering woodlands and timber, other materials consumption and waste, and soils;
- *Distinctive biodiversity and landscapes*: covering biodiversity and landscapes and their historic component;
- *Our local environment*: covering access to the countryside and walkability in rural and urban areas, and flood risk; and
- *Environmental hazards*: covering air quality and water quality.

The current trends in these issues, and the potential role that forestry can play is discussed for each area. A summary of the chief issues is provided at the end. Graphs and maps relating to the baseline are provided in [Appendix B](#).

(a) Addressing climate change: adaptation

Current situation and trends in Wales

Climate change is a global issue, which is already having impacts on parts of Wales. The UK Climate Change Impact Programme (UKCIP) has modelled a number of scenarios based on different emission projections (Appendix B1). In general terms, the model suggests that Wales can expect average temperatures to rise and summer temperatures to increase with an increase in extremely hot days. This may lead to an increase in heat-related deaths linked to high air pollution, increased spread of disease and thermal discomfort in buildings. However, there is also likely to be a decrease in illness resulting from inhabiting cold areas due to milder winters. A higher frequency of storm events is predicted, which poses a threat to the human population and biodiversity as a whole through flooding and associated pressures on sewer systems, storm damage and erosion. There are also likely to be summer water shortages and increased incidence of low river flows (coupled with higher demand).

We can also expect to see habitat and species loss, for example in uplands and wetlands. A major concern is the ability of flora and fauna to adapt to the changing landscape and

climate. Alterations in predator-prey and mating cycles may prevent predators keeping prey numbers in check and species mating in a timely manner, thus have a devastating effect on Welsh biodiversity and agriculture. There may also be issues relating to species that may become pests, diseases and exotic species.

Regarding woodlands, the climatic changes are likely to make areas of Wales unsuitable for some of Wales' most important native tree species (Appendix B2). In general we can expect a longer growing season, with increased growth and production potential for some non-native species, but also greater risk to woodlands of winter storm damage and summer drought and fires. Changes in the pattern of outbreaks of pests and diseases could present an even more serious threat, especially to single species woodlands. The likely impact of changes in phenology of benevolent species such as pollinators is unknown.

Key issues relevant to the WfWS

The *Wales Environment Strategy* has as an outcome: "*Wales has improved resilience to the impacts of climate change. A clear flexible programme of measures is in place to enable Wales to respond and adapt to climate change*". Key issues for forestry are:

- Improving the ability of woodlands to withstand the impacts of climate change. Single-aged single species woodlands are at particular risk from the impacts of a changing climate, being more vulnerable to wind-throw and to outbreaks of pests and diseases. Many planted woodlands also have a low level of genetic diversity which may make them more vulnerable. The resilience of native woodlands is also highly important due to the importance of protecting woodland biodiversity. Resilience can be improved through for example, reducing habitat fragmentation and increasing connectivity; improving native woodland management and the adaptive capacity of woodlands to accommodate climate change, altering the choice of species and provenance used and increasing the genetic, age and species diversity of woodlands at a landscape scale. The positive impacts of diverse, mixed woodlands on ecosystem and landscape quality are well understood.
- Improving the ability of woodland biodiversity to withstand climate change, particularly through the expansion and reduced fragmentation of the native woodland resource.
- Using woodlands and trees to help people and biodiversity adapt to the effects of a changing climate, including through:
 - Downstream flood alleviation;
 - Reducing thermal stress on water courses;
 - Limiting the increased risk of sediment and pollutant inputs from other land uses in the face changes in the patterns of storms or drought;
 - Bringing wider social and environmental benefits e.g. shaded recreation and biodiversity gain through wet woodland and wetland creation;
 - Reducing the effects of increased winter soil wetness and waterlogging of soils on other land uses;
 - Using trees in streets and parks to cool down urban areas in summer, and provide shade for people and buildings. They also help to reduce the pressure on urban

drainage systems, by absorbing water that would otherwise run off the large areas of impermeable surfaces.

(b) Addressing climate change: mitigation

Current situation and trends in Wales

The Kyoto Protocol came into force in 2005 to aid a reduction in greenhouse gas emissions. The UK Government's domestic target is to reduce carbon dioxide emissions by 20% by 2010 and by 80% by 2050. *One Wales* also has a target to reduce emissions by 3% per year. However, recent UK Government announcements indicate that the UK will not meet the 2010 target. The most recent figures for Wales according to the *Wales Environment Strategy*, report a 3.6% decrease in emissions for 2003 compared to 1990; emissions of carbon dioxide were 0.2% above those in 1990.

Fossil fuels supply 95% of Wales' energy, with renewables supplying less than 3%, most of which is wind generated. The main sources of renewable energy in Wales are water, wind, solar power and biomass. The UK Energy White paper sets the target of 10% of energy to be produced from renewable sources by 2010 but recent reports suggest it is unlikely that this target will be met. The WAG target is 4TWh of electricity per annum to be produced from renewable sources by 2010 and 7TWh by 2020. In order to meet this target, 800MW additional installed capacity will be required from onshore wind and 200MW from offshore wind and other renewable technologies.

Key issues relevant to the WfWS

The *Wales Environment Strategy* has as an outcome: "*Greenhouse gas emissions are minimised, consistent with Wales contributing fully to meeting UK-wide targets and in line with more specific Wales targets that are under development.*"

Woodlands and trees can make a small but important contribution in two ways:

- Firstly, through a process known as sequestration, carbon can be stored in growing timber, woodland plants and soils. The carbon stored in Welsh woodland increased rapidly following the massive afforestation programmes of the mid 20th century but is levelling off now as these trees mature, and when they are felled the total carbon stored in Welsh woodlands will decline for a period.
- Secondly, through substitution, carbon-neutral woodland products can be used as sources of energy, or as raw materials for construction and manufacturing, in place of other products derived from, or using, fossil fuels in their production. Most of the carbon in the timber remains locked up for the life of the product - perhaps as long as several hundred years. If the timber is burnt as woodfuel, the carbon is of course released to the atmosphere but, provided this carbon is 'recycled' each year in an equivalent amount of fresh tree growth, it represents an almost carbon-neutral fuel.

Recent research by the Forestry Commission suggests that woodland management aimed at growing enduring timber for construction and manufacturing, using smaller diameter timber for wood fuel and reducing soil disturbance is most likely to deliver long-term reductions in net greenhouse gas emissions. This reflects the importance of balancing

different mitigation strategies –for example, long-term carbon fixing compared to relatively short-term high gain projects such as renewable energy schemes.

(c) Sustainable resource use: woodlands and timber

Current situation and trends

Woodlands and trees are a natural renewable resource that provides a variety of benefits for Wales, and it is in our interest to ensure that they are managed wisely. In terms of sustainable resource use, we are particularly interested in trends in woodland cover and numbers of trees and hedgerows, their level of protection, current and future threats and whether they are being managed sustainably.

There are 287,000 hectares of woodland in Wales, covering 14% of the land surface (Appendix B3 & B4). This represents a dramatic increase in cover since the early 20th Century through both conifer and broadleaf afforestation. However, since the 1990s, this increase has levelled off and Wales remains one of the least wooded countries in Europe (Appendix B5).

The character of woodland in Wales has been influenced by both historic land use and previous government policy, and now most woodland is either:

- conifer woodland, mostly single-species, single-age plantations created during the twentieth century, which generally have been managed by clearfelling and are currently the main source of home-grown timber; or
- native woodland, mostly small and fragmented, mostly privately owned with half on farms. Little native woodland is actively managed, which can have detrimental effects on biodiversity, timber quality and access.

All woodlands have some degree of protection, in that an Environmental Impact Assessment is required before a felling licence is granted for their removal¹. Around 5 per cent of woodlands in Wales have additional protection through designated conservation status (Appendix B7). Certification to the UK Woodland Assurance Standard (UKWAS) also affords a good degree of protection for woodlands, ensuring that they are sustainably managed and that their management takes environmental, landscape and social considerations into account. Currently 121,000 hectares (44%) of Welsh woodland is certified to the UKWAS (including all of the Assembly woodland estate and roughly 10% of non-Assembly woodland). However, certification schemes appear to be failing to attract further woodland (Appendix B6).

Woodland management under a grant scheme also gives some assurance that the woodland is being managed to the UK Forest Standard. Currently there are 36,000 ha in the *Better Woodlands for Wales* grant scheme, all managed to UKFS. This amount has been increasing rapidly as *BWW* replaces earlier grant schemes. However more than half of the

¹ Outside SAC, SPA, Ramsar, SSSI, AONB or National Park sites, woodlands < 1 hectare do not require a felling licence.

woodland outside the Assembly estate has never been part of a Woodland Grant Scheme – and therefore is unlikely to have been actively managed for many years. When we consider farm woods, which account for half of native woodland in Wales, only 5 per cent are within a grant scheme. The condition of these woodlands is largely unknown.

All in all, we estimate that 40,000ha (64%) of ancient woodland and 51,400 ha (40%) of broadleaf fall *outside* designation, certification, grant-funded, AONB, and National Park boundaries (Table 2.2).

Table 2.2 Level of designation and sustainable management of native and ancient woodland in Wales.

NB: since there may be overlap between categories, the figures in the columns and rows do not sum to totals.

| Type of woodland | Conifer woodland | Broadleaf woodland | Ancient woodland | Total woodland |
|---|------------------|--------------------|------------------|----------------|
| Area in with designated conservation status (SAC, SPA, RAMSAR, SSSI or NNR) | 5,800 ha | 9,000 ha | 7,100 ha | 14,800 ha |
| Area certified to UKWAS | | | | 121,000 ha |
| Area managed to UKFS through grant scheme | 28,700 ha | 6,900 ha | 10,300 ha | 35,600 ha |
| Area in AONB or National Park | 50,800 ha | 18,200 ha | 15,100 ha | 69,000 ha |
| Area <i>not</i> certified, designated, in grant scheme or AONB or National Park | 135,100 ha | 51,400 ha | 40,000 ha | 186,500 ha |
| Total woodland | 157,000 ha | 128,000 ha | 62,000 ha | 285,000 ha |

As far as woodland condition is concerned, the Countryside Survey shows that there has been a decrease in species richness in woodlands in Wales since 1990, with particular declines in butterfly food species. This decline may now be slowing. The results indicate that woodland is maturing and the canopy cover is becoming denser, which could be due to simple ageing, or a decline in thinning or coppicing. Current threats to woodland highlighted during UKBAP reporting are identified as climate change, inappropriate grazing, invasive non-native species, pathogens, nutrient enrichment via agricultural pollution, lack of regeneration, and, for wet woodland, drainage and flood defences.

There are another 15 million trees in Wales outside woodlands, contributing to the economy, rural and urban landscapes, and to quality of life. More than half of these trees are growing along linear features like hedgerows, riverbanks and roadsides, while the rest are found in orchards, parks, wood pastures and urban areas. According the Countryside Survey, the total length of hedges in Wales is reasonably stable at 54,000 km (though hedges suffered a major decline in the 1980s). The length of lines of trees/shrubs/relict hedge is also stable at 19,000 km, having increased from 10,000 since 1984. However, since 1978 there has been a significant decline in plant species richness in hedges, particularly in butterfly food species, and although this decline has now stabilised there are

no signs yet of any recovery. Only 36% of managed hedges in Wales were in good structural condition in 2007. There is currently insufficient information available to report on the health and/or age structure of individual trees outside boundary features.

Key issues relevant to the WfWS

Trends suggest that in the absence of a revised WfWS, the area of woodland cover and length of woody linear features is likely to remain reasonably stable. However the condition of these features might either remain stable after declines in the 1980-1990s or, more likely, decline further due to threats of climate change, pathogens and inappropriate grazing in particular. We do not currently have enough data available to be able to understand trends in the numbers of individual trees (veteran or otherwise). Regarding sustainable management, trends suggest that the area of certified or grant-funded woodland would increase only slowly if at all, and therefore that the area of woodland that falls outside any degree of additional protection will remain stable.

Key issues to protect woodlands and trees as a renewable resource for Wales include:

- Protecting woodlands against growing threats of climate change, invasive and/or exotic species, and pests and diseases, and in particular enabling the 'adaptability' of the woodland resource in Wales and promoting the connectivity between native woodlands.
- Expanding the area of woodland managed to UKFS or UKWAS, to ensure that environmental, social and economic benefits are considered in their management.
- Getting more native and ancient woodland into grant schemes that provide a better degree of protection.
- Collection more information about individual trees and hedgerows. More information on their location and status can help us ensure these trees are protected and effectively managed.

(d) Sustainable resource use: materials consumption & waste

Current situation and trends in Wales

Achieving a more sustainable pattern of consumption and production will help reduce the impact that economic activity has on the environment. The *Wales Environment Strategy* requires resource use to be made more efficient, for example by minimising fuel and chemical use and by making use of alternative materials such as sustainably harvested timber. The WES also sets a target of achieving zero waste to landfill in Wales by 2025. This means using and getting value from all materials throughout their life to prevent the landfill of municipal waste in Wales.

The UK uses approximately 56 million m³ of timber per year, and produces only around 9 million m³. We therefore consume six times more timber than we produce, and will undoubtedly continue to rely heavily on imported timber unless vast areas of land are given over to timber production in Wales. The use of uncertified timber from outside the EU can risk exacerbating inappropriate forest exploitation and deforestation (with implications

for biodiversity and climate change), and also increases the number of miles that timber must be transported from source to point of use.

However, if the extent of woodland remains at current levels, there is in fact little scope to increase the amount of softwood harvested in Wales (which is roughly 1.3 million m³ per year and 75% of the annual softwood increment). There is, however, scope to increase the hardwood harvest in Wales, which is currently only about 25 thousand m³ per year and 8% of the annual hardwood increment.

Key issues relevant to the WfWS

The *Wales Environment Strategy* has as an outcome: "*The use of alternative materials ... is maximised where possible in the construction industry.*" In addition, it calls for making more resource use more efficient. Key issues for the WfWS are:

- Encouraging the use of timber as a sustainable renewable material, and particularly as an alternative to aggregates in the construction industry.
- Maintaining or increasing the amount of homegrown timber produced and consumed in Wales in order to mitigate against inappropriate forest exploitation outside the EU and against long distance timber transport
- Encouraging better management and use of the existing Welsh hardwood resource in particular.
- Promoting efficient use of resources such as fuel and chemicals.
- Promoting minimisation of waste during woodland management, harvesting, transport and processing.

(e) Sustainable resource use: water availability

Because of its high rainfall, Wales has abundant water resources but its landscape, soils and geology provide few natural water stores. Consequently, supplies can quickly become scarce whenever there are extended dry periods. There are some areas of Wales where water is already over-abstracted (Appendix B8 & B9). The Environment Agency is currently reviewing the consents for abstraction in Wales. The risk of summer drought is likely to increase with climate change, with the Environment Agency predicting that the summer flow of some rivers will have decreased by as much as 80% by 2050.

Some types of woodlands have the potential to reduce the availability of water within a catchment, depending on the type of woodland, its structure and composition and the scale of forest cover. Short rotation coppice and short rotation forestry could involve the planting of species with a high water use and the establishment of such energy crop sites would be subject to Environmental Impact Assessments through which the impacts on the water environment would be taken into account. The ability of some forests to reduce water supplies, especially in a changing climate, needs to be balanced against other benefits, including the potential to protect water quality and enhance freshwater habitats.

Key issues relevant to the WfWS

The *Wales Environment Strategy* has as an outcome: “*Water resources are managed sustainably meeting the needs of society without causing damage to the environment*”. Key issues for the WfWS are:

- Including an assessment of the impact of new woodland planting and of short-rotation crops in particular on the availability of water in catchments.

(f) Sustainable resource use: soils

Current situation and trends in Wales

Soil plays an important role in supporting biodiversity by providing a habitat for soil dwelling organisms, storing carbon and nutrients and helping to regulate the flow of water. It also helps store and protect archaeological remains.

Welsh soils are high in carbon with about 350-480 MtC in the top metre of soils. Protecting these carbon stocks is a priority. Erosion is one of the main factors affecting the state of soil, with 17% of soils affected and there are significant areas of Wales that are at high risk (Appendix B10). Many of these areas coincide with areas of woodland cover (Appendix B11) – including a moderate area of deep peat (12,400 ha) which is particularly important for soil carbon. The greenhouse gas emission implications of managing peat soils (including carbon and methane fluxes) are complicated and further guidance is required to help us make better decisions about when and how to go ahead with deforestation and habitat restoration. This is especially complex on highly modified sites where the prospects of successfully restoring habitat are less favourable.

Forest cover can provide protection for soils. However, it is acknowledged that poor standards of forest operations can result in erosion.

- **Soil erosion:** Thinning and harvesting trees, preparing ground for planting and building access roads disturb the soil and pose a risk of sediment being washed into water courses. Clearfelling can result in a pulse of nutrients entering water courses. Risks are particularly high on steeper slopes and in deep peat areas. Promotion of reduced soil compacting activities and reduced clearfelling is likely to result in the reduction of soil erosion and the associated loss of soil carbon, turbidity, siltation and transport of nutrients and pollutants into water courses. This will reduce build-up of soil/silt in watercourses that can cause the smothering of river-bed gravels, harming aquatic plants, invertebrates and the eggs of fish.
- **Soil carbon:** It is important also to recognise the role of woodland soils in carbon storage. Organic soils contain more carbon than the trees themselves, particularly the peaty soils of Wales. Woodland management on these soils requires careful practice. In some cases the best course may be to take no action, retaining the current tree cover and leaving the site undisturbed, or to continue a careful mixture of management systems to encourage native woodland and open space. In other cases removing woodland cover permanently and actively restoring the bog habitat may be

appropriate. On specific deep peat sites, which have been identified as high priority open habitats, no or low-impact woodland management is appropriate.

Key issues relevant to the WfWS

The *Wales Environment Strategy* has as an outcome: "Soil is managed to safeguard its ability to support plants and animals, store carbon and provide other important ecosystem services." A key issue for the WfWS is to promote the application of UKFS soil and water guidelines during forest operations, with particular care on soils prone to erosion.

(g) Distinctive biodiversity and landscapes: biodiversity

The map at Appendix B7 shows the location of designated sites within Wales. Sites of Special Scientific Interest (SSSI) are the cornerstone of Welsh conservation practice. There are 1,021 SSSI currently designated in Wales, covering around 13% of the country's land and coastal area (CCW, 2005). These are nationally protected areas and the CCW designate these sites (under the Wildlife and Countryside Act 1981) alongside the Joint Nature Conservation Committee (JNCC). Aside from SSSI, there are other European designations including Special Areas of Conservation (SAC), Special Protection Areas (SPA), and protected wetland areas (Ramsar). There are also 76 National Nature Reserves (24,006 ha) in Wales. Collectively these designated areas include 14,800 ha of woodland (Table 2.2).

Current situation and trends in Wales – Woodland habitats

Priorities for Wales are to halt the loss of biodiversity by 2010, see a recovery in biodiversity loss already experienced by 2025, and to see statutory protected sites in a favourable condition. In terms of the WfWS, we are particularly interested in trends in the extent and condition of native woodland habitats, and the trends in population sizes of woodland species.

UK BAP assessments show that extent of native woodland in Wales is slowly increasing but that Wales is unlikely to meet its UKBAP targets for increasing the area of native woodland by 2020 unless the rate of expansion increases.

Regarding woodland condition, intensive use of land and water; inappropriate management of habitats; pollution, deer, grey squirrels and invasive plant species in addition to climate change all pose potential threats to woodland habitats and thus to ecosystem services. CCW's monitoring of woodland on SAC shows that only 26 per cent of woodlands within European sites are in 'favourable conservation status' with a further 21 per cent in unfavourable but recovering condition. There is still some way to go if we are to meet the Environment Strategy target of having 95 per cent of internationally designated woodland sites in favourable or recovering condition by 2010, and 95 per cent of woodlands on Sites of Special Scientific Interest (SSSIs) in favourable or recovering condition by 2015.

Native woodland species also face threats relating to the long-term consequences of habitat fragmentation and population isolation. The native woodland resource is highly

fragmented (Appendix B3) and the majority of native woodland in Wales occurs in patches less than 5 ha, leaving their component species more vulnerable to local extinction events.

There are 28,000 ha of plantations of (usually) non-native species on ancient woodland sites (known as Plantations on Ancient Woodland Sites (PAWS)), accounting for 45% of all ancient woodland in Wales (Appendix B12). The majority of PAWS have the potential to be restored to more natural state, with benefits for biodiversity. There has already been progress in converting PAWS in Wales (over 5,000 hectares in the last 8 years).

There continues to be poor protection for trees and hedgerows in the landscape, particularly those without a Tree Preservation Order. Veteran trees provide a continuity of habitat for some increasingly rare lichen and bryophyte species, and have cultural and landscape value. Hedgerow trees are also often overlooked and poorly managed yet provide important breeding, feeding and shelter sites for many species.

Current situation and trends in Wales – Woodland-related species

The Welsh Assembly has, in accordance with the Natural Environment and Rural Communities Act 2006, published a list of species of principal importance to Wales. Subsequently, Forestry Commission Wales has produced a draft list of 194 species of conservation concern that may be influenced by forestry. 47 of these species have UK Species Action Plans (SAPs).

The status of these 194 woodland-related species is considered in Appendix B13. Of the 47 SAP species, several are showing steady increases, including the lesser horseshoe bat, otter and song thrush. However, populations of at least 90 other woodland animals, plants lichens and fungi are in decline, including the pied flycatcher, tree pipit and wood warbler.

There is clearly more to be done to improve their native woodland habitats. Some threatened species such as the nightjar, red squirrel and the hazel dormouse occupy more recently planted woodlands, often conifers, and their importance should not be overlooked.

Key issues relevant to the WfWS

Current trends suggest that Wales is unlikely to meet its UKBAP targets for woodland habitats and species. The *Wales Environment Strategy* has as outcomes:

- *The loss of biodiversity has been halted and we can see a definite recovery in the number, range and genetic diversity of species, including those species that need very specific conditions to survive*
- *The wider environment is more favourable to biodiversity through appropriate management, reduced habitat fragmentation and increased extent and interconnectivity of habitats*
- *Sites of international, Welsh and local importance are in favourable condition to support the species and habitats for which they have been identified*

Key issues to maintain and enhance woodland habitats and species include:



- Dealing with inappropriate management or lack of management that may adversely impact health of wood ecosystem or woodland species it contains. Woodland management work can sometimes pose a threat to the protected species such as hazel dormouse, bats and water vole.
- Dealing with the high degree of fragmentation in the native woodland resource, and promoting native woodland expansion where it will increase the size and connectivity of existing native woodland patches. Farm woodland, which accounts for 50% of Wales' native woodland, is particularly important in this regard.
- Dealing with threats that pose challenges to meeting biodiversity objectives. Rhododendron, grey squirrels and deer are a particular concern in Wales, causing a threat to biodiversity, flora and fauna, water quality and human health.
- Dealing with wildlife crime. Wildlife crime is an issue in some woodlands, where rare species are threatened by plant and egg collectors, whilst other woodland managers have to deal with environmental nuisances such as fly-tipping and off-road vehicle access. Illegal fires and poaching pose a risk to local communities, woodland users and wildlife.
- Ensuring a good degree of protection and restoration of ancient woods, and of individual trees (including veterans) and hedgerows.
- Protecting woodland biodiversity against growing threats of climate change and pests and diseases.
- Ensuring that public access to designated sites and rural areas as a whole does not impact adversely on biodiversity, through potential habitat degradation and/or destruction. However, conversely improved access may increase awareness and/or publicity of particular species and therefore impact positively on conservation efforts for some species.

(h) Distinctive biodiversity and landscapes: landscapes and their historic component

Current situation and trends in Wales

Wales' land and seascapes have been shaped since the last ice age by natural and human forces. A distinctive historic character now results, which is continually changing, but faces a range of pressures from the varied demands we place upon the landscape and from the impacts of climate change. There are 69,000 ha of woodland within Areas of Outstanding Natural Beauty and National Parks (Table 2.2, Appendix B7); 43,000 ha of woodland within Historic Landscapes identified by CCW; and 605 Scheduled Ancient Monuments located in woodland (16% of all SAMs in Wales). Although in many cases woodland cover protects the archaeological integrity of heritage sites there are instances where tree roots may be causing damage, and such sites may need special care.

Veteran trees are a cultural resource linking people to place, environment and culture (past and present), and also provide continuity of habitat for some increasingly rare lichens, mosses and fungi. Hedgerow trees can often be overlooked, poorly managed and at risk of

damage by livestock, yet they are distinctive features in the landscape and provide breeding sites, food and shelter for many species.

Key issues relevant to the WfWS

The *Wales Environment Strategy* has as an outcomes: *“The quality and diversity of the natural and historic character of our landscape and seascape is maintained and enhanced”*.

Key issues for the WfWS are:

- Ensuring that forest operations or visitor traffic to woodlands do not degrade SAMS.
- Enhancing the positive contribution that woodlands make to Wales’ landscapes, and to AONB and Historic Landscapes in particular.
- Recognising the cultural value of ancient and native woodlands, veteran trees and hedgerows.

(i) Our local environment: access to green space and walkability in urban and rural areas

Current situation and trends in Wales

Health in Wales, in general, is worse than in England, but health in many parts of the Valleys area and North Wales Coast is substantially worse than in the rest of Wales (Appendix B15). Addressing environmental inequalities directly and delivering higher quality living environments remains a key WAG priority. There is a considerable body of evidence that links the determinants of health with low incomes and with other features of social exclusion. The higher mortality ratios and levels of limiting long-term illness in the Valleys and northern Wales therefore represent the consequences of low standards of living and of social exclusion. They are also reflective of factors which contribute to low levels of economic activity and income.

In terms of access to the countryside, which can contribute to both mental and physical fitness, WAG have set targets to increase the percentage of people using the natural environment for outdoor activities from 36% to 60% and by 2020 to enable 95% of people in Wales to have a footpath or cycle path within a ten-minute walk.

Currently there are 33,200km of public rights of way in Wales (public footpaths, bridleways and byways) and 20% of the Welsh countryside is accessible for public access on foot. According to the Sports Council for Wales’ 2002/03 adult participation survey, walking remains the most popular activity by a considerable margin. Nearly a third of all adults had walked for a distance of at least two miles in the four weeks prior to the survey.

Across Wales, woodlands are an important resource for maintaining and enhancing access to the countryside. More than 50% of Welsh woodland is publicly accessible, including all of the Assembly Woodland Estate. There were 12 million day visits to woodlands in 2001, and 40% of the population report visiting woodlands within the last 12 months. 16% of the Welsh population live within 500m of a 2ha+ accessible woodland and 72% live within 4km of a 20ha+ accessible woodland. However, there is significant scope for improving

accessibility. If all existing woodlands were opened for public access, then 43% more people would have access to a woodland within 500m of their home. Some areas of Wales appear to have particularly low levels of publicly accessible woodland, notably Pembrokeshire, The Vale of Glamorgan, Cardiff, Isle of Anglessey and Carmarthenshire (Appendix B16). Women, people with a disability, people from ethnic minorities and older people are under represented amongst woodland visitors.

There is also the opportunity to use woodlands to increase *walkability* in urban and rural areas. Welsh Transport Statistics reported that in 2004, 11% of people usually walked to work, and only 1% cycled. It also reported that in 2002/03, 32% of trips to schools by 5 to 16 year olds were made on foot; down from 48 per cent in 1989-93.

Key issues relevant to the WfWS

The *Wales Environment Strategy* has as outcomes: *“There is sustainable, widespread and equitable access to the countryside and coast, which recognises the need for a balance between tranquil areas and areas supporting larger numbers of people and a range of activities. Damaging access will be discouraged”* and *“The number of people choosing to walk or cycle as a means of transport is increasing”*. The following issues should be considered:

- There is considerable scope for increasing public access to the countryside (or walkability within urban areas) through working to open up more existing woodland to the public.
- While access to the countryside brings positive human health effects it can impact negatively on biodiversity, access may disturb biodiversity in general, dogs may disturb ground nesting birds, and trampling can compact soil. Increased use will need to be managed to ensure that the quality of the environment is maintained, that areas of tranquillity still remain and habitats and species are not adversely affected.
- Increasing access to the countryside is also likely to promote the transport of visitors and goods to and from these areas, increasing traffic and emissions. This must be considered as part of any plan to increase visitor numbers and measures should be taken to encourage visitors to access sites without needing to travel by car. The volume of people and the mode of access or transport in sensitive areas must be managed, and the impact on the environment of associated infrastructure should be minimised.

(j) Our local environment: flood risk management

Current situation and trends in Wales

Over 150,000 residential properties and many commercial and industrial developments and other key infrastructure like power supplies, transport links and schools as well as important environmental sites are situated on land at risk from flooding. Around half a million people live and work on flood plains in Wales and over £8 billion worth of assets are at risk. Flooding can also have a negative impact on agricultural land. Appendix B17 identifies flood risk areas in northern and southern Wales.

The impact of flooding and coastal erosion is felt most directly by individuals, through property damage, increased insurance premiums, disruption, distress and even ill-health. The impacts of internal or external sewer flooding of properties can also be a matter of considerable distress. While the causes of such flooding are often linked to heavy rainfall, they can also be caused due to sewers being overloaded, sewer blockages and collapse or equipment failure.

Climate change is expected to increase river flooding, cause sea level rise and increased storminess. Increases in flood risk will be particularly significant in low lying coastal areas and river estuaries. A 2004 report on Future Flooding estimated annual economic damage in Wales to range between £121 million and £1,235 million by the 2080s - an increase of 2 to 18 times on current annual costs of £70 million. By adopting an integrated approach to flood risk management, expected annual damage in the 2080s could be reduced to within the range £77 million to £219 million.

The prospect of greater incidence of flooding under climate change has increased interest in the use of woodland to mitigate flooding. Research suggests that woodland has a role to play in downstream flood alleviation (largely by increasing flood storage and delaying the flood peak progressing downstream) Trees can also make it easier for soils to soak up rainfall, so less water runs off into drains and rivers - this can be useful in the upper parts of river systems where rainfall is higher.

Key issues relevant to the WfWS

The *Wales Environment Strategy* has as an outcome: "*Appropriate measures are in place to manage the risk of flooding from rivers and the sea and help adapt to climate change impacts*". Key issues for the WfWS are:

- To look to develop woodland solutions, including new planting, in areas of flood risk in Wales.

(k) Environmental hazards: air pollution

Current situation and trends in Wales

There has been progress on improving air quality in Wales (Appendix B18), but there are still some areas where local air quality is poor leading to increased risks to human health and the environment. The main causes of air pollution at urban sizes are ozone and fine particles (PM10) with PM10 levels exceeding the standard on up to 38 days in urban parts of Wales in 2004. Ozone causes the great majority of pollution days in rural areas – a maximum of 12 in 2004. Production of ozone is strongly influenced by the weather, being created on sunny summer days.

It can be seen that on average the concentrations of ozone in rural areas appear to be showing a gradually increasing trend, perhaps related to the recent warm summers. In urban background areas the increase is much more dramatic as concentrations of total NO_x are decreasing. Ozone in these areas is now much more similar to the rural concentrations

which is of great concern for public exposure to this pollutant. PM10 concentrations show a decrease up until 2004, but then an apparent slight increase over the most recent years.

The review of the literature has shown pollution absorption by trees to be sizeable. In Wales, existing urban trees absorb each year between 45 and 73 megatonnes of particulates and between 91 and 165 megatonnes of sulphur dioxide. The health effects of this pollution absorption are also significant, delaying deaths and preventing hospital admissions from poor air pollution, and these benefits could be enhanced through further urban tree planting.

Key issues relevant to the WfWS

The *Wales Environment Strategy* has an outcome: 'A reduction in air pollution leads to increased life expectancy and ecological protection'. Key issues for the WfWS are:

- Looking to increase the coverage of urban woodlands and trees.
- Increasing access to the countryside is also likely to promote the transport of visitors and goods to and from these areas, increasing traffic and emissions. This must be considered as part of any plan to increase visitor numbers and measures should be taken to encourage visitors to access sites without needing to travel by car.

(I) Environmental hazards: water quality

Current situation and trends in Wales

The Welsh Assembly Government is committed to meeting the requirements of the Water Framework Directive. Water quality (biological and chemical) is directly related to the productivity and/or status of tourism, industry, recreation, human health and biodiversity in Wales. There has been good progress made on improving water quality. Currently, 92.5% of rivers (by river length) in Wales have good chemical river water quality, and 79.3% good biological quality. Poor chemical and biological quality is found in 0.2% of rivers, but not necessarily in the same rivers.

The main areas of concern for water quality in Wales are:

- high levels of nutrients in water bodies (especially phosphorous and nitrogen), which can cause eutrophication. Eutrophication is not a widespread problem, although some catchments in the border area (Rivers Dee, Wye and Usk) are at significant risk. The release of nutrients from the soil and decaying branches left following timber harvesting can also lead to abnormal amounts of nutrients entering water courses;
- nitrate contamination of water used for drinking water;
- hazardous chemicals leaking into rivers, lakes and groundwater from industrial sites;
- pesticides and sheep dip from agriculture entering rivers, lakes and groundwater;
- oxygen depletion in water due to organic pollution from livestock manure;
- sediments from soil erosion smothering habitats in rivers, lakes and estuaries;

- bacteriological contamination of bathing waters and shellfish waters from farm waste and illegally connected sewers.

Common sources of diffuse pollution include:

- spills of oil, fuel and chemicals from industrial areas;
- road surfaces and railways contaminated with oil, debris and herbicides;
- industrial and transport emissions into air leading to acid rain in upland areas;
- agricultural activities and construction sites releasing sediments to surface water. Badly executed forestry operations (ground preparation, planting, harvesting) can lead to sediments entering streams. Therefore careful management of such activities occurs, in line with the Water Framework Directive and Forest and Water Guidelines.;
- surplus inorganic nutrients, animal manure and pesticides washed off agricultural land;
- faecal or other pathogenic bacteria from livestock and wild animals;
- overloaded, leaking or wrongly connected sewerage systems.

Diffuse pollution also has social and indirect economic costs. For example, poor quality urban rivers add to social deprivation. Diffuse pollution impacts on fisheries and bathing waters, limiting recreation and tourism. The costs are difficult to measure but are likely to be substantial. It costs the UK Water Industry several million pounds a year to remove nitrates from drinking water abstracted from river and groundwater sources. In the mid 1970s groundwater required only minimal treatment; now almost half of groundwater used for public water supply requires fuller treatment due to pollution and tighter standards.

Closing the gap between present and good water quality has been given fresh impetus by the Water Framework Directive, which introduces new ways of assessing and managing the impacts of diffuse pollution.

There is little evidence of pesticide pollution problems arising from forestry, even in sensitive upland catchments. There appears to be no evidence suggesting that forestry is a significant risk factor for organic pollution (ammonia and BOD) and the nutrient status of receiving waters. Nitrogen fertiliser is not applied to forest crops in Wales. Nitrate fluxes to waters from upland forests are generally low and comparable with those draining moorland. The main risk from forestry arises after clearfelling when there are risks of a nutrient pulse entering water courses, although this can be effectively controlled by managing the scale and timing of this activity.

Acidification of upland lakes and rivers is an important issue for forestry. Large areas of Wales are vulnerable to acidification, especially the uplands, as the bedrock is slow weathering and the soils have little or no acid neutralising capacity. It is estimated that 34% of soils in Wales are affected by acidic deposition and in these areas about 50% of the first to third order streams may have been damaged. In terms of nature conservation, Wales is the worst affected region in the UK with more than 40% of the total area of SSSI potentially damaged by freshwater acidification.

Forest cover, a major land use in the uplands, and can significantly increase the deposition of acid pollutants due to the greater turbulent air mixing created by forest canopies, contributing in turn to widespread surface water acidification and the decline or loss of fish populations and other aquatic wildlife. Although some recovery is underway in response to emission reductions by EU Member States, many water bodies remain at risk, especially within headwater areas. The critical loads approach is used to identify which waters are at risk from acidification by the additional ‘scavenging’ of acid pollutants by trees (see Appendix B19 & 20). For those waters where the deposition total exceeds the critical load, approval of a woodland planting grant or restocking plan is unlikely until there are further reductions in pollutant emissions. Strict adherence to UKFS Forest Water Guidelines is currently considered sufficient to tackle the contribution of forests to acidification in Wales.

However, woodland also has the potential to act as a solution to water quality issues. Tree roots strengthen stream banks and woodland plants trap the sources of diffuse pollution before they reach the watercourse. The removal of dense conifer shading and opening out of streambanks can significantly increase invertebrate abundance and numbers of trout where water quality is suitable. Targeted clearance of riparian conifer stands casting heavy shade could aid upstream fish migration and the biological recovery of streams showing chemical improvement in response to ongoing emission reductions. Light shading from suitable riparian woodland can help to reduce thermal stress on water courses. Other benefits would also follow in terms of improving bankside stability and river channel form.

Key issues relevant to the WfWS

The *Wales Environment Strategy* has as outcomes “*The quality of our groundwater, rivers, lakes and coastal waters is maintained and enhanced*” and “*Diffuse pollution is better understood and action is being taken to reduce and manage diffuse pollution*”.

The key issue for the WfWS are:

- Promoting wider application of the UKFS Forest and Water Guidelines.
- Using woodlands and trees as a solution to water quality issues, for example by using carefully planned and managed woodland alongside watercourses to reduce the risk of soil erosion, pollution and nutrient run-off from neighbouring fields. Also to use trees and woodlands in urban areas to buffer run-off from roads and buildings.
- To use woodlands to improve the biological water quality of streams, by removing dense conifer shading, opening out streambanks, and where appropriate for riparian biodiversity, replacing with native riparian woodland which offers less dense shading.

Summary of key issues relevant to the WfWS

Table 2.3 The main environmental challenges in Wales relevant to the WfWS

| SEA topic | Issue (s) | Implications for WfWS |
|-------------------------------|---|---|
| Biodiversity, flora and fauna | Many woodland species are in decline and UKBAP targets are unlikely to be | The WfWS should be designed to <ul style="list-style-type: none"> • Encourage more woodlands into sustainable management to the UK Forest Standard |

| SEA topic | Issue (s) | Implications for WfWS |
|---|---|--|
| | met. Significant threats to biodiversity are apparent, particularly from climate change, habitat fragmentation, and invasive species. | <ul style="list-style-type: none"> Promote significant expansion of the native woodland resource, and reduce its degree of fragmentation Address problems of invasive species and deer Protect and enhance ancient woodland and ancient trees Ensure that public access does not impact adversely on biodiversity |
| Soil, water and air | Soils (and the carbon they contain) are at risk from erosion and acidification. Agricultural and urban run off is a major source of diffuse pollution. | <p>The WfWS should be designed to</p> <ul style="list-style-type: none"> Promote wider application of the UKFS Forest Guidelines relating to Soil and Water Promote use of woodlands and trees as a solution to water quality issues, particularly to reduce agricultural diffuse pollution. Promote access to woodland recreation that does not require car use. Ensure new woodlands do not adversely affect the availability of water in catchments Look to use woodlands to manage flood risk Increase the cover of woodlands and trees in urban areas. |
| Climatic factors | Climate change will have significant impacts on Wales' woodlands and biodiversity, and on the human population. Wales is unlikely to meet its targets to reduce greenhouse gas emissions. | <p>The WfWS should be designed to</p> <ul style="list-style-type: none"> Improve the ability of woodlands to withstand the impacts of climate change. Improve the ability of woodland biodiversity to withstand climate change. Promote the use of woodlands and trees to help people and biodiversity adapt to the effects of a changing climate Balance different mitigation strategies including carbon sequestration and the production of timber and woodfuel |
| Population and human health | There are areas of high health deprivation in Wales | <p>The WfWS should be designed to</p> <ul style="list-style-type: none"> Use woodlands to increase public access to the countryside and walkability within urban areas. Promote access to woodland recreation that does not require car use. Manage potential negative impacts of woodland visitors |
| Landscape and cultural heritage | Landscape and cultural heritage in Wales needs to be protected and enhanced. | <p>The WfWS should be designed to</p> <ul style="list-style-type: none"> Enhance the positive contribution that woodlands make to Wales' landscapes, and recognise the cultural value of ancient and native woods, veteran trees and hedgerows Promote wider application of the UKFS Forest & Archaeology Guidelines |
| Material assets (consumption and waste) | The way resources (including woodland resources, fuel and chemicals) are used needs to be made more sustainable | <p>The WfWS should be designed to</p> <ul style="list-style-type: none"> Protect Wales' woodland resource against growing threats of climate change, invasive species, pests and diseases Expand the area of woodland managed to UKFS Encourage the use of timber as a sustainable renewable material, particularly making better use of the Welsh hardwood resource and promoting timber use in the construction industry Collect more information about individual trees (including veterans) to help plan their better protection Promote efficient use of resources such as fuel and chemicals and minimisation of waste. |

Section 3: Assessment of WfWS and its alternatives

3.1 Environmental protection objectives for the assessment

The core of this Strategic Environmental Assessment is that the objectives of the WfWS strategy are compared to a set of environmental protection objectives (a.k.a. SEA objectives) to look for areas of conflict.

We have identified these SEA objectives by:

1. examining the environmental objectives contained within key related plans, programmes and environmental strategies, particularly
 - The *Wales Environment Strategy*
 - The Sustainable Development Action Plan
 - The Wales Rural Development Plan 2007-2013

These plans already incorporate international commitments to environmental protection.

2. synthesising these objectives, and tailoring them so that they are relevant to the Welsh forestry sector.
3. for each SEA objective, developing questions to aid the assessment.

The refined list of SEA objectives is set out in Table 3.1.

Sections 3.3 and 3.4 identify the likely significant positive or negative effects of the proposed WfWS and its alternatives on the relevant SEA objectives (including direct, indirect, short, medium and long-term permanent and temporary effects).

Determination of the significance of each potential effect took into account the following criteria:

- spatial extent;
- magnitude;
- sensitivity of the receiving environment;
- duration and frequency; and
- reversibility.

Using this information, in broad terms, impacts have been classified as either beneficial or adverse, with the descriptor of 'minor', 'major' or 'neutral' used to denote whether the impact is significant or not significant based on particular criteria. The criteria are presented in Table 3.2

Table 3.1 List of environmental protection objectives used for the SEA

Objectives highlighted in bold are those where forestry can make a significant contribution (as identified in the *Wales Environment Strategy*)

| | SEA objective | Questions to ask | Source |
|-------------------------------|---|---|--|
| BIODIVERSITY, FLORA AND FAUNA | The loss of biodiversity has been halted and we can see a definite recovery. | Does the WfWS objective: <ul style="list-style-type: none"> - help to halt the loss of biodiversity and promote recovery in the number, range and genetic diversity of protected species? - help to enhance and protect species without statutory protection? - help Wales meeting woodland habitat BAP targets? - enhance the quality and number of non-woodland natural and semi-natural habitats? - avoid damage and adverse impacts to Priority Woodland Habitats in Wales (including damage from disease, deer, grey squirrels, invasive species and impacts of climate change)? - avoid damage and adverse impacts to other Priority Habitats in Wales within or adjacent to woodland? - promote consideration of biodiversity in decision-making frameworks relating to woodland planning and management? | WES outcome 19 (questions based on RDP SEA and tailored to forestry) |
| | Sites of international, Welsh and local importance are in favourable condition | Does the WfWS objective help to improve the condition of special sites to support the species and habitats for which they have been identified? | WES outcome 21 |
| | The wider environment is more favourable to biodiversity | Does the WfWS objective promote increased extent and connectivity / interconnectivity of habitats where not causing other fragmentation? | WES outcome 20 |
| SOIL, WATER AND AIR | Soil is managed to safeguard its ability to provide important ecosystem services | Does the WfWS objective promote sustainable soil management, including: <ul style="list-style-type: none"> - protecting soil carbon and soil structure, particularly in peatland soils? - minimising and reversing soil erosion, compaction, sealing, acidification and eutrophication associated with poor forestry practices? - avoiding accumulation of harmful substances in soils? | WES outcome 16 (questions from RDP SEA and tailored for forestry) |
| | The quality of our groundwater, rivers, lakes and coastal waters is maintained and enhanced | Does the WfWS objective help Wales to comply with 'good status' under the Water Framework Directive by <ul style="list-style-type: none"> - minimising contributions to water pollution (chemical or turbidity)? - Preventing deterioration of, and promoting protection and enhancement of the ecological status of aquatic ecosystems? - reducing inappropriate woodland cover in critical areas at risk from acidification? - promoting integration of forestry planning with river basin management planning? | WES outcome 35 (questions tailored to forestry) |
| | Diffuse pollution is better understood and action is being taken to reduce and manage diffuse pollution | Does the WfWS objective help Wales to comply with 'good status' under the Water Framework Directive and to comply with the Nitrates Directive through: <ul style="list-style-type: none"> - helping to manage diffuse pollution from agriculture? - helping to manage run-off in urban areas? | WES outcome 36 |
| | Appropriate measures in place to manage risk of flooding from rivers | Does the WfWS objective include measures to reduce flood risk from rivers? | WES outcome 31 |
| | Water resources are managed sustainably | Will the WfWS objective lead to a change in the amount of water available to use in a catchment, taking into consideration the amount of water available at different points in the year? | WES outcome 13 |
| | Reduced air pollution leads to increased life expectancy and ecological protection | Does the WfWS promote access to woodland recreation that does not require car use? Does the WfWS objective help reduce the air quality impacts of timber transport? Does the WfWS objective help to maximise the role of woodlands to improve air quality, particularly in urban areas? | WES outcome 33 |



| | SEA objective | Questions to ask | Source |
|-----------------------------|--|---|---|
| CLIMATIC FACTORS | Greenhouse gas emissions are minimised | Does the WfWS objective help to increase the use of renewable / low carbon energy consistent with wider environmental and rural objectives? Will the WfWS objective help Wales meet target of 20% cut in ghg emissions by 2020 from 2000 baseline? Does the WfWS objective enhance the <i>net</i> contribution of woodland and forestry to the carbon equation (sequestration, protection of carbon sinks, and offsetting of ghg emissions)? | WES Outcome 7 (questions based on WES, RDP SEA. Question 3 tailored to forestry sector) |
| | Wales has improved resilience to the impacts of climate change | Does the WfWS objective include measures to enable Wales to respond and adapt to: <ul style="list-style-type: none"> - hotter average temperatures (and more extremely hot days, and milder winters)? - summer water shortages and low river flows? - increasing thermal discomfort buildings and health problems in summer - increase in winter rainfall and intense rainfall? - increase in growing season? - increase in river flooding and erosion? - increased pressure on sewer systems? - increase in winter storm damage? - Habitat and species loss, e.g. wetlands and uplands? | WES Outcome 8 (questions based on WES and RDP SEA) |
| HUMAN HEALTH AND WELL-BEING | There is sustainable, widespread and equitable access to the countryside | Does the WfWS objective: <ul style="list-style-type: none"> - increase opportunities for access to the countryside and outdoor recreation activities for those living in, as well as for those visiting, Wales? - recognise the need for a balance between tranquil areas and areas supporting larger numbers of people and a range of activities, whilst discouraging damaging access? - promote equality of opportunity in physical access by identifying and removing inappropriate barriers to access? Does the WfWS objective promote: <ul style="list-style-type: none"> - Promote healthy living and reduce health inequalities - increased activity levels, particularly in areas of health deprivation, and across equality and diversity groups? - access to woodlands (incl. new woodlands) in and around urban areas? | WES outcome 29 (questions based on WES and Draft One Wales: One Planet) |
| | The number of people choosing to walk or cycle as a means of transport is increasing | Does the WfWS objective improve <ul style="list-style-type: none"> - 'walkability' in urban areas to encourage walking and cycling as a means of transport? - 'walkability' in rural areas? | WES outcome 30 |
| LANDSCAPE /HERITAGE | The quality and diversity of the natural and historic character of our landscape is maintained and enhanced. | Does the WfWS objective help to avoid damaging practices, and to conserve and enhance: <ul style="list-style-type: none"> - the Welsh landscape character in statutory and designated areas (3 national parks, 5 AONBs, 36 outstanding historic landscape areas, 22 special historic landscape areas)? This may require restructuring of existing woodlands. - the Welsh landscape character in urban and lowland areas? This may require restructuring of existing woodlands. - scheduled ancient monuments and historic parks and gardens? - protected earth science sites, RIGS and geological SSSIs? | WES outcome 23 |
| MATERIAL ASSETS | Timber and woodland resources are managed sustainably | Does the WfWS promote the sustainably management of Wales' woodland and tree resource? | Forestry specific outcome |
| | The use of resources, (incl. fuel & chemicals) and the creation of waste is minimised. | Does the WfWS objective encourage the production of goods from sustainable raw materials and recycled materials? Will the WfWS objective promote efficient use of resources such as fuel and chemicals? Including by individual operators? Does the WfWS objective promote minimisation of waste during woodland management, harvesting, transport and processing? | RDP SEA Objective (questions based on WES) |
| | The use of alternative materials is maximised where possible in the construction industry | Will the WfWS promote the use of wood as an alternative to steel and concrete in the construction industry? | WES outcome 18 (question tailored to forestry sector) |

Table 3.2 Significance Criteria Used in the Assessment of Impacts

| Score | Description |
|-----------------------|--|
| Major Positive ++ | The option/theme/measure (hereafter referred to as 'the option') is very likely to lead to a significant opportunity / improvement, or a series of long-term improvements, leading to large-scale and permanent benefits to the SEA objective being appraised. A major positive effect is also likely to have cumulative and indirect beneficial impact and / or improve conditions outside the specific scheme area. |
| Minor Positive + | The option is likely to lead to moderate improvement in both the short and the long term, leading to large-scale temporary or medium-scale permanent benefits to the objective being assessed. Even where beneficial effects are felt to be temporary, they should not be easily reversible (to detriment of objective) in the long-term. |
| Neutral o | The option is unlikely to have any beneficial or negative impact / effect on the objective being assessed in either the short, or long term. Neutral scoring should only be used where it is very likely that the effect will be neither positive, nor negative. A neutral score is not the same as 'uncertain', where an appraiser is not sure if an effect is likely to be positive or negative, or 'mixed', where the appraiser feels that the effects are likely to be both positive and negative (see below for more detail). |
| Minor Negative - | The option is likely to lead to moderate damage / loss in both short and long-term, leading to large-scale temporary, or medium scale permanent negative impact on the objective. The option may also have limited cumulative and indirect detrimental impact and / or limited degradation of conditions outside the specific policy or project area. It is also likely that it will be possible to mitigate or reverse a minor negative effect through policy or project intervention. |
| Major Negative -- | The option is likely to lead to a significant or severe damage / loss, or series of long-term negative effects, leading to large-scale and permanent negative impacts on the SEA objective being assessed. The option may also have significant cumulative and indirect detrimental impact and / or degrade conditions outside the specific scheme area – i.e. will have negative transboundary effects. The option is likely to threaten environmental thresholds / capacities in areas already under threat. The detrimental effects of the scheme / measure will be hard to reverse and are unlikely to be easily mitigated through policy or project intervention. Any damage or detrimental effect in or to environmentally sensitive areas, issues or landscapes which are recognised and / or protected regionally, nationally or internationally should be scored as a major adverse impact. |
| Mixed + +/- or +/- | The effect is likely to be a combination of beneficial and detrimental effects, particularly where effects are considered on sub-issues, areas or criterion. Mixed effects will be hard to predict, but could be significant in the long-term, or when taken with other effects (cumulative). |
| Indeterminable ? | The effect of the option is not known, or is too unpredictable to assign a conclusive score. The appraiser is not sure of the effect. This may be the case where a scheme/measure covers a range of issues, or where the manner in which a scheme/measure is implemented will have a material impact on the effects it will have. |

Source – Adapted from the Rural Development Plan SEA

3.2 Alternatives to the WfWS

Alongside the assessment of the WfWS itself, four alternative scenarios were also developed and evaluated:

- Scenario 1: Maximising protection and enhancement of natural and cultural heritage
- Scenario 2: Maximising community involvement and local economic development
- Scenario 3: Maximising timber production and climate change mitigation
- Scenario 4: No revision to existing WfWS

All four options were developed with the provisos that they:

- (a) conform to the UK Forestry Standard,
- (b) are affordable,
- (c) meet statutory obligations and
- (d) seek to contribute to the Welsh policy agenda.

We selected these alternatives to show how there could be different balances between environmental (Scenario 1), social (Scenario 2) and economic (Scenario 3) policy aims, and to illustrate the need for a revision of the WfWS (Scenario 4). [Appendix C](#) describes the scenarios in detail.

3.3 Broad assessment of the alternatives to the WfWS

Scenario 1: Maximising protection and enhancement of natural and cultural heritage

In this scenario, Welsh Assembly Government policy has a strong emphasis on enhancing biodiversity, cultural heritage and landscape, and on promoting high standards of environmental stewardship. There would be a major expansion of native woodland and major programmes to improve the ecological condition of woodlands and restore ancient woodlands, historic landscapes and sites. Other activities in woodlands, such as recreation or timber harvest would only be permitted where environmental sensitivities allow. Our assessment showed that this scenario would deliver major benefits for biodiversity, and landscape, and modest gains in terms of soil protection, improved water quality, and flood risk management. However we found that this scenario would fail to deliver on Government goals to reduce greenhouse gas emissions, and to increase accessibility to greenspace. It would also fail to deliver on Government economic and rural development priorities (not considered within the SEA).

Scenario 2: Maximising community involvement and local economic development

In this scenario, woodland owners are only required to meet minimum environmental standards. Instead Welsh Assembly Government policy has a strong emphasis on enhancing recreation, landscape, community involvement and the use of woods by local businesses, and Government support for growing timber is withdrawn. Our assessment found that this scenario would be a major risk to the woodlands as it does not include any

actions to improve the health and resilience of woodlands to climate change. It would also be a major risk to biodiversity, as it fails to respond to major current and upcoming threats to biodiversity, such as climate change, habitat fragmentation, pests and invasive species. A more minor threat of Scenario 2 is that increased visitor traffic and local enterprise activity in woodlands would lead directly to damage to biodiversity. This scenario also failed to deliver on Government goals to reduce greenhouse gas emissions and did not deliver any actions to limit the impacts of increased flooding.

Scenario 3: Maximising timber production and climate change mitigation

In this scenario, woodland owners are again required only to meet minimum environmental standards. Welsh Assembly Government policy places a strong emphasis instead on timber production and reducing greenhouse gas emissions. Our assessment found that this scenario would deliver important gains for reducing greenhouse gas emissions. However, it also represented moderate risks to biodiversity, and some increased of environmental damage risks from more intensive forestry operations. It might also work to reduce the accessibility of woodlands to the public and might risk damage to landscape and heritage features. to accessible greenspace, landscape and cultural heritage.

Scenario 4: No revision to existing WfWS

Our assessment showed that this scenario would provide benefits across several issues but represented a risk to biodiversity since climate change was not considered, and failed to deliver on Government goals to improve water and air quality and reduce the risk of flooding. It also does not acknowledge the role of timber in offsetting carbon emissions. Neither does it acknowledge the importance of improving the health and resilience of woodlands in the face of climate change (representing a reasonable risk of environmental damage), although it does mention reducing habitat fragmentation which would be beneficial to biodiversity. It also does not include actions to use woodlands to reduce flood risk or cool urban temperatures. There is also no focus on urban woodlands as a priority for improving access and thereby creating more routes for walking or cycling to work, and this scenario is likely to be neutral in this area.

Examination of the alternatives to the proposed WfWS underlined the importance of taking a balanced approach, avoiding promoting one specific policy aim to the significant detriment of others. It was also clear that a revision of the existing WfWS was necessary in order to address issues such as climate change, flood risk, and water quality.

3.4 Detailed assessment of the WfWS

The WfWS was assessed following the framework set out in Appendix D. This assessment was undertaken on an outcome by outcome basis, looking at each theme of the SEA objectives in turn.

The assessment process and environmental report has found that the proposed WfWS will have a largely positive effect on SEA objectives. The following paragraphs summarise the results of the assessment, highlighting that in many cases, the WfWS is likely to result in positive environmental effects. There were, however, a number of policy areas where the

potential for adverse effects was identified. Italic text is used in the following paragraphs to indicate where the issue has been addressed through the development of the WfWS.

(a) Biodiversity, flora and fauna

Most of the policies within the proposed WfWS are broadly supportive of biodiversity, flora and fauna, particularly in relation to safeguarding and enhancing significant sites and habitats. The proposed WfWS has the potential to make an important contribution to protecting and enhancing woodland biodiversity in Wales. It prioritises native woodland expansion, improving habitat connectivity, and ensuring that woodland ecosystems are resilient to climate change. This is tempered only moderately by objectives to increase visitor traffic. Mitigation and avoidance of risks to biodiversity could be managed through appropriate timing and zoning on sensitive sites.

There is always the potential for environmental damage from poor standards of forestry practice (i.e. those not meeting UKFS) although the Environmental Liability Directive offers some protection as it makes operators financially liable for threats of or actual damage..

However all objectives relating to timber production are framed within the proviso that this management is to the UKFS and therefore considers biodiversity. Indeed, in many cases, some degree of management for timber will be beneficial.

Overall we could expect the proposals to make a significant positive contribution.

(b) Soil, water and air

The proposed WfWS has high standards of environmental stewardship as a priority, and emphasises the importance of ensuring wide application of the UKFS soil and water guidelines. The strategy includes using woodlands and trees as solutions to soil, water and air problems. We anticipate that the strategy will result in modest gains in soil protection and water quality in Wales (not major gains, since forestry is already a comparatively low-impact land use). It also offers potential for helping to reduce flood risk. Soil and water objectives are unlikely to be compromised to any significant extent by other objectives of the strategy. However, as above, there is always the potential for environmental damage from poor standards of forestry practice (i.e. those not meeting UKFS). *Risks of environmental damage from poor standards of forestry operations should be minimised by ensuring wide application of the UKFS and associated guidelines, and appropriate application of the Environmental Liability Directive, and the Environmental Impact Assessment regulations where afforestation or deforestation is planned.*

The plan was assessed as making a minor positive contribution to air quality through the promotion of more woodlands and trees in urban areas.

(c) Climatic factors

Climate change objectives are positively served by the proposed strategy. Adapting existing woodlands to be more resilient to climate change, and expanding and improving the native woodland resource are important priorities. The strategy will make modest contributions to targets to reduce greenhouse gas emissions in Wales, by protecting

existing carbon sinks and promoting the use of timber and woodfuel as substitutes for fossil-fuel intensive materials. Greater use of homegrown timber will mitigate against inappropriate forest exploitation elsewhere in the world. Because timber production is necessarily 'tempered' by other environmental and social goals the contribution to emissions reduction is somewhat smaller than it might otherwise have been. The strategy however does include important actions to mitigate the impacts of climate change on woodland habitats and species, to manage flood risk, cool urban temperatures, and use woodlands to reduce the risk of soil and pollutant transport during storm events.

(d) Population and human health

A positive overall effect will also be produced in relation to population and human health objectives, through improvements to quality of life as a result of the provision of high quality environments and recreation facilities. The proposed WfWS does not contain any proposals that represent a risk to human health, and contains proposals to enhance the quantity and quality of access to woodlands to enable recreation, sport and relaxation. The strategy encourages a focus on areas of health deprivation, and on urban areas where better access could encourage people to walk or cycle

(e) Landscape and cultural heritage

There is a positive general relationship between the plan and landscape objectives. The proposed WfWS has the protection and enhancement of both landscape and heritage features as a high priority, including the protection of ancient woodland and individual and veteran trees. There are few, if any, outcomes that would be likely to adversely affect landscape and heritage, particularly due to the commitment to reduce reliance on clearfell in areas of productive forestry. We expect it to make an important contribution to these issues.

As mentioned above, there is always the potential for environmental damage from poor standards of forestry practice (i.e. those not meeting UKFS). *Risks of damage to landscape and heritage features from poor standards of forestry operations should be minimised by ensuring wide application of the UKFS and associated.*

(f) Material assets

In terms of material assets, the strategy will produce positive effects on resource consumption. The proposed WfWS has sustainable management of woodlands and trees as an essential precursor to strategy delivery. It also significantly encourages greater harvesting of Welsh timber as an outcome. While this implies greater resource (fuel) use, the use of this timber as a sustainable (and local rather than imported) renewable resource would be an important net benefit to Wales. This is particularly the case if this timber is used in construction in place of more energy-intensive non-renewable resources such as concrete and steel.

(g) Cumulative impacts

The matrix in Appendix D5 was used to identify potential cumulative impacts on the environment of the strategy outcomes. Four potential areas were identified, although none of them were considered to pose a significant risk of environmental damage:

- Risk of cumulative local damage to soil and biodiversity from proposals to increase the recreational use of woodlands as well as to increase the amount of forest operations activity to harvest timber;
- Risk of cumulative increases in greenhouse gas emissions from proposals to increase visitor traffic as well as to increase the amount of forest operations activity to harvest timber;
- Risk of cumulative environmental damage from poor standards of forest operations, arising from several proposals to increase the amount of forest operations activity;
- Risk of cumulative reductions in accessibility of woodlands to the public due to closures during woodland operations.

Section 4: Mitigation measures and monitoring

4.1 Mitigation measures

As indicated above, no major negative impacts were identified in the assessment of the WfWS. Many of the potential negative effects of the WfWS on SEA objectives have been incorporated into the proposed strategy during its development. However, the assessment did raise a number of issues that should be given high priority during the implementation of the strategy in order to minimise any risk of damage and enhance the environment.

Following the publication of the revised WfWS, FCW will, on behalf of WAG, be developing a number of forestry policy positions to develop the detail of the strategy further. The following measures are suggested for inclusion in these policy positions to prevent or alleviate the negative effects indicated by the assessment process:

- Ensure as far as possible that forest operations in Wales comply to the UK Forest Standard and its accompanying guidelines (particularly the guidelines relating to biodiversity, soil, water, heritage and climate change).
- Increase the area of sustainably managed woodland
- Take significant measures to limit the impact of climate change on both native woodland, woodland species and non-native woodland. This to include significant native woodland expansion, and in particular to deal with the high degree of fragmentation in the native woodland resource.
- Take significant steps to ensure that forest cover and its management contributes to improving water quality and does not exacerbate acidification in the uplands.

- Deal adequately with the threats to woodlands, including deer, invasive species and pests and diseases.
- Ensure adequate (temporal and spatial) zonation so that visitor traffic or forest operations do not damage sites of international, Welsh or local importance.
- Focus access improvements on areas that will help people make journeys on foot or by bicycle instead of by car.
- Consideration must be given to the European Landscape Convention.
- Review existing procedures for assessing the environmental impacts of Forest Design Plans (for the Assembly Woodland Estate) and Woodland Management Plans (for other woodlands receiving public money) to ensure that these are adequate. Particular care must be taken to assess all plans that relate to woodlands within or adjacent to European designated sites (SACs, SPAs and Ramsar sites), or operations that might affect European sites further away.
- Review existing procedures for assessing the impacts of forest plans and operations on protected species to ensure that they are adequate.
- Develop a recognised Environmental Management System for FC Wales together with a sustainable procurement policy in order to help drive down the greenhouse gas emissions for the forestry sector.

4.2 Monitoring programme

The proposed WfWS contains within it an outline of a monitoring framework, and more detail is given in Appendix E. The indicators monitor the state and extent of the woodland and tree resource in Wales and cover social, environmental and economic aspects of forestry. 17 of the 23 indicators are relevant for measuring the environmental impact of the strategy as it is defined in this SEA. These are shaded in dark grey in Appendix E. This assessment found that this monitoring framework was adequate, but makes the following suggestions:

- Ensure that acidification is adequately represented in the Water Quality indicator.
- Ensure that the patch size of native woodlands is adequately covered in the Woodlands and Trees indicator.
- Ensure that damage due to squirrels, deer and rhododendron is included in the Tree Health and Resilience indicator.
- Ensure that FCW corporate monitoring records instances of environmental damage due to poor forestry practice.
- Ensure that the Accessibility or Recreation indicators looks also at *walkability* in woodlands and/or number of woodland visitors using woodland to get to work.

There is also a need for a piece of research to identify the area of woodland (including the area of managed woodland)