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Llywodraeth Cymru  
Welsh Government

Welsh Government  
Consultation Document

# Draft Grey Squirrel Management Action Plan for Wales

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Action required: Responses by 21 February 2018

Mae'r ddogfen yma hefyd ar gael yn Gymraeg.  
This document is also available in Welsh.

**Overview**

Grey squirrel are a significant invasive non-native species (INNS) in Wales, negatively impacting on woodland and wider biodiversity. This consultation is to gather views on a draft grey squirrel management action plan for Wales.

**How to respond**

Please respond by completing the questionnaire either on-line or by sending it to

[ForestryPolicy@gov.wales](mailto:ForestryPolicy@gov.wales)

Or by post to

Forestry Resources Policy Branch,  
Rhodfa Padarn,  
Llanbadarn Fawr,  
Aberystwyth,  
SY23 3UR

**Further information and related documents**

**Large print, Braille and alternative language versions of this document are available on request.**

A summary report of the pre-consultation stakeholder workshop held on 6 July 2017 is available in support of this consultation – see consultation web page.

**Contact details**

For further information:

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**Data protection**

How the views and information you give us will be used

Any response you send us will be seen in full by Welsh Government staff dealing with the issues which this consultation is about. It may also be seen by other

Welsh Government staff to help them plan future consultations.

The Welsh Government intends to publish a summary of the responses to this document. We may also publish responses in full. Normally, the name and address (or part of the address) of the person or organisation who sent the response are published with the response. This helps to show that the consultation was carried out properly. If you do not want your name or address published, please tell us this in writing when you send your response. We will then blank them out.

Names or addresses we blank out might still get published later, though we do not think this would happen very often. The Freedom of Information Act 2000 and the Environmental Information Regulations 2004 allow the public to ask to see information held by many public bodies, including the Welsh Government. This includes information which has not been published. However, the law also allows us to withhold information in some circumstances. If anyone asks to see information we have withheld, we will have to decide whether to release it or not. If someone has asked for their name and address not to be published, that is an important fact we would take into account. However, there might sometimes be important reasons why we would have to reveal someone's name and address, even though they have asked for them not to be published. We would get in touch with the person and ask their views before we finally decided to reveal the information.

## Summary

The purpose of this consultation is to seek views on the draft grey squirrel management action plan for Wales, which has been produced jointly by Welsh Government (WG) and Natural Resources Wales (NRW) with input from a working group of stakeholders.

Grey squirrel are a significant and widely spread invasive non-native species (INNS) in Wales, adversely affecting red squirrel populations, and woodlands and their associated benefits. Under Section 14 of the Wildlife and Countryside Act (1981) it is illegal to release grey squirrel into the wild or allow them to escape, even if taken into captivity for welfare reasons.

The Welsh Government's Woodlands for Wales Strategy outlines a commitment to develop a strategic and targeted approach to help tackle threats from non-native invasive species, including grey squirrel. Additionally, article 19 of the EU IAS Regulation<sup>1</sup> requires Member States to put in place effective and proportionate management measures for the eradication, control or containment of listed species. Grey squirrel are on the first Species of Union Concern list which came into force on 3<sup>rd</sup> August 2016. Member States have 18 months from this date to put management measures in place.

The draft plan sets out the case for a management plan, outlining known evidence on the impact of grey squirrel on biodiversity, woodlands and climate change. It proposes a strategic approach to managing grey squirrel populations, associated limitations and the management options – lethal and alternative - for doing so. It also sets out draft actions that could be delivered through a partnership approach between the public, private and voluntary sectors to encourage and assist in grey squirrel population management. It does **not** propose a pan-Wales cull or the eradication of grey squirrel from Wales.

A stakeholder workshop event was held in July 2017 to enable further input into the development of the draft plan prior to this consultation. A summary of the event is available for information on the consultation webpages.

Your views on the draft grey squirrel management action plan are welcome and a response form is provided on the consultation webpages.

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<sup>1</sup> Article 19 of the EU Regulation 1143/2014 on the Prevention and Management of the Introduction and Spread of Invasive Alien Species (the IAS Regulation)

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# 1. Introduction

## Need for a Management Action Plan

Grey squirrels (*Sciurus carolinensis*) are a significant invasive non-native species (INNS) in Wales, having spread rapidly after their introduction to Britain in the late 1800's. The grey squirrel out-competes red squirrels for food, and also carries an infection known as 'squirrel pox virus' which is lethal to red squirrels. Grey squirrels can have a considerable impact on biodiversity and woodland ecosystems, as well as causing damage to both broadleaved and conifer woodland. The economic cost of grey squirrel management and damage to the GB forestry sector is estimated to be £6 million per year, and in Wales, £914,500 per year<sup>2</sup>. This rises to an annual cost of £14 million per year to the British economy where costs to other sectors, such as construction, development and infrastructure are included.

There is a range of activity currently underway in Wales, from grey squirrel management to benefit red squirrel conservation areas, to co-funding of research into grey squirrel management methods and the zoonotic risk this species may pose to native mammals. However a more co-ordinated approach to grey squirrel management would enable scarce resources to be maximised and provide a focus for future funding bids. Such an approach would serve to meet the following obligations and frameworks:-

- Welsh Government (WG) Woodlands for Wales strategy
- Invasive Alien Species (IAS) regulations
- Conservation plan for Red Squirrels in Wales
- UK Squirrel Accord

*The Welsh Government Woodlands for Wales (WfW) Strategy* sets out a 50-year strategy for woodlands and trees, and is supported by an action plan. The Strategy outlines a number of commitments, which includes creating new native/ mixed woodland; encouraging woodland management and habitat restoration; and improving woodland connectivity. Such action aims to increase the environmental quality, health and resilience of the Welsh woodland resource, and the ecosystem services they provide. However woodlands are vulnerable to damage from grey squirrels which threaten tree survival and timber quality, which can impact on biodiversity and woodland resilience. Many of the objectives of the WfW Strategy will be more difficult to deliver unless the negative impacts of grey squirrel are properly addressed.

Responses to the WfW strategy consultation during its development indicated that management of grey squirrel was essential to the delivery of the various WfW policies. In the WfW strategy, Welsh Government made a commitment to develop a strategic and targeted approach to help tackle threats from non-native invasive species, including grey squirrel. This draft Grey Squirrel Management Action Plan aims to meet this commitment.

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<sup>2</sup> CABI - Williams et al (2010) – Economic cost of Invasive Non-native species on Great Britain

*The EU Regulation (EU) No 1143/2014 on the Prevention and Management of the Introduction and Spread of Invasive Alien Species<sup>3</sup> (the IAS Regulation)* entered into force on 1 January 2015. The IAS Regulation requires both a list of invasive alien species of Union concern be drawn up, and Member States to put in place management measures for the eradication, control or containment of listed species. Such management measures must be proportionate to the impact on the environment and appropriate to the specific circumstances of the particular Member State. Grey squirrels are on the first Species of Union Concern list, which came into force on 3 August 2016.

Member States, such as the UK, have 18 months to put in place effective and proportionate management measures for listed species, including grey squirrels. Measures should be based on an analysis of costs and benefits, and prioritised based on the risk evaluation and their cost effectiveness. Monitoring is also required of the effectiveness of the measures put in place. It is unlikely that Brexit negotiations will affect this requirement; hence this draft Grey Squirrel Management Action Plan addresses the requirements of this Regulation in Wales.

*A Conservation Plan for Red Squirrels in Wales* is already in existence. It was prepared by the Wales Squirrel Forum in consultation with the Wales Squirrel Partnership in 2009 to provide a framework for the conservation and recovery of red squirrel in Wales, and is currently being updated. It provides a foundation for action in Wales to protect and enhance the three red squirrel focal sites – Anglesey, Clocaenog and mid-Wales – and maintain breeding populations of red squirrels. The conservation plan for red squirrels includes elements of grey squirrel management within the focal sites and adjacent buffer areas, owing to the combined impact of competition and disease on red squirrel populations.

This draft Grey Squirrel Management Action Plan encompasses a wider remit in recognition of the impact of grey squirrels on woodland as a habitat and as a natural resource, as well meeting WG commitments on IAS as outlined above. Work under this action plan will contribute to the delivery of the revised Red Squirrel Conservation Plan for Wales (RSCPW) and vice versa. However the two plans remain separate owing to the wide range of problems caused by grey squirrels.

*The UK Squirrel Accord* draws together the many organisations interested in the issues surrounding both red and grey squirrels under a common aim. The Accord builds on national efforts by working across borders to provide a focus for shared action at the UK level. The long term vision of the Accord is:-

- Our native red squirrel populations are secure and have expanded beyond their current strongholds
- Our woodlands are flourishing and can continue to deliver multiple benefits for future generations.

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<sup>3</sup> The term ‘Invasive non-native species’ (INNS) is the equivalent of ‘alien species’ as used by the Convention on Biological Diversity (CBD) and are broadly defined as species whose introduction and/or spread threaten biological diversity or have other unforeseen impacts.

The 32 signatories to this Accord, which include Welsh Government and Natural Resources Wales (NRW), recognise the importance of this work and support the following long term aim: Red squirrel populations protected and thriving and greys controlled, through targeted and sustained action. It is also recognised that this must be done through a broad and dynamic partnership between Government, private and voluntary sectors. This draft Grey Squirrel Management Action Plan sets out actions in Wales which will contribute to the Accord's aim and recognises the partnership approach necessary for the delivery of management actions.

## Grey Squirrel Management Action Plan for Wales

### Aim

The aim of this draft management action plan is to develop a more integrated and effective approach to grey squirrel management in Wales, making best use of resources to manage grey squirrel populations, and meet obligations under the IAS Regulation. This document sets out objectives and actions to provide the basis of a Grey Squirrel Management Action Plan for Wales.

### Objectives

It is important to improve the health and resilience of the Welsh woodland resource and the benefits it provides to present and future generations. Grey squirrel is known to have a negative impact on the social, economic and environmental benefits of woodlands and trees.

The objective of this draft management action plan is to manage grey squirrel populations in order to:-

- Reduce the impact on red squirrel populations
- Reduce the impact on tree and woodland ecosystems and the services they provide, including timber production.

This draft grey squirrel management action plan fully supports the Red Squirrel Conservation Plan for Wales, the updated 2017 objectives of which are to maintain and enhance the range of the red squirrel within the Wales Focal Sites; and to maintain and enhance the size of the red squirrel population within the Focal Sites to ensure robust and resilient populations. It is important that the plans for both red and grey squirrels compliment each other in order to maximise the benefit to red squirrel conservation and to promote existing best practice developed for grey squirrel management.

It is **not** the objective of this draft management action plan to *eradicate* grey squirrels from Wales. This is not practical or affordable owing to grey squirrel population levels. The IAS Regulations allow for invasive non-native species to be managed rather than eradicated where such species are already widely established. This draft



management action plan seeks to encourage the management of grey squirrel populations where it is feasible to do so and where the benefits are greatest.

## **2. Other relevant Welsh Government strategies and policies**

In addition to the key commitments already outlined, a number of Welsh Government strategies, policies and wider legislation were reviewed in the preparation of this draft management action plan. These include:-

- Wellbeing of Future Generations (Wales) Act 2015
- The Environment (Wales) Act 2016 and Natural Resources Policy
- Climate Change Strategy for Wales (2010)
- Nature Recovery Action Plan for Wales 2015
- LIFE Natura 2000 Programme After-LIFE Conservation Plan and the Prioritised Action Framework for Wales
- GB Invasive Non-Native Species (INNS) Strategy
- Wales Biodiversity Partnership INNS Group
- Forestry Act 1967

Appendix 1 sets out how this draft management action plan is aligned to and will contribute to the delivery of these.

## **3. Need for Action**

### **Evidence of Impact**

The negative impact of grey squirrels has been significant both in terms of biodiversity and the forest industry as well as threatening agriculture and the urban environment. There are substantial economic consequences associated with these impacts both as a result of damage and direct revenue loss and through the cost of grey squirrel management.

During the analysis for the list of Species of Union Concern, a risk assessment for grey squirrel highlighted its invasiveness, economic impact and mechanisms by which it replaces the native red squirrel, causing wide-scale extinction of the latter. It also identified that due to presence of suitable habitat, climate conditions and the invasive nature of grey squirrel there is a risk that, if introduced, grey squirrel could spread across Europe. Although grey squirrel is present in Great Britain and Ireland the main risk to the rest of Europe comes from range expansion from Italy and escapes from the pet trade.

There are no accurate population estimates for grey squirrel in the UK: in 2010, a number of sources put this at 2-3.3 million<sup>4</sup>. They are widespread in Wales apart from two red squirrel focal areas where they are managed to protect red squirrel populations and on Anglesey where they have been eradicated.

Woodland provides a variety of ecosystem benefits. Although placing a value on these can be difficult, a recent report<sup>5</sup> estimated that the annual value of ecosystem services provided by Welsh woodlands, at 2015 prices, was £108 million for carbon sequestration; £28.3 million for timber extraction; £85 million for recreation and £385 million for air quality services. Although the presence of grey squirrel is related to the decline in red squirrel populations or loss of timber value, their impact on the environment goes far wider :-

### Biodiversity

The presence of the grey squirrel has led to the loss of red squirrel populations across large parts of its natural range throughout the UK owing to direct competition for food and the spread of the squirrel pox virus. Within Wales red squirrels are now restricted to three main areas: Anglesey, where red squirrels are now also establishing in adjacent areas of Gwynedd, Clocaenog Forest in NE Wales and in the network of conifer forests in the Tywi area of mid-Wales. In the absence of the efforts of local red squirrel projects to manage grey squirrels, it is likely that the red squirrel would be close to extinction in Wales.<sup>6</sup> This is reflected in the updated Red Squirrel Conservation Plan for Wales, which focuses on managing grey squirrel in these three main areas and their surrounding buffer areas.

Grey squirrels are known to be a predator of birds' eggs and nestlings, and while there is little evidence of grey squirrels limiting bird populations, there is evidence of a possible link with nest failure for certain species<sup>7</sup>. Grey squirrels have also been implicated in local declines of hazel dormouse populations due to competition for hazelnuts, but insufficient data is currently available to support this view.

Grey squirrels can reach densities four times higher than red squirrels in some broadleaved and mixed woodlands<sup>8</sup>. They are impacting some of Wales' most important woodland sites and have been identified as management problem on eight Sites of Special Scientific Interest (SSSI), including three Special Areas of Conservation<sup>9</sup> (SAC). In total 16 SSSI management units have grey squirrels recorded as an issue, affecting for example oak tree recruitment. It is likely that the total may be much higher due to low awareness of grey squirrel damage and

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<sup>4</sup> CABI - Williams et al (2010) – Economic cost of Invasive Non-native species on Great Britain

<sup>5</sup> Forest Research – Saraev et al (2017) – Valuation of Welsh Forest Resources

<sup>6</sup> Haliwell et al (2015) Striving for success: an evaluation of local action to conserve red squirrels (*Sciurus vulgaris*) in Wales. In: Shuttleworth CM, Lurz PWW, Hayward M (eds) *Red Squirrels: Ecology, Conservation & Management in Europe*, 175-192. European Squirrel Initiative, Woodbridge, Suffolk, England

<sup>7</sup> Gurnell J, Lurz PWW, Shuttleworth CM (2016). Ecosystem impacts of an alien invader in Europe, the squirrel *Sciurus carolinensis*. In: *The grey squirrel Ecology & Management of an invasive species in Europe*, 307-326. European Squirrel Initiative.

<sup>8</sup> Gurnell J, Lurz PWW, Shuttleworth CM (2016). Ecosystem impacts of an alien invader in Europe, the squirrel *Sciurus carolinensis*. In: *The grey squirrel Ecology & Management of an invasive species in Europe*. 307-326. European Squirrel Initiative.

<sup>9</sup> Natural Resources Wales Special Sites Actions Database

confusion with deer browsing by some conservation managers. As such, grey squirrel damage has implications for the wider regeneration and sustainability of woodland habitats, and the flora and fauna associated with it.<sup>10</sup>

### Productive woodlands, tree health and other economic impacts

The impact of grey squirrel damage on the growth and subsequent value of productive timber depends on the species affected, and the quantity and location of damage on the tree. Bark stripping can cause callousing around wounds and enable fungal infections to gain entry resulting in tree death, timber staining or rot. However there is very little evidence to suggest any link between grey squirrel damage and *Phytophthora ramorum* (sudden oak death)<sup>11</sup>. Ring barking damage can result in tree death, loss of tree canopy, deformity or stem snap. In addition to whole or partial tree death, damage often results in a downgrading or loss in value of the mature tree e.g. from higher value, versatile timber to lower value firewood. A 30% loss of tree canopy through bark stripping can affect tree growth rate, timber and biomass yield.<sup>12</sup>

Susceptible species include oak, sycamore, beech and sweet chestnut, with conifer species including Norway spruce, pine and larch. Birch and Sitka spruce have also had reports of damage. Ash, which has been planted as an alternative to susceptible species owing to its relative resistance to squirrel damage, is now no longer planted in Wales due to the Chalara Ash die-back fungus<sup>13</sup>. This further reduces the options available to woodland owners considering broadleaved woodland planting.

In 2000, the cost of grey squirrel damage to the UK Timber Industry was estimated at around £10 million, at the *end* of the then current rotation of standing crops of sycamore, beech and oak at the time. A report by CABI<sup>14</sup> in 2010 estimated the total costs of grey squirrel to the British economy to be £14 million *per year*. This figure included costs of damage and grey squirrel management to the construction, development and infrastructure sectors. The cost to the Welsh forestry sector was estimated at £914,500 *per year*. As this included management costs using warfarin which has since been withdrawn, the cost to the forestry industry is now likely to be higher due to the increased cost of trapping.

Recent anecdotal evidence from the private sector<sup>15</sup> has indicated instances of severe damage to young woodland ranging from 20-100% depending on age and species, with broadleaves particularly badly hit. This can bring additional costs of replacing dead trees, or the potential loss of grant aid due to failure of the crop. In extreme cases, complete felling and replanting of woodland copses have been known where damage is such that trees cannot retain or increase in productive value. Higher levels of damage may be more acceptable in broadleaved woodland

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<sup>10</sup> Mayle et al (2007) Controlling grey squirrel damage in woodlands, FC practice note

<sup>11</sup> Forest Research website – Are grey squirrels implicated in spreading *P. ramorum*? - last updated 2012

<sup>12</sup> Mayle and Broome (2013) Changes in the impact and control of an invasive alien: the grey squirrel in Great Britain, as determined from regional surveys. *Pest Management Science* 69: 414-424.

<sup>13</sup> Chalara response for Wales (2016), Welsh Government/ Natural Resources Wales

<sup>14</sup> CABI - Williams et al (2010) – Economic cost of Invasive Non-native species on Great Britain

<sup>15</sup> Confor – collated member evidence (2016)

grown for amenity or biodiversity reasons, where the cost of grey squirrel management cannot be justified.

The reduction of economic value from affected woodland can result in discouraging owners from undertaking woodland management and creation. Evidence indicates that thinning broadleaved trees to reduce competition and enable tree growth can increase the risk of grey squirrel damage to the remaining trees.<sup>16</sup> Hence trees that are grown for quality timber will require a higher commitment to grey squirrel management. Forestry statistics show a 50% decline in hardwood timber production over the last 40 years from 48,000 down to 23,000 green tonnes in Wales<sup>17</sup>. The increase in demand for lower value firewood may help to stimulate some woodland management, but the trend for managing broadleaves for quality timber production is clearly downwards. The impact of grey squirrel damage on quality timber production places more reliance on timber imports to the UK, which accounted for 82% of all wood (produced and imported) in 2015<sup>18</sup>. Increasing production of home-grown quality timber would support sustainable management of natural resources and contribute to the well-being goal of “A globally responsible Wales” within the Wellbeing of Future Generations (Wales) Act.

Other less obvious costs to the economy attributed to grey squirrel includes damage to loft insulation and wiring. Such damage and associated costs of control was estimated at around £427,000 per year for Wales<sup>19</sup>. Another consideration is the health and safety risk of damaged trees and the associated cost of arboricultural services.

### Climate change

Producing timber of a quality that can be used in long term products ensures that the carbon removed by the growing trees is stored, often for lengthy periods. Such products are often more suitable for further re-use as recovered timber, extending the storage of carbon further. Good quality hardwood timber can be re-used many times before the timber needs to be disposed of. Damage by squirrels prevents broadleaved trees from growing to a size or quality where the timber is useful for longer term end uses such as construction. Although conifer species are less prone to damage, policies to encourage species diversity through including broadleaves in conifer sites are likely to have made these plantations more attractive to grey squirrel, reflected in increasing reports of conifer damage.<sup>20</sup> Damaged trees are frequently infected with fungal organisms which cause weakening and staining of the timber, reducing their use to mainly wood fuel, and hence reducing opportunities for long term carbon storage. This undermines the potential to substitute high energy construction materials with carbon-storing timber. The twin impacts of grey squirrel

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<sup>16</sup> Mayle et al (2009) - Influence of tree size and dominance on incidence of bark stripping by grey squirrels to oak and impact on tree growth. Forestry Vol 82

<sup>17</sup> FC Statistics – wood production and trade (2016)

<sup>18</sup> FC Statistics – trade (2016)

<sup>19</sup> Williams et al (2010) *Economic cost of Invasive Non-native species on Great Britain – Final Report*. Centre for Agriculture and Bioscience International, Wallingford, UK.

<sup>20</sup> Mayle and Broome (2013) – Changes in the impact and control of an invasive alien: the grey squirrel in Great Britain, as determined from regional surveys

on tree death and lower tree growth rate also reduces the overall ability of a woodland to lock up carbon and hence can indirectly affect the contribution of woodland to the mitigation of climate change.

Grey squirrel damage has also been found to contribute to a change in the constituent tree species within a woodland through impact on natural regeneration and vulnerable tree species. This can result in a less diverse species mix and age structure, with implications for woodland habitat resilience in response to climate change. The predicted milder winters resulting from climate change are likely to favour grey squirrel survival, and hence a rise in tree damage in future years. When coupled to an increase in pests and diseases also arising from climate change, the pressure on tree health is likely to grow. Thus, the potential for grey squirrel damage acts as a barrier to the 'future proofing' of forests and the use of new potential tree crop species that may be resistant to emerging tree pests and diseases or more suited to predicted climatic change<sup>21</sup>,

### **Implications of Inaction – a summary**

Grey squirrel populations are likely to increase in light of milder winters and the expansion of favourable broadleaved habitat.<sup>22</sup> The impacts are listed above, and the implications for inaction are as follows:-

- Red Squirrels – populations of red squirrel are likely to be lost if the current on-going programmes of grey squirrel management are not continued. This is recognised in the updated Red Squirrels Conservation Plan for Wales. This draft management action plan seeks to compliment and build on the grey squirrel management work undertaken to date.
- Designated sites –grey squirrel damage will continue to impact on the condition of woodland habitats and associated biodiversity. This could potentially undermine the delivery of the Nature Recovery Action Plan for Wales, the LIFE Natura 2000 Programme After-LIFE Conservation Plan and the Prioritised Action Framework for Wales, and could result in penalties from the European Union.
- Woodlands for Wales strategy – contributes to a number of wider WG strategies and policies, including the WG Natural Resources Policy. Grey squirrels impact on the delivery of a number of outcomes in the following strategic themes of the WfW Strategy, which in turn will affect the contribution of woodlands towards these wider WG policies:-
  - Welsh Woodlands and Trees - Impacts on tree survival, loss of growth, timber quality and end-use can discourage woodland management or new planting. Reduction in the choice of alternative

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<sup>21</sup> Shuttleworth et al. (2012). Integrating red squirrel (*Sciurus vulgaris*) habitat requirements with the management of pathogenic tree disease in commercial forests in the UK. *Forest Ecology and Management* 279: 167-175.

<sup>22</sup> Press Release March 16 – Grey squirrel numbers to increase – European Squirrel Imitative

tree species in the face of new pests and diseases, impacting on woodland resilience<sup>23</sup>.

- Responding to Climate Change – Damage affects the rate of carbon capture in both new and existing woodlands, and the potential for substitution for non-renewable materials e.g. in construction.
- A competitive and integrated Forest Sector –Damage affects the production of usable, versatile timber for processing and reduces the potential of Wales to capitalise on a demand for home-grown timber with fewer opportunities for timber processing businesses and associated employment.
- Environmental Quality –The composition and quality of designated sites, ancient woodlands, native woodlands habitats and other plantings can be impacted by grey squirrel. Reduction in the benefits provided by woodland e.g. water and soil protection.

## Cost-benefit of Management

*Timber production* - There is little data to identify the point at which grey squirrel management becomes cost-effective in relation to the end market value of the timber. This is difficult to determine, as the estimate of the final tree crop is made during the damage-vulnerable period, at least 50 years before harvest.<sup>24</sup> There are many variables that affect this, including the owners' objectives, tree species, site conditions, growth rate, end market, the level of grey squirrel populations and subsequent damage. The potential economic impact of squirrel damage on woodlands can influence the choice of species planted.

Since the withdrawal of warfarin poison, humane trapping and dispatch is the main method of management. However the labour costs of maintaining such traps over the main active period from late April to the end of July mean that costs have increased significantly. Anecdotal evidence from the private sector indicated that the costs range from £21 - £71 per hectare per year, depending on the method chosen, distances travelled and accessibility of the woodland.

Well planned and sustained grey squirrel management can make a difference. The Forestry Commission annual assessments of squirrel damage to woodlands in southern England showed that damage levels reduced from 50% to 8% following 11

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<sup>23</sup> Shuttleworth et al. (2012). Integrating red squirrel (*Sciurus vulgaris*) habitat requirements with the management of pathogenic tree disease in commercial forests in the UK. *Forest Ecology and Management* 279: 167-175.

<sup>24</sup> Mayle and Broome (2013) – Changes in the impact and control of an invasive alien: the grey squirrel in Great Britain, as determined from regional surveys.

years of annual control<sup>25</sup>. However, as many broadleaved tree species are vulnerable between the ages of 10-40 years, managing grey squirrel for quality timber objectives is a substantial commitment for the owner. This investment can also be undermined where populations resurge or management fails in a particular year. Given the geographical spread and mobility of grey squirrel, many landowners cannot justify the costs.

*Biodiversity* - The cost-benefit of grey squirrel management for biodiversity reasons such as protecting red squirrels or reducing damage to designated woodland habitats is also difficult to gauge. The eradication of grey squirrels from Anglesey between 1998 and 2015 is estimated to have cost just over £1million<sup>26</sup>. The Mid Wales Red Squirrel Partnership estimated around £14,000 was spent on grey squirrel management in 2015-16, most being volunteer time, estimated at around half of the labour cost/hour on private estates.

NRW spends between £20 – 30,000 per annum on grey squirrel management for the conservation of red squirrels on the Welsh Government Woodland Estate (WGWE). This varies depending on the availability of funding and compliments other active projects such as Red Squirrels United<sup>27</sup> and BASC Green Shoot<sup>28</sup> projects. Whenever possible, NRW also incorporates sensitive conservation management within the three red squirrel focal areas (Mid Wales, Clocaenog and Anglesey) to benefit their habitat. Longer term actions such as retaining harvestable trees, maintaining connectivity and restocking with less productive tree species to diversity habitat, can add to costs.

It should be noted that the extent of grey squirrel management, whether undertaken by volunteer groups, or private or public landowners, is dependent on funding and available resources. This can often limit the amount that can be achieved, whether for red squirrel conservation, habitat restoration or the protection of timber crops.

## 4. A strategic Approach to Management

Sect. 14 of the Wildlife and Countryside Act (1981) makes it illegal to release or allow to escape into the wild any animal which is not ordinarily resident in Great Britain and is not a regular visitor to Great Britain in a wild state, or is listed in Schedule 9 to the Act. The grey squirrel is included in Schedule 9 meaning that it is illegal to release a grey squirrel into the wild, or allow one to escape, even if it was

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<sup>25</sup> Derbridge JJ, Pepper HW, Koprowski JL (2016). Economic damage by invasive grey squirrels in Europe. (2016). In: *The grey squirrel Ecology & Management of an invasive species in Europe*, 393-405. European Squirrel Initiative.

<sup>26</sup> Derbridge JJ, Pepper HW, Koprowski JL (2016). Economic damage by invasive grey squirrels in Europe. (2016). In: *The grey squirrel Ecology & Management of an invasive species in Europe*, 393-405. European Squirrel Initiative.

<sup>27</sup> <http://dev-squirrel.pantheonsite.io>

<sup>28</sup> <https://basc.org.uk/conservation/green-shoots/>

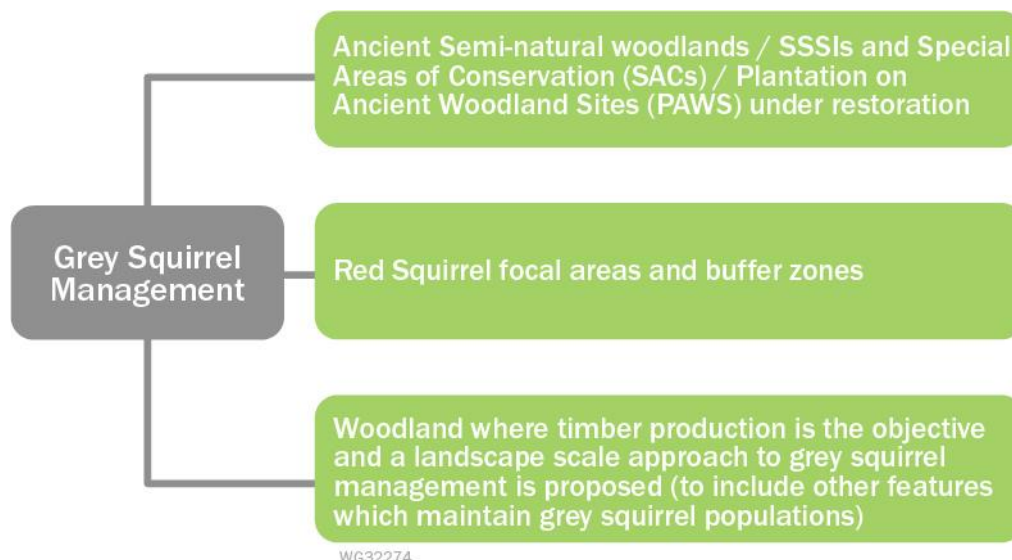
taken into captivity for welfare reasons. Under the Animal Welfare Act 2006, it is an offence to cause unnecessary suffering to an animal under a person's control (this includes animals held in cage traps). The Animal Welfare Act also places a responsibility on a person to ensure that the welfare needs of all animals under their control, are met. More recently, Article 7 of the IAS Regulation provides that invasive alien species of Union concern shall not be intentionally released into the environment.

## Targeting Resources

Owing to the widespread and prevalent nature of the grey squirrel population in Wales, any type of grey squirrel management needs to be long-term and collaborative if it is to be effective<sup>29</sup>. Grey squirrel management for the protection of red squirrel populations is effective when carried out as a continuous programme of strategic trapping, both within the core focal areas and in surrounding buffer areas. If this action were to stop, grey squirrels would recolonize these areas.<sup>30</sup>

The same applies where management is undertaken for other reasons – whether to protect a young timber crop or alleviate pressure on a woodland habitat. The decision by a landowner to control squirrels is an on-going commitment of resources and finance during the 30 years or more that the timber crop is vulnerable. The level of management needs to be relevant to the objectives of the woodlands.

At a time of reducing resources, the following categories should be targeted for grey squirrel management. These are not in any order of priority as the end decision to manage grey squirrel rests with the landowner.



<sup>29</sup> Mayle et al (2007)

<sup>30</sup> Shuttleworth et al (2016) Identifying incursion pathways, early detection responses and management actions to prevent grey squirrel range expansion; an island case study in Wales. The Grey squirrel: ecology and management of an invasive species in Europe



It is likely that the nature and availability of public funding may mean that the main focus is the protection of red squirrel populations. However there is scope for landowners to co-operate to achieve their own objectives, given adequate support through access to training, trap loan schemes and best practice. As recognised in the Red Squirrels Conservation Plan for Wales, a collaborative approach at a landscape scale is recommended to maximise effectiveness, and a project officer approach to assist in co-ordination would also contribute to success.

A high level map of vulnerable wooded areas in Wales could be developed, based on available data on age and proximity to mature woodland. This “vulnerability map” could allocate a high/ medium/ low risk score to woodlands in Wales, providing an indication of clusters of vulnerable wooded areas where a collaborative approach could be targeted. The map could also provide background evidence for groups bidding for funding when/if this becomes available.

Although individual landowners taking action on their own to control grey squirrels may not be as successful as a collaborative landscape scale approach, this should not prevent access to grant aid if this becomes available.

#### Question 1

Owing to limited resources, action for managing grey squirrel populations needs to be targeted. The categories stated above are not in order of priority as this will depend on the objectives of landowners and local groups. However, flagging these for targeting helps recognize the importance of these categories and could form the basis of further targeting in future.

Do you agree with these categories? Please give a reason for your response.

#### Question 2

A “vulnerability map” of wooded areas in Wales could be developed to help indicate where a collaborative approach to grey squirrel management could be focused.

Do you agree that this tool would assist in a collaborative and targeted approach to grey squirrel management? Please provide details of any other targeted approaches.

### **Limitations of grey squirrel management**

*Public opinion* - Grey squirrels are firmly in the public eye as being part of British wildlife. The general public perception of the grey squirrel is one of endearment; they are engaging animals and are often fed in gardens and parks. Negative public reaction to grey squirrel management can be considerable, which has acted as a disincentive to manage grey squirrel numbers by some bodies and charities.

*Population* - The grey squirrel is a frequent breeder, having two litters per year, with a typical litter size of three young. Estimated survival is around 50% per litter<sup>31</sup>. Young are ready to leave the drey at seven weeks of age. Population levels can vary according to availability of food, particularly in winter months.<sup>32</sup>

*Spread and Dispersal* - It is accepted that grey squirrels are prevalent in all parts of mainland Wales<sup>33</sup>, apart from red squirrel focal areas where management is undertaken to reduce their numbers. Dispersal routes favour woodland and river corridors, field and habitat edges, grass verges and tracks.<sup>34</sup> Knowledge of these routes can be used to target management. Habitat and food availability has been expanded as more broadleaved species have been planted. Policies that encourage diversification of conifer woodlands through broadleaved plantings, are likely to have encouraged grey squirrel encroachment.<sup>35</sup> The average rate of colonisation in GB is considered to range from 5.7 – 8.2 km/year.<sup>36</sup>

*Isolated action* - Grant assistance for grey squirrel management has been on an individual basis in the past. Efforts to manage grey squirrels can be undermined where neighbours fail to control squirrels in adjacent woods. Evidence indicates that grey squirrels will recolonize a cleared area within 6-8 weeks if adjacent uncontrolled populations are present.<sup>37</sup> Hence the lack of co-operation between woodland owners is a disincentive to manage grey squirrels, and has discouraged the planting of broadleaved woodlands for quality timber.<sup>38</sup>

*Costs of Management* – The main cost of grey squirrel management is labour – to set, check and reset traps. This is particularly relevant with the withdrawal of warfarin. The long timescale over which management is needed, coupled to uncertainty about the end value of the timber produced, acts as a disincentive to owners.

*Alternative food sources* - Where woodlands are adjacent to residential areas, efforts to trap grey squirrel are undermined by local residents providing alternative feed in gardens. The feeding of pheasants for shoots can provide an alternative food source, but is usually accompanied by management of grey squirrels.

*Costs of Eradication* - A report by CABI examined the potential for eradication of grey squirrel in the UK estimated late stage eradication costs for the UK to be £850 million over 8 years, which was considered to be conservative. The equivalent cost in Wales would be £76 million over the same period. The report acknowledged that,

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<sup>31</sup> Hayssen, V – Reproduction in grey squirrels: from anatomy to conservation. *The Grey Squirrel – Ecology and Management of an Invasive Species in Europe* (2016)

<sup>32</sup> Gurnell, J. (1996) The effects of food availability and winter weather on the dynamics of a grey squirrel population in southern England. *Journal of Applied Ecology* 33: 325-338.

<sup>33</sup> Dutton, C (2016) – *The Grey Squirrel Management Handbook*, European Squirrel Initiative

<sup>34</sup> Stevenson et al (2013) - Modelling ecological networks and dispersal in grey squirrel.

<sup>35</sup> Mayle and Broome (2013) Changes in the impact and control of an invasive alien: the grey squirrel in Great Britain, as determined from regional surveys. *Pest Management Science* 69: 414-424.

<sup>36</sup> Signorile et al (2014) Do founder size, genetic diversity and structure influence rates of expansion of North American grey squirrels in Europe? *Diversity & Distribution* DOI: 10.1111/ddi.12222

<sup>37</sup> Mayle and Broome (2013) Changes in the impact and control of an invasive alien: the grey squirrel in Great Britain, as determined from regional surveys. *Pest Management Science* 69: 414-424.

<sup>38</sup> Confor – member's comments

given the practicalities of eradication, lessons from attempts to eradicate early invasion in Italy, and the failure of previous attempts to do so in mainland UK, it may no longer be possible to eradicate grey squirrels in Britain. Despite the successful Anglesey eradication programme, the high dispersal ability, established population numbers, extended geographic border with England and the potential costs mean that **the complete eradication from Wales is currently not possible.**

*Red squirrels* - Controlling and preventing the re-establishment of grey squirrel populations within red squirrel focal sites aims to avoid competition for food and the spread of the squirrel pox virus. Although a squirrel pox vaccine is in development, such populations are likely to remain vulnerable, requiring the on-going management of grey squirrels around these areas.

## **Management options and best practice**

Raising awareness of the impacts of grey squirrels should help stimulate action but also help the wider public understand why action is necessary. It is also important that landowners assess damage levels in order to make an informed decision on grey squirrel management, and employ best practice to ensure action is effective and humane.

The level of grey squirrel management will depend on the objectives for a particular area. The recommended method<sup>39</sup> of reducing grey squirrel damage to woodlands requires an assessment of the likely level of damage<sup>40</sup>, followed by targeted management to reduce population levels to below damaging levels. This is likely to require repeated or on-going management over a number of years while the trees are vulnerable to damage. Best practice on assessing squirrel damage is available through Forest Research - [https://www.forestry.gov.uk/PDF/fcpn1.pdf/\\$FILE/fcpn1.pdf](https://www.forestry.gov.uk/PDF/fcpn1.pdf/$FILE/fcpn1.pdf)

Woodlands managed for biodiversity or amenity may not require or justify the costs of grey squirrel management. In contrast, the protection of red squirrel habitat is likely to necessitate the complete removal as far as possible, of grey squirrel on a long term basis. Therefore different objectives will influence the choice of management options and to what extent. Other influencing factors include the resources available, skills, knowledge, costs and the timescale in which the objective needs to be achieved.

There are a number of sources of advice, training and best practice on the methods of grey squirrel management. These are at Appendix 2.

### Alternative management methods

*Pine marten* – This is a native woodland carnivore with a varied diet, which can include squirrels. Although pine martens are scarce in Wales, the Vincent Wildlife Trust project has involved the licenced release in 2015 and 2016 of a small number

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<sup>39</sup> Mayle et al (2007) Controlling Grey squirrel damage to woodlands. FC Practice Note.

<sup>40</sup> Pepper (1998) Nearest Neighbour Method for Quantifying Wildlife Damage to Trees in Woodland. FC Practice Note

of pine martens to mid-Wales to reinforce remnant populations<sup>41</sup>. Evidence from Ireland suggests that the recovery of red squirrel populations in some areas is linked to return of pine martens and the subsequent decline of grey squirrel populations<sup>42</sup>. However, there is currently poor understanding of how this effect operates. Hence pine martens cannot be relied upon as an effective grey squirrel management measure.

*Forest design* - Grey squirrels are able to exploit particular woodland habitats and species mixes better than others. When managing existing woodlands or planting new areas, consideration should be given to avoiding certain tree species which are attractive to grey squirrels. This has to be balanced with the objectives of the woodland i.e. timber production or biodiversity value. Forest design can have a part to play in the management of grey squirrels at the individual forest scale but also potentially at the larger, landscape scale.

*Immuno-contraception* – This novel method of population management is still being researched. Work is focused on the oral delivery to grey squirrel of an existing effective injectable contraceptive to reduce the population size in a given area. The contraceptive bait is a vaccine (protein) not a reproductive hormone. As such, the vaccine will be broken down in the tissues and stomach of the host animal making it likely that the amount of active product (if any) passed onto predators or humans via squirrel meat, would be very small and very unlikely to have any biological effect. Further work is required to confirm its effectiveness and target uptake, as well as captive and field trials. This could provide a potentially cost-effective management method which will sit alongside existing methods of grey squirrel management. Full detailed data on secondary hazards will be collected when registration is considered for this vaccine.

### Lethal management methods

The overarching requirements of lethal management options are that they are humane. Lethal methods can only be undertaken by where a landowner or occupier has given consent.<sup>43</sup> It is recommended that those undertaking lethal methods of management should be properly trained in operating traps and humane dispatch.

*Poisoning using Warfarin* - Warfarin, (Grey Squirrel bait) is **no longer authorised** for grey squirrel management such as in woodlands (authorised use expired on 30<sup>th</sup> September 2015). Use as an indoor biocide has also been withdrawn with authorisation for marketing expiring on 31<sup>st</sup> July 2017 and use expiring on 27<sup>th</sup> January 2018.

*Live trapping* - This involves the capture of live animals, followed by cranial dispatch when the trap is checked, which should occur at least once per day. This method **must** be used where red squirrels may be captured, as they can be then be

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<sup>41</sup> <http://www.pine-marten-recovery-project.org.uk/>

<sup>42</sup> Sheehy, E. & Lawton, C. (2014). Population crash in an invasive species following the recovery of a native predator: the case of the American grey squirrel and the European pine marten in Ireland. *Biodiversity and conservation*, 23, 753-774

<sup>43</sup> 1981 Wildlife and Countryside Act. 27 (1) Interpretation of part 1

released. Grey squirrels caught in the traps must be dispatched as it is illegal to release these once caught.

*Spring trapping* - These trap designs kill the animal as it moves through and triggers the trap. The traps authorised for use have been approved through the Spring Trap Approval Order (Wales) 2012<sup>44</sup> for their humaneness and effectiveness. Measures must be taken to restrict access by non-target species. It is recommended that spring traps are checked at least once per day.

*Shooting* - Shooting grey squirrels can be undertaken legally and humanely. Opportunistic shooting of grey squirrels has not been regarded as an effective method of grey squirrel management in the past. However pilot schemes using baiting stations and coordinated shooting efforts are being tested to maximise the efficiency.

New traps and methods of grey squirrel management are continually under development. It is important that owners ensure that their methods of management are legal, humane and avoid capture of non-target species. Where there is a risk that red squirrels may be caught, advice should be sought from local red squirrel groups.

## Research

There continues to be a range of research into the ecology and behaviour of grey squirrels, and how this knowledge can be used to provide more effective methods of management.

Defra manages research budgets and programmes for England and Wales, except for a small element of delivery-related animal health and welfare surveillance which has been devolved. Welsh Government, as part of the wider Defra research group, which includes Forestry Commission, Animal Plant Health Agency and others, engages in research on grey squirrel, including:

- Investigating the impact of grey squirrels on woodlands and the reasons for bark stripping behaviour;
- Identifying efficient control strategies, including new trapping methods, immuno-contraception and natural predation
- Investigating the range of infections carried by grey squirrels and the risk these pose to native wildlife and domestic animals.

Forest Research provides advice on the management of grey squirrels and tree protection issues, and lists published research.

<http://www.forestry.gov.uk/fr/greysquirrels>

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<sup>44</sup> <http://www.legislation.gov.uk/wsi/2012/2941/introduction/made>)

## 5. Table of actions and lead bodies

The management of grey squirrels requires a collaborative partnership approach between all stakeholders. WG and NRW can contribute through raising awareness of best practice, research and training; supporting co-operation and partnership; and taking appropriate action on the WGWE. However success depends on landowners and managers taking responsibility for managing grey squirrel on their own land and working with other landowners and groups in a co-ordinated, landscape approach.

The UK Forest Standard sets out the principles of sustainable forest management and best practice. It states that woodland owners should 'Monitor forest damage, and intervene to protect vulnerable trees from browsing and grazing mammals, including voles, deer, rabbits, hares, grey squirrels and livestock'. As such, all woodland owners should monitor damage and consider whether grey squirrel management is necessary.

A number of opportunities have arisen over the years to collect the views of stakeholders in relation to grey squirrel management in Wales and more recently in England. Key points identified from these, along with input from a Wales stakeholder working group have informed the development of the actions listed below.

The following draft actions set out what will be done to support a more strategic and collaborative approach to grey squirrel management in Wales.

The draft actions are set out below in a table which shows:-

- Actions that will contribute towards delivering the objectives
- Lead Bodies involved in delivering the action who have a funding and/or co-ordinating role, and thus are active in driving forward the delivery of the actions. A partnership approach between lead bodies and other groups or organisations will be needed to deliver the actions.

Action	Lead Body
<i>Sustainable Management of Natural Resources.</i>	
1) Highlight the impact of grey squirrels on the woodland resource and biodiversity in appropriate future policy developments.	All partners
2) Investigate the development of a Vulnerability Analysis of Wales' woodland resource to provide a focus for a co-ordinated approach to grey squirrel management by local partnerships and landowners.	WG/NRW

3) Encourage the establishment and support of landscape-scale and collaborative grey squirrel management partnerships.	WG/NRW
4) Examine the feasibility of incentives for a strategic and collaborative approach to grey squirrel management in the design of future natural resource management schemes.	WG/NRW
5) Where it is feasible and beneficial to do so, undertake grey squirrel management activity on the WGWE as part of a co-ordinated landscape scale partnership approach.	NRW
6) Continue to provide support on grey squirrel management for red squirrel conservation on private land through provision of advice and loan of equipment	NRW
7) Continue to manage grey squirrel for red squirrel conservation on the WGWE in line with the Red Squirrel Conservation Plan for Wales through a partnership approach.	NRW
8) Work collaboratively to improve the delivery of actions within both the Red Squirrel Conservation Plan for Wales and the Grey Squirrel Management Action Plan for Wales	Wales Squirrel Forum
<i>Guidance</i>	
9) Raise awareness of the impacts of grey squirrel on woodland, timber production and wider biodiversity, with the wider public and land managers.	Wales Squirrel Forum
10) Promote best practice, highlight the need to assess the risk of damage and implement a plan of management, encourage updating of information and the continuation of grey squirrel management training through a range of partners.	Wales Squirrel Forum
<i>Research and monitoring</i>	
11) Continue to support research into improvements in management methods including the Defra England and Wales wildlife and biodiversity research and development budget.	WG
12) Maintain an awareness of grey squirrel management research in the UK and identify research gaps that would better inform grey squirrel management. Flag to research commissioners.	Wales Squirrel Forum
13) Further develop methods to monitor the impact of grey squirrel	WG/NRW

management measures where funding allows, minimising the impact on biodiversity, non-targeted species, related ecosystem services and economy.	
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### Question 3

Draft actions 3) and 4) relate to support and incentives in future grant schemes with a focus on collaborative working. Do you agree that support, if available, should focus on a strategic and collaborative approach to grey squirrel population management? Please explain your answer.

### Question 4

Owing to limited resources, it is not possible or feasible to manage grey squirrel on every part of the Welsh Government Woodland Estate. Draft action 5) relates to work that NRW could undertake when resources allow. Do you agree that this should be focused where it is feasible to do so and there is a partnership approach with other woodland owners? Please detail any other considerations or limitations for identifying areas for action.

### Question 5

Draft action 8) relates to working collaboratively to improve action on the ground. Do you agree? How could this be achieved?

### Question 6

Draft action 10) relates to promoting best practice and training, and highlighting the need for risk assessment of damage. Do you agree that these actions are necessary to encourage grey squirrel management? How could this be done effectively?

## **6) Governance and Monitoring**

The delivery of this draft management action plan is dependent on a partnership approach between the public, private and voluntary sectors. A steering group would be the best way to facilitate this. It is proposed that the Wales Squirrel Forum (WSF), who already provides a steer on the delivery of the existing Red Squirrel



Conservation Plan for Wales, could act as a steering group to co-ordinate, support and provide advice on the implementation of the final management action plan.

#### Advantages of WFS governance

- The Wales Squirrel Forum is a partnership of stakeholders whose remit already includes both red and grey squirrel management, although the current focus has been on the Red Squirrels Conservation Plan for Wales.
- Many members have direct experience in managing grey squirrel populations to benefit red squirrel and advise on best practice.
- Current membership could be extended to include those with specifically grey squirrel interests through invitation.
- This would acknowledge the common goal of managing grey squirrel populations, provide opportunities to share best practice and ensure the action plans of both species are closely linked.

It is felt that setting up a separate steering group specific to the grey squirrel management action plan would duplicate common areas of work and demand for resource (public, private and third party).

#### Question 7

It is proposed that the Wales Squirrel Forum could be adapted to provide a steering group for the delivery of the plan and avoid duplication of effort. Do you agree that an adapted Wales Squirrel Forum would be the most appropriate steering group to assist in the delivery of this plan? Please give reasons for your response.

Although it is widely acknowledged that grey squirrel populations and the associated damage is increasing, baseline data for monitoring this is not available and is likely to be prohibitively expensive. This action plan will be monitored against the following methods:-

- Report on action plan activity progress – on an annual basis via a wider stakeholder event.
- National Forest Inventory (NFI) – investigate how the currently available data for Wales can be utilised to best effect
- Red squirrel population data – as undertaken to report on the Red Squirrel Conservation Plan for Wales

### Question 8

As accurate baseline monitoring data for grey squirrel populations and associated damage is not available, the plan proposes 3 monitoring methods. We are interested in hearing about other existing or potential monitoring methods that have not been referenced in the consultation document. What are these and what is involved?

### Question 9

We would like to know your views on the effects that the draft grey squirrel management action plan would have on the Welsh language, specifically on opportunities for people to use Welsh and on treating the Welsh language no less favourably than English.

Please also explain how you believe the draft grey squirrel management action plan could be formulated or changed so as to have positive effects or increased positive effects on opportunities for people to use the Welsh language and on treating the Welsh language no less favourably than the English language, and no adverse effects on opportunities for people to use the Welsh language and on treating the Welsh language no less favourably than the English language.

### Question 10

The draft plan sets out the context for a grey squirrel management action plan for Wales, and actions that we feel are necessary and realistic in delivering action on the ground.

Are there any actions that you feel are unnecessary or have been missed?  
Are there any other comments that you would like to make?

### **Other relevant Welsh Government strategies and policies**

In addition to the obligations and frameworks which have led to the development of this draft management action plan – Woodlands for Wales Strategy, IAS Regulations, Red Squirrel Conservation Plan for Wales and the UK Squirrel Accord - this draft Grey Squirrel Management Action Plan will also contribute to a number of wider legislation, strategies and policies. These are:-

#### **Wellbeing of Future Generations (Wales) Act 2015**

The Well-being of Future Generations (Wales) Act is about improving the social, economic, environmental and cultural well-being of Wales.

To make sure we are all working towards the same vision, the Act puts in place seven well-being goals.

- A prosperous Wales
- A resilient Wales
- A healthier Wales
- A more equal Wales
- A Wales of cohesive communities
- A Wales of vibrant culture and thriving Welsh language
- A globally responsible Wales

The Act places a Well-being Duty on public bodies to carry out sustainable development in achieving these goals. It also sets out five ways of working for public bodies to demonstrate they have applied the sustainable development principle.

The draft Grey Squirrel Action Plan meets the sustainable development principle in that it has been developed through the involvement of stakeholders and partners with the aim of taking collaborative action to reduce the impact of grey squirrels, and improve the resilience of woodlands and the red squirrel population in the longer term. The actions will be delivered collaboratively by partners and will help deliver outcomes in other policies and strategies.

The draft management action plan will directly contribute to the goal of creating “a resilient Wales” and is also relevant to the goals of “a prosperous Wales” and “a globally responsible Wales”. The aim is to establish the draft management action plan as a joined up and integrated approach with partnership working at its heart.

#### **The Environment (Wales) Act 2016 and Natural Resources Policy**

The Environment Act introduces an approach to natural resource management that is about managing our natural environment in a joined up sustainable way that

delivers real outcomes for the environment, people, the economy and our communities. The aim is to make the most of the opportunities that Wales' natural resources present while safeguarding and building the resilience of natural systems to continue to provide these benefits in the long term. The Act includes a biodiversity duty requiring public authorities to seek to maintain and enhance biodiversity, and promote the resilience of ecosystems, where it is within the proper exercise of their functions. It also introduces 9 principles of sustainable management of natural resources.

The draft Grey Squirrel Management Action Plan is well aligned to the ambitions of the Environment Act. It is of direct relevance to the three key features introduced by the Act: - the State of Natural Resources Report; the Natural Resources Policy and Area Statements. The objectives and actions proposed to establish a joined up approach to grey squirrel management should be a strong contributor to the delivery of the Act and the principles of sustainable management of natural resources. This draft management action plan will help deliver the Natural Resources Policy through managing grey squirrel as a pressure that impact on the resilience of natural resources such as woodlands and other habitats, and the services they can provide. The introduction of Area Statements provides an important opportunity to reflect and build upon the work that is already being undertaken around red squirrel focal areas and to consider how this can be extended.

### **Climate Change Strategy for Wales 2010**

The Climate Change Strategy for Wales and associated delivery plan set targets to reduce greenhouse gas emissions in Wales by 3% every year and achieve at least a 40% reduction by 2020 compared to figures from 1990. They confirm where action should be focused and the policies and programmes that will help meet the targets. The Strategy also recognises how actions taken by people, communities and organisations across Wales will help reach the target.

The Climate Change Strategy delivery plan outlines that new woodland creation for carbon capture and management of the existing woodland carbon sink will contribute towards reducing greenhouse gas emissions from the agriculture and land use sector in Wales. A key part of this policy is to ensure that timber grown is of a quality that can be used in long lived products, such as construction timber, which effectively stores carbon captured during tree growth. Grey squirrel damage has an indirect effect on climate change through the curtailment of tree growth which reduces carbon capture. Additionally, damage can affect the end use of the timber, which is often fuel wood and hence carbon release back into the atmosphere. The draft Grey Squirrel Management Action Plan has the potential to reduce damage to woodlands through targeted and collaborative grey squirrel management.

## Nature Recovery Action Plan for Wales 2015

The Nature Recovery Action Plan for Wales is comprised of a Strategy for Nature, its associated action plan and a Nature Recovery Framework which sets out the governance structure to deliver action in Wales.

The ambition to be addressed through the Nature Recovery Action Plan is:

*‘To reverse the decline in biodiversity, for its intrinsic value, and to ensure lasting benefits to society’*

The Nature Recovery Action Plan defines the objectives and key actions needed in Wales to achieve our ambition and meet both the Resilient Wales goal and the global and European commitments to halting the loss of biodiversity. This draft Grey Squirrel Management Action Plan has the potential to contribute to Objectives 2, 3 and 4 of the Nature Recovery Action Plan by:-

- *Objective 2: Safeguard species and habitats of principal importance and improve their management.* Red squirrel is currently listed as a species of principle importance. Targeted control of grey squirrel in and around red squirrel focal areas, as undertaken through the Red Squirrel Conservation Plan for Wales, will help to safeguard these populations.
- *Objective 3: Increase the resilience of our natural environment by restoring degraded habitats and habitat creation.* If the problem of grey squirrels can be addressed, landowners will be able to plan for future economic returns from semi-natural woodlands and may be encouraged to undertake longer term woodland management as a result.
- *Objective 4: Tackle key pressures on species and habitats.* Squirrel pox virus is a clear pressure on red squirrel populations and represents a direct threat to their survival. Woodland habitats can be gradually altered as grey squirrel impact on vulnerable species, affecting their composition and longer term resilience.

## LIFE Natura 2000 Programme

There are 123 designated habitat and species features on the 92 Special Areas of Conservation (SACs) and 20 Special Protection Areas (SPAs) in Wales. Together with designated areas across Europe, they comprise the Natura 2000 network (N2K network).

The purpose of the LIFE Natura 2000 Programme for Wales, led by NRW was to enable Wales to make significant progress towards bringing Natura 2000 species and habitats in Wales into favourable condition and help meet its commitments under the European Habitats and Birds Directives.

The Wales LIFE Natura 2000 Programme created a number of outputs including 11 Thematic Action Plans, each of which detail priority strategic actions to address major issues and risks which have been identified as having an adverse impact on Natura 2000 features across the network. The Thematic Action Plan on Invasive

Species and Pathogens recognises the importance of having a strategic approach to grey squirrel management and this is listed in a table of Strategic actions to improve the condition N2K sites.

The LIFE Natura 2000 Programme outputs were used to develop the Welsh chapter of the revised UK Prioritised Action Framework (PAF). The PAF informs the European Commission of priorities for Natura 2000.

The 'After-LIFE' Conservation Plan describes how the actions described in the LIFE Natura 2000 Programme will be delivered by relevant organisations including NRW, WG and third sector bodies. In some cases, actions can be delivered through existing programmes of work. In other cases, such as the draft Grey Squirrel Management Action Plan, new areas of work may need to be developed, for example by making bids to external funding schemes or exploring new ways of working together to make better uses of resources.

### **GB Invasive Non-Native Species (INNS) Strategy**

The overarching aim of the GB Strategy is to minimise the risk posed by INNS<sup>45</sup> and reduce their negative impacts. It follows the Convention on Biological Diversity (CBD) hierarchical approach stressing prevention, followed by early detection and rapid response and finally long-term management and control. Although the main emphasis of the Strategy is directed towards prevention and rapid response, the strategy also recognises there is still a need to manage in a cost effective and strategic manner the impacts of the large number of INNS that are already established in GB.

The GB INNS Strategy vision is to better protect biodiversity, quality of life and economic interests against the adverse impacts of INNS. Through:

- Widespread awareness and understanding of the risks and adverse impacts associated with INNS, and greater vigilance against these;
- Integration of INNS within the broader biosecurity agenda.
- A strong sense of shared responsibility across government, key stakeholder organisations, land managers and the general public for action and behaviour that will reduce the threats posed by INNS;
- A guiding framework for national, regional and local mitigation, control or eradication initiatives helping to reduce the detrimental impact of INNS;
- Improved co-ordination and co-operation on INNS issues at a European and international level.

This draft Grey Squirrel Management Action Plan aims to contribute towards this vision.

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<sup>45</sup> The term 'Invasive non-native species' (INNS) is the equivalent of 'alien species' as used by the Convention on Biological Diversity (CBD) and are broadly defined as species whose introduction and/or spread threaten biological diversity or have other unforeseen impacts.

## **Wales Biodiversity Partnership INNS Group**

Grey Squirrel is currently listed on the Wales Biodiversity Partnership INNS Group's Priority Species for Action in Wales as a Long-term Management Priority Species. These are species that are established in Wales and where long-term management approaches are feasible and beneficial (e.g. protecting key areas, containment, control or mitigation). This draft Grey Squirrel Management Action Plan contributes towards this aim.

## **The Forestry Act 1967**

Legislation relating to forestry and woodland management is embedded in the Forestry Act 1967. It recognises the negative impact that grey squirrels can have on forests, trees and timber.

## Appendix 2

### Grey Squirrel Management - Support in Wales

There is a range of information and advice available in Wales on the management of grey squirrel, which includes, (in alphabetical order):-

Name of organisation	Main support areas	Location	Contact / website
British Association for Shooting and Conservation (BASC)	<ul style="list-style-type: none"> <li>• Training courses on grey squirrel management</li> <li>• Best practice advice on grey squirrel management</li> <li>• General information on grey squirrel management</li> <li>• BASC grey squirrel management project</li> </ul>	<p>Pan Wales</p> <p>Targeted to Red Squirrel Focal sites</p>	<p><a href="https://basc.org.uk/basc-wales/">https://basc.org.uk/basc-wales/</a></p> <p><a href="https://basc.org.uk/game-and-gamekeeping/advice-and-fact-sheets/basc-grey-squirrel-control/#">https://basc.org.uk/game-and-gamekeeping/advice-and-fact-sheets/basc-grey-squirrel-control/#</a></p> <p><a href="https://basc.org.uk/conservation/green-shoots/green-shoots-in-wales/grey-squirrel-control/">https://basc.org.uk/conservation/green-shoots/green-shoots-in-wales/grey-squirrel-control/</a></p>
Coed Cymru	<ul style="list-style-type: none"> <li>• Advice and support to landowners</li> </ul>	Wales	<a href="http://coed.cymru/index.html">http://coed.cymru/index.html</a>
Farming Connect	<ul style="list-style-type: none"> <li>• Training, including grey squirrel management</li> <li>• Technical news bulletins</li> <li>• Demonstration events</li> </ul>	Pan Wales	<p><a href="http://www.gov.wales/farmingconnect">www.gov.wales/farmingconnect</a></p> <p>Service Centre</p> <p>08456 000813</p>
Forest Research	<ul style="list-style-type: none"> <li>• Best practice on grey squirrel management, assessing damage to woodland and other.</li> <li>• Lists published research on grey squirrels</li> <li>• Provision of advice and guidance</li> </ul>	UK wide	<p><a href="http://www.forestry.gov.uk/fr/grey-squirrels">http://www.forestry.gov.uk/fr/grey-squirrels</a></p> <p><a href="https://www.forestry.gov.uk/PDF/fcpn1.pdf/\$FILE/fcpn1.pdf">https://www.forestry.gov.uk/PDF/fcpn1.pdf/\$FILE/fcpn1.pdf</a></p>



Mid Wales Red Squirrel Partnership (MWRSP)	<ul style="list-style-type: none"> <li>• Trap Loan Scheme for landowners and residents situated within the mid Wales red squirrel focal site and buffer.</li> <li>• Training in grey squirrel management</li> </ul>	Mid Wales, within the focal site and buffer.	<a href="http://midwalesredsquirrels.org/">midwalesredsquirrels.org/</a> 07972 201202
Mwmac Ltd	<ul style="list-style-type: none"> <li>• Grey Squirrel Management Training</li> </ul>	Wales	<a href="mailto:chris@mwmac.co.uk">chris@mwmac.co.uk</a>
Natural Resources Wales	<ul style="list-style-type: none"> <li>• Provision of advice on grey squirrel management.</li> <li>• Provision of guidance on legislative requirements.</li> <li>• Commissioning research</li> <li>• Working in partnership with other initiatives.</li> <li>• Secretariat to Wales Squirrel Forum</li> </ul>	Pan Wales	<a href="http://naturalresources.wales/">http://naturalresources.wales/</a>
Private woodland management companies - listed as Glastir woodland management planners.	<ul style="list-style-type: none"> <li>• Provision of advice and guidance</li> </ul>	Pan Wales	<a href="http://gov.wales/docs/drah/publications/170321-registered-glastir-woodland-planners-contact-details-en.pdf">http://gov.wales/docs/drah/publications/170321-registered-glastir-woodland-planners-contact-details-en.pdf</a>
Red Squirrels Trust Wales	<ul style="list-style-type: none"> <li>• Contingency plans to prevent, detect and respond to grey squirrel incursion.</li> <li>• Training courses on grey squirrel management</li> <li>• Research into grey squirrel viral infections</li> </ul>	Anglesey/ Gwynedd	<a href="http://www.redsquirrels.info">www.redsquirrels.info</a> 07966150847
Red Squirrels United	<ul style="list-style-type: none"> <li>• Support and recruit volunteers for grey squirrel management</li> <li>• Publish research on grey squirrel management</li> <li>• Provision of advice and guidance.</li> </ul>	Pan Wales	<a href="http://dev-squirrel.pantheon.io/about/">http://dev-squirrel.pantheon.io/about/</a>
UK Squirrel Accord	<ul style="list-style-type: none"> <li>• Raise public awareness</li> <li>• Landowner and local group engagement</li> </ul>	UK wide	<a href="http://squirrelaccord.uk/index.html">http://squirrelaccord.uk/index.html</a>

	<ul style="list-style-type: none"> <li>• Commissioning research</li> <li>• Signposting to information</li> </ul>		
Welsh Government	<ul style="list-style-type: none"> <li>• Advisory leaflet - Urban grey squirrels (Available on request)</li> </ul>	Pan Wales	<a href="mailto:Wildlife@wales.gsi.gov.uk">Wildlife@wales.gsi.gov.uk</a>
Wales Squirrel Forum	<ul style="list-style-type: none"> <li>• A group of stakeholder representatives which provide a steer on the delivery of the Red Squirrel Conservation Plan for Wales (remit may expand in future to include this draft management action plan)</li> </ul>	Pan Wales	NRW (Secretariat)