

Rhododendron in the Rainforest

Approaches to a growing problem

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WOODLAND
TRUST SCOTLAND

Gordon Gray Stephens
Native Woods Cooperative (Scotland) Ltd
gordon@nativewoods.co.uk

Bob Black
Argyll Woodlanders
argyllwoods@btinternet.com

Summary

Temperate rainforest is a globally rare habitat, and Scotland is home to a substantial proportion of the surviving European fragments. Its significance to our own history, culture, nature and economy means we should look after it, and it gives us a global responsibility to do so. The Scottish Government has committed to the targets laid out in The Convention on Biological Diversity, and a 2019 review by NatureScot acknowledged that while progress had been made, more effort is needed if the relevant targets are to be met.

Scotland's rainforest is subject to a number of threats including overgrazing, climate change, tree disease, fragmentation and invasive *Rhododendron ponticum*. This paper focusses primarily on means of supporting work to reduce invasive rhododendron. Without action invasive rhododendron will increasingly dominate the rainforest, suppressing tree regeneration and shading out the internationally important plants that form a key part of rainforest biodiversity. Approximately 140,000 hectares are affected, from dense stands among high quality woodlands to scattered bushes in associated habitats and domestic gardens. It is increasingly recognised that treatment at a population level is necessary to remove the threat. A long-term approach is required to deal with both the invasive and persistent nature of the plant and the requirement to bring together community-based alliances to tackle the problem.

In 2017 the Scottish Government agencies published "An approach to prioritising control of rhododendron in Scotland". This approach included a focus on specific areas within the rainforest zone, and some progress has been made in controlling invasive rhododendron in some of these areas. However, this progress has been neither smooth nor uniform. Further, prioritisation of areas means that other areas of high importance are not being treated. The approach included a commitment to review the priority areas, and this provides an opportunity to reconsider progress made and the best means of supporting future control in the rainforest zone.

Land managers may be subject to a voluntary agreement to control invasive rhododendron through forest certification commitments, however, these commitments are limited in scope. Scottish Government ministers have also placed a burden of control on individual land managers. Government agencies have powers to seek voluntary agreements with land managers or to enforce control, however these powers are largely unused and little known.

Financial support has been available to land managers via the Scottish Rural Development Programme, NatureScot's Biodiversity Challenge Fund, other Government agency funding, the EU LIFE programme and lottery funding. While this support is welcome and has led to some progress, many stakeholders are concerned about the bureaucracy of the process, the short-term nature of funding for a long-term problem, and the difficulty of drawing together adequate funding to deal with the varied nature of landholdings containing invasive rhododendron. Further, it is evident that there is not always a joined-up approach to rhododendron control between different arms of Government.

The rainforest is an important national resource, and there are several ways in which Scotland can better protect this treasure from invasive rhododendron. Building on the work of the Alliance for Scotland's Rainforest, there is a need to increase public awareness of both the resource, its vulnerability and the potential for action. From Government there is a need to consolidate the many reports and statements of intent into cohesive action across a wide range of players. This paper's headline ask is for a Rainforest Action Fund, a dedicated long-term funding stream which will deal with the unique issues that the rainforest faces, while also contributing to Scotland's Green Recovery. There is scope to use an innovative funding mix that includes NGOs and corporate bodies, using the concept of Natural Capital streams to multiply any Scottish Government contributions.

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Glossary

ACT	Argyll and the Isles Coast and Countryside Trust
AECS	Agri-Environment Climate Scheme
ASR	Alliance for Scotland's Rainforest
BCF	Biodiversity Challenge Fund
FGS	Forestry Grant Scheme
FLS	Forestry and Land Scotland
FSC®	Forest Stewardship Council®
GAEC	Good Agricultural and Environmental Condition
INNS	Invasive non-native species
LLTNPA	Loch Lomond and the Trossachs National Park Authority
NS	NatureScot
PEFC	Programme for the Endorsement of Forest Certification
RBAPS	Results Based Agri-Environment Payment Scheme
SCA	Species Control Agreement
SCO	Species Control Order
SF	Scottish Forestry
SFGS	Scottish Forestry Grant Scheme
SNH	Scottish Natural Heritage
SRDP	Scottish Rural Development Plan
RPID	Scottish Rural Payments and Inspections Division
SSE	Scottish and Southern Energy
SSSI	Site of Special Scientific Interest
UKFS	UK Forestry Standard
UKWAS	UK Woodland Assurance Standard
WGS	Woodland Grant Scheme



1 Introduction

This document has been commissioned by Woodland Trust Scotland, a partner of the Alliance for Scotland's Rainforest¹(ASR). The paper aims to investigate past, present and future means of supporting the work to deal with the impacts of invasive rhododendron on the rainforest. It was written in February and March 2021 by two independent consultants, Gordon Gray Stephens of Native Woods Cooperative Scotland (Ltd), and Bob Black, Argyll Woodlanders.

The review was solely a desk exercise and includes no woodland visits as it was produced during the Covid pandemic with its associated restrictions. Extensive electronic interviews and discussions were conducted with a range of stakeholders, including a selection of Government agency staff, NGO staff, rhododendron control landowners and managers, community representatives and contractors. Our thanks to everyone who gave their time and their insights to the authors.

The ASR is a voluntary partnership of more than 20 organisations that are all committed to collaborative action for the benefit of the rainforest. The Woodland Trust is a partner and has signed up to ASR's vision that:

Scotland's rainforest will thrive once again.

The mosaic of woodland and other habitats that make up the wider rainforest will be bigger and in better condition; more vital and regenerating; the best sites will be expanded and re-connected to each other to allow the spread of wildlife.

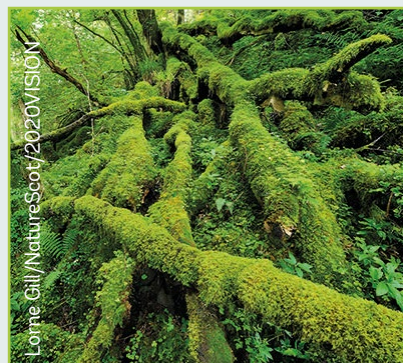
They will be more diverse in terms of the trees, shrubs and flora and fauna they contain as well as in their age and structure. This variety will allow for an even greater abundance of the rare and exceptional mosses, liverworts and lichen that make the rainforest so special.

A bigger, more vigorous and better-connected rainforest should also be more resilient to threats, shocks and change and therefore better able to survive and thrive in the long term. And it will contribute more to sustainable development and economic growth.

Sites will be visited more, become more productive, and will be better championed and supported by businesses and local communities as well as by charities and Government agencies.



Stragglng Pouchwort is a leafy liverwort found in the rainforest zone, Isle of Skye



Moss covered trees and fallen branches at Barnluasgan, Argyll



Woodland mosses growing in Scotland's rainforest, Argyll.

¹ <https://savingscotlandsrainforest.org.uk/>

Ravine rich with mosses and liverworts, Beinn Eighe.



2. The rainforest and invasive species

2.1 Significance of the rainforest

Scotland's temperate rainforest, also known as Atlantic woodland or Celtic rainforest, is a unique west coast habitat of ancient native woodlands, open glades, boulders and ravines; sometimes dappled by sunlight, and almost always dripping with moisture. Wood warbler and the redstart flit through the canopy, while the glades provide shelter for rare butterflies such as the pearl-bordered fritillary. Most importantly, for wildlife conservation, it is also home to a spectacular diversity of lichens, mosses, liverworts, fungi and ferns, many of them nationally and globally rare and some found nowhere else.

Temperate rainforest is a globally scarce habitat, far rarer than tropical rainforest. It relies on high rainfall, clean air and an equitable climate, and is found in several parts of the world where the right climatic conditions occur (see Figure 1). It used to be found along much of the Atlantic coast of Europe, but over millennia it has been altered and more often lost. This leaves Scotland as the last substantial stronghold of Europe's rainforest. Its significance to our own history, culture, nature and economy means we should look after it, and gives us a global responsibility to do so.

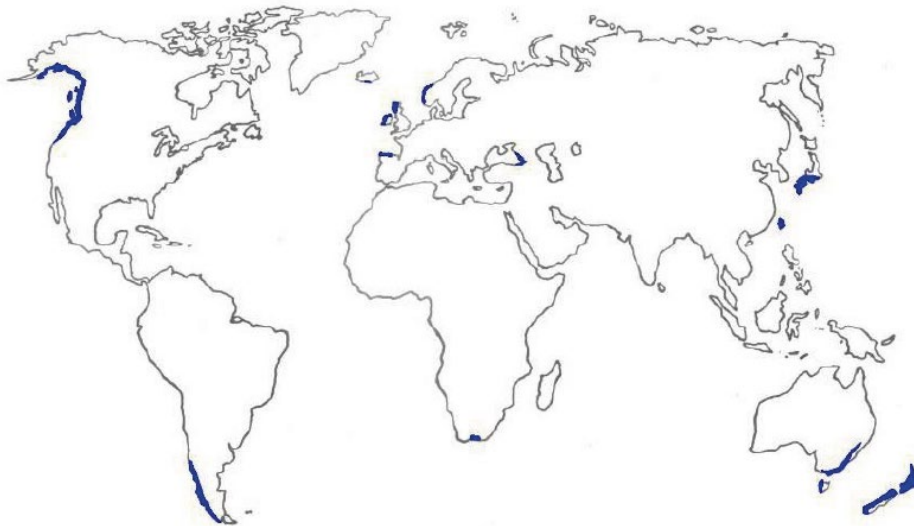


Figure 1.
World distribution of
Coastal Temperate
Rainforest²

There are only 93,000 hectares of native woodland within the mild, humid and clean air 'rainforest zone' on the west coast of Scotland (see Figure 2). As little as 30,235 hectares are thought to be the best sites which contain the rare and unique rainforest lichen, moss and liverwort communities. These woodlands are small, fragmented and under threat.



Pearl-bordered fritillary



Wood warbler



Red squirrel

² Averis, A.B.G., Genney, D.R., Hodgetts, N.G., Rothero, G.P. & Bainbridge, I.P. (2012). Bryological assessment for hydroelectric schemes in the West Highlands – 2nd edition. Scottish Natural Heritage Commissioned Report No.449b



Figure 2. Scotland's “hyper-oceanic” or rainforest zone

2.2 Rainforest threats

Two of the main threats facing Scotland's rainforest are unsustainable herbivore impacts and invasive species along with climate change, tree disease and habitat fragmentation. This paper focuses on the impact of the main invasive species, however this section gives a brief overview of other threats.

Herbivore impacts

More than 40%³ of the rainforest is grazed and browsed so heavily, mainly by deer, that natural regeneration is unlikely to occur; even more is being browsed at levels that restrict regeneration of palatable species like oak.

Other non-native species

Invasive *Rhododendron ponticum* and other invasive non-native species (INNS) are recognised as one of the five principal drivers of biodiversity loss across the world⁴. In addition to rhododendron, other invasive species having an increasing impact on the temperate rainforest include Japanese knotweed, Himalayan balsam, giant hogweed, giant rhubarb and American skunk cabbage. All are listed by NatureScot (NS) along with rhododendron as the "top 6"⁵, targeted for strategic control. Spanish bluebell, gaultheria and snowberry are other plants which cause concern to stakeholders.

Many invasives are currently established at low population levels and may still be in their "lag phase"⁶, an appropriate time to act before the challenge becomes more substantial.



Himalayan balsam



Japanese knotweed



Giant hogweed

Other threats

The rainforest is in fact a shadow of what it once was. There has been a long history of fragmentation of woodland cover going back hundreds of years and up until the 1980s the rate of fragmentation was alarmingly high. Widespread overgrazing by livestock and, especially in the middle decades of the 20th century, conversion of rainforest to conifer plantation were major factors.

³ <https://forestry.gov.scot/forests-environment/biodiversity/native-woodlands/native-woodland-survey-of-scotland-nwss>

⁴ IPBES (2019): Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. S. Díaz, J. Settele, E. S. Brondízio E.S., H. T. Ngo, M. Guèze, J. Agard, A. Arneth, P. Balvanera, K. A. Brauman, S. H. M. Butchart, K. M. A. Chan, L. A. Garibaldi, K. Ichii, J. Liu, S. M. Subramanian, G. F. Midgley, P. Miloslavich, Z. Molnár, D. Obura, A. Pfaff, S. Polasky, A. Purvis, J. Razzaque, B. Reyers, R. Roy Chowdhury, Y. J. Shin, I. J. Visseren-Hamakers, K. J. Willis, and C. N. Zayas (eds.). IPBES secretariat, Bonn, Germany. <https://doi.org/10.5281/zenodo.3553579>

⁵ <https://www.nature.scot/professional-advice/protected-areas-and-species/protected-species/invasive-non-native-species/invasive-non-native-plants>

⁶ <https://www.gov.scot/publications/non-native-species-code-practice/pages/2/>



While herbivore threats remain, other threats have now risen to prominence, notably plant diseases and climate change. Dutch elm disease has had a major impact on some parts of the rainforest, though its progress into the main rainforest zone is now slow, probably because the characteristic rainforest climate does not suit the beetle responsible for spreading the disease. More recently, ash dieback has spread north and is causing serious concern about the future of one of the rainforest's key species. The fungal-like organism *Phytophthora kernoviae*, also spreading northward, poses a potential threat to pedunculate oak. Rhododendron is also a key host and reservoir for other *Phytophthora* tree pathogens. The spread of all these diseases appears to have been caused by or has been encouraged by human activity and it is likely that the remnant nature of the rainforest has reduced the available gene pool of trees capable of resisting new disease.

The multiple threats to the rainforest place it under increasing stress. The uncertainty around the impacts of a changing climate on a delicately balanced ecosystem underlines the need to protect it now by reducing the stresses where we can and increasing resilience to the changes that are coming.

The impact of invasive rhododendron

Invasive rhododendron is widespread throughout the rainforest, although sometimes at low density. It poses a threat because it can colonise and dominate rainforest woodland, suppressing tree regeneration and shading out important lichens, bryophytes and other characteristic flora. Rhododendron has been observed in a total area of 12,290 hectares of the core rainforest woodland. In addition, *The Native Woodland Survey of Scotland* showed that almost 30,000 hectares of native woodland within the oceanic zone had some rhododendron. This is likely to be an underestimate of the prevalence of invasive rhododendron in the rainforest landscape because the survey did not include land outside of native woodlands, such as open moorland, which is also susceptible to rhododendron invasion and where it causes negative impacts on biodiversity.

2.3 What is the scale of the challenge?

The ASR estimates that over 12,000 hectares of core rainforest sites, and 17,000 hectares of other important woodland sites in the rainforest zone need to be cleared of invasive rhododendron that we are already aware of. A further 24,000 hectares in a 150-metre buffer around known infested sites also needs to be surveyed and possibly cleared to prevent re-invasion. A further 80,500 hectares of other habitats in the rainforest zone are also in need of similar treatment⁷.

The requirement for a buffer zone will vary from site to site, depending on several factors, including exposure to prevailing winds, barriers to transmission such as dense woodland, and intactness of the habitat in the buffer. For example, in Snowdonia seed travelling more than two kilometres has been recorded⁸.

⁷ <https://www.woodlandtrust.org.uk/publications/2019/05/state-of-scotlands-rainforest/>

⁸ https://www.eryri-npa.gov.uk/_data/assets/pdf_file/0031/164785/Rhododendron-Strategy-Final.pdf

Woodland Trust Scotland are currently removing invasive rhododendron by hand in precious rainforest habitat at Ben Shieldaig.



3 Current policy drivers and framework

Global concern over a loss of biodiversity has grown rapidly in recent years, as has a recognition that this loss is affecting human wellbeing in a seriously negative way and if allowed to continue at current rates these effects will become ever more severe.

The urgency of the crisis has been spelt out in the Dasgupta report to the UK Treasury⁹ that points out that all of us “are embedded in nature”. Apart from the value of biodiversity for human wellbeing, this report looks at nature, of which biodiversity is a core component, in economic terms, as ‘natural capital’, an asset that benefits people and one that is as important to us as economic or social capital.

This growing recognition of the importance to us of biodiversity loss and the link between that and invasive species has resulted in several policy strands that cover invasive plants, and these operate at international, national, and regional levels. This document will consider biodiversity, forestry strategy and forestry standards.

3.1 A biodiversity crisis

In response to a parliamentary question on the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Report, the First Minister said in 2019 that “The challenges facing biodiversity are as important as the challenge of climate change, and I want Scotland to be leading the way in our response.”¹⁰

A NatureScot (formerly Scottish Natural Heritage) report on the condition of protected areas highlights the negative impact of invasive rhododendron: “A major cause of unfavourable site condition on designated sites, including more than half of those designated under the EU Habitats Directive for Western acidic oak woodland” - our temperate rainforest “for which Scotland has significant international responsibilities”¹¹. Several large-scale control projects have tackled the issue in Scotland, but success rates have been poor, with reinvasion of previously cleared areas. Key past weaknesses have been failure to eradicate at the whole-population scale, and failure to implement legacy biosecurity arrangements post eradication.

International obligations

International obligations to biodiversity are laid out in the Convention on Biological Diversity, which in 2010 set the Aichi Targets, 20 global targets which were to be met by 2020. The related strategic priorities for Scotland were laid out in the *Scottish Biodiversity Strategy: 2020 Challenge for Scotland’s Biodiversity*, and the *Route Map to 2020* identified large scale collaborative projects that would contribute to these targets.

For the purposes of this report, the two most relevant of the 20 Aichi Targets are:

Target 5

By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

⁹ <https://www.gov.uk/government/publications/final-report-the-economics-of-biodiversity-the-dasgupta-review>

¹⁰ <https://www.nature.scot/urgent-action-needed-halt-continued-decline-scotlands-wildlife>

¹¹ SNH Official Statistics (2019). The Proportion of Scotland’s Protected Sites in Favourable Condition 2019. <https://www.nature.scot/information-hub/official-statistics/officialstatistics-protected-sites>.

Target 9

By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

The *Scottish Biodiversity Strategy: 2020 Challenge for Scotland's Biodiversity* sets the strategic priorities for Scotland, and the *Route Map to 2020* identifies the large-scale collaborative projects. In 2019 NS assessed progress towards these targets, and the overall woodland management picture for Targets 5 & 9, except for meeting new planting, is:

“Progress towards target but insufficient (unless we increase our efforts the target will not be met by its deadline).”¹²

UK strategies

The 2008 UK strategy on INNS called for “rapid response and prevention”, including a strategic approach to ensure that “pathways” of spread are dealt with. The updated 2015 strategy acknowledged that insufficient progress was being made in this area¹³.

3.2 European sites (formerly Natura 2000) and designated sites

European sites represent the very best of Scotland's nature and are internationally important for threatened habitats and species. These sites were designated under European law, and this status continues¹⁴. The features of these sites are combined with the features of domestically designated sites, Sites of Special Scientific Interest (SSSIs), and the status of these features is reported annually by NS¹⁵.

It is notable that woodland habitats have considerably more natural features than any other habitat. It is also unfortunate that the most recent report shows the percentage of woodland features in favourable condition in a continuing decline at 64.3%. This is against a habitat total of 78.7%; woodland would appear to be underperforming, and a major cause is the impact of invasive rhododendron.

3.3 A forestry strategy for Scotland

Scotland's Forestry Strategy 2019–2029 presents the Scottish Government's vision for Scotland's forests and woodlands:

“In 2070, Scotland will have more forests and woodlands, sustainably managed and better integrated with other land uses. These will provide a more resilient, adaptable resource, with greater natural capital value, that supports a strong economy, a thriving environment, and healthy and flourishing communities.”

¹² <https://www.nature.scot/scotlands-biodiversity-progress-2020-aichi-targets-report-2019#a9>

¹³ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/455526/gb-non-native-species-strategy-pb14324.pdf

¹⁴ <https://www.nature.scot/professional-advice/protected-areas-and-species/protected-areas/international-designations/european-sites>

¹⁵ <https://www.nature.scot/information-hub/official-statistics/official-statistics-protected-sites>

To achieve this vision, priorities for action aimed at “upholding the international principles of sustainable forest management” include “Maintaining and enhancing biodiversity, in particular by...improving mitigation of the risks posed by invasive non-native species... Safeguarding priority habitats and species...Supporting activity to improve the ecological condition and habitat quality of native forests and woodlands...[and] Managing for, and mitigating against, the threats posed by tree pests and diseases.”

3.4 A national approach to rhododendron

In 2017 SNH, now NatureScot (NS), and Forestry Commission Scotland, now Scottish Forestry (SF), published *An approach to prioritising control of rhododendron in Scotland* (herein referred to as the National Approach), placing responsibility for rhododendron removal on landowners. The document was:

- “aimed at supporting decision makers in Scottish policy-making, funding and landowning organisations, who must decide on where and how funding is committed to achieve the successful control of rhododendron in priority habitats and, in the longer term, across Scotland. The success of this approach will be reviewed in 2020.”
- “The underlying principle of the approach is to prioritise control of rhododendron in designated habitats where the greatest benefit can be gained from synchronised control at a landscape scale and where action can be co-ordinated across multiple land holdings. Scottish Government funds should be targeted towards priority habitats, should control entire populations of rhododendron, and will be expected to follow best practice management techniques.”

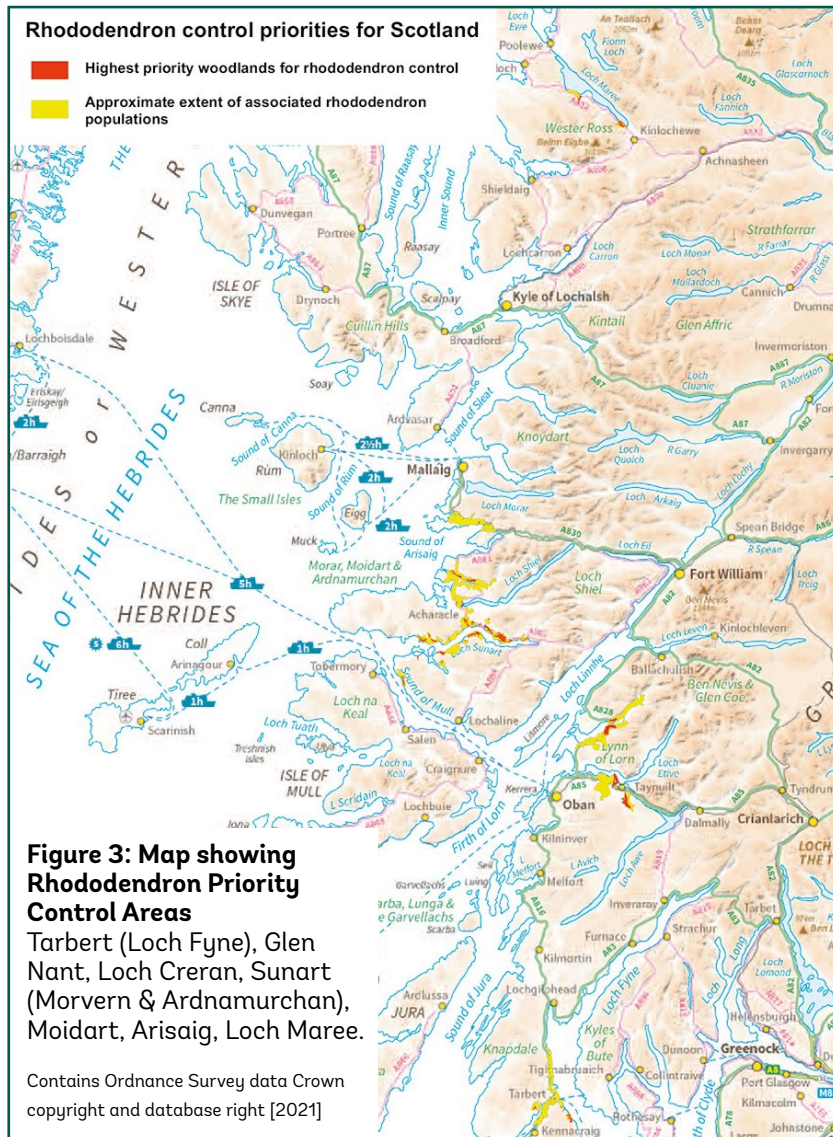
The document lays out three objectives:

1. Focus efforts on priority control areas (see Figure 3)
2. Target entire local populations, including a buffer zone
3. Ensure effective use of available funds by ensuring sustained control programme until local eradication is achieved.

As well as laying out a medium term (5-10 years) “future step” of securing commitment and resources for the longer term, the document is clear that SF and NS will:

- Support delivery by ensuring that the approach is embedded on the National Forest Estate and other land managed by the Scottish Government
- Implement a proportionate and risk-based approach to using Species Control Agreements (SCAs) and Species Control Orders (SCOs) to support a co-ordinated approach to rhododendron control (see section 3.5).

NS have indicated that consideration is being given to reviewing the Priority Control Areas map in line with the commitment made in the National Approach. There are grounds for welcoming this review, but it should also consider other significant areas where public funds have already been committed or where there is demonstrable local support. It is also important to ensure that this is not at the expense of a long-term focus on these Priority Areas.



Loch Lomond and the Trossachs National Park Authority (LLTNPA)

LLTNPA, also has its own long-term plans for rhododendron control in the Park, which include a Long Term 2040 Vision “No semi natural habitat within The Loch Lomond and The Trossachs National Park will be at risk from invasive Rhododendron.”¹⁶ There are also specific targets within its 2018-23 Biodiversity Action Plan.

Priority areas for action include East Loch Lomond, Loch Lomond Islands, North and West Loch Lomond, Strathard, the Trossachs and Loch Goil, and LLTNPA has been devoting staff resources and seeking funding to developing landscape scale projects with some success in areas including East Loch Lomond and Strathard.

¹⁶<https://www.lochlomond-trossachs.org/park-authority/publications/wild-park-our-biodiversity-action-plan/>

3.5 Powers of persuasion

Where a relevant body is aware of a situation in which there is an invasive plant or animal outwith its native range, and where control is considered by the relevant body to be both viable and of sufficient priority, it must attempt to make a Special Control Agreement (SCA) with the owner or any occupier of the land.

The 1981 Wildlife and Countryside Act introduced the concept of SCAs and Special Control Orders (SCOs). Their scope was defined in the Scottish Government's non-native species Code of Practice (2012) "A SCA is a voluntary agreement [that should set out what must be done by whom and by when] in order to control an invasive non-native plant or animal. There is no penalty for non-compliance with these voluntary agreements (although it may result in a SCO being made)."

The Code of Practice states that SF is responsible for species which affect woodland habitats. However, it also suggests that a partnership approach may be taken where a species affects more than one habitat as is the case with rhododendron, where NS are providing the lead.

3.6 Forestry management standards

In the UK, two standards of forest management are used by the forestry sector, and by other land managers whose landholding includes areas of woodland. However, many in the agricultural sector, for example, are not engaged in this process, and therefore a substantial area of rainforest and associated open ground is not encompassed by forest standards or certification.

UK Forestry Standard Guidelines on Forests and Biodiversity

The UK Forestry Standard Guidelines on Forests and Biodiversity (UKFS) is the technical standard for grant aided forestry and includes regulatory requirements for woodland establishment and tree felling. The UKFS defines the agreed approach to sustainable forest management as: the stewardship and use of forest lands that maintains biodiversity, productivity, regeneration capacity, vitality and potential to fulfil now and in the future relevant ecological, economic and social functions at local, national and global levels and that does not cause damage to other ecosystems.

UKFS is supported by guidelines, and regarding rhododendron these guidelines require that forest managers consider the following:

- a) Where non-native species are invasive and pose problems, control or remove them where this is feasible; act early while populations are still small.
- b) Participate in collaborative actions to control invasive species.
- c) Plan for the control of invasive species where feasible by developing barriers to their dispersal; ensure newly created elements in habitat networks do not facilitate dispersal.
- d) Consider how forest operations, such as felling and thinning, might promote the spread of invasive species and take action to control them beforehand.
- e) In the riparian zone, favour locally native tree and shrub species and control the spread of invasive and non-native species.

UK Woodland Assurance Standard

The UK Woodland Assurance Standard (UKWAS) is the independent certification standard and audit protocol for verifying sustainable woodland management in Scotland and the rest of the UK. UKWAS combines the government requirements set out in the UKFS with those of the Forest Stewardship Council® (FSC®) and Programme for the Endorsement of Forest

Certification (PEFC), the two independent internationally recognised voluntary certification schemes operating in the UK. UKWAS certified woodlands are subject to third party audits. UKWAS has a requirement that “Management of invasive plants and of wild mammals shall be undertaken where relevant in co-operation with statutory bodies and where possible and practicable in co-ordination with neighbours..... Where appropriate and possible, the owner/ manager shall consider opportunities for co-operating with neighbours in landscape scale conservation initiatives.”

UKWAS also has requirements about the use of chemicals in forestry:

- a) The use of pesticides and fertilisers shall be avoided where practicable.
- b) The use of pesticides, biological control agents and fertilisers shall be minimised.
- c) Damage to environmental values from pesticide and biological control agent use shall be avoided, mitigated and/or repaired, and steps shall be taken to avoid recurrence.”

There are further relevant requirements to have an effective integrated pest management strategy that:

- a) Is appropriate to the scale of the woodland.
- b) Adopts management systems that shall promote the development and application of non-chemical methods of pest and crop management by placing primary reliance on prevention and, where this is not practicable, biological control methods.
- c) Takes account of the importance of safeguarding the value of sites and features with special biodiversity attributes when considering methods of control, and
- d) Demonstrates knowledge of the latest published advice and its appropriate application.

While UKFS establishes requirements to consider rhododendron control, and UKWAS to control where relevant, it is important to recognise that the requirements are essentially voluntary.

4 Grant assistance for rhododendron control

4.1 Development of the current grant system

Invasive rhododendron control is a costly intervention, using up substantial quantities of scarce resources. As Dieter Helm wrote “The loss of biodiversity and much of our natural environment may be a physical and biological process, but the solutions lie squarely in the allocation of scarce resources.”¹⁷

Grants to support the removal of rhododendron became available through the Forestry Commission’s Woodland Grant Scheme (WGS) from the late 1980s onwards. The presence of grants for rhododendron control on private land came from a recognition of its negative impact on woodland management and the high cost of removing it and of stopping it from spreading. Three versions of WGS were followed by the Scottish Forestry Grant Scheme (SFGS) in 2003. Each successive scheme required more planning inputs from applicants than the one before, with detailed rhododendron management plans and cost breakdowns becoming mandatory. Sometimes the financial viability of landowners was investigated. Grant rates became standardised.

In 2008 SFGS was replaced by the Rural Development Contracts – Rural Priorities, which integrated the agricultural, forestry and rural development grants into one system. For rhododendron control, previously approved long-term forest plans for large woodlands or less demanding biodiversity management plans for smaller woodlands became mandatory.

¹⁷ “Natural Capital: valuing our planet” Dieter Helm 2015

Since 2014 grants for rhododendron control have been available under the current Scottish Rural Development Plan 2014-2020 (SRDP), now extended till 2024. Under the umbrella of the SRDP, rhododendron control for woodland habitats is available through the Forestry Grant Scheme (FGS), administered by each area Conservancy of Scottish Forestry (SF). Rhododendron control for non-woodland habitat is funded through the Agri-Environment Climate Scheme (AECS), a separate funding channel from FGS and administered by the Scottish Rural Payments and Inspections Division (RPID) and NS.

As for previous schemes, the FGS has provision for a follow-up treatment for areas where rhododendron has been controlled. There are fixed standard costs per hectare for rhododendron work, with rates depending on control method, density of rhododendron infestation and difficulty of ground conditions. A different rate, 100% of actual costs based on contractor's quotes, is available for designated sites such as SSSIs.

A significant change from previous schemes is that, except in exceptional circumstances, funding is primarily available in Priority Control Areas, since 2017 tightly defined as woodland areas of the highest biodiversity value already affected by or vulnerable to being affected by rhododendron (see Figure 1). These areas are all on the west coast of Argyll and Bute and Highland regions. In addition, some funding has been allocated to the control of rhododendron in and around affected SSSIs outwith the Priority Control Areas.

This prioritisation of woodland of high biodiversity value marks a recognition of the importance of rhododendron invasions as drivers of biodiversity loss and signifies a greater focus on the conservation of Scotland's rainforest as a reservoir of Scottish biodiversity.

An additional potential source of funding for rhododendron control has been the Biodiversity Challenge Fund (BCF), launched in February 2019 by SN to fund projects aimed at improving biodiversity. These have included projects for the control of rhododendron. There have been three rounds of one-off funding, the last of which closed for applicants at the end of 2020. The annual nature of the funding is a limitation for rhododendron control.


In the past EU LIFE funds have been successfully deployed to tackle large scale biodiversity issues such as infestations of invasive rhododendron. Indeed, this funding source may well have supported more large-scale invasive projects than any other. As Britain has exited the EU, the final attempt to attract this type of funding is a peninsula wide eradication programme in Morvern. Past projects have attracted concern from the EU regarding legacy issues. Although initial treatment was carried out, it was considered that there were weaknesses in approaches to the follow-up treatments.

4.2 The strengths and weaknesses of the current grant system

Feedback from woodland managers and owners involved with rhododendron control suggests that levels of satisfaction with the current form and availability of grant are mixed. Some aspects of the system are generally liked, others are less popular.

Getting project proposals approved

For applicants, project approval is a demanding, time-consuming and potentially expensive process, with no guarantee of a successful outcome. However, as there are limited funds of public money available and as rhododendron control is an expensive operation, a rigorous approach to approving schemes is generally recognised as the right approach.



While not within the rainforest zone, these images are an example of Woodland Trust rhododendron clearance, sourcing grants and working with neighbours to deal with the problem. Showing before and during rhododendron removal in Black Wood, Lang Craigs, West Dunbartonshire. Techniques used were mechanical mulching or cutting and burning, followed by stump treatment, on steep ground or areas close to living trees. Across Lang Craigs a total of 30 hectares of rhododendron were removed, 17 hectares of this was from the Black Wood.

Niall Bervie/WT/M



WT Staff/WT/M

It is striking that satisfaction levels with the process vary markedly between the SF conservancies. There are several possible reasons for this but most stem from the interplay between the chance of a successful outcome for the application and the cost of applying for it. Though there is a grant available for long-term forest plans, there are none for the subsequent operations needed to advance the proposal, including the preparation of a rhododendron management plan. Generally, the high quality of application submissions required by SF necessitates the skilled input of a forestry or ecological consultant, which is potentially a costly commitment. Satisfaction levels are less where there is a feeling that, despite the effort put in, the chance of a successful outcome is low.

Eligibility requirements

The criteria determining the locations of Priority Control Areas are strict, limiting eligible schemes to a very restricted geographical area, except in exceptional circumstances, primarily where designated sites outwith the priority areas have a rhododendron problem. The logic behind this restriction reflects the concern that funding should go to areas where control has the greatest beneficial impact on biodiversity.

A problem arises when a woodland that has locally high biodiversity and/or cultural significance lies outside the eligible area and is not a designated site. In theory, there is sufficient flexibility within the scheme structure to take this into account, though some woodland managers feel that this flexibility is not sufficiently exercised.

A different eligibility problem comes when the rhododendron infestation occurs both within woodland and in open ground, very often because of rhododendron spreading out from a woodland core. Funding for the open ground rhododendron is unavailable under FGS and an application for open ground control goes through Agri-Environment Climate Scheme (AECS), a whole 'farm' scheme that has a separate application process with a narrow annual window for submissions. This adds substantially to an already complex application process, but without tackling the open ground rhododendron as well as that within the woodland, the long-term success of the project is compromised.

Cash and confidence

As rhododendron control is expensive, the landowner or manager is signing a contract involving a lot of money, often tens of thousands of pounds. There is generally a high level of confidence that the grant will be paid, though less confidence that it will be paid promptly. This is a legacy problem though for some landowners the fear of delayed payment persists. Even if paid promptly, there will be a gap between paying a contractor for work done and receipt of grant, a gap that must be bridged by the applicant. Though large schemes will be phased over several years, thus reducing the outlay at any one time, this gap presents a serious cash-flow problem for some applicants, especially those undertaking large schemes.

One condition within the FGS contract is that "Claims can be made after the initial clearance has been carried out, but applicants must ensure that at year five there must be no rhododendron present on site." This is less categorical than previous requirements that rhododendron should be "eradicated" by year five, but it is still off-putting to anyone signing a contract, when they know that there are very few if any examples of a control programme that has eradicated rhododendron by year five. FGS includes funding for one follow-up treatment with the option to apply for a second follow up. Even so, the nature of rhododendron control means that eradication even after two follow-up treatments is unlikely to be 100%. Happily, it seems that this contract requirement has been interpreted with a degree of realism.

As well as the issue that some land managers have with the amount of work required to apply for a FGS grant, there may be concern about the significant cost of managing a scheme that is up and running. There is no grant available for managing a complex scheme and professional managers in particular may be wary of the financial uncertainty that this implies. Anticipating the true cost of rhododendron control is notoriously difficult. If the application fails or the application succeeds but the scheme requires significant amounts of unanticipated management input, if the work ends up costing more than expected or the contractor fails to complete the work satisfactorily, who is liable for the extra costs? These concerns have led some skilled forestry professionals to avoid getting involved in grant-aided rhododendron schemes.

For 100% funding on designated sites, concern about unforeseen costs may be to the forefront, as the grant rate for initial control work and the first follow up later is based on a firm quote from the cheapest of three contractors at the time of the initial application. Managers must have a high level of confidence in all the contractors invited to quote because they will not know beforehand which one will be the cheapest.

Short-term funding, long-term needs

The FGS provides for one follow-up treatment with an option to apply for a second follow-up, which is likely to be in year five or six of the project. An uncertainty with new schemes is what the situation will be by year five. An application submitted now will have funding for the first follow-up but as the scheme is only planned to last till 2024, there must be a question about funding for subsequent control.

There is mounting evidence of the difficulty of maintaining an effective control programme after the initial burst of activity. This can be seen in many older projects where the rhododendron is re-establishing itself. Sometimes there may be a lack of long-term commitment from the land manager or owner but there is also an inherent problem with the funding model, which has always been short-term, whilst to keep on top of re-infestation, effective control requires 'patient' long-term funding.

The collaborative approach

There is growing recognition of the need to tackle rhododendron on a landscape, 'whole-population' scale, rather than piecemeal over only part of a population area. Even if rhododendron has been effectively suppressed in one area, if neighbouring land contains untreated rhododendron, it will spread into the treated area.

Recognising this as a problem, the FGS application process requires, where appropriate, that applicants demonstrate an attempt to work collaboratively with neighbours. In practice, collaborative work with neighbours has proved difficult to achieve, for a variety of reasons. The existence of a Forestry Co-operation Grant within SRDP recognises some of the difficulties of a collaborative approach and offers some financial assistance to offset the costs of this approach, but though the grant has been used for deer control there is no evidence of its use for rhododendron control.



Colonsay in progress, showing the total suppression of ground flora in cleared area to the left.

Bob Black

Colonsay: a whole population approach to rhododendron control

The Isle of Colonsay has very high biodiversity significance, including some fine examples of temperate rainforest. It also had a severe infestation of invasive rhododendron, centred in the policy woodlands and woodland garden around Colonsay House, from where it had spread out onto open moorland and into ancient oak woodland. This woodland and adjacent moorland is part of a SSSI. Rhododendron had also invaded land that is part of a crofting community and from there it was beginning to move into a second SSSI.

In the 1990s the local community together with the landowner entered into an agreement with SNH to control rhododendron, initially in policy woodland peripheral to the core areas of infestation. Through the management agreement, a team of four islanders were employed, cutting and burning larger bushes and spraying smaller ones. This approach, employing people from the local community, has the potential to add local value to rhododendron control projects. Additional funding was secured through the WGS. The WGS soon became the main means of financing the project and work became focussed on the core policy woodland and woodland garden.

At this point progress was slowed by difficult ground conditions and a decision was made to engage a professional contractor and his team of full-time rhododendron control workers. Funding was rolled over into the SFGS, the funding scheme that replaced WGS. Under this scheme clearance work was completed in stages in the core areas and then in the outlying rainforest and all the adjacent open heathland except for that under crofting tenure. One follow-up treatment was also completed, funded by the grant, and some areas received a second, unfunded follow-up treatment. Work under these forestry schemes finished in 2018.

The vision throughout has been to eradicate rhododendron from the island, something that is possible because of its remote location. But this remoteness brings logistical problems. One of these is the additional cost of bringing a team to the island, accommodating them and finding work for them during periods of adverse weather. The landowner was able to offer accommodation and he also provided work for the team when they could not spray rhododendron. The forestry grant covered most of the cost of the project, but the landowner also contributed a significant amount of money and time to make it work.

A long-standing issue, hopefully now being resolved, was how to control the rhododendron that had spread from estate policy woodland onto adjacent crofting land. With crofting land under multiple ownerships and management, a project under any of the forestry schemes was going to be very difficult to pull off. This problem has been partially solved by inputs from NS, and by involving the Argyll and the Isles Coast and Countryside Trust (ACT), who were able to engage a contractor for the initial clearance and follow-up work on the common grazings, with one crofter independently cutting rhododendron on his own croft.

Now, on both the crofting land and the estate land, the main problem is the control of regenerating rhododendron. The nature of rhododendron regeneration means that to be successful eradication requires long-term 'patient' funding and a co-ordinated approach. It is doubtful whether currently available grant schemes can answer this need; it requires consistency of work over several years in both woodland and open ground and where there are multiple ownerships and tenancies and where the island is not a Priority Control Area.

Joining up approaches to controlling invasive rhododendron

A brief investigation and commentary on one of the areas prioritised in the 2017 Prioritisation Document.

The most southerly of the Priority Areas runs along the west side of Loch Fyne, running past Tarbert and encompassing areas on West Loch Tarbert. The area includes three designated sites, two areas managed by Forestry and Land Scotland (FLS), the A83 trunk road, managed by BEAR Scotland, parts of the road network managed by Argyll and Bute Council, a new pylon line being created by Scottish & Southern Energy (SSE), and ground owned by a variety of other public and private entities ranging from farms and estates to investment forestry and private gardens.

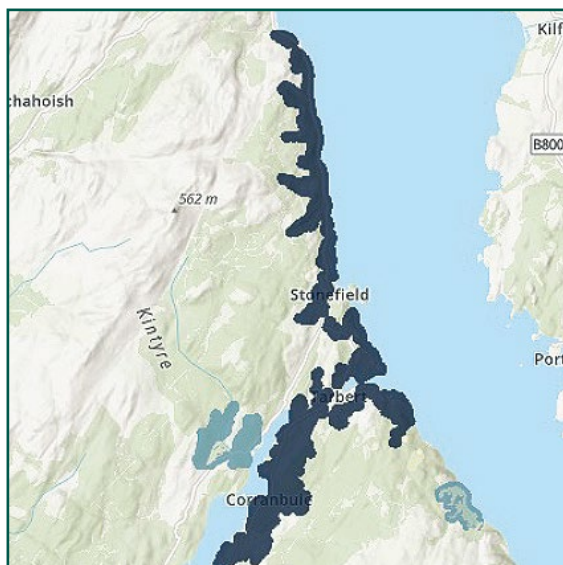


Figure 4.
Loch Fyne and Tarbert Priority Control Area.

The dark colour shows "highest priority woodlands for rhododendron control", the lighter colour shows "extent of associated rhododendron populations".

Contains Ordnance Survey data Crown copyright and database right [2021]

Implications of invasiveness

One of the authors of this document prepared management proposals for one of the private estates and provided management advice to three other private owners during the 1990s. A brief revisit to the area confirms that in the eye of this woodland consultant, rhododendron is invasive over a 25–30-year timescale. Where there were small clumps and isolated bushes, there are now more extensive areas of rhododendron, and frequent bushes. There has been substantial spread, especially along the road corridor, and over ground cleared for roadworks since the 1990s. Twenty-five years is regarded as a typical time scale; however, the speed of invasion does vary depending on factors including woodland structure and ground conditions. In addition, other invasive plants, especially buddleia, have spread along the road corridor.

Progress since 2017

Contact with various stakeholders reveals that NS have made progress with one private owner, and that FLS have also been consolidating clearance on designated sites that they manage in the zone and have applied for Horizon 2020 funding for additional work. Another private owner has secured AECS funding for rhododendron control in non-wooded areas.

Constraints and issues

Rhododendron control at a population level is a complex issue, especially where it involves severe infestation on the edge of or within settlements. The population in this area is substantial and established along roadsides, through woods and along cliffs above the roads. It is also present in country houses and in and around gardens and public ground in the village of Tarbert. The control costs are likely to run to a 7-figure sum, and this figure will have increased since 2017, and will continue to increase.

The prioritised area is a slice of a rhododendron population, excluding bushes which are immediately adjacent to the prioritised area. Even where a project to be brought forward to clear the whole prioritised area, this would not amount to population level control, as the area excludes ground that is either a part of the village of Tarbert or is ground adjacent to the Stonefield Hotel.

There is no leadership of the type required to bring a project of this scale together. NS staff have indicated that if there was a proposal, then they would support it wholeheartedly, and FLS staff are also aware that there are sustainability issues in maintaining their island of successful control within a sea of other people's rhododendron.

Despite Scottish Government's recognition of issues with invasive rhododendron, there does not appear to be a joined-up approach to the problem, even within a priority area. For example, BEAR Scotland manage the trunk road corridor on behalf of the Scottish Government, but there is no indication of a programme to control the spread of the plant. For example, areas of cliff which have been cleared and netted to prevent rockfall are turning into part of the sea of rhododendron, and an area of ground cleared of rhododendron has not had follow up treatment and is at the stage where a follow up treatment will no longer be practicable. As this report is being written SSE are about to clear an 80 metre rhododendron seedbed (the line of a new overhead line) either within or immediately adjacent to the priority area under a Scottish Government Section 37 consent. There is no indication that they are aware of the Scottish Government priority attached to this area. The focus of their publicly available Impact Assessments mitigation against invasive rhododendron is limited to actions taken within 7 metres of a bush.

Given the typical timescales required to draw together and deliver a project at this scale, in the best scenario a priority area identified four years ago is unlikely to be cleared in the foreseeable future. Some of the other Priority Areas are understood to face similar challenges.

5 Strengths and issues with the current situation

There is grant support both through FGS and AECS, as well as targeted support via the Biodiversity Challenge Fund (although there is no confirmation that this Fund will be repeated). SF provided £1,851,591 of grant support for rhododendron control projects between April 2016 and March 2019¹⁸. Further, both National Heritage Lottery Fund and People's Postcode Lottery have committed funding to invasive rhododendron control projects.

The Scottish Government has committed to maintain their existing agricultural and forestry grant support until a post-Brexit replacement scheme is put in place.

The Scottish Government has adopted a National Approach, which includes a prioritisation of sites, as well as the provision for this list of priority sites to be updated.

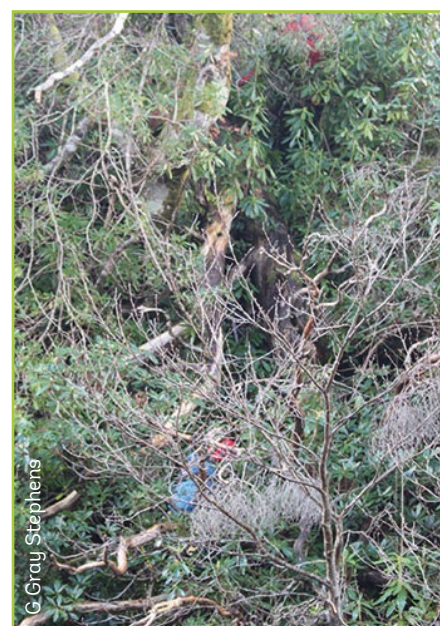
5.1 Opportunities at present

The Scottish Government's *Scottish Biodiversity Strategy post-2020: Statement of Intent* includes "We envisage transformational changes in upland and woodland stewardship, and enhancements in habitat quality and the richness of nature, while continuing to support the rural economy."¹⁹

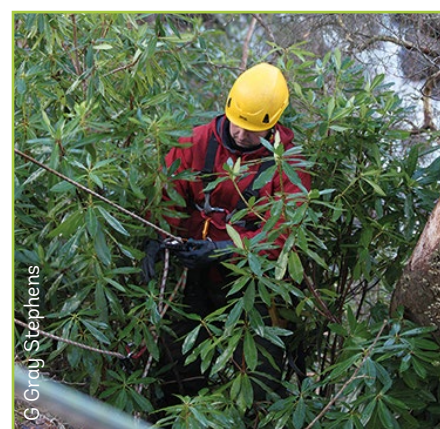
Scotland's rainforest has an increasing profile, it is an internationally important habitat which is threatened by a problem that we know how to deal with, and for which an estimate of control costs could be relatively easily derived. Restoration of the habitat would be a significant step in meeting the biodiversity crisis that Scotland faces.

Post-Brexit funding arrangements for farming and forestry may give Scottish Government the scope to develop a joined-up grant scheme which simplifies application processes and achieves the necessary long-term support for invasive control.

Rhododendron control is a labour-intensive operation and presents the opportunity to create teams of well trained and motivated people working in green jobs in the rural environment, thus contributing to the green recovery agenda. The authors of this paper estimated a figure of 15-25 workdays per hectare of rhododendron clearance for a 2020 study on the FLS rhododendron control programme. There are also opportunities to turn mature rhododendron stumps into 'eco - charcoal', which the National Trust for Scotland have done as part of the clearance of rhododendron on their estate. This can create an added value product which could incentivise rhododendron clearance. Scottish Government policy support and investment in the 'Saving Scotland's Rainforest' project would facilitate significant environmental restoration and create jobs.



The scale of the problem is shown as two climbers are hidden in rhododendron on cliff carrying out stem injection.



Stem injection and rope access.

¹⁸<https://betaproxy1.parliament.scot/chamber-and-committees/written-questions-and-answers/question?ref=S5W-26534>

¹⁹<https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2020/12/scottish-biodiversity-strategy-post-2020-statement-intent2/documents/scottish-biodiversity-strategy-post-2020-statement-intent/scottish-biodiversity-strategy-post-2020-statement-intent/govscot%3Adocument/scottish-biodiversity-strategy-post-2020-statement-intent.pdf?forceDownload=true>



Woodland Trust are leading by example at Lang Craigs, sourcing grants and working with neighbours to deal with the problem.

Niall Benvie/WTPPL

5.2 Issues identified by stakeholders

Scale of clearance operations

The Scottish Government's approach favours a population level control programme; however, SF grant support tends to focus on single landholdings, rather than taking the holistic approach prescribed by the Scottish Government. The FGS works under the umbrella of the SRDP and the way the latter works makes it difficult to look at potential forestry proposals that extend beyond a single landholding. Single landholding schemes are no doubt easier to put together and develop than schemes that cover multiple landholdings but there is a real danger that without the holistic approach they will be unable to control rhododendron in the medium to long-term.

Timescales for completing complex, multi-landownership schemes

Managers are concerned that there is insufficient recognition of the time commitment required to deliver a population level scheme. Bringing together all the parties that need to be engaged can take much time and much commitment.

For example, in Lochgoilhead, a priority area for LLTNPA, an initial sample of 300 households in the potential population area yielded approximately 170 properties where rhododendron probably occurred. 57% of these properties did not have anyone present at any of three separate visits by contractors (with some visits timed for evenings and weekends). Initially only just over 40% of those contacted were supportive of the proposal to remove rhododendron from their property. Securing agreement from every landholder may involve building trust over many months, if not years.

Raising the project finance for a multi-landownership scheme is also a long and complex process. Small landholdings such as gardens will not be eligible for existing SRDP funding, so funding must come from another source. The landscape scale project at Glen Creran took six years from the time of first contact with Glen residents to the arrival of the contractors. Most of those early years were occupied with first getting everyone behind the project and then securing the funding. These delays meant that early rhododendron surveys became partially outdated due to the ongoing spread of the infestation, and some properties changed hands, requiring a fresh approach to a new or unknown owner. In another example, in work undertaken in Aberfoyle, over 20% of houses involved after the initial survey had either been sold or were about to be sold by the time the necessary funding had been secured.

In common with less complex projects, there must be a recognition built into the funding model that eradication of rhododendron is not something that can be accomplished within a short timeframe. However, funding must come to an end sometime and for a project to succeed in the long-term landholders should be prepared to take over the project and complete the work with only limited support from outside parties.

Funding issues for schemes eligible for SRDP funding

Delays in grant payments have been an issue in the past, and for some land managers there remains a perception that this is still a problem, creating a reluctance to commit to a new scheme.

A barrier to entering a scheme can be uncertainty around costs incurred but not covered by grant. Some costs are excluded from grant support, notably the initial costs of surveying. There may also be costs arising from the actual rhododendron control that are not covered by grant.

There is also a perception by agents that rhododendron control is unlikely to be a profitable enterprise when compared with other forestry operations, such as new planting or harvesting.

Where there is competition for the services of a forestry professional, this can make it less likely that schemes will be promoted by an estate's forest manager.

Invasive rhododendron is not a Scottish Government Key Performance Indicator

The focus is on the condition of designated sites, and although woodland performs badly on this metric, and this is often because of invasive rhododendron, this separation of cause and indicator is felt to reduce the focus on the problem of rhododendron.

The biodiversity duty on public bodies does not get much traction

Public bodies in Scotland have a duty to further the conservation of biodiversity. This biodiversity duty is about taking care of nature all around us, not just in specific protected sites or for particular species. It extends to the reporting processes of a range of public bodies, but this requirement has limited influence. For example, the Highland Council Report for 2015-17 includes "The new Highland-wide Local Development (2018) will include a dedicated policy related to the natural environment and will state that damage caused by non-native invasive species can be irreversible and that proposals, where possible, will prevent their spread."²⁰ The phrase "where possible" immediately dilutes the clear intention of the 2004 Act, and it is reasonable to question under what circumstances a developer regards expenditure to prevent the spread of rhododendron as "possible".

Other bodies with a partially public facing role but not a "public body and office holder", such as those responsible for the Trunk Roads network, or energy networks, are not captured in the public duty requirement.


6 Proposals for new approaches to invasive rhododendron control

6.1 To make a real difference requires a step change in public funding and policy support

Public awareness of the importance of our rainforest and the importance of dealing with the threats that it faces is an important factor in bringing about action. The action can be as simple as an increased number of volunteers assisting with the control of invasives, and this assistance can range from hill walkers providing GPS records of isolated bushes that they see, to volunteers who get involved in physical clearance. Increased awareness and engagement are a good way of building societal recognition of the problem, an important step on the way towards financial support for rainforest restoration.



²⁰ https://www.highland.gov.uk/downloads/file/12147/2015-2017_biodiversity_duty_report



Rhododendron in rainforest in Lochgoilhead.

6.2 Parliamentary engagement

Debate in Scottish Parliament

The Scottish Parliament members' business debate on the rainforest in January 2016²¹ was a powerful demonstration of the cross-party support for the rainforest. There is scope for a separate debate that focusses on appropriate actions to address the threats faced by the habitat.

6.3 Joined-up government

The Scottish Government has issued a position statement on development of the fourth National Planning Framework (NPF4):

“In particular, opportunities for natural infrastructure to address the long-term risk of flooding, water and drainage issues, temperature management and everyday livability of places will inform our approach to planning and enhancing our spaces and places. As part of this, consideration will also be given to the integration of ecological networks to protect and restore biodiversity and ensure that habitats and species can adapt to a changing climate.”²²

There is scope to ensure that local authority buy-in to control invasives is strengthened by this Framework.

6.4 Catching it early

A critical part of cost-effective control of invasive rhododendron (and other invasive species) is catching it early. Both the UK and the Scottish Government have protocols to help with this process. However, action at a landholding level is required to ensure that this early intervention is delivered.

Under SRDP, Good Agricultural and Environmental Condition (GAEC) has been a mechanism that could have been used to achieve this. Consideration should be given to ensuring that future grant schemes include an element of cross compliance, as part of a suite of measures to engage landholders in the business of invasives control.

6.5 Stopping the sale

Invasive rhododendron continues to be offered for sale by plant nurseries in the UK, both as a flowering plant and as the rootstock for grafted rhododendron species. A DEFRA consultation in 2009 included *Rhododendron ponticum* on a list of 15 alien species that were being considered for a ban on sale. The Horticultural Trade Association expressed concern

²¹https://www.parliament.scot/parliamentarybusiness/report.aspx?r=10290&mode=html#iob_94669

²²<https://www.gov.scot/publications/scotlands-fourth-national-planning-framework-position-statement/pages/7>

that a ban would be difficult to implement, and growers and retailers would be disproportionately affected. The continued sale and planting of invasive rhododendron in UK, especially in the rainforest, clearly increases the risk of further spread to new locations. If invasive rhododendron and its rootstock are still on the market, it will be difficult to build a sound case for eradicating it in the wild.

6.6 Prioritising areas for treatment

NS and SF have indicated that they are preparing to review the priority control areas. In the first instance this review should include an assessment of existing projects, drawing lessons from both success and difficulties. Thereafter the opportunity should be used to widen the scope of the selection process. It is suggested that the following additional measures should be included:

Community inputs

Individuals and their communities have a fundamental impact on the sustainable removal of invasive rhododendron. The Scottish Government should support communities in the rainforest zone where there is demonstrable buy-in, particularly where there is a track record of success. Support should focus on both the planning and delivery phases. A bottom-up approach to tackling invasives can also help to build community capacity and cohesion.

Inputs from other Scottish Government bodies

Both LLTNPA and FLS have their own priority areas, and both have already invested public money in control programmes. Any national approach should reflect the achievements and the future programmes of players such as these.

6.7 Reducing the cost of treatment and minimising herbicide use

Stem injection is a lower cost approach to treating rhododendron than the more traditional cut-and-burn; it is used extensively in other countries such as Wales. It also has the advantage of reducing the amount of glyphosate used in treatment, and thus reducing the probability of collateral damage to vulnerable species during control operations. Stem injection has had less take up in Scotland. Its use should be encouraged through further trials and promotion, and by the development of training videos.



Stem injection

6.8 Using the powers of the Wildlife and Natural Environment Act (WANE Act)

In 2011, the WANE Act created powers for the Scottish Government and their agents to take certain actions to ensure that appropriate action is taken to control invasive species. Some use of these powers has been made however stakeholders find that there is uncertainty about how these powers are to be used, and a belief that voluntary action would be more likely if there was an agreed publicly available framework for their use.

6.9 Planning gain and positive net effects for biodiversity

Section 75 agreements, created by Town and Country Planning (Scotland) Act 1997²³, have been used by local authorities to secure “planning gain” by making woodland management a condition of planning approval. The LLTNPA have also taken steps to deliver elements of invasive control through use of the planning system. Although this is not always successful, it does produce some useful occupier-led action, with positive effects for biodiversity. There is merit in investigating mechanisms to strengthen the use of planning gain, and in extending this approach to other areas. Planning agreements seeking support for rhododendron clearance should include securing maintenance and monitoring over a long-term period to ensure the clearance is effective and permanent.

The Planning (Scotland) Act 2019 requires that securing positive effects for biodiversity will be one of the six key outcomes of the emerging National Planning Framework 4 (NPF4). As the NPF4 is developed there is an opportunity to tie in ‘positive effects for biodiversity’ with rhododendron clearance subject to the following principles:

- Projects that harm ancient woodland cannot deliver positive effects for biodiversity. Ancient woodlands are irreplaceable therefore no amount of harm or loss could be compensated for.
- The condition of ancient woodland should not be a factor when making decisions about development that harms ancient woodland.
- Any funding from developments that should deliver positive effects for biodiversity shouldn’t be used to fill funding gaps that should be covered because of other commitments (e.g. protected areas condition) otherwise it fails to achieve additionality.


These principles should be written into the NPF4 or associated guidance on ‘positive effects for biodiversity’.

7. A bigger funding picture

As described above, the Scottish Government has already committed funds to help land occupiers to control invasive rhododendron. However, there is no general feeling among stakeholders that this funding is making significant inroads into rhododendron control. Indeed, some stakeholders are of the opinion that Scotland is going backwards now: more rhododendron is establishing and re-establishing in previously cleared areas than is being cleared.

Some non-monetary approaches to the problem have already been outlined, however there is no doubt that successful control within the rainforest requires increased funding, and this paper makes some suggestions, both in the short-term and the medium-term.

²³ <https://www.legislation.gov.uk/ukpga/1997/8/section/75/>



Oak seedling naturally regenerating in Crinan Wood, Argyll.

7.1 A Restoration Fund

The rhododendron issue is of a scale and complexity to justify a specific fund. A holistic approach would deal with two other issues, deer control and natural regeneration of trees. This holistic approach would help to secure the overall condition of our rainforest and help to deliver the Scottish Government's woodland expansion targets, thus also contributing to Scotland's targets for climate change.

Deer control

A key issue facing Scotland's rainforest is herbivore impacts, and particularly deer impacts. An Action Fund should include measures to ensure that herbivore numbers are also brought into balance. Anecdotal evidence suggests that the nature of site recovery once rhododendron has been controlled is dramatically affected by deer impacts. Where deer are not controlled a monoculture of moss may dominate, whereas with deer control a more complex, diverse ground flora, including young trees, is allowed to develop.

Natural regeneration

Control of deer will allow the rainforest to expand as well as adding resilience. Adoption of this approach at scale across the rainforest area would make a substantial low impact contribution to the Scottish Governments' woodland expansion targets.

7.2 A Rainforest Restoration Fund

The Scottish Government has already established a successful and much-admired fund to deal with a similar large scale restoration project, the Peatland Action Fund, an ambitious programme that has recently been extended, providing a £250m funding package over a 10-year period. Many of the issues facing rainforest managers are shared by peatland managers. The Scottish Government's Green Recovery proposals describe how these issues are being addressed for peatland:

“We are currently working with our peatland restoration delivery partners and others involved across the public, private and third sectors to improve and streamline how we organise, fund and deliver increased restoration in the coming years, and to identify and develop solutions to any current barriers. These include the need for multi-year funding, enhanced contractor capacity, as part of developing a peatland restoration sector, and improved awareness among landowners and managers of the opportunities and benefits of peatland restoration. We will also be exploring with major landowners and stakeholders a strategic approach to achieve large-scale restoration projects over multiple years.”²⁴

²⁴<https://www.gov.scot/publications/securing-green-recovery-path-net-zero-update-climate-change-plan-20182032/pages/12/>

In addition, the following elements of the Peatland Action Fund are also transferrable to a Rainforest Restoration Fund:

- **Support for facilitating project officers:** The Peatland Action Fund has funded project officers who are able to work with land occupiers to develop schemes that work for both the Fund and the land occupier.
- **A simple application process minimising transaction cost:** The Peatland Action Fund application process reduces barriers to entry.
- **Concerted action:** The Peatland Action Fund requires that the impacts of deer upon peatland condition are also addressed as a condition of support. Deer control with rhododendron control should be required, while conversely herbivore control without rhododendron control should not be encouraged.

7.3 Other aspects of a Rainforest Restoration Fund

Scope for hybrid Scottish Government/NGO/corporate funding pot

Given the increased interest in the rainforest by NGOs, and the increasing public and corporate awareness of this special woodland habitat, there may be opportunities to draw additional support into the Fund, thus potentially multiplying its impact. This model is already being adopted by the Scottish Conservation Finance Project, which is being delivered jointly by Scottish Wildlife Trust and Scottish Environment Protection Agency. This collaborative approach between Government, agencies, NGOs and others has considerable potential as the concept of Natural Capital funding develops (see 7.4).

Training teams to create local green jobs

As part of a green recovery, there are significant opportunities to provide recognised training courses for people in innovative and under-utilised approaches such as community engagement and stem injection. Given appropriate long-term commitments and structures this has the potential to provide skilled green rural employment as well as increasing the resilience of our rainforests.

Teams of trained people could be deployed to deal with rhododendron control in selected areas. This could provide a satisfactory means of developing community-based schemes, working at a large scale, providing value for government money, and removing the perceived risk to landowners in participating in clearance operations.

These teams would require appropriate supervision and could be run both by private forestry contracting companies, and by regional partnerships such as ACT, which already has a track record of delivering rhododendron control projects.



Ardnamurchan West Highland Area



Lochaline



Ben Shieldaig

7.4 Other operational and funding mechanisms worth exploring for the rainforest

Footpath funding via SRDP as a model for funding across ownership boundaries

The Improving Public Access option under SRDP has a mechanism that allows third parties to undertake access work, particularly where a path crosses more than one ownership. A “contractual licence” or similar agreement allows other parties to apply for the funding and deliver the scheme²⁵. A similar approach to population control of invasive rhododendron would remove many of the barriers to entry that are concerns for stakeholders.

Results Based Agri-Environment Payment Scheme (RBAPS)

England has piloted RBAPS in Wensleydale (on species rich meadows and grassland for breeding waders) and Norfolk/Suffolk (delivering plots of winter bird food and flower-rich mixes for pollinators). Farmers had complete flexibility on how to manage their land, but the annual scheme payment was linked to their level of success in delivering the biodiversity outcome.

Ireland has also trialled RBAPS in the Burren²⁶, with the addition of capital payments to farmers for necessary works prior to entry to the annual payment process.

A pure results-based approach provides an important motivation, and a value-for-money safeguard to ensure payments are only made for performance above a defined minimum level. The results-based approach has considerable potential to improve the performance of agri-environmental measures, and early indications suggest that delivery costs and scheme payments are unlikely to be significantly different to those of management-based measures, suggesting that the approach could deliver some efficiency gains. Such an approach would require a recognition of the timescales involved in controlling invasive rhododendron, and of the prioritisation approach.

Future scope to use Natural Capital Funding mechanisms

The Scottish Government is committed to “Protecting and enhancing our stock of natural capital” as this “is fundamental to a healthy and resilient economy.”²⁷ Furthermore, the Scottish Government’s “Natural Capital Knowledge Account” identifies INNS as a significant threat, a “Future Driver”²⁸. Future drivers are factors typically causing the degradation of natural capital assets. This subsequently leads to system failures, and to functions and services that cannot fully recover unaided within extensive timescales²⁹.

Invasive rhododendron already has a deleterious impact on Regulating, Supporting, Provisioning, and Cultural Ecosystem Services, the four services identified by the UK National Ecosystem Assessment process as the benefits provided by ecosystems that contribute to making human life both possible and worth living³⁰. This impact is increasing and will continue to increase unless there is effective and enhanced intervention.

²⁵ <https://www.ruralpayments.org/topics/all-schemes/agri-environment-climate-scheme/management-options-and-capital-items/improving-public-access/guidance-for-improving-public-access/>

²⁶ https://rbapseu.files.wordpress.com/2019/01/rbaps_gh01_general_guidance.pdf

²⁷ Scotland’s Economic Strategy (2015)

²⁸ <https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2020/02/environment-strategy-scotland-vision-outcomes/documents/natural-capital-knowledge-account/natural-capital-knowledge-account/govscot%3Adocument/natural-capital-knowledge-account.pdf>

²⁹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/909202/ncc-terminology.pdf

³⁰ <http://uknea.unep-wcmc.org/EcosystemAssessmentConcepts/EcosystemServices/tabid/103/Default.aspx>.

The Scottish Conservation Finance Project's £1bn Challenge identifies INNS as an issue that has both negative ecological and economic impacts and proposes an innovative solution. Loans would be made available to organisations looking to put in place biosecurity measures to prevent the arrival or spread of INNS, and thus to help eradicate INNS in Scotland. These loans, which would result in ecological and economic benefits, would potentially pay for themselves through future savings in the costs of management³¹.

Natural Capital is a developing concept, with the potential to justify additional funding for the proposed Rainforest Action Fund.



Phoenix oak tree in Crinan Wood, Argyll.

Niall Benzie/WTML

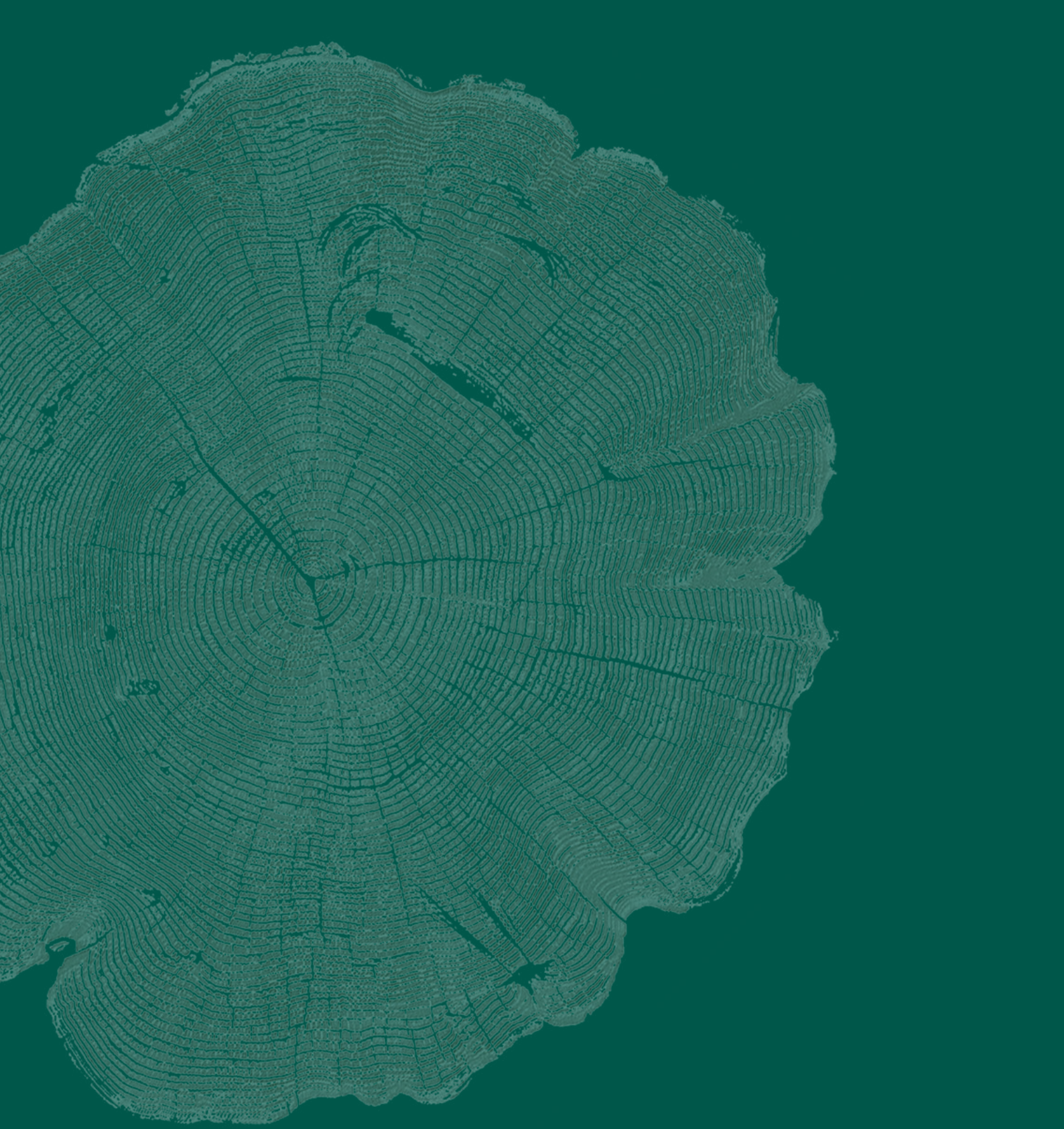
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8 Recommendations

- Action to safeguard the future of Scotland's rainforest biodiversity needs to address the multiple threats from invasive non-native species and from herbivore impacts.
- Translate the recognition of the threat to rainforest biodiversity from invasive rhododendron into more focussed and better funded action. A clear, unambiguous lead from Government is likely to prompt other organisations to pay more attention to rhododendron control. A meaningful national target for the control of invasive rhododendron is one way in which Government could provide this lead, and such a target should be developed as part of the next Biodiversity Strategy.
- Revisit the criteria for Priority Control Areas to allow more flexibility in funding clearance projects where there are local champions and potential for large biodiversity gains. The current Priority Control Areas for funding rhododendron control were derived on a national level from criteria that may not reflect local or regional priorities.
- A new funding model for rhododendron eradication in woodland of high biodiversity value is required:
 - Explore the creation of a dedicated Rainforest Action Fund for rhododendron control, or rhododendron and herbivore control, as a matter of priority. This would be initially funded by Government and could be on the lines of the existing Peatland Action Fund and targeted to the 'rainforest zone.' It would provide long-term funding and a project officer to initiate projects, co-ordinate landowner involvement, provide management support and disseminate best-practice advice. The fund would complement and support existing initiatives by organisations such as LLTNPA, Royal Society for Protection of Birds, National Trust for Scotland, FLS and Argyll Coast and Countryside Trust.
 - Additional funding should be sought from NGOs and corporate bodies. The concept of protecting natural capital is feeding through from theory into practical action, as demonstrated by the establishment of the Scottish Conservation Finance Project. Initiatives such as this should be encouraged, to boost action to control INNS, particularly invasive rhododendron.
- A results-based approach for assessing the success of funded projects should be piloted to see whether this model delivers more effective results than the current SRDP model.
- Make powers of enforcement more widely known and used where necessary. These powers, which include SCAs and SCOs, already exist for controlling rhododendron in key rainforest areas where landowners are reluctant to act, and yet they are barely used at present.

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