



# RESOURCES FOR MANAGING WOODLAND FOR RESILIENCE

Royal Forestry Society in partnership with



March 2022



The UK Forest Standard (UKFS) defines resilience as:

**“The ability of a social or ecological system to absorb disturbances, while retaining the same basic structure and ways of functioning, the capacity for self-organisation, and the capacity to adapt to stress and change.”**

The following table contains resources on the aspects of forest management linked to resilience, from climate change impacts and adaptation to surveying and maintenance of the soil resource. For practical examples please refer to *Managing for Resilience - 12 case studies* delivered in partnership by the RFS and Forestry Commission.

**Key:**

Yellow	guides, advice or schemes
Green	reference material (book, report, article)
Blue	online tool or database

The table is not designed to be exhaustive but rather to provide helpful starting points for each topic. Resources are freely available unless otherwise specified. It has been adapted from an article: *Forest Resilience Part 2. Practical considerations* by Tew, E., Rob Coventry, Emily Fensom and Chris Sorensen, C. (2021) which appeared in the Quarterly Journal of Forestry 115 (3), July 2021.

Pictures: Forestry Commission

Category	Topic	Reference (type of resource)	Description	Link/details
Planning	Impacts of climate change	Managing England's woodlands in a climate emergency (2019) <i>(Forestry Commission guide)</i>	Practical, general advice on how to manage woodland to combat the effects of climate change.	<a href="http://www.gov.uk/government/publications/managing-englands-woodlands-in-a-climate-emergency">www.gov.uk/government/publications/managing-englands-woodlands-in-a-climate-emergency</a>
		Climate Change Adaptation Manual (2020) <i>(Natural England and Royal Society for the Protection of Birds manual)</i>	Resource to support practical and pragmatic decision-making on adaptation to climate change in different ecosystems. Includes sections for each of the main broad woodland types and links to available resources and tools.	<a href="http://www.publications.naturalengland.org.uk/publication/5679197848862720">www.publications.naturalengland.org.uk/publication/5679197848862720</a>
		Climate Change Factsheet series (2021) <i>(Forest Research factsheets)</i>	A series of factsheets exploring the effects of climate change on trees and woodlands.	<a href="http://www.forestresearch.gov.uk/news/forest-research-launches-climate-change-factsheet-series/">www.forestresearch.gov.uk/news/forest-research-launches-climate-change-factsheet-series/</a>
	Resilience Implementation Framework	Resilience and tree health: a basis for implementation in sustainable forest (Article) management (2016) <i>(Article)</i>	Review on the definition and understanding of resilience, including a six-step framework to help forest managers to implement resilience.	Fuller, L. and Quine, C.P. (2016) <i>Forestry</i> 89 (1): 7-19. <a href="http://www.doi.org/10.1093/forestry/cpv046">www.doi.org/10.1093/forestry/cpv046</a>
		Resilience Implementation Framework guide (2021) <i>(Forest Research guide)</i>	An accessible guide to help forest managers apply the Resilience Implementation Framework.	Boyd, F. et al. (2021) <i>Forest Research</i> : <a href="http://www.forestresearch.gov.uk/tools-and-resources/fthr/resilience-implementation-framework/">www.forestresearch.gov.uk/tools-and-resources/fthr/resilience-implementation-framework/</a>
	Woodland management plan guidance and funding	Create a woodland management plan (UK government webpage)	Guidance on creating a UK Forestry Standard compliant management plan, including examples and a template.	<a href="http://www.gov.uk/guidance/create-a-woodland-management-plan">www.gov.uk/guidance/create-a-woodland-management-plan</a>
		myForest <i>(Sylva Foundation online tools and resources)</i>	Online tools and resources for woodland management.	<a href="http://www.myforest.sylva.org.uk/home">www.myforest.sylva.org.uk/home</a>
		Countryside Stewardship woodland support grants (UK government webpage)	Funding for woodland improvement for biodiversity or water benefits, restocking following tree health issues, removal of rhododendron, woodland management planning and woodland creation.	<a href="http://www.gov.uk/government/collections/countryside-stewardship-get-paid-for-environmental-land-management#woodland-support-grants">www.gov.uk/government/collections/countryside-stewardship-get-paid-for-environmental-land-management#woodland-support-grants</a>

Category	Topic	Reference (type of resource)	Description	Link/details
Site assessment	Soil	The identification of soils for forest management (2012) (Forestry Commission field guide, £17)	A field guide for rapid identification of forest soils using the Forestry Commission classification system.	<a href="http://www.forestresearch.gov.uk/research/the-identification-of-soils-for-forest-management/">www.forestresearch.gov.uk/research/the-identification-of-soils-for-forest-management/</a>
		Ecological Site Classification (ESC) Field Survey Pack (Forestry Commission guide)	A field survey pack with identification guides and recording forms for soil, humus form, and indicator vegetation. Designed for use alongside ESC.	<a href="http://www.forestresearch.gov.uk/documents/2110/escfsp.pdf">www.forestresearch.gov.uk/documents/2110/escfsp.pdf</a>
		ESC Woodland Species Guide (2017) (Royal Forestry Society guide)	A guide for identification of common plant indicator species (species that are linked to particular soil characteristics). Designed for use alongside ESC.	<a href="http://www.rfs.org.uk/learning/professionaldevelopment/resources/woodland-plant-i-d-guide/">www.rfs.org.uk/learning/professionaldevelopment/resources/woodland-plant-i-d-guide/</a>
	Climate	Forest Research Climate Matching Tool (Forest Research online tool)	A tool that illustrates the likely effects of climate change for any location in the UK, by showing locations that currently have climates comparable to future UK site conditions.	<a href="http://www.forestresearch.gov.uk/tools-and-resources/fthr/climate-matching-tool/">www.forestresearch.gov.uk/tools-and-resources/fthr/climate-matching-tool/</a>
		UK Climate datasets (Met Office data)	Range of datasets to explore climate statistics for different regions. Modelled data are also available at fine resolution (1km squares) but more advanced data processing skills are required to download and view it.	<a href="http://www.metoffice.gov.uk/research/climate/maps-and-data/data/index">www.metoffice.gov.uk/research/climate/maps-and-data/data/index</a>
		Ecological Site Classification tool (ESC) (Forestry Commission online tool)	An online tool that uses site data (soil type, windiness etc) to generate tree species suitability predictions under current and potential future climates. ESC default soils maps are for strategic level use so local soil information is essential.	<a href="http://www.forestresearch.gov.uk/tools-and-resources/fthr/ecological-site-classification-decision-support-system-esc-dss/">www.forestresearch.gov.uk/tools-and-resources/fthr/ecological-site-classification-decision-support-system-esc-dss/</a>

Category	Topic	Reference (type of resource)	Description	Link/details
Species / provenance selection	Species Selection	Ecological Site Classification tool (ESC) <i>(Forestry Commission online tool)</i>	See 'Climate' section in above.	
		Royal Forestry Society Species Profiles <i>(Royal Forestry Society short articles)</i>	15 papers about less familiar species, e.g. 'The redwoods and red cedar', 'Macedonian pine', 'Noble hardwood alternatives to ash'.	<a href="http://www.rfs.org.uk/insights-publications/climate-change-and-forest-resilience/">www.rfs.org.uk/insights-publications/ climate-change-and-forest-resilience/</a>
		Silviculture of Trees Used in British Forestry (2019) <i>(Book, £95)</i>	Information on tree species suitability for different purposes, including climate and soil requirements and other silvicultural characteristics.	Savill, P. CABI. 3rd edition.
		Tree species database <i>(Forest Research online database)</i>	Information on over 60 tree species that are either widely grown in British forests at the present time or which could play an increasing role in the future.	<a href="http://www.forestresearch.gov.uk/tools-and-resources/tree-species-database/">www.forestresearch.gov.uk/tools-and- resources/tree-species-database/</a>
	Species provenance	Genetic considerations for provenance choice of native trees under climate change in England (2019) <i>(Forestry Commission, Natural England and Woodland Trust Policy Advice Note)</i>	Practical, take-home messages from research evaluating the evidence around provenance choice and adaptation to climate change when planting native woodland.	<a href="http://www.assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/809733/Policy_Advice_Note_Final180619.pdf">www.assets.publishing.service.gov.uk/ government/uploads/system/uploads/ attachment_data/file/809733/Policy_ Advice_Note_Final180619.pdf</a>
		Provenance variation of emerging species <i>(Forest Research webpage)</i>	Summary of provenance recommendations for eight emerging conifer species. Includes links to further reference material.	<a href="http://www.forestresearch.gov.uk/research/provenance-variation-emerging-species/">www.forestresearch.gov.uk/research/ provenance-variation-emerging-species/</a>
		Forest Research Climate Matching Tool <i>(Forest Research online tool)</i>	See 'Climate' section on previous table. Supports the selection of tree species and provenances suited to current and future climates.	<a href="http://www.forestresearch.gov.uk/tools-and-resources/fthr/climate-matching-tool/">www.forestresearch.gov.uk/tools-and- resources/fthr/climate-matching-tool/</a>

Category	Topic	Reference (type of resource)	Description	Link/details
Silvicultural systems	Species mixtures	Establishing robust species mixtures (2020) <i>(Quarterly Journal of Forestry article)</i>	Describes a method to design robust mixtures of species at the establishment phase. Includes a methodology for determining a compatibility score of species combinations.	Kerr, G. et al. Quarterly Journal of Forestry 114 (3)
	Continuous Cover Forestry	Continuous cover silviculture <i>(Forest Research webpage)</i>	Information, tools and research on various aspects of CCF.	<a href="http://www.forestresearch.gov.uk/research/continuous-cover-silviculture/">www.forestresearch.gov.uk/research/continuous-cover-silviculture/</a>
		Managing continuous cover forests (2008) <i>(Forestry Commission Operational Guidance Booklet)</i>	Practical guidance for continuous cover forestry.	<a href="http://www.forestresearch.gov.uk/research/managing-continuous-cover-forests/">www.forestresearch.gov.uk/research/managing-continuous-cover-forests/</a>
		Successful Underplanting (2016) <i>(Forestry Commission guide)</i>	Practical guidance for underplanting.	<a href="http://www.forestresearch.gov.uk/documents/1512/UnderplantingGuideVersion10_11October2016.pdf">www.forestresearch.gov.uk/documents/1512/UnderplantingGuideVersion10_11October2016.pdf</a>
		Continuous Cover Forestry (2017) <i>(Pro Silva Silviculture guide, €10)</i>	Guidelines on implementing continuous cover forestry and close to nature forestry management practices.	<a href="http://www.prosilvaireland.com/welcome-to-pro-silva-ireland-the-authority-of-continuous-cover-forestry-in-ireland/information-booklets/">www.prosilvaireland.com/welcome-to-pro-silva-ireland-the-authority-of-continuous-cover-forestry-in-ireland/information-booklets/</a>
		Encouraging Greater Use of Continuous Cover Forestry <i>(Quarterly Journal of Forestry articles)</i>	Part 1: Stand and site considerations. Part 2: Wider considerations	Mason, W. (2020) Quarterly Journal of Forestry 114 (4) & Mason, W. (2021) Quarterly Journal of Forestry 115 (1)
	Forest Development Types	Forest Development Types: an essential tool for diversifying stands in Britain (2021) <i>(Quarterly Journal of Forestry article)</i>	Introduction to Forest Development Types, describing their benefits and application.	Haufe, J. et al. (2021) Quarterly Journal of Forestry 115 (2)
		Forest Development Types <i>(Forest Research webpage)</i>	Information on Forest Development Types and how they will be used.	<a href="http://www.forestresearch.gov.uk/tools-and-resources/fthr/forest-development-types/">www.forestresearch.gov.uk/tools-and-resources/fthr/forest-development-types/</a>

Category	Topic	Reference (type of resource)	Description	Link/details	
Ecosystem integrity	Soil protection	Protecting the Environment during Mechanised Harvesting Operations (2005) (Forestry Commission Technical Note)	Technical note covering site planning, machine selection, brash mat construction and maintenance, drain and watercourse crossing, forest road approaches and roadside stacking.	<a href="http://www.forestresearch.gov.uk/research/protecting-the-environment-during-mechanised-harvesting-operations/">www.forestresearch.gov.uk/research/protecting-the-environment-during-mechanised-harvesting-operations/</a>	
		Guidance on cultivation and UKFS compliance for application in England (2021) (Forestry Commission Operations Note)	Operational note for England on the use of cultivation and a six-step process for determining which technique, if any, is the most appropriate. A full UKFS Technical Note (covering all countries) is under consideration.	<a href="http://www.gov.uk/government/publications/guidance-on-cultivation-and-ukfs-compliance-for-application-in-england-operations-note-53">www.gov.uk/government/publications/guidance-on-cultivation-and-ukfs-compliance-for-application-in-england-operations-note-53</a>	
		Soils Cultivation on Afforestation Sites (2021) (Royal Forestry Society YouTube video)	Webinar recording covering soil cultivation and an excellent introduction to soils identification.	<a href="https://www.youtube.com/watch?v=jxPJwMPPYk&amp;t=90s">www.youtube.com/watch?v=jxPJwMPPYk&amp;t=90s</a>	
	Species management	Species management	Manage threats to woodland: destructive animals, invasive species (UK government webpage)	Information on managing deer, feral wild boar, grey squirrels and other invasive species.	<a href="http://www.gov.uk/guidance/manage-threats-to-woodland-destructive-animals-invasive-species">www.gov.uk/guidance/manage-threats-to-woodland-destructive-animals-invasive-species</a>
			Non-native species secretariat (Webpage and database)	Resources and guidance about biosecurity and management of non-native species. Includes a searchable database for information about non-native species.	<a href="http://www.nonnativespecies.org/home/index.cfm">www.nonnativespecies.org/home/index.cfm</a>
			Managing and controlling invasive rhododendron (2006) (Forestry Commission Practice Guide)	Practice guide covering surveying and monitoring of a site, and selecting and implementing control techniques.	<a href="http://www.forestresearch.gov.uk/research/managing-and-controlling-invasive-rhododendron/">www.forestresearch.gov.uk/research/managing-and-controlling-invasive-rhododendron/</a>
			Controlling grey squirrels in forests and woodlands in the UK (2019) (UK Forestry Standard Technical Note)	Updated information on methods of grey squirrel control in response to changes in legislation as well as recent developments in control methods and trap designs.	<a href="http://www.forestresearch.gov.uk/research/controlling-grey-squirrels-forests-and-woodlands-uk/">www.forestresearch.gov.uk/research/controlling-grey-squirrels-forests-and-woodlands-uk/</a>
			Deer Initiative: best practice guidance (Deer Initiative webpage)	Best practice guidance on deer management and how to carry it out effectively; how to safeguard personal and public safety and animal welfare; and how to maintain legal requirements.	<a href="http://www.thedeerinitiative.co.uk/best_practice/">www.thedeerinitiative.co.uk/best_practice/</a>
			Advice from Forestry Commission Deer Officers	Webpage with contact details for Forestry Commission Woodland Officers, who will forward enquiries to Deer Officers as appropriate. Deer Officers can give advice on deer management and establishing landscape-scale initiatives.	<a href="http://www.gov.uk/government/organisations/forestry-commission/about/access-and-opening#area-offices">www.gov.uk/government/organisations/forestry-commission/about/access-and-opening#area-offices</a>
			Preventing mammal damage to trees and woodland (Forest Research webpage)	An overview of control methods and links to further information.	<a href="http://www.forestresearch.gov.uk/research/preventing-mammal-damage-to-trees-and-woodland/#tablea">www.forestresearch.gov.uk/research/preventing-mammal-damage-to-trees-and-woodland/#tablea</a>

Category	Reference (type of resource)	Description	Link/details
Biosecurity	Plant Healthy Certification Scheme	A voluntary biosecurity certification scheme for nurseries and horticultural, arboricultural and forestry businesses to help protect them, and the natural environment from destructive plant pests and diseases.	<a href="http://www.planthealthy.org.uk/certification">www.planthealthy.org.uk/certification</a>
	DEFRA: The UK Plant Health Information Portal (Web-based portal)	Contains resources on biosecurity, risk assessment, contingency planning, and reporting and managing threats to plant health.	<a href="http://www.planthealthportal.defra.gov.uk/">www.planthealthportal.defra.gov.uk/</a>
	TreeAlert (Forest Research webpage)	A web-based form to report signs of tree pests and diseases to Forest Research.	<a href="http://www.forestresearch.gov.uk/tools-and-resources/fthr/tree-alert/">www.forestresearch.gov.uk/tools-and-resources/fthr/tree-alert/</a>
	Forestry Commission: Prevent the introduction and spread of tree pests and diseases (UK government webpage)	Information on measures you can take to prevent tree pests and diseases from establishing and spreading, including putting together a biosecurity kit.	<a href="http://www.gov.uk/guidance/prevent-the-introduction-and-spread-of-tree-pests-and-diseases">www.gov.uk/guidance/prevent-the-introduction-and-spread-of-tree-pests-and-diseases</a>





Discover more about the RFS at  
[www.rfs.org.uk](http://www.rfs.org.uk)

**The Royal Forestry Society**

The Hay Barns, Home Farm Drive, Upton Estate,  
Banbury OX15 6HU.

Tel: **01295 678588**

Fax: **01295 670798**

Email: [rfshq@rfs.org.uk](mailto:rfshq@rfs.org.uk)

**For more on building resilience in woods go to:**

*Managing for Resilience - 12 case studies*

The RFS is a Registered Charity (No. 306093) and also a charitable company limited by guarantee incorporated in England & Wales (No. 5306975). Our VAT registration number is 697 9058 62. Patron: HM The Queen.

Published March 2022



**Emily Fensom**

Woodland Resilience Officer, Forestry Commission

Tel: **07584 462146**

Email: [emily.fensom@forestrycommission.gov.uk](mailto:emily.fensom@forestrycommission.gov.uk)