ROYAL FORESTRY SOCIETY




PLANTING FOR RESILIENT WOODS

INSIGHT REPORT NOVEMBER 2018

www.rfs.org.uk

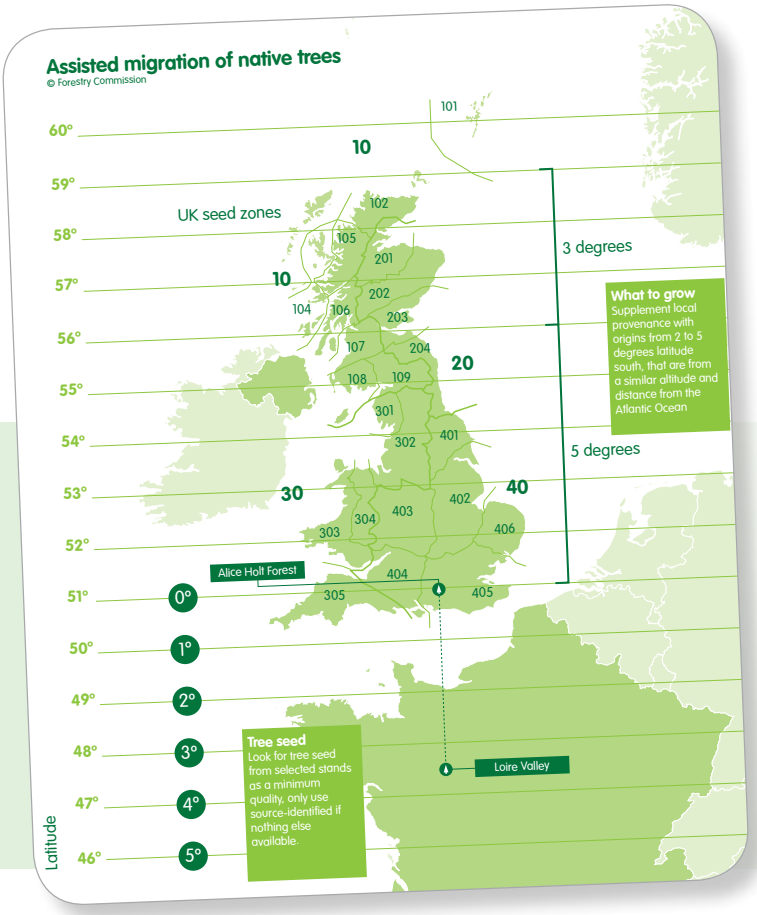
Foreword

Forestry Commission England advice is that we need to adopt a 'Portfolio Approach' to forestry and woodland management - to plan for and plant a wider range of tree species, according to site conditions and owner's appetite for risk – so our woodlands will be able to withstand environmental change.

Under the **Action Plan for Climate Change Adaptation of forests, woods and trees in England** launched in 2018, the RFS is committed to help create a knowledge hub to ensure that advice and best practice is freely accessible to all who need it and to provide CPD training around climate change adaptation.

To help us support owners developing woodland that is future proofed and fit for their own management objectives, we carried out a short Insight Survey among members who are landowners, managers or other woodland professionals.

We asked whether they are planting more diverse species now than five years ago, and if so what their experiences were in sourcing them.



Key findings*

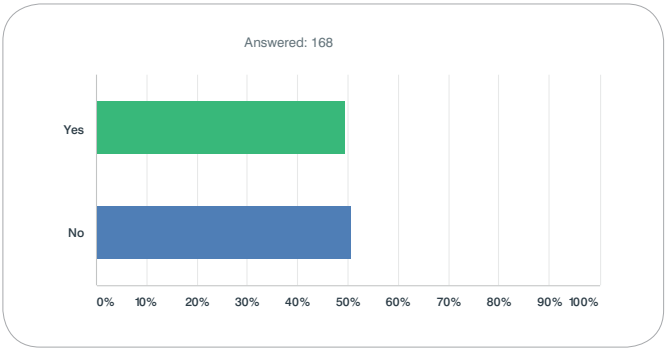
- Almost 50% of respondents are already planting a wider range of tree species than just five years ago.
- Of those who are not, more than 63% are actively considering including more species and 14% said they would not be doing so.
- More than 60 species were named.
- While 45% of those planting more species found it 'easy' or 'very easy' to find out which species or provenance to plant, it was significantly less easy to source the species or provenance required.
- More than half of those planting more species than five years ago, said the cost was 'about the same' as their traditional mix.
- A significant proportion of the broadleaved trees being selected are native trees that have not been planted much in recent years but are widely available at costs that are not dissimilar to more traditional choices of Oak, Ash, Beech, Sycamore and Birch.
- Of conifers being planted as alternatives to respondent's traditional choices, Douglas Fir with its proven timber values, Western Red Cedar, Japanese Red Cedar and Coast Redwoods were the most likely to be planted.

*results based on 168 respondents out of 1072. Woodland represented were 10% conifer, 44% mixed and 48% broadleaved.

Diversifying species can mean:

- Planting a wider range of broadleaved species than Oak, Ash, Beech, Sycamore and Birch.
- Planting a wider range of conifer species than Sitka spruce, Norway spruce, Douglas Fir, Larch, Corsican Pine and Scots Pine.
- Increasing genetic diversity within species by introducing trees from 2 degrees up to 5 degrees latitude south (approx. 140 - 350 miles south of your location).

Are you planting a wider range than 5 years ago



Spreading the risk

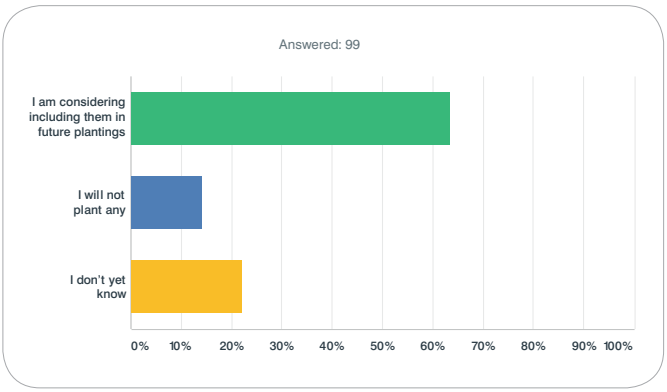
Among those who are already planting new species, no two lists of species choice were the same. In all more than 60 species were mentioned.

Among the broadleaved varieties were native species such as Wild Service Tree, Cherry, Field Maple, Hornbeam and Lime alongside 'familiar' non natives such as Sweet Chestnuts and Black Walnut. There were also early adopters of less familiar species like Eucalyptus, Italian Alder and Southern Beech.

More than 20 conifer species were mentioned, with known timber producing species such as Douglas Fir predominant but with some lesser known species also being tried, including Chinese Fir and Swamp Cypress.

And for those who answered 'No'.

What are your future plans regarding planting alternative species?



Choosing new species

"The Ecological Site Classification (ESC) was one filter, the constraints of the English Woodland Grant Scheme was more important."

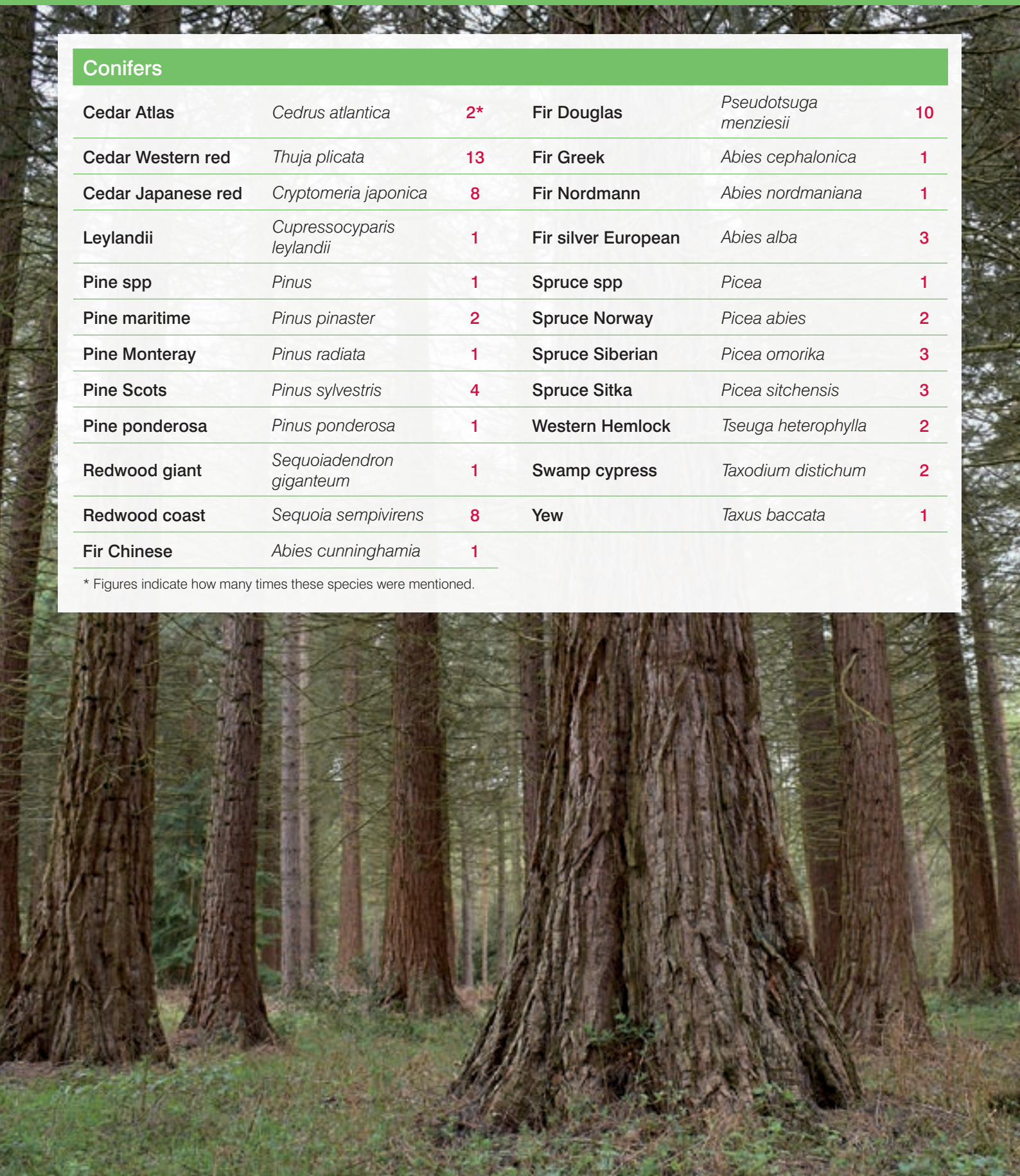
"I have already planted more broadleaves in the last 10-15 years and will continue the strategy of planting what is correct for soil type and climate. As to new conifer species. I am well aware of the risk of a monoculture of Sitka and would happily plant an appropriate alternative if available."

"Ash Dieback has made me consider more Sycamore/Aspen in new planting and Sycamore as a beat up species where I have Oak or Birch failures. Also in beat ups of Douglas Fir I have now started to plant Western Red Cedar. The recent RFS articles in the Quarterly Journal of Forestry have impressed me and made me consider the wider options."

Tree species being planted

Broadleaved					
Alder spp	*Alnus spp*	12*	**Maples spp**	*Acer spp*	1
Alder red	*Alnus rubra*	1	**Maple field**	*Acer campestre*	4
Alder Italian	*Alnus cordata*	2	**Maple norway**	*Acer platanoides*	3
Alder green	*Alnus viridis*	1	**Maple red**	*Acer rubrum*	1
Ash common	*Fraxinus excelsior*	6	**Maple silver**	*Acer sacharrinum*	1
Ash - american white	*Fraxinus americana*	1	**Oak spp**	*Quercus spp*	8
Aspen	*Populus tremula*	5	**Oak pedunculate**	*Quercus robur*	2
Beech common	*Fagus sylvatica*	6	**Oak holm**	*Quercus ilex*	1
Birch spp	*Betula spp*	5	**Oak red**	*Quercus rubra*	4
Birch silver	*Betula pendula*	2	**Oak sessile**	*Quercus petraea*	5
Catalpa	*Catalpa bignonoides*	1	**Plane spp**	*Platanus spp*	1
Cherry bird	*Prunus padus*	2	**Wingnuts**	*Pterocarya*	1
Cherry wild	*Prunus avium*	14	**False acacia**	*Robinia pseudacacia*	2
Spanish chestnut	*Castanea sativa*	17	**Sorbus spp**	*Sorbus spp*	1
Dogwood	*Cornus spp*	1	**Rowan**	*Sorbus aucuparia*	9
Crab apple	*Malus sylvestris*	1	**Wild Service Tree**	*Sorbus torminalis*	10
Elm	*Ulmus spp*	2	**Southern Beech spp**	*Northofagus spp*	4
Eucalyptus spp	*Eucalyptus spp*	7	**Sycamore**	*Acer pseudoplatanos*	6
Fruit trees		2	**Walnut common**	*Juglans regia*	2
Hawthorne	*Crataegus*	2	**Walnut black**	*Juglans nigra*	2
Hazel	*Corylus avellana*	7	**Walnut spp**	*Juglans*	7
Hickory	*Carya ovata*	1	**Whitebeam**	*Sorbus aria*	4
Hornbeam	*Carpinus betulus*	13	**Willow goat**	*Salix caprea*	1
Lime large leaved	*Tilia platyphyllos*	1	**Willow grey**	*Salix cinerea*	1
Lime small leaved	*Tilia cordata*	11	**Willow white**	*Salix alba*	1
Lime spp	*Tlia spp*	9	**Willow spp**	*Salix spp*	4
Magnolia		1	**Wych elm**	*Ulmus glabra*	1

* Figures indicate how many times these species were mentioned.



Conifers

Cedar Atlas	*Cedrus atlantica*	2*	**Fir Douglas**	*Pseudotsuga menziesii*	10
Cedar Western red	*Thuja plicata*	13	**Fir Greek**	*Abies cephalonica*	1
Cedar Japanese red	*Cryptomeria japonica*	8	**Fir Nordmann**	*Abies nordmaniana*	1
Leylandii	*Cupressocyparis leylandii*	1	**Fir silver European**	*Abies alba*	3
Pine spp	*Pinus*	1	**Spruce spp**	*Picea*	1
Pine maritime	*Pinus pinaster*	2	**Spruce Norway**	*Picea abies*	2
Pine Monteray	*Pinus radiata*	1	**Spruce Siberian**	*Picea omorika*	3
Pine Scots	*Pinus sylvestris*	4	**Spruce Sitka**	*Picea sitchensis*	3
Pine ponderosa	*Pinus ponderosa*	1	**Western Hemlock**	*Tseuga heterophylla*	2
Redwood giant	*Sequoiadendron giganteum*	1	**Swamp cypress**	*Taxodium distichum*	2
Redwood coast	*Sequoia sempivirens*	8	**Yew**	*Taxus baccata*	1
Fir Chinese	*Abies cunninghamia*	1			

* Figures indicate how many times these species were mentioned.

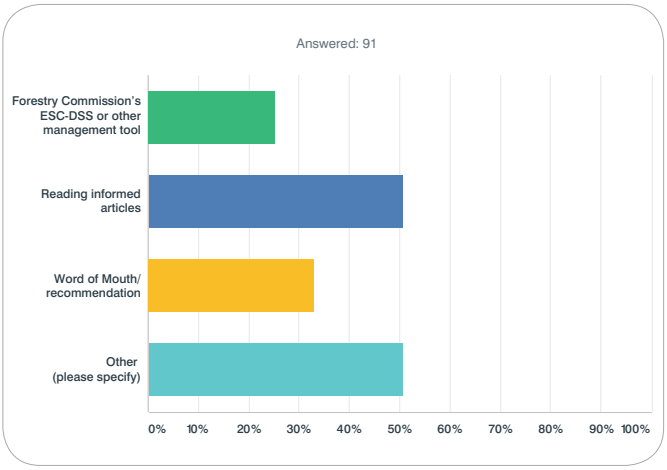
Alternative Species

How did you decide which species to plant?

Articles, word of mouth and recommendations were important primary sources of information alongside Forestry Commission species choice tools. For those quoting other sources, personal preference and local knowledge, a desire to plant more fruiting and nut bearing species, advice from consultants and from specialists such as the Walnut Club, RFS meetings and visits all featured.

For some it was the need to find alternatives to Ash (because of Ash Dieback) and Larch (because of Phytophthora ramorum) that had precipitated the search.

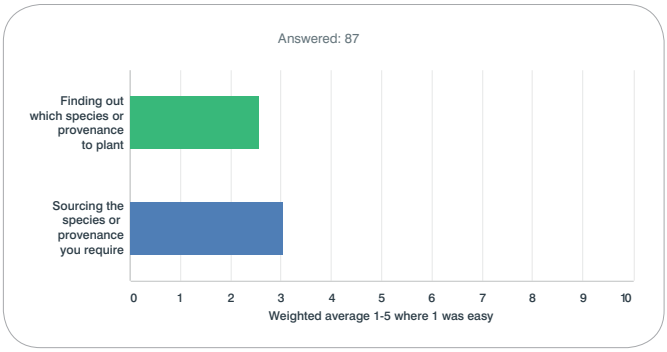
For a number it was restrictions placed upon them by grant schemes which were dictating species choice.



"We already have 35 species of tree in our 30 hectares and experience high levels of natural regeneration. We are currently reducing the stocking density in order to facilitate further regeneration and enhance the mix of species across the compartments."

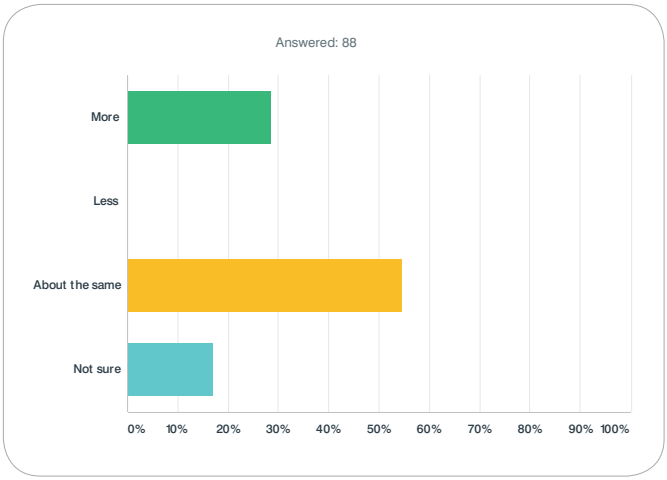
How easy/difficult was it to find out about and source species/ provenance?

Just over 50% of those who have been planting alternative species in the last five years found it difficult or very difficult to find out which species or provenance they should consider planting and 60% found it difficult or very difficult to source the species or provenance they want.



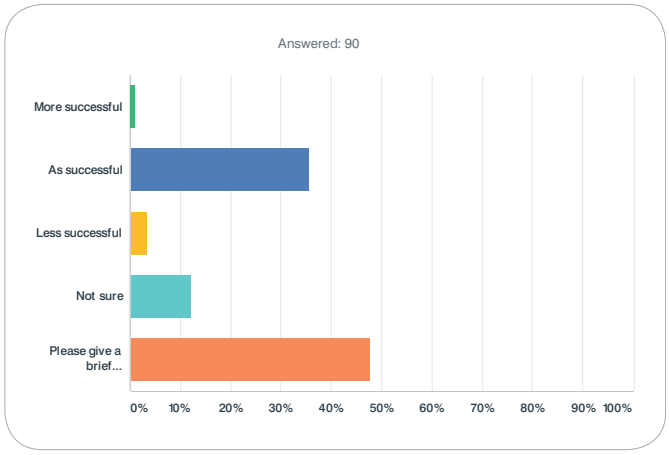
How does the cost of planting alternative species compare with your usual choices?

More than 54% reported that costs were about the same but for more than 28% choosing new species was costing more (see barriers page 8). This is likely to be a function of species choice with the more exotic and unusual species costing more.



How have any alternative plantings you've carried out performed to date?

For most of those who have already planted alternative species, it is too early to say how their establishment has compared to their traditional choices however more than 36% of respondents reported plantings were 'more' or 'as successful' and only 3% that they were 'less successful'.



Choosing species

"Interest in expanding the use of Aspen from an environmental view and perhaps commercial too."

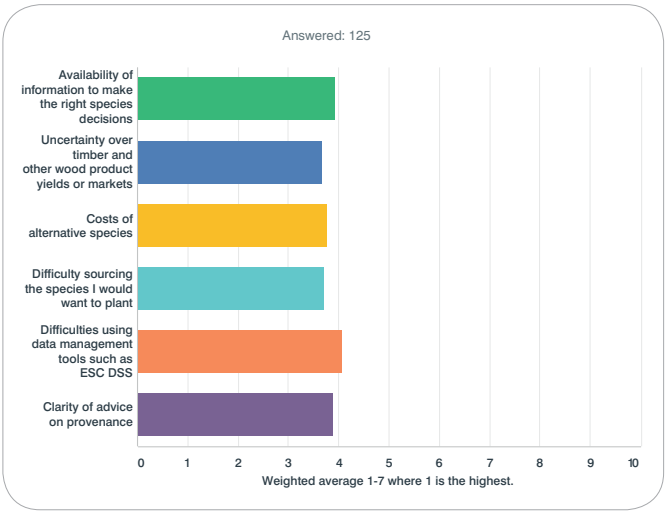
"Search for different type of trees that suited our soil and water levels. Used various sources such as RFS, Forestry Commission and internet."

"Scatter gun. Try as many as possible and review in 'n' years time."

"Knowledge of site, soil, climate etc. i.e experience. Also, some species no longer an option e.g. Larch and Ash"

Barriers and concerns

What are your main concerns about planting alternative species?



For those who have yet to plant alternative species, concerns were almost evenly spread across:

- Availability of information
- Uncertainty over timber and other wood markets
- Costs
- Sourcing
- Using management tools
- Provenance

Feedback also included:

Restrictions imposed on species choice:

"Organisations such as Natural England should appreciate the issues involved and accept the need to diversify plantings in ancient woodlands and ancient semi natural woodlands."

"Local authority regulators and NGOs are still widely ignorant of long-term risks and still advocating local provenance and certainly locally native species. Fortunately non-availability of Ash as an option is forcing wider consideration."

"Separate consideration needs to be given to diversification in Ancient Semi-Natural Woodland (ASNW). We will run out of species to plant unless there is a wider choice of new species available for ASNW."

The continuing menace of grey squirrels is also putting some woodland owners off planting:

“Planting broadleaves in small separate blocks of woodland has been a pointless waste of time and money. What the squirrels didn’t ruin after 15 years or so, Ash Dieback will. Until there’s the political will to cull squirrels on a national scale there seems little point re-planting little blocks with anything other than semi-commercial crops such as Douglas and Sitka.”

“I totally rely on natural regeneration and would not plant any trees, whether native or not, until there is an effective means of controlling the grey squirrel. Any grant money given to me to plant trees would be a waste of public money.”

“When planting broadleaved trees for timber the main consideration is suitability of the site and susceptibility to damage by the grey squirrels.”

Markets and finding models that work:

“A main concern is the attitude of sawmills, and their ability to find a marketing strategy to encourage a wider acceptance to new timbers in the building trade, but the main concern is the lack of knowledge in the end uses that saw millers sell to. I have also lived through other “fashions” i.e Poplar, Nothofagus, Lodgepole Pine, and I worry that once planted the “market” will reject this decade’s fashion (eg Western Hemlock) in 30-40 years time.”

“I think it’s a case of coming up with local show schemes - only small - but demonstrating what can be done in a practical way with smaller woodlands like ours.”

“Irrespective of climate, a diverse range spreads your bets and supports more wildlife. Different crown shape and shade tolerance allow mixed stand structures.”

“Need also to consider planting species in mixtures rather than in pure stands.”

Sourcing plants

“The reduced number of forest nurseries who have to rely on mainstream production species just to stay in business, does not allow the time or money to explore better existing species or new ones. The whole system is very close to a critical failure of plant supply that will be very difficult to recover from.”

Impact on the wider environment

“I thought our native species had lived through several variations of climate and we should stick with them. Who knows what our insect life etc will find attractive in species from other parts of the world.”

Accessing research

“Inclusion of research results and publicity about new plantings of productive fruit and nut trees either as edge trees (besides rides, within open ground areas, under power lines etc within recently planted woodlands) and more publicity/education given re associated agroforestry and combination forestry (forestry with edible products and other non-timber forest products).”

Accessing support

“More advice and enthusiasm from the Forestry Commission to spur owners on - and a grant scheme which assists owners of small woodlands by offering a little extra. The current scheme favours large land owners.”

Management techniques

“You focus on planting, but a key way of increasing diversity is by selective thinning in existing stands with the aim of enhancing variety including favouring less common species.”

Conclusion

There was much positivity among respondents about instigating alternative planting to counter climate change and in response to pests and diseases like Ash Dieback.

The species list is a snap shot of those being chosen by respondents and represents species that are 'alternatives' to their more usual choices with some clearly hoping that trees such as Ash and Oak will survive current challenges that include Ash Dieback, Acute Oak Decline and squirrel damage.

Surprisingly, the list does not include species like Tulip Tree (*Liriodendron tulipifera*) which the RFS knows is also being planted in some locations as an alternative to Ash.

There is concern that some woodland managers are gravitating to species based primarily on personal preferences rather than making more evidence-based choices suitable for their locations and soil types as well as for their particular management objectives. A scatter gun approach risks the sustainability of woodland in the long term.

The results also suggest most land managers are sticking to more traditional choices, opting for tried and tested mixes (species with known qualities and end markets e.g. Sweet Chestnut). A few early adopters are choosing more unusual and exotic alternative species (those that are relatively untested in woodlands in the UK e.g. Eucalyptus). As confidence in the performance of these species grows we can expect more people to adopt them.

Overall, this Insight Survey suggests the messages of preparing now for climate change are being heard. The perception of respondents was that alternative species planting is being considered by most (23%) or at least a few (54%) of woodland owners.

There is also a sense of a need to move away from pure stands to mixed planting, the issue of grey squirrel damage remains a constant concern.

Among the more popular broadleaved species being chosen many have known properties and end markets which will be attractive to woodland owners whose management objectives include making a positive return on investments;

- Native Wild Cherry (*Prunus avium*) is known to be fast growing, good for biodiversity, able to produce highly sought-after timber for veneers, furniture and turning and is relatively immune to grey squirrel attack;
- The non-native Black Walnut (*Juglans nigra*) has been grown for its timber since being introduced to Europe from North America in 1629. It is faster growing and more resilient to honey fungus than Common Walnut. Climate warming should extend the range of suitable suites for it in England and Wales.

Among conifers being chosen:

- Western Red Cedar (*Thuja plicata*) is native to the Pacific North West of America. It is moderately frost tolerant with a timber that is extremely resistant to decay and suitable for use as shingles, exterior siding and lumber, fencing, boat building, boxes, crates and musical instruments;
- Douglas Fir (*Pseudotsuga menziesii*), also from North America was introduced to the UK in 1827 and is now increasingly used by the construction industry in buildings.

'Exotic' alternative species that are becoming increasingly common place;

- Eucalyptus varieties which are resilient to UK climate conditions. They are very fast growing making them valuable for biomass and firewood;
- Coast Redwoods (*Sequoia sempivirens*) previously grown largely for their ornamental value, are likely to be increasingly valued for carbon sequestration and for durable timber that would primarily be used for exterior decorative carpentry, cladding and shingle roofing.

More needs to be done:

- To make evidence-based species selection and sourcing easier
- To overhaul restrictions placed by grants on species selection
- Match nursery supply and demand
- Bridge gaps between end users

Further reading:

- Action Plan for Climate Change Adaptation of forests, woods and trees in England

  http://www.rfs.org.uk/media/512806/action-plan-for-climate-change-adaptation.pdf

- Case studies: Planting woodland for resilience:

  http://www.rfs.org.uk/learning/case-studies/woodlands-planted-for-resilience/

- Growing houses:

  http://www.rfs.org.uk/learning/case-studies/growing-for-houses/

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