



## Final Report

### - The Patsy Wood Trust Scholarship -

By Jonas R. Brandl

September 2020



### **Acknowledgements**

I would like to acknowledge and express my thanks for the support I got from the funders – The Patsy Wood Trust, Future Trees Trust (FTT) and the Royal Forestry Society (RFS) and its people, without whom the completion of this Scholarship would have been impossible.

First, I want to thank **Jo Clark** (Head of Research at FTT) for her support, advice and relentless effort throughout the whole year. Secondly, I'd like to thank **Tim Rowland** (CEO at FTT) for his support and positive critique of my work throughout the year. Thirdly, I'd like to thank **Simon Lloyd** (CEO at RFS) for his support and calm advice throughout a turbulent year.

Also, I would like to thank **Jeremy Ralph** (Founder of Timber Strategies) for sharing his knowledge and experience with me and providing such a great working atmosphere. In addition, my thanks go to **Mike Gardner** (Founder of Sawmills Devon) for inviting me into his forestry and timber world and providing such a buzzing working environment. Furthermore, I would like to thank **John Channon** and **Harriet Bell**. Thank you!

**Jonas R. Brandl**  
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## 1. Introduction

My passion for the environment first evolved at the age of 14 during an internship on a biodynamic farm, where I also helped to thin, cut and plant trees. After completing my A-levels at a Steiner School in Germany in 2011 I did an international voluntary year of social service in a kindergarten in London, UK. Back then, I travelled through England and Scotland during my holidays and fell in love with the countryside. Hikes through the Peak District, Lake District and the Scottish Highlands were particularly memorable. It was back then that I decided to come back one day to work in this beautiful landscape and to help sustain and manage it.

Back in Germany I completed a [BSc in Forestry, Environment and International Forestry](#), at Albert-Ludwigs-University Freiburg, and was subsequently accepted for an [MSc in Agroforestry](#) at Bangor University in Wales. During my undergraduate studies, I gained excellent knowledge of forest ecosystems, their complex functions and interrelations, and of sustainable forest management. My main focus included silvicultural techniques and forest mensuration at the forefront of silvicultural research at Freiburg University, with the black forest as a “playground”.

During my master’s, I focussed on temperate agroforestry practices and systems and learnt in depth about the different designs, approaches, functions, species choices and the multiple benefits of agroforestry. In addition, I had the chance to get acquainted with UK forestry terminology, standards, schemes and policies.

Towards the end of my postgraduate studies, I was exploring my future career and life’s journey options when I came across a scholarship scheme that would allow me to continue my UK adventure while following my interests in (agro)forestry. Through the Patsy Wood Fund – the [Future Trees Trust](#), the [Royal Forestry Society](#), and three innovative businesses in Devon: [Timber Strategies](#), [Dartington Hall Trust](#) and [Sawmills Devon](#), I gained my first post-graduate research and commercial work experience.

In my role as Forestry Research and Development Assistant I gained a unique learning experience from tree seed to timber end-use and from research to practical applications and had the chance to apply my academic knowledge to real world scenarios. I was very lucky to find this fantastic opportunity in Devon where I could follow my interests and gain professional development as a young graduate – I can’t thank my sponsors enough.

I believe that my work is/was relevant and promotes conservation, forestry and sustainable land use aims in South West England, just in the spirit of Patsy Wood’s mission.

## 2 Dartington Hall Trust

### 2.1 Future Species Analysis

Dartington’s woodlands and trees are believed to face a changed climate in the future, just like the rest of the UK. Therefore, I evaluated the resilience of the current tree species composition on the Estate against possible future climate scenarios. Two possible future, drier climate scenarios have been tested using the Ecological Site Classification Decision Support System (ESC-DSS) provided by the Forestry Commission. In addition, diseases and other threats, as well as the ecological and timber attributes of tree species were evaluated. The species analysis aims to inform future planting decisions at Dartington on a landscape level, it acts as a general guidance for species selection, not a substitute for a specific site evaluation. 150 tree species were assessed on this basis for their current and future site suitability. Table 1 shows an example case of the planting recommendation table.

Table 1: Excerpt from the planting recommendation table based on a future species analysis

Common name	C1	C2	Diseases / Pests	Attributes	Subjective recommendation
Alder (Common)/ <i>Alnus glutinosa</i>	suitable	suitable	Phytophthora alni	Nitrogen fixer-increases soil fertility  Wood is soft and porous, but durable if kept under water. Timber properties need further research.  Biomass High quality charcoal  Very suitable to replace Ash assessed on ecosystem functions and medium suitability based on ash-associated species	Yes  Grows well, possible ash replacement.

### 2.2 Agroforestry

With my colleague Harriet Bell I’ve been developing strategies to increase revenues from the silvo-arable plot that she initiated some years ago. Agroforestry is in place where trees interact with agriculture, but it is as much about agricultural crops and trees as it is about people. Thus, the silvo-arable plot at Dartington aims to bring different people together through shared tenure rights. It is a pioneering project that brings together several food producers in one field and is establishing a compelling new model for how agroforestry might work in practice in the UK.

On 48 acres, the land owner (The Dartington Hall Trust), farm tenant (Jon and Lynne Perkin, Dartington Dairy at Old Parsonage Farm) and agroforestry tree license holders (Luscombe Drinks, Apricot Centre, and Salthouse & Peppermongers) are managing 1,600 elderflower trees, 600 edible and juicing apple trees, and 250 trees of sichuan pepper. The latter proved an inappropriate choice, as only 5 trees survived, most likely due to unsuitable site requirements and poor initial establishment. Our task was now to either use the sichuan pepper site as a trial to test different protection guards and site preparation methods to investigate if sichuan pepper can be grown on the

site at all, or to place our hopes into a new tree component. Eventually, the decision was made to plant cobnuts based on site and economic considerations.

### **2.3 Ash dieback**

I started my role at Dartington just in time for the management of ash dieback (*Hymenoscyphus fraxineus*) which was affecting considerable numbers of ash (*Fraxinus excelsior*) on the estate. Before getting involved in the harvesting of infected trees, I spent a day with the experienced arboriculturist and former lecturer in botany Rupert Baker surveying ash in proximity to public paths and roads on an estate near the Plymouth coastline and on the Dartington estate.

In preparation for ash harvesting and instructed by the head forester Mike Gardner I made sure the risk assessment and site-specific hazards were known to the chainsaw operators and all safety measures were in place. Keeping the general public out of the danger zone was of particular importance on a much-visited site like Dartington. Once I successfully gained my NPTC Level 2 Award in Ground Based Chainsaw Operator for cross cutting and small tree felling I also took part in the processing of the timber. Additionally, I researched possible species that could replace ash through artificial planting in terms of its biodiversity and timber value.

Two months into my work at Dartington, I had the chance to assist Jo Clark (Head of Research at FTT) to plant the ash archive with trees showing a high degree of tolerance to the disease. It was a great feeling to plant the same species that many in the forestry sector seem to have lost their faith in. I feel very privileged to have had the chance to do my part in hopefully sustaining and increasing the ash stock in the UK. Besides, it was really interesting to see how a research trial is designed.

## **3 Sawmills Devon**

### **3.1 Forest Management**

The distinctiveness of Sawmills Devon compared to other sawmilling enterprises lies in its interdisciplinary work scheme that includes forest management, sawmilling and timber processing as well as small-scale carpentry and joinery work. This vertically integrated supply chain within one enterprise shapes the way the product is understood, managed and used.

The silvicultural management is adapted to ecological principles and thus biased towards Continuous Cover Forestry (CCF) from single-tree selection (photo 1) to small group cuttings aiming to promote structurally diverse stands that are resilient and rich in biological habitats. What sets apart Sawmills Devon's forestry service is the exceptional knowledge of timber products which influences, for example, marking criteria and adds value to stem forms that would be overseen by most foresters.

Photo 2 and 3 shows, for instance, how the chainsaw operator cuts a bend stem into a unique product for a lucrative timber framing market. My responsibilities within forest management ranged from practical applications to operational and strategic planning; I was involved in:

- developing silvicultural prescriptions and outlines of work for forest holdings under Devon Sawmills management,
- the writing and mapping of operational plans and online felling license applications.
- marking exercises in CCF stands,
- assisting in harvesting operations through ensuring the chainsaw operators and the general public's safety as well as fasten the winch correctly to the stem,
- the measuring & grading of lying roundwood and evaluation of cubic meter and hoppus foot as well as price calculations,

- assessing soil types and soil health - which was substantially informed by a soil identification course given by Andy Moffat and provided by the RFS,
- the felling of small to medium-sized trees and their cross cutting to various product lengths, thereby assessing the natural properties of the stem,
- pruning and tree planting.



*Photo 1 Redwood harvest at Dartington. Redwood stands are managed in a CCF system, where mature trees are harvested in a single-tree selection system and the coppice is singled (Photo Jonas Brandl).*



*Photo 2 shows an oak stem cut to length for a timber frame (Photo Jonas Brandl); photo 3 shows a traditional timber frame building (source Jez Ralph)*

### **3.2 Sawmilling and building with timber**

Sawmills Devon works with a Mebor bandsaw mill which allows for the processing of oversized, large diameter hardwoods. A wide range of species are milled at the yard; 100% of which are sourced from the South West England and 95% from Devon. Timber products are processed from oak, ash, Douglas fir, sweet chestnut, western red cedar, coastal redwoods, and larch, while for specific jobs, Norway maple, elm and walnut may be utilised. Most timber products are planks and beams used for cladding and construction while seasoned floorboards, specific joinery work, and character slabs are attractive markets too. My work at the yard included:

- Correctly stacking sawn timber products.
- Measuring stacked timber planks.
- Assisting with the milling of timber.
- Milling the timber to specific products (photo 4).
- Designing and building a new wooden building (photo 5).



*Photo 4 The picture shows me processing larch roundwood into planks for a specific job (Picture Mike Gardner)*



*Photo 5 Building a small timber building with a curved front from scratch (Photo Jonas Brandl)*

## **4 Timber Strategies**

### **4.1 Project development**

Timber Strategies works across the whole forestry and timber supply chain, from forest management, timber processing to timber applications in the built environment. Timber Strategies work focusses on landscape-scale forestry strategies and policy development, solutions for resilient forest management, increasing quality in growing stock, product development as well as teaching at schools of forestry and architecture. The company distinguishes itself from other enterprises in the industry through its innovative and refreshing unconventional solution-based working approach.

The founder Jeremy Ralph elegantly combines his experience from forest management, timber products and wood science into a consultancy and strategy planning business that attracts a broad client base from woodland owners to sawmills and architects, which results in a very diverse conglomerate of projects. I was involved in a large number of projects of which the most prominent ones were:

- Completion of a suite of internal research & development proposals including proposals for work on the health benefits of timber in internal joinery; development of e-learning courses for foresters & timber users; promotion of the use of alternative species in forestry to create climate resilience in UK forests.
- Client centred market-research and involvement in investment strategies for an innovative sawmill developing a new product range [Brimstone](#).
- Creating and implementing a Geographical Information System (GIS) based strategy for analysing woodland condition and supply-chains in protected landscapes.
- Building connections with Universities and developing the links for Timber Strategies to offer students research projects and placements.
- Shared publication of the article “Innovating from Seed to Timber Supply” in Forestry & Timber News, February 2020 and another article “Bridging the gap between forestry and timber use: Innovation in the timber industry” is currently under review for the UK Quarterly Journal of Forestry.

- Creation of a funding proposal and strategic plan on how to move forward and how to re-design the [Silvifuture](#) website.
- Participated in a meeting with the Centre for Natural Material Innovation, University of Cambridge.
- Excursion with architectural students from Bournemouth University to Hook Park the Architectural Associations woodland campus in Dorset (Photo 6 and 7).
- Presentation at the Kingston Maurward College on Forest Management, Timber industry and Agroforestry to arboriculture, nature conservation and agricultural students.

#### 4.2 Crossing disciplines and sharing knowledge

I enjoyed the vast variety of projects we worked on at Timber Strategies and the innovativeness of the work. The central theme and unifying piece of all my work for Timber Strategies was the innovativeness of the projects around new trends in the sector, emerging technologies and their application (such as 3D scanning and digital fabrication) and the strength of systems thinking and cross disciplinary work.

If timber users would understand the complexity of contemporary forest management and if foresters would understand contemporary building the whole supply chain and sustainable forest management would prosper. Therefore, one of the highlights of this year was the excursion to Hook Park where I could see innovative lowland forest management and engage with architectural students that design and build with timber.



*Photo 6 The Workshop at Hook Park, build out of elastic pole stage thinning's (picture website Hook Park)*



Photo 7 Robotic milling at Hook Park (source Jeremy Ralph)

## 5 FTT research projects

In order to engage in depth with the work of Future Trees Trust and to identify further areas of development, I investigated, summarised, and analysed the organisation and level of forest genetic resources (FGR) and tree improvement knowledge in Germany.

My report on tree improvement and FGR in Germany can now be viewed on the Trust's website. It explores the emphasises of policies and the focal points of research and forest management. The genetic composition, such as structure and diversity determine the aptitude of forests and trees to adapt to changes in site factors. Maintaining and increasing genetic variation within populations is *the* key measure to adapt our forests to changes in climate and increasing their resilience. It is found that *in situ* measures (FGR) are prioritised over *ex situ* measures (tree improvement) in German policies, however *ex situ* measures are gaining momentum and importance as the recent launch of a national genetic monitoring program (GenMon) shows.

### Thoughts and Outlook

I would like to take the opportunity again to thank my funders - the Patsy Wood Trust, Future Trees Trust and the Royal Forestry Society. The overwhelming support I got from you during this year made the scholarship a wonderful, exciting, enjoyable and instructive experience from which I will prosper from this point onwards. I would here like to especially thank Jo Clark, Tim Rowland from the Future Trees Trust and Simon Lloyd from the Royal Forestry Society for their support throughout the year and for their efforts to enable a smooth transition of my contract from Dartington Hall Trust to Sawmills Devon when the former furloughed their staff during the Covid 19 lockdown period. It is a real shame that I couldn't use more of FTT's and RFS's continuing professional development (CPD) program due to the lockdown restrictions but I'm confident that we'll see each other at the latest at the next Annual FTT Supporters' Day and RFS Treescape Conference.

Furthermore, I want to thank Mike Gardner from Sawmills Devon and Jeremy Ralph from Timber Strategies for inviting me into their businesses, sharing their experience and knowledge with me, and providing such a great working atmosphere. The collaborative effort of all partners involved guaranteed the continuity of the Scholarship also during the difficult lockdown period and was vital for its successful completion.

I believe the Scholarship was a career stepping stone for me. In the future, I would like to continue working on interesting forestry projects that have a strong timber supply chain focus either as an employee or a consultant and share my experiences of the Pasty Wood Scholarship, acting as an ambassador of cross-disciplinary work, sustainable forest management, and improved seed stock.

**Jonas R. Brandl**

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