



# A 'North Atlantic island signature' of timber exploitation: Evidence from wooden artefact assemblages from Viking Age and Medieval Iceland



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## ABSTRACT

Throughout history, wood has been of key importance to many human communities both as a source of fuel and as material for construction. This applies not only in areas with plentiful woodlands or forests, but also in more marginal island environments where limited native wood resources are available. In such environments, the use of 'exotic' timber such as driftwood or imported wood plays a key role in resource provision. The exploration of patterns of use of both native and 'exotic' woods in wood-poor environments has great potential to contribute to discussions of resource management and control and human response to landscape change. Using Iceland as a case study, this paper compares wood anatomical analyses of artefact assemblages from across Europe to determine the likely origin of wood (native, imported, drifted) from archaeological sites in the North Atlantic islands, and demonstrates the emergence of an 'island signature' in wood utilisation patterns in this region. The paper also highlights the potential pitfalls of the categorisation of wood remains through taxonomic determination, and examines how these obstacles might be overcome in future research.

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## 1. Introduction

Wood has been of vital importance to human communities throughout history. As well as being used as fuel for heat, light, cooking, and industry, it is also a key raw material for the construction of buildings, modes of transportation such as boats, carts, and sleds, and the production of objects, from items of furniture to storage vessels and household utensils. Decorative carving of wood is also frequently employed to create objects of art and of ritual or symbolic significance. For most groups reliant on wood, their needs are met by local forests, however in areas where local wood resources are scarce, these requirements are filled or supplemented by other means, such as the importation of timber or the use of driftwood. In such regions, understanding the use of these non-native wood resources is an integral part of comprehending subsistence strategies, lifeways and world-views. However, the certain identification of these woods can prove challenging. This paper synthesises analyses of uncarbonised archaeological wood remains from the North Atlantic region to demonstrate how the taxonomic identification of archaeological wood remains can be used to categorise the raw materials utilised for wooden artefact production into native, drift, and imported or traded wood. To some extent, this method is applied to both charred and uncarbonised wood assemblages by archaeologists investigating wood utilisation patterns throughout the world (e.g. Tengberg, 2002; Asouti, 2003; Gale, 1994; Caruso Fermé et al., 2015), however it is at

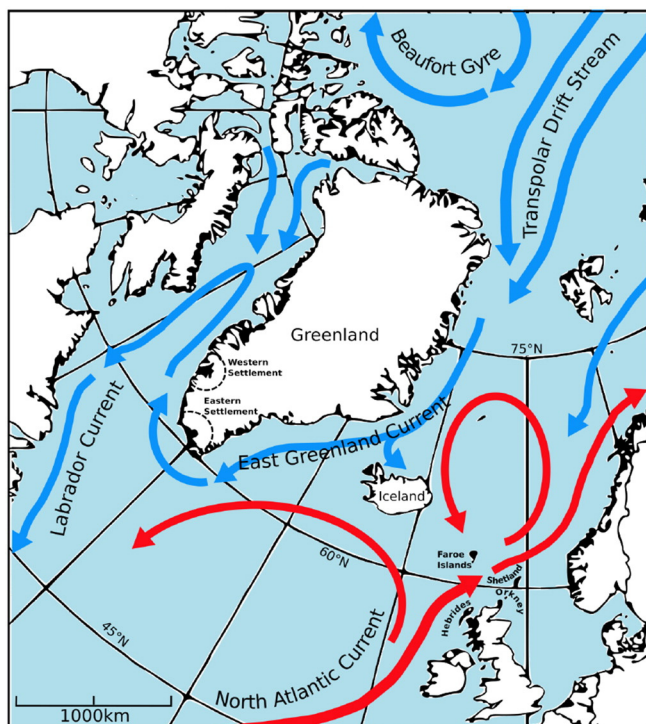
its most informative in wood-poor environments. Archaeological studies of wood use among past native populations are well known from tundra environments in North America, in Alaska (e.g. Lepofsky et al., 2003; Alix and Brewster, 2004; Alix, 2012; Shaw, 2012) and the Canadian Arctic (e.g. Dyke and Savelle, 2000; Alix, 2009a, 2009b; Steelandt, 2014). Timber procurement strategies in the North Atlantic islands have also been investigated by various scholars (e.g. Lawson et al., 2009a; Zutter, 2000; Owen, 1993; Malmros, 1994; Stummann Hansen, 1991; Kristjánsdóttir et al., 2001; Guðmundsdóttir, 2013; Mehler and Eggertsson, 2006; Mooney, 2014, 2016), however these studies have in general focused on the economies of individual sites. This paper incorporates the findings of individual studies of assemblages of uncarbonised wooden artefacts from Iceland (Mehler and Eggertsson, 2006; Guðmundsdóttir, 2013; Mooney, 2014, 2016) into a discussion of broader regional trends in wood utilisation across the North Atlantic, set against a backdrop of increasing landscape degradation and declining availability of native timber.

## 2. Categorisation of wood resources by taxonomic determination

### 2.1. The relevance of categorising wood resources into native, imported and drifted wood

While this study focuses on material from Iceland, similar methodologies could easily be applied to Greenland and the Faroe Islands, as well as Shetland, the Orkney Islands and the Hebrides (Fig. 1). On all of these islands or island groups, various factors including high latitude and

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**Fig. 1.** Map of the North Atlantic showing regions discussed in the text and key ocean currents. By the author.

geographical isolation mean that only a limited number of tree species are present, and their harsh climate often leads to small, low and twisted growth forms ill-suited to construction purposes. In many cases, this innate paucity of timber has been compounded by anthropogenic impacts on the landscape.

The clearance of woodland for arable fields and pastures, the use of native trees in construction and as domestic and industrial fuel, and the grazing of domestic mammals in woodland areas all contribute to the diminishment of available wood resources (Eysteinnsson and Blöndal, 2003). Furthermore, woodland ecosystems take a long time to recover from damage due to the long periods of time it takes for trees to reach maturity (Jones and Schmitz, 2009). In marginal areas such as the North Atlantic Islands, with harsh conditions and short growing seasons, the combination of human impacts and insufficient recovery time can lead to large scale environmental degradation and soil erosion, as has been seen in Iceland (Buckland, 2000; Dugmore et al., 2000, 2005, 2009, 2014; Eysteinnsson and Blöndal, 2003; Lawson et al., 2007; Mairs et al., 2006; Simpson et al., 2001, 2004; Sveinbjarnardóttir et al., 2008; Vésteinsson et al., 2002; Vickers et al., 2011). Where wood is required for construction and artefact production, this cycle of overexploitation and landscape degradation can lead marginal communities to rely increasingly on non-native wood resources. As such, identifying the use of non-native wood resources can be integral not only in understanding trade networks and patterns of resource utilisation, but also in discussing both mechanisms of and responses to environmental change.

## 2.2. Factors influencing taxonomic categorisation

### 2.2.1. Native flora

Depending on the area being investigated, several factors can influence the categorisation of wood species as likely to derive from native, drifted or imported wood resources. The first of these is the native tree flora of the region during the time period in question. Identification of 'exotic' taxa through taxonomic determination relies on making a distinction between native flora and those likely to arrive by drifting,

importation or trade. This is often possible in marginal island environments, as these generally have a tree flora of limited diversity, which is distinct from continental regions to which the island may have had connections. In the case of Iceland, which provides the case study in this paper, the native tree flora comprises only nine species, which became established during the Holocene and prior to the arrival of the first Norse settlers on the island (Caseldine et al., 2004) (Table 1). This flora remained constant until the mid-20th century, when taxa imported through forestry programmes began to become naturalised (Baldursson, 2014: 274), and therefore can be used for categorisation purposes for the majority of the history of human settlement on the island. In other areas, distinctions are less clear-cut. The Neolithic site of Stanydale in Shetland, for example, has produced remains of substantial spruce timbers from structural contexts (Turner, 1998: 45). Spruce is not native to the UK, and initial interpretations suggested that the timber had been imported to the site from Scandinavia. However, during this time period no species of spruce were native to the west coast of Scandinavia, from where imports would have been most likely to derive. It is more likely that the spruce timbers are in this case the result of exploitation of local driftwood resources (Turner, 1998: 46).

### 2.2.2. Imported wood

As can be seen in the case of the Stanydale timbers, another key factor in establishing the categorisation of wood taxa is whether or not the import of timber to the region is possible, and what species are likely to be imported. While all of the island communities discussed here could be described as 'isolated' and 'marginal', some are more so than others. The Hebrides and the Orkney Islands, for example, are considered remote when compared to mainland Britain, but are all located less than 100 km from the coast of Scotland, and Shetland is located within 170 km of Scotland and 300 km of Norway. The travel distances to the Faroes are greater: 370 km to Scotland and 600 km to Norway, but these distances are small compared to the approximately 1000 km separating Iceland from Scotland and Norway. Greenland is more remote again – it is around 1500 km by sea from Iceland to the Eastern Settlement, and over 1000 km from the west coast to Newfoundland. Of course the 'isolation' of Greenlandic sites depends on whether they are native or Norse, as conceptions of marginality must have differed between the two groups.

Beyond simple geographical distance, the likelihood of timber importation to an island is also linked to the navigational and nautical technologies available at the time period in question. The rafting of timber over short distances is known from prehistory, although usually on lakes or rivers (Eiðing and Dittmar, 2011), but the transport of timber over long distances over open ocean necessitates the use of more complex vessels. Cultural connections are also key: while geographical proximity is a consideration in the establishment of trading partnerships, it is not the sole factor. Once a likely source of imported timber has been established, the native tree flora of this area at the time period in question must again be assessed. Furthermore, timber choice may become an issue, especially in regions with access to abundant and varied wood resources. Certain taxa are often preferred for certain purposes: it is likely that with a variety of woody taxa available, different species will be preferred for fuel, construction, carpentry, fine carving, etc. An assessment of wood choice in assemblages from the area from which imports may derive must be conducted in order to establish which taxa are likely to be imported, while also noting that there may be social and political factors involved in whether the timber exported is of preferred taxa or of those thought to be inferior.

### 2.2.3. Imported versus drifted wood

The possibility of access to significant quantities of driftwood must also be considered when determining the likely provenance of wood taxa in an area. Driftwood has been proposed as an important source of timber and fuel in all of the North Atlantic islands. Finds of 'exotic' conifer wood taxa in the Hebrides have been assumed to derive from

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