

Survey to determine the quality of the larch resource in Wales

1. Introduction

The purpose of this survey is to determine the quality of the larch resource in Wales, and extrapolate this data for the Marches.

We now know that the impact of *P. ramorum* will be dramatic with the whole of the UK larch resource probably becoming infected and therefore having to be felled over the short to medium term. At the start of the outbreak it was thought the felling in Wales would be conducted over ten years but with the spread of the disease increasing substantially in 2012 and 2013 it may be that this time frame is too long. The felling period will be heavily influenced by weather and the impact of sanitation measures.

We know that larch timber has some excellent qualities being strong and moderately durable. However, in recent decades it has gone out of fashion and been replaced by spruce which is faster growing and higher yielding although less durable. The conformation of larch stems can often be poor, restricting the available percentage of longer sawlogs suitable for higher value uses. Even after conversion the timber can often be difficult, suffering from spiral grain and reaction wood both of which can cause drying defects such as twist, spring and bow.

With the increased dominance of spruce as the preferred species for sawmillers, markets for larch have declined and so the timber has mainly been sold into the sawn fencing market. There is a limited demand for larch in the round fencing market, e.g. for straining posts where its durability when in ground contact is desirable. More recently the biomass market has seen an increasing demand for larch, which dries relatively quickly.

With a large volume coming onto the market we need to know the quality of the resource and match it to the market place. This information can then be used to assist investment decisions for the processing sector and aid the marketing strategy.

2. The Resource

An analysis of the data published by FC statistics shows some inconsistency in the figures but broadly it appears that ownership and volumes for Wales are:

| Ownership | Area (000 hectares) | Volume (million m ³) |
|-----------|---------------------|----------------------------------|
| Public | 12.3 | 2.76 |
| Private | 8.6 | 3.12 |
| Total | 20.9 | 5.88 |

There are a further 1.7 million m³ in the West Midlands which could be increased to approx. 2.25 million m³ to cover the Marches - this area will be seeking access to the same markets as timber from Wales. Of this additional volume about 2 million m³ is in private ownership and 0.3 million m³ in public ownership. The total volume available is approximately 8 million m³ with 3 million m³ (37%) in public ownership and 5 million m³ (63%) in private ownership although in Wales the split is 47%/53% by volume.

The larch resource was mostly planted between 1940 and 1990 with the 1950s and 1960s showing the highest planting figures. It is likely therefore that there could be a significant percentage of sawlogs although we know that the quality of larch is heavily dependent on the thinning regime and a lack of management, particularly at the time of first thinning, will have a significant impact on quality.

3. The Survey

3.1 Sampling Methodology

Samples were taken from 55 sites across Wales (see map). Using the new Natural Resources Wales regions 12 sites were surveyed in North Wales, 14 in Mid Wales, 12 in South West Wales and 17 in South East Wales.

All sites had a minimum area of 14 hectares, contained a minimum of 90% Larch, and were planted at least 30 years ago. A photograph for visual reference with a GPS position tag was taken at each site.

On each site one 8m radius plot was taken, the diameter at breast height (DBH) of each tree within the circle was measured and the top height of the tallest tree in the plot was measured. In addition to the 8m plot, the DBHs were measured of a further 30 individual trees chosen at random across the site and they were assessed for suitability of use in the same way as the sample plot. The top height of one additional tree was taken on each site.

Each tree was assessed for suitability of use with a percentage given for:

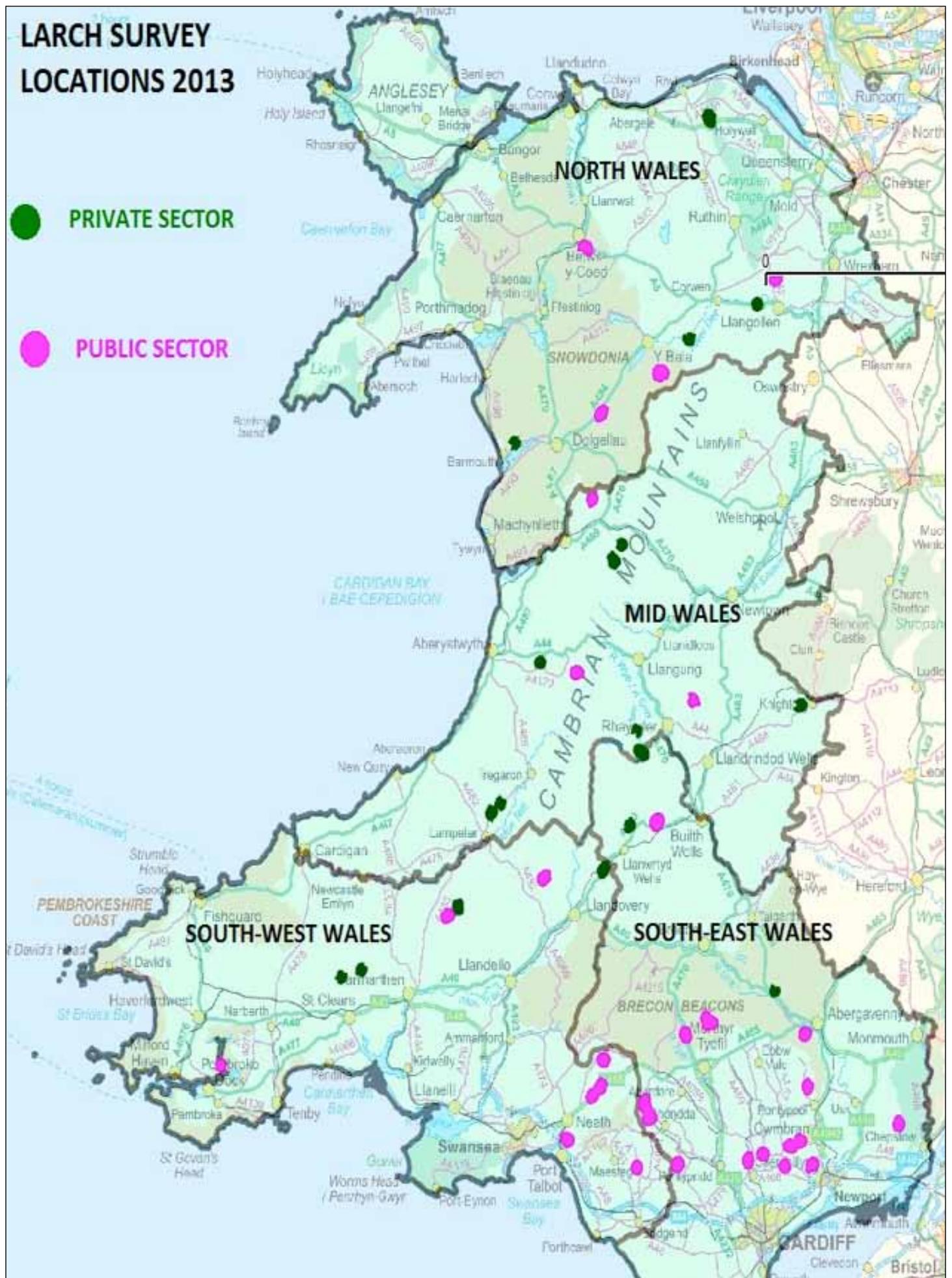
- a) Construction i.e. 4.9m x 18cm min. top diameter logs. Straightness and knot size are important factors.
- b) Sawn fencing or other non-construction uses i.e. 3.7m x 18cm min. top diameter logs. Straightness and knot size are still relevant but the quality is of a lower grade than construction timber.
- c) Short sawlogs (for which there is currently only a very limited market) i.e. 2.5m and 3.1m x 18cm min. top diameter logs. This size would be helpful to maximize the productivity from the log with butt sweep and poor form often evident which reduces the ability to cut longer logs of sufficient quality.
- d) Bars i.e. 2.5m and 3.1m x 14cm min. top diameter.
- e) Biomass/chipwood i.e. 2.5m or 3.1m x 7cm min. top diameter. Quality is not an issue for this grade although maximum butt size and rot are relevant factors.

The percentages were always attributed to deliver the maximum output on the basis that the longest logs would give the best return followed by 3.7m logs, 2.5m logs, bars and biomass. Clearly, if it were possible to use part of the log for construction it would also be possible to use it for any of the other categories and changes in market prices may result in the crop being cut to produce the above in a different order of priorities.

All the sites were surveyed by the same person in order to ensure consistency.



3.2 Location of the sites



4. The Results

Table 1 Percentage by product type

| Area | No. of sites surveyed | 4.9m logs % | 3.7m logs % | 2.5m logs % | 2.5m/3.1m bars % | 2.5m/3.1m biomass/chipwood % |
|---------------|-----------------------|-------------|-------------|-------------|------------------|------------------------------|
| North Wales | 12 | 30 | 8 | 13 | 13 | 36 |
| Mid Wales | 14 | 22 | 13 | 13 | 13 | 39 |
| S. West Wales | 12 | 25 | 8 | 16 | 11 | 40 |
| S. East Wales | 17 | 21 | 4 | 13 | 10 | 52 |
| All Wales | 55 | 24 | 8 | 14 | 12 | 42 |

Table 2 Volume by product type (millions m³)

| Area | Total resource in Wales | 4.9m logs % | 3.7m logs % | 2.5m logs % | 2.5m/3.1m bars % | 2.5m/3.1m biomass/chipwood % |
|-----------|-------------------------|-------------|-------------|-------------|------------------|------------------------------|
| All Wales | 5.88 | 1.42 | 0.47 | 0.80 | 0.68 | 2.5 |

It is likely that more of the larch in the Marches has been thinned and possibly there have been more interventions which would suggest a better quality resource with a higher percentage of sawlogs and less biomass/chipwood.

Table 3 The following breakout and volumes for the Marches have been assumed:

| Product | % | 000m ³ |
|------------------|----|-------------------|
| 4.9m. logs | 25 | 0.56 |
| 3.7m. logs | 15 | 0.34 |
| 2.5m. logs | 15 | 0.34 |
| Bars | 10 | 0.23 |
| Biomass/chipwood | 35 | 0.78 |

Table 4 If the figures from table 3 are added to the Welsh data we have the following volumes:

| Product | million m ³ |
|----------------------------------|------------------------|
| 4.9m. sawlogs | 1.98 |
| 3.7m. sawlogs | 0.81 |
| 2.5m. sawlogs | 1.14 |
| 2.5m. and 3.1m. bars | 0.91 |
| 2.5m. and 3.1m. biomass/chipwood | 3.29 |
| Total | 8.13 |

5. Conclusion

We know that the form of larch can be deceptive often giving the impression of a better quality tree when standing than felled at which point the lack of straightness becomes more apparent. Therefore, if we are to be cautious in the analysis of the data it may be sensible to adjust the breakout, reducing the volume of 4.9m logs and increasing the volume of 3.7m logs to give 1.5 - 1.75 million m³ of 4.9m logs and 1.0 - 1.25 million m³ of 3.7m logs.

Subject to the butt diameter it is probable that some of the 2.5m sawlogs could be used in the bar market but the reverse is not the case. Therefore, there could be in excess of 1 million m³ of bars and failing a new medium to high volume market for short logs this volume would be absorbed into the bar and biomass/chipwood markets.

Using figures from above, the worst case scenario gives 2.5 million m³ in total of 4.9m and 3.7m sawlogs. At a conversion rate of 55%, yield of sawnwood is therefore 1.375 million m³ which would be enough larch for 68,750 three bedroomed timber framed, timber clad houses using 20 m³ per house. Assuming the best scenario of 2.79 million m³ of sawlogs from Wales and the Marches, there would be enough sawn larch for 76,725 timber framed and timber clad three bedroomed houses.

Clearly, it is not reasonable to assume that all the log material will go into construction as there are existing fencing markets to be supplied. However, it may be that 20,000 - 30,000 houses could be built using Welsh larch. In addition, there could be further potential construction timber available from the 2.5m logs and bar material. However the main challenge remains; how can the housing construction sector be encouraged to use the available larch resource and, if demand does increase, will the sawmill sector be able to supply?

To avoid the real risk of the larch resource being used in lower added value markets it is critical these questions are addressed with some urgency.

The base data for the survey can be found on the Wales Forest Business Partnership website at www.wfbp.co.uk

Wales Forest Business Partnership

Unit 6, Dyfi Eco Park, Machynlleth,
Powys SY20 8AX

Telephone: 0845 456 0342

Fax: 01654 700050

Email: timber.info@wfbp.co.uk

www.wfbp.co.uk



Llywodraeth Cymru
Welsh Government

February 2014