Wales Field Visit to Ffrwdgrech Estate, 14 October 2015
By invitation from Mr M.D.D. Evans

About 25 members of CCFG assembled at this well known forestry estate to the south of Brecon on a beautiful sunny day where we were welcomed by Ian Barrington on behalf of the estate’s owners. The morning’s visit concentrated on Held Wood while some of the outlying blocks were visited in the afternoon.

**History & Background of the Estate**
Ffrwdgrech Estate lies 2 miles south of Brecon, within the Brecon Beacons National Park. It has been in the Evans’ family for four generations, since 1880 and comprises of 94.9 ha of woodland and approximately 179 ha of agricultural land and buildings.

The woodlands are divided into 15 separate areas ranging from only 0.8 ha to the 26.1 ha Held Wood. The woodlands were converted from mainly oak and mixed broadleaved woodland pre-1900. Approximately 40% of the woodlands are on ancient woodland sites, including the whole of Held Wood. Significant felling occurred during 1914-1918 and again in 1940-1945. Replanting was completed by 1960, since which time the woods have been managed primarily on a continuous cover management system.

Soils are derived mainly from Devonian sandstone, providing a fertile fine loam which results in good growth. Elevation ranges from 150 – 270m, and much of the woodland is quite exposed either to the north or the west.

There are a wide variety of species, reflecting the trends in replanting in the early 1960’s. The main conifer component is Douglas fir, with decreasing proportions of Norway and Sitka spruce, Japanese and European larch, western red cedar, Corsican pine and western hemlock. The fertile soils have produced high yield classes (18-22m³/ha/yr.) in most species. Broadleaves account for approximately 20% of the woodland area, where ash and oak predominate as timber producing species, with smaller element of beech and birch.

**Objectives of Management**
- To generate an economic return from the woodlands
- To produce timber of high quality in both conifers and broadleaves
- To maintain an irregular forest structure using continuous cover forest systems
- To provide a continuity of diverse habitat for wildlife
- To create an example of the use of CCF systems to provide inspiration for others
Management Systems
Much of the woodland is managed under an Irregular Group Shelterwood System using a Target Diameter approach. The establishment of regeneration has proven to be difficult on such fertile soils, so many of the groups that are created are replanted. Natural regeneration of broadleaved species such as ash, birch and oak is accepted to maintain species diversity.

The concept of Target Diameter thinning is generally well known and widely used on the continent. At Ffrwdgrech, the stands have been managed by favouring the best stems through the removal of larger diameter poorer quality trees. The best stems are removed when they reach their target diameter which in the case of Douglas fir is in the region of 50-70cm DBH. Where sufficient target diameter trees have been removed from a single locality, the area is restocked.

Douglas fir has become the preferred restocking species. This species produced very high quality timber in the previous rotation and is also particularly suited to being planted in the partial shade of a small coupe, or as an underplanting beneath an open canopy. In addition to the restocking of coupes, there has been an element of underplanting through areas where the canopy is sufficiently open to allow development of young trees. The removal of more trees that reach their target diameter in future thinning operations then provide enough light to release the younger trees.

Management History
The woods were managed by Talis Kalnars until his death in January 2005. Talis was a well-known advocate and practitioner of CCF management for much of his life, and the standing crops at Ffrwdgrech are a testimony to the consistent application of this approach for many decades. After his death, Ian Barrington eventually took over the management, initially with Tilhill and later with Pryor Rickett Silviculture,

The principal task on taking up the management was to gain a full understanding of the Estate. This was aided at the time by the preparation of a Better Woodlands for Wales management plan, which was supplemented by both CCF, PAWS and Ecological specialist assessments. It took over two years to write the plan. The period 2010 to 2014 saw the execution of that plan, some of the results of which were inspected during the meeting.

HELD WOOD

Stop 1; Compartment: 1a; Area: 2.3 ha; Species: Douglas Fir; Planted: 1991

Management History
This was formerly a crop of 1950 DF that suffered badly in the 1990 gales, a few remnants of which still remain. It was replanted entirely with DF and was visited during the 2003 CCFG Meeting, which was led by Talis. Talis had suggested it would be subject to an early thin, aged 12, but Ian considered that this never took place. The crop was brashed pre-2005.

The crop was due to be first thinned in 2010 (aged 19), but a high proportion of bent stems made the thinning look highly uneconomic. Quoted working cost at the time was in excess of £40/tonne. Instead, the most poorly formed stems were felled to waste at a cost of £1500.
Discussion

Once the group had taken in the historic management practice, the conversation ranged widely, considering: Initial spacing of the understory, was this too regular and in fact too close. We talked about the opportunity to open out spacing and the effect that might have on grant and licence approval as well as the effects on timber quality. The initial windthrow, was this a product of removing too much of the growth increment at one time or was it just a consequence of an unusually catastrophic wind event. The group concluded the latter. Opportunity to continue with the shelterwood system now in place was also discussed along with the effects of large harvester forwarder setups and the lack of availability of smaller machines in the contractor base.

Stop 2: Compartment: 2a; Area: 1.2 ha; Species: Douglas fir, western red cedar; Planted: 1960 / 2002

Management History

This mixed stand had received regular thinning while several small coupes were located along the eastern edge of the compartment in 2005, which were weeded to ensure successful establishment. Few trees appeared to be over 60cm DBH, suggesting that the target diameter Talis was using was around this value. Butt rot was noted in some of the cedar logs, and 60cm appears to be a safe limit within which a premium price can be achieved without significant loss of timber volume due to defects. Thinning of the compartment was undertaken in 2010 using tractor and winch, with specific attention paid to enlarging the coupes that were already becoming shaded by the surrounding trees.
Discussion
The group commented on the effects of side light or the lack of it in this case on what was a very small patch within the sub-compartment. Establishment of the understory had been slow but the group felt Douglas fir can withstand lower light in that early stage. We also discussed the lack of stone used in the permanent ride structure, the difficulties this presents in managing such a woodland where the owners are keen to see the whole woodland as an amenity for their enjoyment as well as a working profitable holding. Initially an established contractor was successfully used for harvesting in the woods but the contractor had recently scaled up moving from a motor manual processing system to harvester forwarder. Timing of the work on these sites with flexibility to move off site when wet proved critical in meeting the current objectives and work methods.

Stop 3; Compartmenet: 7c; Area: 1.1 ha; Species: Japanese larch & Douglas fir; Planted: 1950/1999

Management History
This area had been heavily thinned under the supervision of Talis, and under-planted with DF in 1999. History between 1999 and 2005 is unknown, but it was last thinned in 2007 to allow for further development of the underplanting. Approximately 40 stems were removed at a target diameter of 50 cm DBH. Sawlogs were sold into a premium market in West Wales, achieving £50/tonne roadside. Under the BWW, it was intended to remove further trees that reached their target diameter. However, contractor availability was limited in the forecast year (13/14) and the work not carried out. That was also the last year of the BWW plan, and while an EOI was put in for Glastir at the outset, Ffrwdgrech was never taken up for entry into the Woodland Management Scheme.

Discussion
Two questions were posed by Ian at this stop. Given the development of Phytophthora ramorum in South Wales, in what way should (or could) the management of this stand be modified to;

a) Mitigate the risk of infection of larch
b) Secure the ongoing development of the under-planted DF

The discussion of these questions had a strong focus on future threats to the forest.
What would be the long term effect on the resilience of Held Wood given the current focus on Douglas fir as the future crop? Larch is a small proportion of the species present on the estate, was there a price penalty for infected timber, what about the other species? Adjacent there was a crop of mature Corsican pine. What would be the appropriate level of species diversity for this woodland and at what stage in the transformation process would you expect that diversity, in early stages only, right through the woodland at all levels. The debate would probably still be ongoing but we had to move on so these questions remain unanswered!

**Stop 4; Compartment: 7c; Area: 1.1 ha; Species: western hemlock, western red cedar & Mixed broadleaves  Planted: 1960 / 2010**

**Management History**
In this stand, some mediocre western hemlock had been cleared under BWW as part of a PAWS restoration programme along the main watercourse. Prior to identifying the restoration potential of this area, small coupes of less than 0.05 ha had been cleared and planted with DF. These were retained, on the basis that during cleaning, native elements would be favoured. The WH was felled in 2010 and replanted winter 2010/11 mainly with ash to suit the ground conditions. Red cedars of reasonable form would be retained until they reach a suitable diameter. The area on the opposite side of the stream was left to regenerate naturally and/or provide an element of riparian open space. The major opening up of the canopy gave rise to vigorous weed growth, which has required persistent weeding. The growth rate of the ash has also been somewhat disappointing.

**Discussion**
This was ultimately a grant-led operation, where the cost of clearing “other conifer” was subsidised, and the restocking with native broadleaves covered at an enhanced rate. The threat of *Chalara* was another aspect of concern. We then talked more widely about appropriateness of moving ancient woodland, where clear-fell is dictated by disease control legislation, entirely to native species at that transition point. The complexities of how we define PAWS were well illustrated by the particular nature of this part of Held Wood. There has been a long tradition of species mixtures combining native and non-native broadleaves with conifers on traditional estates. Compartment 7 lies just above the waterfalls in the policy woodlands. The non-native broadleaves and the conifers are well integrated and form part of the accepted traditional estate landscape. This poses the question of how to re-stock with a reduced pallet of native species. Perhaps we should abandon prescriptive and expensive re-stocking operations leaving sites to recover with a mix of regeneration of various species.
After lunch, the first afternoon visit was to Hoel Fannog, an outlying block slightly higher in altitude than the Held Wood block and with a far more exposed feel and poorer acid upland soils.

HOEL FANNOG

**Stop 1; Compartment:** 21a; **Area:** 1.1 ha; **Species:** western hemlock; **Planted:** 1968

**Management History**
This compartment was last thinned in 2011, focusing on the removal of trees > 40cm DBH. Approximately 50 trees were removed, enough to make up two loads of sawlogs for Pontrilas. Regeneration present at the time of thinning varied in density, and in height from seedling to 2m. The original even-aged structure of the stand, thinning history, and upper diameter limits on marketing have created a uniform shelterwood; regeneration up to 4m with a fairly homogeneous overstorey. Thinning has allowed some bramble to develop in places, and this has inhibited further regeneration, whereas under areas of tighter canopy, more WH regeneration is emerging. The regeneration has been left to self-select, though it is now of a size where brashing could be undertaken. No money has been expended on this stand for many years.

**Discussion**
Discussion centred on how to further manage the stand. Both the diameter limit and developing butt-rot added urgency to remove the larger trees. The consensus was that thinning of the overstorey should continue to remove a proportion of the larger trees and not be concerned with a uniform reduction. A more uneven overstorey would reduce the likelihood of a uniform and undifferentiated understorey developing, and management could address areas where local light gaps where no regeneration was evident.

This area had the most advanced irregular structures seen on the estate. A wide stem size distribution, wide spatial irregularity and very distinct clumps of regeneration that included native broadleaves amongst the WH showed a dynamic and functional stand structure at work. The present constraints on marketing WH timber are unfortunate but need to be overcome along with the need to increase the market for small volumes of mixed species and large dimension timber in Wales.

**Stop 2 & 3; Compartment:** 21b / 21c; **Area:** 1.9 ha / 3.8 ha; **Species:** Norway spruce; **Planted:** 1988

The next site was down slope of the first stop, and noticeably flatter, consequently a change in vegetation and soils were seen which suggested a higher water-table.

**Management History:** 21b: Thinning took place pre-2005 under the supervision of Talis. Work was carried out strictly on a breakeven cost basis with skidder and forwarder. Work ceased when thinning became unviable. The division between 21b and 21c is where this thinning effort stopped. 21c: Birch was very thick throughout the whole stand, and it was included in the BWW for cleaning, which was carried out in 2010.
Cost per ha for cleaning was in excess of £600, though effort was put in to carry the work out systematically to ensure the site was walkable afterwards. Cut material was laid down in every other row, which proved to be a very workable system for the contractors. Thinning took place in winter 2012/13 following delays over the very wet summer of 2012. With pressure to complete the work to maximise grant income secured under BWW, the work was undertaken in less than ideal conditions in January 2013 using a mechanised harvester/forwarder. Without the opportunity to amend the contract, a significant amount of grant would have been foregone.

Basal area was recorded at 46 m²/ha pre-thinning, and reduced to approximately 38 m²/ha post thinning. Visually, the intensity and selection looked well balanced. However, just over a year following thinning, the February 2014 storm hit and caused widespread damage. This was cleared in summer 2014, but further damage has re-occurred.

**Discussion**

Wind damage was thought to be allied to a number of factors. The February 2014 storm was severe, and so it was not unreasonable to expect some stands to incur damage due to their position in the landscape, regardless of management. The recent thinning of the stand had made it more susceptible to wind damage for a window of time until compensatory root and stem growth occurred; it was unfortunate that a storm hit within this period. Harvesting within a wet period may have caused some root damage locally, whereas this might have been avoided had work been undertaken in a dry spell. The greater issue appeared to be that the site was generally boggy and gleyed and so spruce trees had inherently shallow rooting and poor stability. Less wind damage seemed to have occurred in the parts of the stand which had been thinned in 2005, suggesting that early intervention to encourage individual tree stability had a benefit on a site like this.
Future management of the stand centred on the choice between planting to adjust the species mix or to take the zero cost option of accepting birch and spruce regeneration that was starting to appear. Deep rooting species were suggested to improve overall stand stability. Oak was discounted due to squirrels, and European silver fir due to potential lack of markets. Filling gaps with marketable Sitka spruce was suggested, or a self-thinning mix of Sitka and lodgepole pine to increase stability and tree volume on harvest without the need for marginal thinnings. Given current stand instability and uncertainty, the zero-cost option was seen as probably the most pragmatic solution.

**WATERFALL WOOD**

**Stop 1; Compartment:** 11a; **Area:** 0.6 ha; **Species:** Douglas fir; **Planted:** 1930 / 2000

**Management History**

This is one of the oldest stands of DF on the Estate, which is situated in one of the most dramatic positions in a narrow valley. The stand is sandwiched in a strip between a minor road and neighbouring farmland. Progressive selective thinning has produced some fine stems, of which there are approximately 125 throughout the whole wood. This area was heavily thinned in 2000 under the supervision of Talis and underplanted with DF. Last thinning took place in 2008, with the removal of 29 DF stems (average size = 2.9 m³). Directional felling was critical here to minimise damage to the understorey. Thinning selection was guided more on the need to open up the developing understorey, rather than the strict criteria of target diameter.
Discussion

There was no pressing need seen to remove the large Douglas fir stems, and indeed they represented a significant capital store for the estate as they were of a size able to attract premium prices (c.£100/m³ delivered). The large stems were putting on increment at a high rate, so were also increasing rapidly in value. The overstorey was also not seen as a constraint on understorey development. The young trees were developing, but no intervention was seen to be essential at present, and could wait to be combined with any future felling.

Stop 2; Compartment: 10a; Area: 3.8 ha; Species: Douglas fir, western hemlock & Mixed BL, Planted: 1930 / 1960 / 1990 (DF)

Management History

This was a more complex stand than the previous one, with less regular structure. It was last thinned in 2008 on more of an intermediate basis, taking the opportunity to free up coupes planted in 1990. Access was again challenging; the compartment formed a strip running below the same minor road with a river gorge forming the lower boundary.

Discussion

The concept of target diameter as a control on harvesting was again discussed. Neither the sweet chestnut nor the western hemlock had a target size which corresponded to site growing space. The concept of when the tree had reached its greatest value was more applicable in this instance. Quality of the sweet chestnut and hemlock was not good, they would not yield much revenue on harvesting, and did not represent a significantly increasing source of capital. The hemlock was not marketable past 50cm so was limited in terms of growing on.
The larger sweet chestnut had a significant effect on the stand through occupying a large crown space, so the low tree value was in effect further reduced by its competition on younger trees.

Any future thinning would have to balance the needs of stand development against degrading the high current amenity of the stand. The identification of future crop trees (frame trees) was seen as a useful way of concentrating work where needed and allowing some larger and poorer trees to grow on and maintain the aesthetic value of the stand.

We thanked Ian Barrington very much for taking us round such an interesting set of sites, and were pleased to see how well Talis Kalnars’ principles of forest management continued to be applied at Ffrwdgrech. We asked Ian to pass on our thanks to the Evans’ family for allowing us to visit these fascinating woodlands.

Steve Cresswell and Martin Price

Photographs courtesy of Martin Pice