

Wessex Silvicultural Group

Field Meeting Notes

2017 Study 'Regeneration: Renewal and Creation'

Meeting 2: Stourhead (Western) Estate, Wednesday 10th May 2017

Theme: Natural and artificial renewal techniques in conifer dominated stands

Our second meeting of the year took us to Stourhead (Western) Estate, where the focus of the day was natural and artificial renewal techniques in conifer dominated stands. Led by David Pengelly (Forest Consultant) and with guest experts Jonathan Cameron (Cheviot Trees Ltd) and Sam Firkins (Forestart Ltd), the visit offered the opportunity to further explore this year's theme of 'Regeneration: Renewal and Creation', exploring issues including tree selection and sourcing the best genetic material, and planning and forecasting seed and plant material.

Since the mid-1990s Stourhead (Western) Estate have been pursuing silvicultural management techniques that reduce the cost of tree renewal and improve the genetic base for timber production. During the day, the group visited stands subject to irregular shelterwood felling, mosaic felling and selection felling, considering the strategies used for regeneration and renewal.

Stop 1: Kingswood Warren (Cpt 806a)

Our first stop of the day was Kingswood Warren (part of Cpt 806a), a steep, exposed N/NW-facing site. Here, the original crop had been P1947 Japanese larch, but following the issue of a Statutory Plant Health Notice (SPHN) in October 2016, the statutory treatment area had been felled and brushwood cleared in winter 2016/17. Restocking was subsequently carried out in March 2017, and the site now comprises principally broadleaved species (pedunculate and sessile oak, sweet chestnut, small-leaved lime (which appears to do very well on greensand) and hornbeam), with a smaller conifer contingent (Douglas fir, western red cedar, European silver fir, Norway spruce and Sitka spruce). The aim of regeneration has been to achieve a range of species and provenances. Douglas fir, for example, comes from three different provenances, including Stourhead selected material. Young broadleaved trees at this site have been protected (e.g. groups of small-leaved lime have been netted), along with small groups of conifers. Where there are large groups of conifers, every other tree has been protected, while very large groups have been left unprotected.

Jonathan Cameron, Sales and Marketing Manager for Cheviot Trees (cell grown plant producers), here discussed issues surrounding regeneration from a nursery perspective, beginning with the position with alternative species. Cheviot Trees started working with alternative species in 2010, when there was a shift to bring in larger numbers to the UK market. Initially, work focussed on 12 alternative species. Driven by market forces, this range has now been condensed down to five key species: European silver fir *Abies alba*, Atlas cedar *Cedrus atlantica*, Japanese red cedar *Cryptomeria japonica*, Macedonian pine *Pinus peuce* and Serbian spruce *Picea omorika*. Coast redwood *Sequoia sempervirens* does not appear on this list, not being considered an 'alternative' species. In addition, mortality rates of coast redwood in the nursery are very high, and looking at yield from nursery perspective, the cost of producing these trees is disproportionately large. The viability of seeds appears to naturally be low, with germination rates of 10-20% characteristic of the species. These issues do not appear to be due to bad husbandry – the problem is a pan-European issue, with growers continuing to seek suitable solutions.



Kingswood Warren Cpt 806a (Stop 1), looking across to the Mendip Hills

In terms of plant planning and forecasting, the need to express an indication of interest early was emphasised. Some alternative species have much longer lead times (the time between the initiation and completion of tree production). Where traditional species such as Douglas fir may be ready after just 18 months, alternative species such as *Pinus peuce* can take much longer.

Sourcing seed poses an ongoing challenge for nurseries, with good quality forestry seed sources often insufficient. A diverse source of seed is required, and collectors are looking to a range of potential sources, including old demo plots, arboretums, and even other countries (although many countries are often reluctant to see their seed go elsewhere).

At Kingswood Warren, herbicide has been used effectively throughout the process of regeneration. Ian Willoughby (Forest Research) drew attention to the current situation with regard to Asulox, a highly effective bracken-selective herbicide. The product has recently been through a process of reregistration, and we will know whether or not we can continue to use it after next year (although it is likely that we will, regulations regarding application and dosage rates may change). Until then, emergency legislation covers usage (coming into force in late May). The Forestry Commission are currently looking at alternatives.

Stop 2: Kingswood Warren (Cpt 806a)

The second site visited, a separate area of the same compartment (Kingswood Warren, cpt 806a), had also originally comprised P1947 Japanese larch. Here a system of progressive group shelterwood has been employed. Felling has been concentrated in wedges, which



Kingswood Warren Cpt 806a (Stop 2)

are being expanded across and down the slope during each felling intervention. The site has been restocked with broadleaves on the upper slope (POK, SOK, SC, SLI, HBM) and conifers on the lower slope (DF, RC, ESF, NS, SS) with some planted in the shelter of the larch overstorey. Sixty percent of the ground has been planted, with brash left in rows every 20-25m. These linear strips will form either future extraction racks, or provide areas for natural regeneration to become established, thus reducing the cost of establishment in the absence of restocking grants. As David pointed out, the aspect of the slope (N/NW-facing) provides ideal conditions for natural regeneration, as desiccation is minimised.

Protection of young trees on site includes the use of CactusPro plastic bud caps (right). These are blue plastic clips with three 20cm long 'whiskers' at the top, which cost around 14p each. The clip is attached to the needles of a conifer leader at the end of the growing season to protect them over winter. It has to be moved up once per year at the end of each growing season until the tree is above browsing height. The blue coloration is significant, apparently deterring deer more so than other colours (deer are particularly sensitive to blue light, having no UV filter in the eye). These guards, which are only suitable for conifers with stiff stems, are being trialled on European silver fir across the estate.



As Gary Kerr pointed out, raw sheep's wool can also be used effectively to protect shoots of young trees, having been used in Germany for some time. A small amount of wool is wound around the leader, providing a cheap and light form of protection that could potentially be a very useful tool if it works in the UK. Victoria Stokes at Forest Research's Northern Research Station is currently trialling the use of raw sheep's wool in the protection of regeneration in the UK.

At this stop, Sam Firkins of Forestart (suppliers of tree and shrub seed) emphasised the importance of selecting the best genetic stock for your woodland. However, where Sitka spruce has been the subject of extensive tree breeding programmes, and we now know much about the selection of superior genetic material, this is not the case with most other species. While there are proven gains in using qualified material derived from orchards, for many broadleaved species such material is limited. With regard to other coniferous species, there is at present one Douglas fir orchard in the UK, and just two selected stands of Norway spruce on the UK register, both of which are located in Scotland. Selected stands must meet certain criteria, including being greater than 50 years of age, and producing good quality timber. There is no financial incentive for simply having a stand on your land, however, if seed is collected a royalty is offered (10% of the

commercial value of the seed). While the greatest genetic diversity of individual species is likely to be found within the central geographic range (linked with glacial refugia), material derived from UK selected stands will be best climate adapted.

Stop 3: Jack's Castle (Cpt 401a)

Jack's Castle, a steep NW-facing 9.33ha site, presented a fantastic example of how woodland resilience can be promoted in a landscape stand through the use of species mixtures. Originally a stand of P1950 Sika spruce, with some Scots pine on the upper slope, around 35% of the original coniferous component remains, with natural and artificial regeneration now comprising a range of largely coniferous species (SS, DF, RC, LC, SP, JL). There have been three major felling interventions since 2001, which have involved the gradual removal of Sitka spruce, with felling (in wedges) progressing down the slope. The aim at this site has been to encourage natural regeneration, while using enrichment planting of target species (i.e. DF, RC) as an opportunity to manipulate species composition. Following felling, respacing focusses on achieving a mixture of species, with Sitka spruce in particular being targeted for removal.



Jack's Castle Cpt 401a (Stop 3)

Stop 4: Berridge (Cpt 102g)

Berridge (Cpt 102g) sits on a level plateau, where the original crop was P1951 Japanese larch. Since 2004, selection felling has been carried out, focussing on removal of the coniferous component. Around 20% of the standing volume has been removed at each felling intervention, with the aim being never to remove the overstorey completely. Instead, management focusses on the gradual removal of larch, the development of the vertical structure, and the improvement of the genetic and species make-up. Regeneration at this site represents a good balance between artificial and natural methods. The species composition of natural regeneration is addressed following felling using respacing (with an emphasis on the positive selection of DF, the best timber tree on site), while enrichment planting (mostly DF and RC) allows the species mixture to be manipulated further. Short shelters act as a sufficient deterrent to roe deer, while permanent extraction racks marked throughout the stand aid harvesting operations. Woodland resilience has been encouraged through careful management of the site, which has aimed to develop a mixture of species at relatively low stocking densities. The latter has promoted the development of healthy trees with large crowns that are likely to be more robust in the long-term.



Berridge Cpt102g (Stop 4)

Stop 5: Serpentine (Cpt 102e – pt.)

The Serpentine has been the site of a local experiment into deer protection, carried out by the estate. This small 0.5ha compartment was previously a P1945 western hemlock monoculture that was clearfelled in 2013 when a market opportunity arose. In 2013/14 the site was restocked, primarily with DF (80%), and with some RC (15%) and RSQ (5%). Three treatments had been applied to young trees on site: 1. Mesh guards installed; 2. Leaders sprayed pink (using forestry marker spray); 3. No deterrent. Results showed 13% mortality of

unprotected trees, 8% mortality of trees protected by mesh guards, and 30% mortality of trees which had been sprayed with paint. Despite the reported success of spraying leaders as an approach to deer protection in Germany, results could not be replicated at this site.

Stop 6: Great Combe (Cpt 103a)

Great Combe (Cpt 103a) is home to one of the estate's selected seed stands of Douglas fir, planted 1903-1923, and registered in 2015. The compartment is also home to a local research stand, where careful monitoring allows the annual increment of trees to be determined, along with other key stand parameters. Results indicate that the annual increment of Douglas fir over recent years has not been as great as expected, with increment varying considerably between individual trees. With crown condition suspected to be linked with the poor increments observed, future felling interventions will take into account the condition of the crown of individual trees.

Giving a further insight into the nursery trade, Jonathan Cameron highlighted the potential future impact of pests and diseases not currently present in the UK, particularly *Xylella fastidiosa*. Johnathan emphasised the importance of knowing your nursery, knowing what you are buying and only buying from nurseries which can provide full traceability (e.g. provide plant passports that confirm plants are free of pests and diseases, and hold records of stock). Supply chain traceability has proved hugely important in the event of an outbreak (e.g. ash dieback), allowing rapid trace back of infected material. The Confor nursery producers group (comprising nine nurseries) offers confidence and transparency, operating under agreed rules (Confor, 2014).

Stop 7: Great Combe Bank (Cpt 104a – pt.)

The final stand visited, consisting predominantly of P1963 western red cedar, represented another of the estate's selected seed stands. Bringing the day to a close, Sam Firkins highlighted some of the issues around seed sourcing in the UK, including the often unpredictable nature of seed production, and the lack of registered seed stands for many species in the UK. Consideration must also be given to the potential for seeds to harbour certain seed-borne diseases. *Hymenoscyphus fraxineus*, for example, has been found to infect ash seeds (with hot-water treatment being a possible method for eradicating such infection (McCartan *et al.*, 2015)). There is also evidence that a new emergent fungal disease *Neonectria neomacrospora* may be seed-borne. Currently affecting *Abies* species elsewhere in the EU, the disease has recently been added to the UK pest risk register.

References/Further Information

Confor (2014) *Nursery Producers Group information leaflet*. Available at: <http://www.confor.org.uk/about-confor/nursery-producers-group/>

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Pengelly, D. (2017). *Wessex Silvicultural Group visit to Stourhead (Western) Estate*. Supplementary notes.

Forestry Commission (2007). *Forest reproductive material: regulations controlling seed cuttings and planting stock for forestry in Great Britain*. Forestry Commission, Edinburgh.