

Silviculture on steep terrain: reflections on a study tour to alpine regions of northwest Italy

By Alex Gilham, Forestry MSc student at Bangor University and Nick Hill, Woodland Creation Forester, Forestry and Land Scotland

Woodland Heritage Garthwaite Travel Bursaries helped Alex Gilham and Nick Hill to attend the joint CCFG/Pro Silva Ireland study tour on the 6-9 June 2019 in Northern Italy. Alex describes the busy programme, whilst Nick reflects on how he might apply what he learned.

Over the three-day tour, we were taken to Val Susa, west of Turin, the Aosta Valley near Saint-Rhemy-en-Bosses on the Swiss boarder and Val Sessera, north east of Turin.

Val Susa, on day 1, is an area of predominantly Larch forest where the management exists along-side other important functions, such as skiing, mountain biking and walking. The area is owned by 14 municipalities but managed under one consortium for consistency. Historically these forests were managed with large clear fells followed by direct seeding, planting and natural regeneration. We were shown examples of shelterwood systems used by the consortium and unsuccessfully planted areas where disease and bad form were present, due to, what was discussed as the use of an inappropriate provenance of tree species.

Day 2 took us to the Aosta Valley near the French boarder, to a site of mainly Larch and Norway Spruce, managed predominantly as a direct protection forest for the defence of the many alpine villages below. Natural regeneration is the main afforestation technique where gaps created by the selective harvesting of large trees offer regeneration opportunities. Trees left during interventions are favoured in clusters ('collectivo'), which enhance stability over time structural diversity benefiting young trees from browsing and disease. En-route to the summit, we passed two 'V' shaped, man-made stone wall buildings, which were created in the 19th century as a defence system against avalanches. These were never tested by an avalanche and due to the high up-keep costs they have been replaced by large wire fencing.

Day 3 in Val Sessera in the Biella Alps is a Natura 2000 protected site, whose presence of an endemic species, the beetle, *Carabus olympiae*, is incorporated within the management directive. This species was close to extinction during the 1920s so the LIFE CARABUS project was created with an aim to introduce a new model of forest management, environmental protection and the development of rural Alpine areas. Around 25 percent of the park is covered in predominantly Beech forest, previously coppice which was used for charcoal, with some conifer plantations elsewhere. The park includes many private owners who are often pleased with the financial recuperation of management practices, but not always the aesthetic restoration, although operational costs for many foresters are a barrier, with many only having enough funds to secure one fifth of the timber they would like to remove.

Alex Gilham



The group discusses silvicultural decision making and operational practicalities in a stand recently thinned and extracted by skyline



The group view the local landscape of high alpine peaks, forested lower slopes and valley bottoms laced with roads, train lines and villages from a stone avalanche defence built in 1841. Forests provide a key protection function, slowing and catching avalanches and rock falls.

Forest management on steep terrain is a significant challenge in many parts of the UK. Decades of post war woodland expansion has driven productive conifer and mixed broadleaf woodland out onto evermore challenging ground.

This legacy is now stretching the creativity and expertise of contemporary foresters in steep slope harvesting and in setting long-term visions for such sites. In a social and political climate that has rejuvenated woodland expansion efforts in recent years, we are looking again at the diverse benefits (e.g. soil stability, infrastructure protection, biodiversity, timber) provided by woodland on steep ground. A few key points that I took from the trip are mentioned below.

Throughout the tour we were shown a range of continuous cover forestry systems working on steep alpine



A solar compass used by foresters to achieve optimum exposure to direct daylight, when designing canopy gaps created by group felling.

terrain. Objectives include sustained provision of physical avalanche protection to infrastructure and dwellings down slope, resilience to fire and severe winter weather, and improvement of local biodiversity. Thinning and harvesting operations are often extremely challenging, commonly requiring extraction by skyline. Economic sustainability of such work appears to be reliant generally on the following principles:

- A high value product. Furniture grade European larch is frequently achieved thanks in part to slow growth under continental alpine conditions.
- Long-term working relationships with small teams of specialist, skilled operators and buyers. This is complimented by a vibrant local woodland culture, with woodland work a visible part of many local livelihoods and village identities.
- A hands on approach to making and communicating informed management decisions, e.g. innovative use of solar compasses to calculate optimal gap size and shape with desired daylight hours, aspect, slope and canopy height considered, during tree selection by foresters.

Now back to my day job, designing new woodlands for former open cast coal mines in Central Scotland, my vision into the potential for steep slope forestry on my sites has gained further clarification. The more I see of forestry industries and practices around the globe, the more I appreciate our common issues in each of our local contexts. Long may such exchanges of lessons, experience and specialist expertise continue!

Nick Hill