The Benefits of Mountain Woodland

The lack of any complete altitudinal range of woodland from the forest zone into the subalpine is evident in Britain today. There are only two extant patches of 'semi-natural' treeline woodland, one on either side of the Cairngorms. All other high altitude remnants are unviable isolated fragments, including all areas of montane scrub, the highest altitudinal extent of mountain woodland. The many benefits that would accrue from a fully functioning forest system are missing, or similarly fragmented and malfunctioning.

The mission of MSAG is to promote the expansion of mountain woodland and hence our focus here is to outline the benefits that increasing areas of woodland above 400m would have on biodiversity, the ecosystem and the services it provides.

The role of enhanced biodiversity in mitigating the effects of climate change is increasingly recognised (IPBES 2019). Mountain woodland areas, either naturally expanded or planted, are likely to develop as a mosaic of woody cover, decreasing in height as altitude is gained, with open grass or heath areas. Within this habitat there is structural variability, with open and more enclosed spaces, windy and sheltered sites, all providing a wide diversity of ecological niches and supporting a range of animal life, particularly small mammals, invertebrates and birds. Rarer birds like the black grouse and ring ouzel are at home in these habitats; and the increase in density and variety of prey species attracts predators, including golden eagle which will exploit the upper fringes of these mosaics. An expanded natural treeline would increase resilience to climate change and to the spread of pests and diseases by facilitating species movements. It would also perhaps provide suitable breeding sites for infrequent visitors, such as bluethroat, encouraging them to establish populations here.

Many of the less common woody plants characteristic of the tall shrub element of mountain woodland, the montane willows and dwarf birch, have specific associated species, both phytophagous insects (e.g. sawflies and micro-lepidoptera) and mycorrhizal fungi. The additional shelter also provides a wider range of niches for plants, allowing taller more palatable species, including many tall herbs more commonly associated with ungrazed mountain ledges, the potential to flower and set seed.

Carbon sequestration could be significant in the sub-low Alpine zone, although possible mineralization of soils could mitigate this to some extent. However, taller woody plants can play an important role in upland hydrology. Firstly the canopy, whether conifer or broadleaf, intercepts rainfall. Secondly, when compared to heath communities, the water that does reach the ground falls on a greater depth of organic matter, composed of leaf litter and an active soil microbe population, with slower infiltration. Thirdly, the woody plants tend to have deeper, longer roots than those of grasses and dwarf-shrubs, again providing better infiltration into the soil layers. These effects combine to reduce the speed and volume of runoff, and hence the potential for erosion and nutrient leaching following heavy rainfall. The outcome is a reduced flow and less sediment in the rivers, resulting in a lower flood risk and less damage to fisheries.

Extending woodland cover uphill to create a treeline zone also creates a softer visual boundary between forest and open hill. Both stock and deer will benefit from increased shelter from harsh weather, and from the more nutritious forage, and longer growing season, available in woodland areas. This more diverse landscape also creates greater opportunities for people in the hills. Thus a different hunting experience would be on offer, both with game birds and deer stalking; and a wider range of plants, with greater likelihood of flowering and fruiting, would allow for the harvesting of berries and fungi.

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