

Restoring heathland by removing birch *Betula* woodland and adding heather *Calluna vulgaris* seed at The Lodge RSPB Reserve, Bedfordshire, England

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SUMMARY

In order to restore heathland, birch *Betula* trees were cleared, the humic layer was removed, and heather *Calluna vulgaris* seeds were spread out over the restoration area. Two years later there was a good growth of young heather plants with 5-10% cover seven years after the initial clearance, whilst some areas were dominated by wavy hair-grass *Deschampsia flexuosa*.

BACKGROUND

Lowland heathland dominated by dwarf shrub vegetation such as heather *Calluna vulgaris*, a rare habitat in the UK, supports a distinctive fauna and flora. The dwarf-shrub vegetation can be out-competed by silver birch *Betula pendula*, a tree which typically invades open heathland, especially after fire or when there is a lack of grazers to browse on seedlings and saplings. Heathland restoration projects often involve removal of birch scrub and woodland from former heathland (e.g. Mitchell *et al.* 1997). This case study describes the regeneration of dwarf-shrub heathland following birch removal at the RSPB's reserve at The Lodge in central England.

ACTION

Restoration site: An area of 0.6 ha of former heathland at The Lodge (National Grid ref: TL 190479) that had reverted to silver birch dominated woodland (through natural succession), was selected for heathland restoration. The area comprised a relatively steep, east-facing slope underlain by a Brown Sands (light, free-draining acidic sands) soil.

Silver birch clearance: In the winter of 1997/98, birch trees of about 40 years of age and 8-10 m in height were cleared. The humic layer was then removed by hand-raking to eliminate birch seeds and seedlings, and to reduce the soil organic content.

Introduction of heather: Heather cuttings with ripe seed were collected from mature heather adjacent to the site in autumn 1997. These were scattered over the newly cleared area but were not trampled in. The quantity of seed used was not recorded. The area was fenced against rabbits *Oryctolagus cuniculus* to prevent the grazing of young heather plants, should they become established.

CONSEQUENCES

Heather establishment: By 2000 there was a good pioneer phase (young seedlings) and building phase (older plants) of heather on the lower part of the slope, with a small amount of grass, but the upper slope was dominated by wavy hair-grass *Deschampsia flexuosa*. It is thought that much of the heather seed may have been flushed downhill, as a result of rainwater washing down the surface. Interestingly, plenty of heather was also growing outside the rabbit fence in areas that had also been cleared.

Effect of rabbits on heather establishment: Rabbits had actually tunnelled under the fence and started a small warren inside. The implications are that, either rabbit fencing is unnecessary when there is plenty of vegetation to forage on, or that fencing is only worthwhile for a duration of a couple of years or so. The fencing was removed in summer 2002. Significant extra manpower would be needed for daily checks to ensure that such fencing



Photo 1. The hillside from which birch *B. pendula* was removed and heather *C. vulgaris* seed added. The lower 5-10% is dominated by heather with the rest of the slope is dominated by wavy hair-grass *D. flexuosa*, The Lodge RSPB Reserve, 2005.

remained rabbit-proof, should the need for longer duration fencing/rabbit exclusion arise.

Establishment of other plants: The hillside from which the birch was removed is shown in Photo 1, taken in April 2005. The lower 5-10% of the hillside was dominated by heather with the rest of the slope dominated by wavy hair-grass. It should be noted that the foreshortening in the photograph makes it look like a much larger proportion of the hillside was dominated by heather. Based on a visual estimation, the wavy hair-grass-dominated areas contained 5-10% cover of bracken *Pteridium aquilinum* and 5% cover of hypnoid mosses, mainly *Hypnum jutlandicum*, together with a low cover (<1%) of several other acid grassland species such as heath bedstraw *Galium saxatile*. There is now less than 1% bare ground in these wavy hair-grass dominated areas and the hair-grass appears to be out-competing any heather that did become established on these upper slopes.

Vegetation prior to birch removal: The vegetation under the birches before they were removed was not recorded in detail, but was similar to that in adjacent birch woodland. This adjacent woodland contained (in April 2005) about 80% cover of bracken, 5% wavy hair grass and 5% hypnoid mosses, mainly *Brachythecium rutabulum* and *Eurynchium praelongum* with few other species present.

REFERENCES

Mitchell R.J., Marrs R.H., Le Duc M.G. & Auld M.H.D. (1997) A study of succession on lowland heaths in Dorset, southern England: changes in vegetation and soil chemical properties. *Journal of Applied Ecology*, 34, 1426-1444.