

## Appendix 1 – Swanworth Restoration Update

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# SWANWORTH QUARRY RESTORATION UPDATE 2015

Most recently sown area developing well | Grazing regime to be implemented

### Original Experimental Area

Originally sown in 1997, species rich grassland has been established on this area for 16 years. 80% of the species that were sown are still present including both greater (*Centaurea scabiosa*) and black knapweed (*Centaurea nigra*), field (*Knautia arvensis*) and small scabious (*Scabiosa columbaria*), cowslips (*Primula veris*) kidney vetch (*Anthyllis vulneraria*), restharrow (*Ononis repens*) and lady's bedstraw (*Galium verum*). The grasses include characteristic limestone grassland species such as quaking grass (*Briza media*), sweet vernal grass (*Anthoxanthum odoratum*), crested dog's-tail (*Cynosurus cristatus*) and sheep's fescue (*Festuca ovina*). This year both broomrape (*Orobanche* sp.) and pyramidal orchid (*Anacamptis pyramidalis*) were recorded.

In 2014 the grassland was cut and the hay removed. The beneficial impact of that management can be seen. The grasses have not lodged as much as in previous years. However, grazing is necessary to manage the site well.



### 'Recently' sown area

IN 2012 we sowed seed that had been collected from Hill Bottom and propagated and bulked-up at Emorsgate Seeds (Bath). Many species have local ecotypes and it was noted that several species exhibited local types that were particularly small and low growing. The seed represented a substantial investment in the site and it has been rather tense over the last three years as we waited to see how well the grassland would establish. We know from past experience that, as we use no topsoil on the site, the grassland establishes slowly but relatively weed free. Nevertheless it was a relief this year to see that the area sown in 2012 has developed into the beginnings of a good limestone grassland and 70% the area is now vegetated.

The newly sown area now supports a range of species including bird's-foot trefoil (*Lotus corniculatus*), kidney vetch (*Anthyllis vulneraria*), black medic (*Medicago lupulina*) lady's bedstraw (*Galium verum*), harebell (*Campanula rotundiflora*), pale flax (*Linum bienne*) and grasses such as sheep's fescue (*Festuca ovina*) and quaking grass (*Briza media*), all of which were sown.

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### Cattle on their way

By the time you read this the cattle should be installed on the restored area at Swanworth quarry.

Cows will be brought in by a local farmer to graze the grassland. They will be managed using electric fence and they will be moved systematically across the site to ensure the effect is distributed evenly.

Although limestone grassland is commonly grazed by sheep, the site is rather overgrown and it will benefit from the less selective grazing of cattle. Cattle also tend to churn the ground with their hooves and this will open up micro-sites allowing the limestone species to spread. In the future sheep may be used to manage the site but this will be assessed on a year-by-year basis.

The area sown in 2004 is also in good condition, with a particularly good populations of pale flax (*Linum bienne*) and pignut (*Canopodium majus*), the latter of which is not found anywhere else on site.

The area that was covered with topsoil and allowed to regenerate naturally demonstrates the importance of sowing seeds and not adding nutrients. The naturally regenerated area is dominated by grasses, especially couch (*Elymus repens*), rye (*Lolium perenne*) and cock's foot (*Dactylis glomerata*), although these grasses occur elsewhere on site they do not dominate in the same way. While some species spread readily (e.g. kidney vetch, *Anthyllis vulneraria*) other species such as harebell (*Campanula rotundiflora*) and cowslip (*Primula veris*) are slow to spread and these species are not found on the regenerated area. Furthermore the additional nutrients in the topsoil is likely to have encouraged the weedy dominant grasses and these outcompeted the less competitive limestone flora.

Overall the site is developing well, key species are present and the local ecotypes have been conserved on site by sourcing seeds locally. The plan is that newly restored areas will be sown with seed collected on site, using hand collection or brush harvesting where possible. The site is now sufficiently well developed that the quarry operators will be able to avoid bringing in seed from beyond the quarry gate.

The original aim was to restore the site to a condition where it could be considered an extension of the existing limestone grassland at Hill Bottom (the adjacent valley). Although there are differences and Swanworth quarry is not yet as species rich, it can be seen that there is potential for this ambitious aim to be achieved.