Cocking Chalk Pit

Restoration Plan

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Executive Summary

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This report proposes a restoration plan for the Cocking Chalk Pit using the methodology of natural recolonisation. The plan is to create a species-rich calcareous grassland site characterised by grasses and herbs dominant in a chalk downland landscape. The plan considers the various existing uses of the site other than mineral working, as well as the need to preserve the historic geology now evident from the previous workings of the chalk pit.

1. Background

1.1. Background

The Cocking Chalk Pit benefits from planning permission CK/00/068 which has enabled the working and extraction of chalk. The planning permission was last reviewed in March 2001. This review looked at the original planning permissions granted under references CK2/57B and CK2/57C and was undertaken by West Sussex County Council who imposed a number of conditions. A number of these conditions have not been implemented and require significant investment to enable the pit to continue to operate. This is thought to be the reason why the previous operators Dudman left the quarry.

The current permission is due a further review this year and an application must be made to the South Downs National Park before 19th March 2016 for the determination of new planning conditions. It is likely that this would lead to the same conditions being imposed and potentially further restrictions added as the controlling authority are now the South Downs National Park.

Planning Permission CK/00/068 is attached at Appendix 1 and details all of the 18 conditions.

The key condition for this report are no.16 which states:

Within six months of the completion of quarrying or such longer period as may be agreed in writing with the Mineral Planning Authority, the application site shall be restored to a condition suitable for the creation of a Chalk Grassland habitat in accordance with a detailed scheme which shall be submitted for approval to the Mineral Planning Authority by 30th March 2003. The scheme shall specify the following matters, and shall include a programme and timetable implementation of:

- *(i) The final levels of reinstated land*
- *(ii) The manner in which ecological and geological interests within the quarry shall be incorporated into both the restoration of the working and the quarry as a whole;*
- *(iii) Where imported material shall be placed within the application site*
- *(iv) The method of restoration and the techniques to be used in achieving high-quality soil husbandry;*
- *(v) The source and type of imported material to be used;*
- *(vi) The source and type of seedbank to be used in creation of such a habitat.*

This report proposes that the planning permission is allowed to lapse and for the Estate to work with the South Downs National Park to agree a restoration plan to recreate a calcareous grassland site characterised by species-rich grass and herb communities using natural recolonisation as the primary methodology for establishment.

1.2. Current Uses

The Cocking Chalk Pit is currently used by the Cocking Shoot and the Estate's in-hand business, being the home farm for chalk to be used on tracks and for photo shoots and other infrequent ad-hoc events.

2. Restoration Proposal

2.1. Restoration Proposal

It is proposed to recreate a calcareous grassland site characterised by species-rich grass and herb communities using natural recolonisation as the primary methodology for establishment. This is a low impact method of creating chalk grassland and is deemed suitable for the Cocking Chalk Pit due to its location within the National Park and close proximity of the South Downs Way National Trail where importation of significant material would be disruptive.

The general principle proposed is to allow the existing worked benches to naturally collapse, which will form an undulating ground surface upon which calcareous grassland should establish as it was prevalent in the area prior to disturbance and subsequent reclamation. It is hoped that a natural seed bank may remain in the existing substrate and surrounding undisturbed areas, leading to natural colonisation producing species-rich habitats that are consistent with and appropriate to the local area.

The site below is Heyshott Down, located in close proximity to Cocking Chalk Pit and within the ownership of the Cowdray Estate. This was also a former chalk quarry where regeneration of the chalk grassland habitat has been successful.

Figure 1 - Heyshott Down

Source: Murray Downland Trust

Figure 2 - Downland Chalk Grassland

3. Methodology

3.1. Methodology

3.1.1 Habitat creation and establishment practice

3.1.2 Option 1 - Natural colonisation of bare substrates may be suitable where long establishment time frames are acceptable and species-rich calcareous grassland communities are adjacent. If lowland calcareous grassland existed in the area prior to disturbance and subsequent reclamation, a seed bank may remain in the existing substrate and should be assessed using germination trials. Natural colonisation can produce species-rich habitats that are appropriate to the local area. The process tends to be very slow and it may take several decades to establish a stable community. Natural colonisation can be accelerated through the selective introduction of grassland species via turf inoculants, seeding or green-hay strewing.

3.1.3 Option 2 - Turf inoculants can be taken from adjacent donor areas and incorporated into the bare substrate. These can be either whole turf fragments or plugs of grassland containing desirable species. Permission must always be sought from landowners before taking any materials. If there is doubt about the type of donor NVC Calcareous Grassland, a vegetation survey should be conducted by a trained botanical surveyor. Where either natural colonisation or turf inoculant methods are being adopted, it can be advantageous to first sow a pioneer/nurse mix (see Table 2 for an example pioneer/nurse mix). The benefits of thinly sowing pioneer species include the stabilisation of substrates, and the rapid creation of an attractive sward while leaving sufficient bare soil to allow natural colonisation to occur. Example seed mixture for pioneer/nurse mix:

Common name	Scientific name	
Common Bent	*Agrostis capillaris*	10%
Sheep's-fescue	*Festuca ovina*	40%
Red Fescue	*Festuca rubra* ssp. *megastachys*	20%
Red Fescue	*Festuca rubra* ssp. *rubra*	20%
Smooth Meadow-grass	*Poa pratensis*	10%

3.1.4 Option 3 - Green-hay strewing is a useful alternative to turf inoculants or natural colonisation. It involves taking freshly cut hay containing seeds from local calcareous grassland, and spreading this over the site to be colonised. Ensure that the hay is cut after flowering but while the seeds are still attached; good working knowledge of the target species and when their seed is at point of dispersal will yield best results. Hay should be spread within 24 hours of collection to prevent the spoiling or loss of seeds during storage. Using a local source means that a closer match can be made between the new and existing grasslands and the grasses will be of native genotype; it will also help to keep transport costs to a minimum. Where a local calcareous grassland donor site is not available, a commercial seed mix may be used as a starter sward.

3.1.5 - Option 4 Seeding can be undertaken using seed collected from a local donor site. Care must be taken not to deplete the donor site of seed by over-harvesting. Alternatively, seed may be bought. A reputable seed house will supply seed mixtures suited to the climate and principal soil conditions of your site. Seed should be of local provenance, where available. Wildflowers and grasses are normally sown together as grasses help to stabilise the soil and provide important cover in winter. Seed is normally sown in September/October, either by hand or using agricultural machinery such as slot seeders and seed drills, which maximise the area sown for the amount of seed used (Crofts and Jefferson, 1999). If sowing by hand, mix with damp sand to help ensure the seed is evenly distributed and lightly roll or tread the soil surface. Raking should be avoided as it can concentrate seed

distribution or bury the seed too deep. If there is a prolonged dry period, the seeded area may be lightly watered. Birds and other seed predators should be kept off the land as much as possible.

(Source: The Land Regeneration and Urban Greenspace Research Group)

It is proposed that Natural Colonisation will be the predominant form of restoration; however, following review of the progress at the site it is envisaged that Options 2, 3 and 4 will be considered for implementation as appropriate.

3.1.6 Restoration Timeline Plan

Year 1 – 2016/17	1. Preliminary site investigation survey to identify potential risks to human health and the environment.
	2. Survey prior to any reclamation activities to ensure existing interest is not destroyed.
	3. Remove scrub/invasive species, predominantly: • Silver birch (Betula pendula) • Buddleia/butterfly bush (Buddleia davidii)
	4. Clear metal and other rubbish • Scrap metal • metal tank • plastic • old cartridges
	5. Check and drain fuel tanks of historic machinery to be retained
Year 2 – 2017/18	6. Continue scrub/invasive species clearance
	7. Monitor bench collapses
	8. Survey to identify recolonisation species
Year 3 - 2018/19	9. Continue scrub/invasive species clearance
	10. Monitor bench collapses
	11. Survey to identify recolonisation species
	12. Assess pest control requirement – rabbits etc.
	13. Review sward height and consider mowing
Year 4 – 2019/20	14. Continue scrub/invasive species clearance
	15. Monitor bench collapses
	16. Survey to identify recolonisation species
	17. Consider Turf inoculants or Green-hay strewing if required
Year 5 – 2020/21	18. Continue scrub/invasive species clearance
	19. Monitor bench collapses
	20. Survey to identify recolonisation species
	21. Consider introduction of stock grazing if sufficient grass sward – maintain sward at less than 10cm.
Year 6 – 2021/22	22. Continue scrub/invasive species clearance
	23. Monitor bench collapses
	24. Survey to identify recolonisation species
	25. Review grazing regime and management plan

3.1.7 Machinery to be retained

3.1.8 Scrap/Rubbish to be removed

3.1.9 Views of the Chalk Pit

3.1.10 Invasive Species

Buddleia / Butterfly Bush (Buddleia Davidii)

Silver Birch (Betula Pendula)

4. Conclusion

4.1 Conclusion

A programme of Natural Colonisation is recommended as a suitable method of establishing a chalk grassland habitat for Cocking Chalk Pit, if necessary importation of a suitable seedbank from nearby Heyshott Down or grass strewn from other local sources should ensure appropriate grasses and forbs establish. Implementation of a careful and selective grazing regime utilising both cattle and sheep will help produce a mosaic of grassland with small patches of scrub. The eventual long term objective should be to create a similar habitat to that at Heyshott Down, whilst maintaining the legacy of the Chalk Pit and ensuring the continued use of the site for the Cocking Shoot and Cowdray Estate.

5. Appendix 1

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