



Restoration Objectives

The overall objective of restoration of this site is to focus on biodiversity enhancement and habitat creation. The restoration approach to the quarried areas will be undertaken with an aim of restoring primarily to scrub/woodland with marginal grassland habitat. Bare rock and scree mosaic interspersed by base-rich flush habitat associated with swale channels, localised ephemeral water ponding, and clusters scrub/pioneer woodland habitats. Treatments can be summarised as follows:

Quarry Floor

While the restoration to specific habitats cannot be guaranteed exactly as shown, potential will be maximised by the following approach:
 Whilst further rock extractive operations are not permitted within this substitute consent application, in order to restore the site as illustrated localised grading and earth moving operations will be required.
 This will effectively involve the identification and relocation of stored soil deposits (generally located around the periphery of the site). In addition with the exception of rock faces all loose materials will be profiled and grading to slope angles max 1:2

The floor of the quarry will be graded to allow surface run off to shallow channels / swales that will provide opportunities for wetland flush conditions. The aim of this subtle profiling is to create potential for habitats to emerge and develop associated with this surface water source.
 All remaining overburden, soils and unselectable rock from processing will be spread across the floor to a min depth of 100mm with deeper clumps up to c.1m depth. This material combined with the water controlled as described above has potential to sustain shrub habitat and clusters of pioneer woodland/scrub. In time the scrub/woodland species would deposit further organic material which would offer further opportunities for colonisation and natural regeneration.

Former Plant Site

All plant would be appropriately decommissioned & removed off site. Recovered quarry dust, overburden, soils, and organic materials would be deposited across area prior to seeding.

W1 PIONEER WOODLAND /SCRUB MIX						@2500 Plants Per Ha
%	SPECIES	COMMON	SIZE	GROWN	HEIGHT/TRANSPL	
Ps	30 Pinus sylvestris	Scots Pine	60-90cm	BR / Cell	1 + 1 Branched	
Sc	5 Salix cinerea	Grey Willow	60-90cm	BR / Cell	1 + 1 Branched	
Bp	10 Betula pubescens	Birch (Downy)	60-90cm	BR / Cell	1 + 1 Branched	
Bpe	10 Betula pendula	Birch (Silver)	60-90cm	BR / Cell	1 + 1 Branched	
Ap	20 Acer pseudoplatanus	Sycamore	60-90cm	BR / Cell	1 + 1 Branched	
Ps	20 Alnus glutinosa	Alder	60-90cm	BR / Cell	1 + 1 Branched	
Sp	5 Prunus spinosa	Blackthorn	60-90cm	BR / Cell	1 + 1 Branched	

S1 SCRUB THORN MIX (Deterrent)						@2500 Plants Per Ha
%	SPECIES	COMMON	SIZE	GROWN	TRANSPLANTS	
Ue	70 Ulex europaeus	Gorse	40-60cm	BR	1 + 1 Branched	
Ps	30 Prunus spinosa	Blackthorn	40-60cm	BR	1 + 1 Branched	

G1 'Nurse' Grassland Mixture (Alkaline Soil)

This mix is a simple combination of low growing grasses that produce a short, open 'flower-friendly' sward. The species and the low density of spread make it ideal as an open nurse sward which will allow natural regeneration and colonisation of species rich grassland.

Sowing Rate 12.5kg/ha2 (3-4gm2)

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

Proposed Management of Woodland Planting - Years 1-5

Maintain shrub & woodland areas in a weed free condition
 Prune minor damage back to healthy wood and check for and treat disease.
 Gap up to replace damaged or failed plant material in accordance with the original planting specification, which shall form part of the management documentation. Check protective fencing, where used, and maintain in good condition. As canopies merge into years 4-5, remove guards and stakes and cease weed control. Thin out weakest specimens if planting becomes overcrowded and start to restrict growth.
 At the end of this period determine if thinned to 5 m to maintain continued grassland cover beneath. Felled trees to be used to create hibernacula.

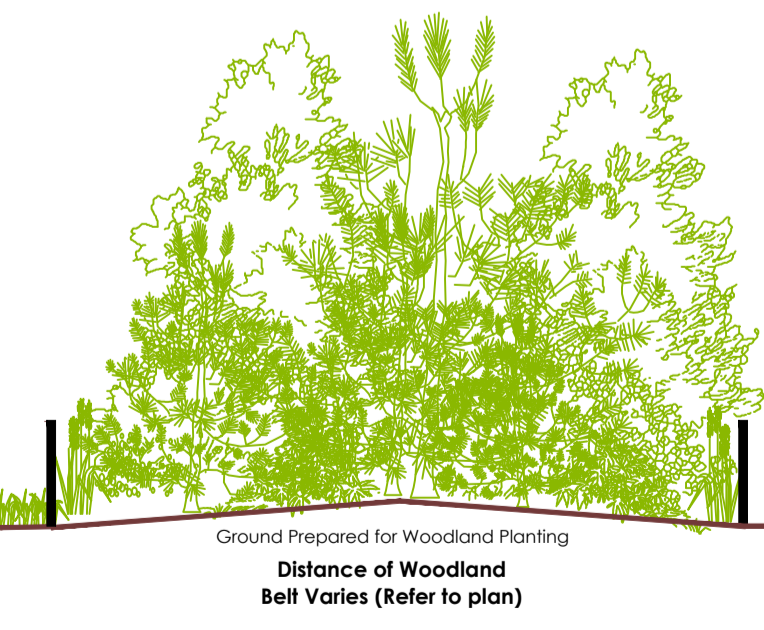
Proposed Grasslands

Preparation
 Ground preparation should follow the supplier's instructions with the removal of weeds, rubbish. The seed will be sown following extraction activities during times of sufficient warmth and moisture, ideally in late spring or early autumn.

First year management

Most of the sown species are perennial and will be slow to germinate and grow and will not usually flower or develop seed heads in the first growing season. In the second and subsequent years sown areas can be managed in a number of ways which, in association with soil fertility, will determine the character of the grassland.
 On shallow soils one or two cuts at the end of the summer, or seasonal light grazing, may be all that is required to maintain diversity and interest.
 On deeper soils best results are usually obtained by traditional meadow management based around a main summer hay cut in combination with autumn and possibly spring mowing or grazing. Meadow grassland is not cut or grazed from spring through to late July/August to give the sown species an opportunity to flower.
 Refinement of options would tailor by the project ecologist and form part of future management plans.
 After flowering in July or August take a 'hay cut': cut back with a scythe, petrol trimmer or tractor mower to c 50mm. Leave the 'hay' to dry and shed seed for 1-2 days then remove from site.
 Mow or graze the re-growth through to late autumn/winter to c 50mm and again in spring if needed.

PLANTING DETAILS



- Whip Planting**
1. No. pointed cane driven into ground until firm.
 2. Cane affixed into biodegradable brown spiral free guard.
 3. 300mm disk of mulch (50mm deep) around base.
 4. Root cell notch planted with slow release fertilizer and watered until saturated.

- Light Standard (8-10cm girth)**
1. 75mm dia stake pressure treated driven min 800mm below ground 500mm above ground
 2. Tie affixed to tree with Tom tie.
 3. Pit with open textured face.
 4. Topsoil min 250 depth within pit
 5. Fork over base of pit.
 6. To have a clear stem height of 1800mm, girth 8-10cm, min.

Pollinators / Small Mammals

TARGET FAUNA POST RESTORATION

NOTE: No herbicides or pesticides to be permitted during the establishment or extractive operational stages or after operations have ceased & restoration established.

Bats / Red Squirrel

With positive landcover conditions to promote a healthy insect population, combined with roosting and nesting opportunities, protected species such as bat and red squirrel will be encouraged.

Birds

Diversity habitat will first attract common native birds & in line with appropriate management encourage a hierarchy of bird species (incl raptors nesting on rock faces).

Larger Mammals

With positive landcover conditions to promote a healthy insect, small bird and mammal population, combined with a balance of woodland, species rich grassland and meadow habitat, larger native mammals such as hare, hedgehog, badger & fox will be encouraged.