

## Wider application

This relatively inexpensive, one-step operation can be applied in young plantations with a well developed tree canopy. It enables seedlings to establish successfully in suitable microsites, thus creating a more natural appearance than that achieved by planting. It is not necessary to blanket sow, as successful establishment in patches can lead to colonisation of adjoining areas. The greater the residual fertility in the soil, the more important it is that the existing vegetation is suppressed by herbicide and that a fairly high level of shade is maintained.

## Further information

### National Urban Forestry Unit

This leaflet is one of a series produced by the National Urban Forestry Unit. NUFU provides a national focus for the exchange of information and good practice in urban forestry.

If you would like further information on other case studies or their application, or if you have examples of good practice to share with others, please contact:

<b>National Urban Forestry Unit</b>	<b>Tel :</b>	<b>01902 828600</b>
<b>The Science Park</b>	<b>Fax :</b>	<b>01902 828700</b>
<b>Stafford Road</b>	<b>E-mail :</b>	<b>info@nufu.org.uk</b>
<b>Wolverhampton WV10 9RT</b>	<b>Web site :</b>	<b>www.nufu.org.uk</b>
<b>United Kingdom</b>		

### Further reading

Cohn EVJ & Packham JR (1993)

The introduction and manipulation of woodland field layers: seeds, plants, timing and economics *Arboricultural Journal* **17** 69-83

Cohn EVJ & Millett P (1995)

Problems in the implementation and management of urban woodland habitat creation schemes *Land Contamination and Reclamation* **3** 89-92.

Cohn EVJ (1998)

Woodland enhancement and forest integrity. The National Forest: from vision to reality *East Midland Geographer* **21** 54-61

Cohn EVJ, Trueman IC & Packham JR (2000)

More than just trees *Aspects of Applied Biology* **58** 93-101

Fee DJ, Putwain PD & Walmsley TJ (1996)

The establishment of naturalistic woodland plant communities on colliery spoil *Aspects of Applied Biology* **44** 351-356

Francis JL, Morton AJ & Boorman LA (1992)

The establishment of ground flora species in recently planted woodland *Aspects of Applied Biology* **29** 171-178

Packham JR, Cohn EVJ, Millett P & Trueman IC (1995)

Introduction of plants and manipulation of field layer vegetation In Ferris-Kaan R (ed) *The Ecology of Woodland Creation*, Wiley.

Photographs: Frazer Bryant, Wolverhampton University, National Urban Forestry Unit

PRODUCED BY



IN PARTNERSHIP WITH



# Urban Forestry in Practice

## Establishing wild flowers in recently planted woodland



# Establishing wild flowers in recently planted woodland

## Introduction

If a new plantation is to develop all the characteristics of true woodland, then other elements of the habitat need to be introduced. This is particularly the case with woodland wild flowers. Popular woodland species such as primroses, foxgloves and wood anemones cannot colonise from a distance, but they can be successfully established artificially.

## Specific example

### Project name and location

**NEDGE HILL, TELFORD**, Shropshire, UK *Grid reference SJ 720 070*  
**NEACHELLS LANE, WOLVERHAMPTON**, West Midlands, UK *Grid reference SO 945 986*

### Project partners

- University of Wolverhampton
- Wolverhampton MBC
- Wrekin Council
- Telford Development Corporation

### Project objectives

- To demonstrate techniques for increasing woodland wildflower communities in young plantations
- To research the performance of woodland wildflowers in secondary woodlands

### Site description

Nedge Hill, Telford and Neachells Lane, Wolverhampton are amenity plantations with a diverse mix of mainly native tree and shrub species. They were respectively 15-20 and 7-10 years old when the wildflower projects were first established in 1990. Both had a fairly coarse, grassy groundcover with varying proportions of other perennial non-woodland herbs. Both were subject to heavy public pressure.

Nedge Hill is a large plantation where experimental plots were established along a 10m wide margin of a 4 hectare compartment. The site is on former agricultural land on the urban fringe. Neachells Lane is a small 1 hectare plantation on an urban former mining and landfill site which had been capped with fly-ash, rubble and some soil. The tree canopy is patchy.

### Implementation

At Nedge Hill, after cutting the tall, coarse vegetation in autumn 1990, herbicide (*glyphosate*) and rotovation treatments were applied, on their own and in combination, to replicated 5m wide strips. Woodland herb seeds (see *Table 1*) were then sown across the strips. Some strips were left unsown in order to make comparisons with the unaided natural colonisation of woodland herbs. At Neachells Lane, the shorter, denser, grassy vegetation did not need cutting prior to the application of herbicide, rotovation and seed sowing.



*A dense carpet of primroses established from seed in herbicide-cleared and cultivated ground*

*Table 1*

INTRODUCED SPECIES, PROVENANCE AND SOWING RATE			
Species		Provenance	Sowing rate
		C = Commercial source L = Locally collected	No. seeds/m <sup>2</sup>
<i>Brachypodium sylvaticum</i>	Wood false brome	L	25
<i>Bromus racemosus</i>	Hairy brome	L	25
<i>Campanula trachelium</i>	Bats in the belfry	C	100
<i>Carex pendula</i>	Pendulous sedge	L	25
<i>Circaea lutetiana</i>	Enchanter's nightshade	L	10
<i>Digitalis purpurea</i>	Foxglove	C	100
<i>Filipendula ulmaria</i>	Meadowsweet	C	25
<i>Galium odoratum</i>	Sweet woodruff	L	10
<i>Geum urbanum</i>	Wood avens	C	100
<i>Hyacinthoides non-scripta</i>	Bluebell	C	100
<i>Hypericum hirsutum</i>	Hairy St John's wort	C	25
<i>Luzula sylvatica</i>	Greater woodrush	L	10
<i>Lychnis flos-cuculi</i>	Ragged robin	C	25
<i>Milium effusum</i>	Wood millet	L	25
<i>Primula vulgaris</i>	Primrose	C	100
<i>Sanicula europaea</i>	Wood sanicle	L	10
<i>Scrophularia nodosa</i>	Figwort	C	100
<i>Silene dioica</i>	Red campion	C	100
<i>Stachys officinalis</i>	Betony	C	100
<i>Stachys sylvatica</i>	Hedge woundwort	C	100
<i>Stellaria holostea</i>	Greater stitchwort	C	25
<i>Veronica montana</i>	Wood speedwell	L	10
<i>Viola riviniana</i>	Common violet	C	25

*(It is important with field layer introductions, as with any other habitat creation, to ensure that other plant communities of equal or greater value are not being replaced and that new introductions are recorded)*

## Results

In the second year after sowing, the numbers of individuals of the introduced herbs were significantly higher in herbicide treated plots than in unsprayed plots or in plots treated with rotovation alone. At Nedge Hill, average plant density for all introduced species was 25/m<sup>2</sup> in herbicide treated plots, compared with only 6/m<sup>2</sup> in control plots. At Neachells Lane, where the grassy sward was more vigorous, densities of 15 and 3 plants per m<sup>2</sup> were achieved. Red campion, wood avens, nettle-leaved bellflower, primrose and wood false brome were the most successful species and the best results were achieved from autumn sowing.



*Foxgloves colonise rapidly once established*

The grass and tall herbs present at the beginning of the experiment grew back, but with reduced vigour, particularly where shaded by a well developed tree canopy. Bare ground immediately around the seeds at the time of sowing was critical in aiding establishment. After eight years both woodlands have diverse, attractive and natural looking field layers in areas that were seeded after herbicide treatments. Unsown and untreated plots in other areas of the woodlands showed little or no colonisation of herb species over this period.