Floodplain woodland restoration on mineral sites: Design, creation and management

Floodplain woodlands are rare and extremely fragmented habitats. Across Europe, 90% of their original area has disappeared and remaining fragments are typically in critical condition. However, they are an important component of the mosaic of habitats that make up natural floodplains.

Until recently, floodplain woodland restoration was often overlooked on mineral sites situated on floodplains. However, certain sites could offer excellent opportunities for creating floodplain woodland, which in turn would provide multiple benefits:

- ✓ **Biodiversity conservation** – floodplain woodland is an excellent habitat for a wide range of plant species, bat species, hoverflies, beetles, butterflies, birds and otters.
- ✓ **Water quality improvement** – control of diffuse pollution e.g. by recycling nutrients from farmland runoff.
- ✓ **Flood control** –wooded washlands can help to reduce stream flow
- ✓ **Enhancement of landscape integrity** – creating forested corridors through the landscape
- ✓ **Timber production** – trees may be suitable for short rotation coppice and/or cricket bat willow.

Design

Hydrological conditions need to be suitable. Sites must have a high water table and it is desirable to have a degree of seasonal drawdown and recharge. When designing the woodland, retain existing river and channel features and look to landform new braided river channels, pools, islands, marshy areas, and sandbanks.
Key features/processes to consider in a restoration scheme:

- ✓ **Regular inundation**. Flood events will scour channels between trees and re-fill former channels and pools. Accumulated woody debris should be allowed to hold water in shallow lakes and swampy areas.
- ✓ **Channel movement**. Natural floodplains have a distinctive disturbance regime with the river constantly re-shaping, undercutting banks and moving sediment around.
- ✓ **It's not just about trees**. Floodplain woodland is a mosaic of habitats, including woodland, scrubby areas and some open spaces.

Establishment techniques

Natural colonisation of trees and shrubs

Many floodplain forest species are pioneers that readily colonise new disturbed ground as propagules are transported and deposited by the river. Natural regeneration is a good option where sites are close to existing semi-natural woodland or within a catchment that features floodplain woodland. Natural colonisation promotes conservation of local biodiversity as colonising species will be adapted to the conditions found on the site.

- ✓ Prepare a rough seedbed – this will often enhance germination and take up of new trees.
- × Do not use fertile topsoil as this will encourage weed species.
- ✓ Pioneer species, such as willow, birch and blackthorn are ready colonists of suitable ground. They will form a dense cover relatively quickly (around 10 years).
- ✓ Natural succession produces a varied age structure, spatial distribution and species diversity and creates a natural look to the landscape.

Patience is key! Floodplain woodland is slow to develop full assemblage of species but it is an extremely valuable habitat at all stages of establishment. Where time is not a constraint, natural colonisation should be the favoured option.

Tree and shrub planting

Additional planting may be appropriate where natural colonisation is unlikely because the site is not near to existing woodland. In addition, species that are slower to colonise can be planted to create a mosaic of diverse woodland types mixed with wetland habitats. Whatever the planting method used it is important to ensure that:

- ✓ Trees and shrubs are planted in loose friable soil to ensure adequate water storage. Any compaction can be redressed by ripping where necessary.
- ✓ Rootstock is always protected from desiccation.
- ✓ Soil fertility is low. Poorer soils help to reduce competition from grasses and herbaceous vegetation, and develop a diverse ground flora

Planting patterns and spacing

- ✓ Develop a naturalistic planting scheme, avoiding straight lines and sheer edges.
- ✓ Vary the spacings - plant some areas are denser and some sparser, reflecting species and topography.
- ✓ Wider spacing = fewer trees, lower planting/maintenance costs, bushy trees and a slower closing canopy.
- ✓ Plant shrubs randomly, some in tight clusters to form thickets, others more widely spaced; some clusters of mixed species, others of single species, depending on soils and topography. Slow-growing species should not be planted in association with faster-growing, competitive species.
- ✓ A planting scheme of around 40% trees to 60% shrubs (and open spaces) will help optimise structural diversity.
- ✓ Undertake planting during the dormancy period – November to February – avoiding frosty weather. Roots must not dry out. Heel unplanted stock in until it can be planted out.

For further guidance on planting, see www.afterminerals.com.

Wet scrub

Wet scrub is an important component of floodplain woodland, both within the woodland and along woodland edges. The structural diversity and interface (ecotone) that develops between scrub and surrounding habitats provides warmth, shelter, and foraging opportunities for an increased range of species. Several species, such as blackthorn and willow, are ready colonists of suitable ground. Again, natural colonisation should be the favoured option where establishment time is not a constraint.

Long-term management

It takes many years for floodplain woodland to develop its full characteristics and management in the short term may be minimal. Longer-term management can involve various measures at various stages of establishment and may include:

- Thinning and coppicing of pioneer species to help develop a complex structure.
- Controlling established scrub through periodic rotational cutting, thinning and natural regeneration.
- Retaining gaps/glades in the woodland structure (making allowances for these if following a planting scheme).
- Retaining open areas of swamp and shallow water.
- Retaining both standing and fallen deadwood where it occurs. This is important for a range of invertebrates and hole-nesting birds (e.g. woodpeckers).
- Ensuring deer numbers are kept low to ensure regeneration and structure are maintained.

Funding opportunities

At the time of writing, grant schemes, which were available to support woodland management and creation, are under review as part of the Common Agricultural Policy review. Up to date information on grants can be obtained from your local Forestry Commission Woodland Officer.