Naturally Resilient

Natural Flood Management techniques- Level 1

Tree planting

Intercepting Water

Description

Creation of woodland in run-off prone areas, such as across slopes and either side of the watercourse, can intercept water and slow its flow into the channel. Increasing woodland across the catchment as a whole can also provide these beneficial effects. Trees also have other benefits including; shading, carbon storage and habitat creation.

Design

When creating new woodland it is important to consider it at a landscape scale. This will influence the size, location and species that will provide the greatest benefit. When considering riparian woodland, the size of the river will dictate the size of the riparian woodland. It is important to plant a range of native tree species, that are suitable to the local climate and habitat type. Space out new trees so that they can grow to an open crown. You should aim for 1600- 2250 tree per Hectare with around 20-30% open space.

Key points to consider

1. Woodlands designed to slow water should be planted at a density of 1600-2250 trees per ha.
2. Trees should be planted during the dormant season (November-April)
3. Livestock must be excluded, generally using fence, to help trees get established.
4. Tree guards should be used to help protect the tree while growing.
5. Consider the location of trees to ensure it does not conflict with other important habitats or historic environment.
6. Where possible, trees can be used to link up existing habitats to create corridors enabling species movement.
7. Species mix should be site specific.
8. The long term management of the trees needs to be carefully planned, this will determine the success of the woodlands.

Suggested tree species for riparian woodland *

Alder	**Hazel**
Willow	**Birch**
Hawthorn	**Rowan**

* Tree selection is site specific

Consents

Consenting for tree planting might be required, please check with relevant local authorities.

If within 5m of a main river, Environment Agency consernt will be required.

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Riparian Planting

Planting the trees alongside the water course slows the speed at which water enters the channel by increasing the riparian roughness. The trees also act as a barrier preventing sediment, pesticides and fertilisers entering the water. Shade provided by the trees creates habitats for aquatic life. The rooting systems help stabilise the bank, protecting it against erosion.

Gill Planting

Planting trees in areas prone to run-off, such as the steep sided valleys surrounding gills, can act to intercept the water and encourage infiltration. This can lead to reduced soil erosion and prevent washing away of fertilisers and pesticides. Gill woodland can work well alongside contour hedging and leaky dams.

Floodplain Planting

Trees in the flood plains act to slow the speed at which water enters the channel and reduces the velocity of flood waters. The rooting systems help to increase infiltration and the trees themselves take up water, reducing the amount of overland flow.

Materials required:
Trees (refer to species mix)
Stakes and guards

Equipment required:
Tree planting spade
Lump Hammer
(*Fencing contractor will be required for fencing*)

Estimated cost:
(Per hectare, excl fencing)
£3.00 per tree
£7.50 per metre for fencing.

Maintenance (Low)

- Tree guards are used to encourage growth, protect from deer, voles, rabbits annd allow chemical weed control. The guards should be removed once trees established
- Remove competing vegetation until trees are established
- Replace any trees that die
- Maintain fences
- Maintain areas of open space

Links and resources

Forestry Commission England: https://www.forestry.gov.uk/england
Yorkshire Dales National Park: http://www.yorkshiredales.org.uk/living-and-working/trees
The River Restoration Centre: http://www.therrc.co.uk/manual-river-restoration-techniques