FACTSHEET

Grip and Gully Blocking

Grips and gullies lower the water table (drying out the land). This has several unfortunate side effects:

- It makes the peat soil more susceptible to erosion
- It kills or severely inhibits the active peat-building plants such as *Sphagnum* moss
- The gullies and grips themselves become deeper and/or wider through water erosion
- The grips and gullies carry much eroded peat from the hill, affecting water quality at treatment plants
- Large amounts of water flowing quickly off the hill increase the flood risk downstream

Gully blocking (dam installation) is intended to reverse these effects by trapping water and/or sediment, slowing the flow of the water, and/or raising the water table. For example, monitoring of the gully blocking work carried out by Moors for the Future Partnership on Kinder Scout since 2011 has demonstrated the following:

- 95% of gully blocks surveyed in winter 2014/15 were holding either water or sediment, or both
- 94% of gully blocks were vegetated or beginning to show signs of re-vegetation
- In systems that have been both gully blocked and re-vegetated, the amount of carbon particles (mostly peat) in the water has been reduced by 42%
- In systems that have been both gully blocked and re-vegetated, the water table has risen such that its depth below the surface is up to 30% less than its pre-treatment depth

Blocking should start at the head of the gully (where it is eroding into the existing peat) and work downstream. The height of the block is dependent on the objectives; if the aim is water retention and re-wetting of the peat then the block should be level with the existing surface, whereas if the aim is trapping sediment then the block can be much lower. Block height is also determined by the scale of the gullies; for example, where they are deep and wide, a lower block may be more appropriate.

Dams should in general be installed using a 'top-to-toe' principle, so that the base of an upstream dam is at least level with the top of the downstream dam, as shown in *Figure 1*, below. In this way, water flowing over the top of a dam falls onto a water surface rather than onto bare peat or mineral soil. This means that the spacing interval has to be shorter as the gradient increases, with fewer dams required on gentle slopes. However, this approach is not always necessary, particularly for permeable dams (in which much of the water leaks through the dam rather than overtopping it) and for well-vegetated channels (which are less prone to erosion).

Dams fall into two broad categories:

- Impermeable dams, designed to trap water to create pools (and raise the water table)
- Permeable dams, designed to slow (but not stop) the water flow and trap sediment, which will build up soil on the gully floor to be re-vegetated

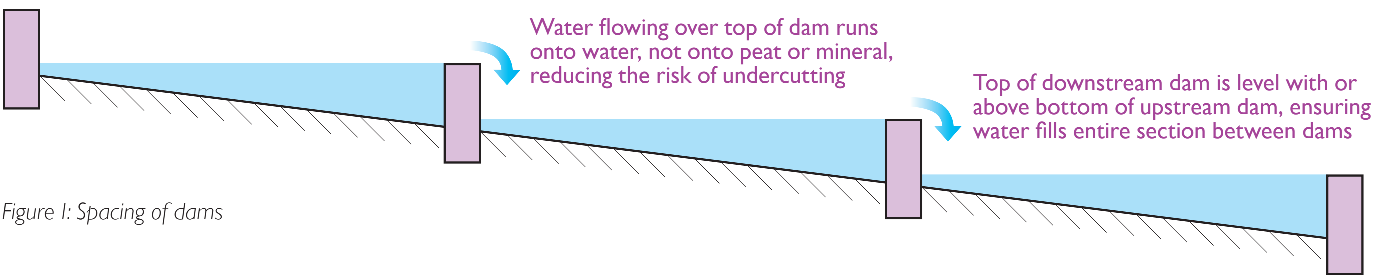

Figure 1: Spacing of dams

TYPES OF DAM

Most sites will benefit from a combination of these impermeable and permeable dams, by tailoring the dam types to the soil depth, gully depth, gradient etc found in each area to achieve the site's overall ecological objectives. Five types of dam are used by the Moors for the Future Partnership. These are:

- Heather Bales *permeable dams installed by keying in bales of heather into the channel*
- Peat Dams *impermeable dams created from on-site peat using an excavator*
- Plastic Dams *impermeable dams installed by driving sheets of plastic into the channel*
- Stone Dams *permeable dams created from piles of stone airlifted onto site*
- Timber Dams *semi-permeable dams constructed from planks of timber*

No one dam type is 'better' than the rest for every situation; each has its place, dependent upon the ecological objectives to be achieved, the nature of the site (for example, gully profile and peat depth) and their effect upon the long-term management of the site. Individual Factsheets have been produced for each dam type, in which they are discussed in detail, but the table below summarises their relative strengths and weaknesses, ranging from green (favourable) to red (less favourable).

Dam type	*Creates pools*	*Traps sediment*	*Uses natural materials*	*Availability of materials*	*Installation easy and not disruptive*	*Resistance to fire*	*Robustness (5 years after installation)*	*Cost*
Heather Bale	🟡	🟢	🟢	🟡	🟡	🟢	🟢	🟡
Peat Dam	🟢	🟡	🟢	🟡	🟡	🟢	🟡	🟢
Plastic Dam	🟢	🟡	🔴	🟢	🟢	🟡	🟡	🟡
Stone Dam	🟡	🟢	🟢	🟢	🟢	🟢	🟢	🔴
Timber Dam	🟢	🟢	🟡	🟢	🟡	🟡	🟡	🟡

Figure 2: A series of peat dams

With the exception of peat dams, materials are airlifted onto site and ground vehicle access is not required. Peat dams require ground access for one or more excavators, but do not require construction materials to be brought in; local peat is re-profiled to create these dams.

MoorLIFE2020

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www.moorsforthefuture.org.uk

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