

Path restoration techniques in the Peak District National Park

The general aims of upland path repair work are:

- 1 To protect and restore the fragile soil and vegetation.
- 2 To provide a durable walking surface by using established and experimental techniques.
- 3 To ensure all work is in harmony with the wild and unspoilt landscape.

The principles of restoration are to work from the basis of 'minimum intervention necessary', in order to achieve these aims whilst preserving the character of the moors and the unspoilt landscape. Full consideration is taken of wider issues such as remoteness, sensitivity of wildlife or archaeology, aesthetics and wider recreation and land management issues.

To ensure the appropriate solutions have been chosen, restoration and repair of trampling damage has adopted a series of 'guiding principles'. These are:

- Repairs are necessary to prevent or ameliorate visual intrusion and environmental damage.
- Works should be of a high standard of design and implementation using indigenous materials, sympathetic in colour and texture to the immediate surrounding area. Uniformity of construction should be avoided, e.g. steps.
- Techniques used should protect existing vegetation and, normally, only locally occurring plant species should be used in restoration. Non local species will be acceptable only where necessary as a nurse crop and where natural succession will rapidly result in their disappearance.
- The more remote the path, the more stringently the criteria for path repairs should be applied. This will be a matter of judgement but in general, the more remote or wild the location the less acceptable an obviously engineered path will be.
- Repaired paths should be suitable to the route's use and constructed on a scale appropriate for the intended use as a footpath, bridleway or byway.
- Before any repair is agreed the question should be asked, 'is there a better solution?'
- The use of waymarks, cairns or other intrusive features, other than those traditionally established on summits and path junctions, will be discouraged.
- A sustained commitment of resources to path management will be sought, so that small scale continuous maintenance can replace infrequent, major repairs as the normal method of path management.

The Moors for the Future Project has therefore adopted the following sequence of techniques, as a means of achieving the best possible restoration:

- 1 To re-align the route, where possible, onto naturally more durable terrain.
- 2 Where it is necessary to engineer a solution, to use natural, if possible *in-situ*, material, to provide a hard surface.
- 3 To revegetate the bare areas.

Stone-flag surfacing

The traditional method of laying stone flags has been chosen to repair eroded footpaths on shallow gradient blanket peat. This technique, developed centuries ago, has many advantages for the modern path builder, and has proved durable and popular.

The method of laying stone-flag paths, locally known as 'causey' paths, evolved during the Middle Ages and continued until the industrial revolution as a means of improving transport links for the packhorse trains across the boggy moors. These old causeys were built using the local sandstone and gritstone, which is easily dressed to large flat flags about two feet wide. Streams were crossed with large flags to form clapper bridges. The best known examples of these medieval causeys in the Dark Peak are on the Long Causeway, Doctor's Gate and below Derwent Edge.

The advantages of flagstones over other deep peat surfacing techniques are:

1. The stone is native to the southern Pennines. Some paths have been built using aggregates such as limestone or basalt which not only look intrusive in a moorland setting, but can affect adjacent vegetation by the leaching of minerals.
2. The flags are recycled from demolition sites. They are therefore relatively cheap and do not have the impact on the local environment of newly quarried stone.
3. The recycled stone has the benefits of 150 years of aging, which gives it a weathered look, and provides a hardened patina making it more durable. The unevenness of the hewn or naturally rippled surface provides good grip even in wet weather.
4. The flags can be laid directly on the eroded peat surface without the need for an underlay or geotextile, due to the size of stone spreading the surface area loading. This minimises cost and eliminates the need to bring man-made materials onto the moor.
5. Unlike unconsolidated aggregate, the solid stone flag does not suffer from surface wash-out by rain water. This quality minimises the requirement for drainage works, such as ditching, which alter the natural water flow and can lower the water table of a mire. It also reduces the requirement for maintenance.
6. Small water courses across the path can be crossed using longer flags as 'clapper bridges', without the necessity of pipes or other intrusive engineering structures.

7. The estimated life span of a maintained flag-path is five-times that of aggregate and ten times that of wooden boardwalk.

Laying the flagstones requires a combination of physical strength and an understanding of the aesthetics of both the stone and the moorland setting. The reclaimed stone comes ready-dressed into different sizes, with an average thickness of 100 mm and width of 1 metre. Length can be from 0.5 metres to 1.5 metres. The dimensions are important – if they are too small the stones don't bed properly onto the soil surface and may rock or sink, however the larger stones (at up to 0.5 tonnes each) are difficult to get into position. The flags are butted together to provide mutual support and limit the potential for creating trip points.

On fibrous peat, or where they can be laid on intact vegetation, the flags are laid directly on to the surface, with some levelling and ground preparation using spades or mattocks. On very wet amorphous peat the flags are generally laid proud of the surface to allow settling, but on mineral soils they are dug in flush with the ground surface.

Experienced staff understand that the aesthetics of a flag path are important, not only to its appearance but also to the comfort of the user. The stones should be level with each other with an even edge. The path line should conform to the undulations and curves of the existing path-line, to follow the preferred walk line, prevent unnaturally straight lines and break up the visual impact. Turf from nearby is generally brought to the path sides to improve both the visual appearance of the new path and to promote revegetation of the eroded line.

Flag paths have been most successful at repairing paths crossing the blanket mires at gradients of less than 5 degrees. However flagstones have also been successfully employed on eroded mineral soils and on gradients of up to 10 degrees. Occasional problems have been encountered by ice where surface water has crossed the path, but generally the paths remain dry and comfortable to use all year. Maintenance is minimal - the occasional resetting of a tilted flag is all that is required.

As with all things to do with management of the National Park, there is a fine line to follow in the balancing of conservation and access.