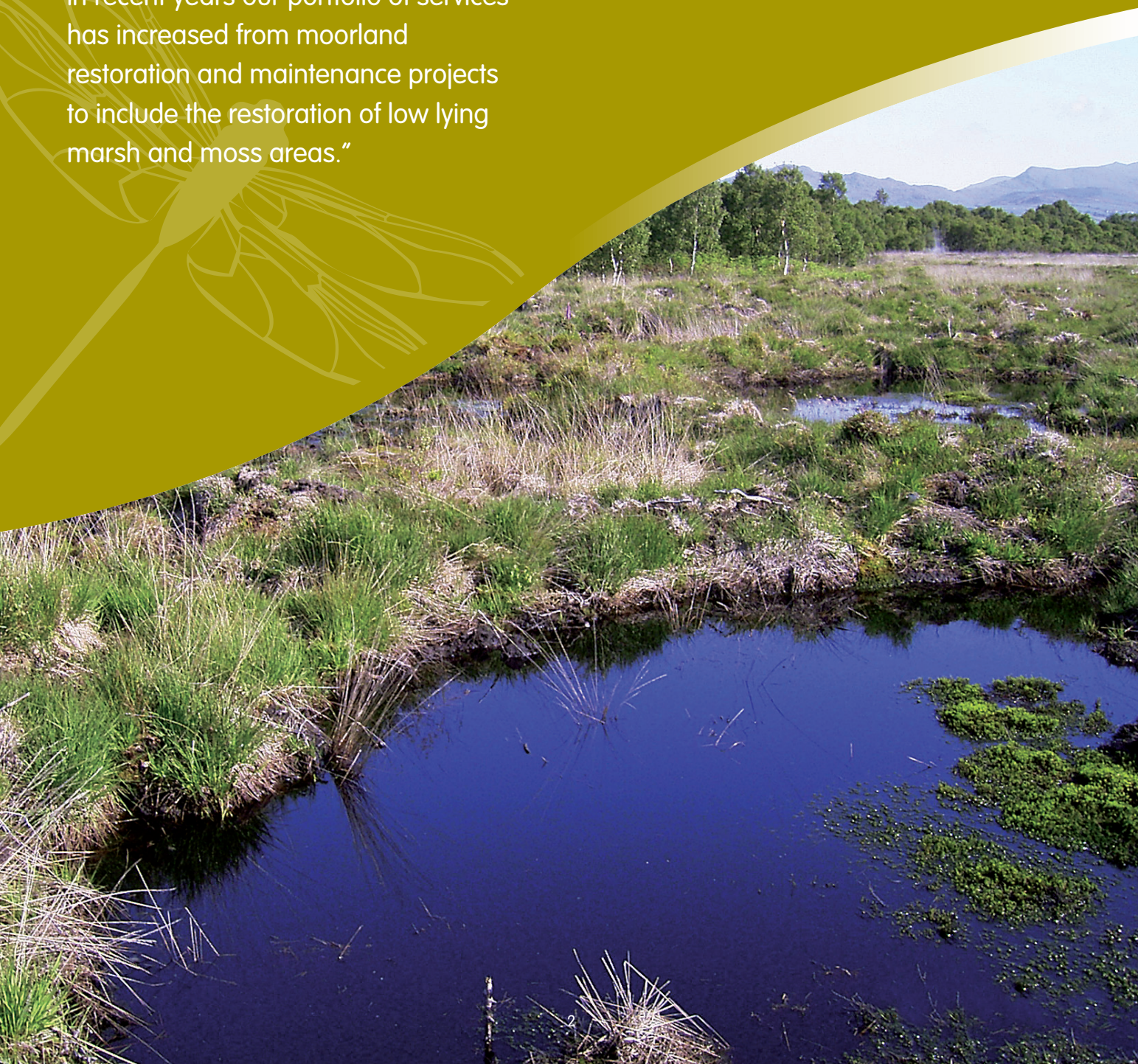


"DMS has over three decades of habitat regeneration experience. In recent years our portfolio of services has increased from moorland restoration and maintenance projects to include the restoration of low lying marsh and moss areas."

*Front cover: The Life Project RSPB, Penarun, Wales;
Below: Glasson Moss, South Solway Mosses National Nature Reserve.*



Environmental Translocation

The preservation of a habitat can be made even more difficult if it is to be moved to another nearby area, but this can be exactly what is needed in areas where there is activity such as quarrying, earthworks, or pipelines. Environmental translocation involves moving major elements of a particular area to another area, typically of less environmental significance, so that the moved habitat can re-establish and recover, whilst other earthworks commence in the vacated area.

Such environmental translocation work with quarrying is sometimes a continuous process of using vegetation from the new quarry area to reinstate the old quarry area. DMS has the relevant skills and equipment for this type of work and has successfully completed numerous projects of this type.

Invasive Weed Control & Management

The definition of an invasive non-native species could be said to be one that has been transported outside of its natural range and that threatens environmental, agricultural or economic resources. Across the UK, on commercial land, in areas selected for development, in public spaces and even in water courses certain species present a growing problem for landowners and environmental managers. Their rapid growth habit precludes our indigenous plant species and changes the way our native landscape should look.

DMS employs a variety of methods in the control and management of non-native invasive weeds such as Japanese Knotweed (*Fallopia japonica*) and Himalayan Balsam (*Impatiens glandulifera*). These include chemical treatment, biological techniques and excavation.

Native invasive species such as Common Ragwort, Spear Thistle, Creeping or Field Thistle, Broad Leaved Dock, Curled Dock and Rhododendron Ponticum can also be tackled.

If you have a specific Habitat Restoration or Management project that you wish to discuss please contact us.

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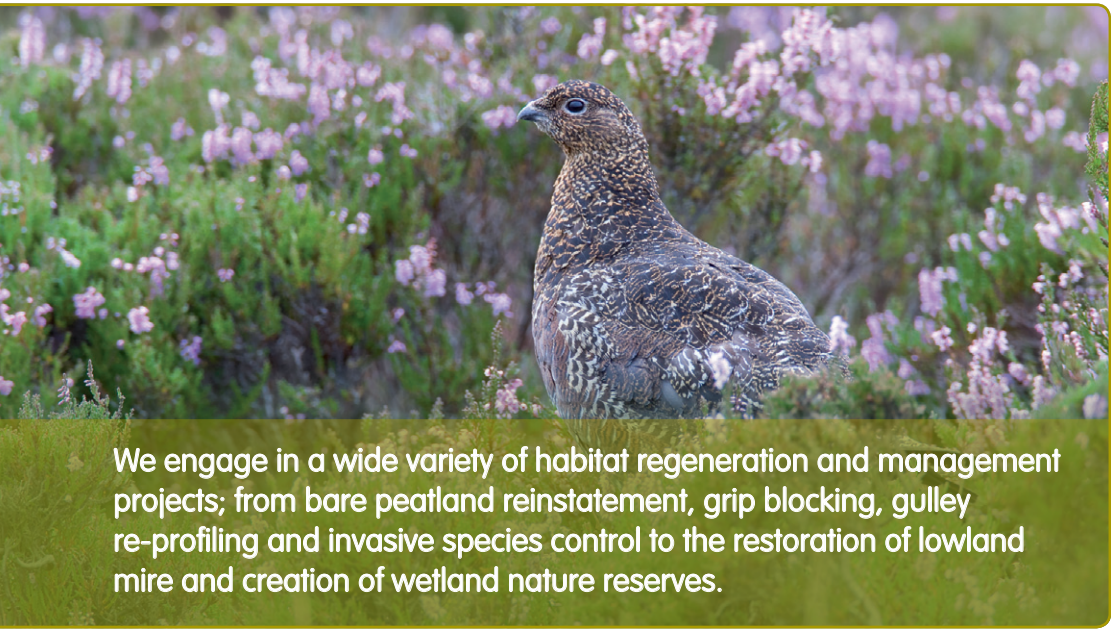
Habitat Restoration & Management



13. Aerial movement of materials during translocation work at disused quarries on Brandwood Moor, Lancashire;
14. Translocation of vegetation;
15. Control of invasive weeds.



Habitat Restoration & Management



We engage in a wide variety of habitat regeneration and management projects; from bare peatland reinstatement, grip blocking, gully re-profiling and invasive species control to the restoration of lowland mire and creation of wetland nature reserves.

Moorland Services

As the company's name suggests Dinsdale Moorland Services (DMS) derives a large proportion of its project work from assignments in upland and moorland areas. Areas of expertise include:

• **Heather management** - using dual wheeled tractors DMS can create cut areas in blocks or lines across heather moorland, to form firebreaks. The capability to work in gangs on the moorland allows a greater area to be cut with the minimum of impact to other moorland users. All machines are fitted with GPS computers to allow for the location of any areas to be targeted or avoided whilst working. As all work is GPS recorded the exact heather cuts can be provided to the client for a record of the works done. Using these maps an estate or client can create annual heather cutting management plans.

• **Heather re-seeding** - following periods of over grazing or after moorland fire damage, large areas of moorland may need to be repaired and regenerated by re-seeding with native species of vegetation. DMS has many years experience in the analysis, planning and implementation of ground repair and re-seeding programmes, from initial land survey and soil assessment to aftercare and management of newly-sown areas.

• **Bracken & rush control** - bracken control is usually a key aspect of successful moorland habitat management. Left unchecked, it has the ability to cover very large areas of ground, rendering it of no value for stock and of very limited value as a wildlife habitat. DMS is fully equipped and skilled for this activity, using weed wiping, selective spraying and mulching techniques to control the bracken; and then a variety of programmes to allow appropriate species to establish and colonise.

Soft rush areas are an important element of the moorland landscape as they offer partial shelter for stock, particularly young lambs, and provide habitat for various birds, invertebrates and insects. However, in recent years these plants have tended to spread to form large, unbroken beds, thus diminishing grazing and habitat value. DMS manages in excess of 2,000 acres of in-bye land and open moor each year to control the plant in small broken beds intermixed with other vegetation.



1. Specially adapted dual tyred tractors at work heather cutting;
2. Heather reseedling with a specially adapted Kubota vehicle;
3. Piston Bully sprayer in action in a bracken thicket;
4. Rush topping in progress.

• **Environmental reinstatement** - when an environment has become barren or unsightly due to natural erosion or altered land use (eg. felled forest) an environmental reinstatement plan can be activated. The objective is to modify the site in order to get the ground condition right, so that with suitable mulch and seed additions, the proliferation of native flora is encouraged. DMS is experienced in the formulation, implementation and management of such programmes. These have extended to the reinstatement of moorlands which have become barren due to peat extraction, upland areas after the timber from managed forests has been harvested and upland blanket bog environments which have been damaged through past ditching or 'gripping' works.

In addition, areas of land which have been damaged due to over-grazing or intensive traffic can also be repaired. For example, many upland areas receive large numbers of walkers and/or mountain bikers and this has led to heavy use of existing footpaths, in turn resulting in erosion and other damage. Even in cases where damage is so extensive that a wide margin of ground is affected, DMS has the expertise and specialist equipment to restore the right of way itself, making it robust enough to withstand future demands, and reinstate the damaged ground on either side, be it footpath, bridleway or other byway open to all traffic.

• **Grip blocking, gully & edge re-profiling** - in accordance with agricultural policy of the early 1970s many thousands of acres of UK moorland were drained by open ditches or 'grips' in an effort to create more viable grazing land by drying out these upland areas. The result in many areas has been serious erosion and loss of habitat. DMS has become the country's leading expert in the blocking of such grips for the benefit of water quality, wildlife diversity and landscape value. Using aerial photography and GPS ground surveys of the grip systems, new watersheds can be designed which take the water away from the grips to be filled in, re-wet dried out areas and remove excess run-off water from the land. These are designed to follow a route of minimal impact and erosion.

In some cases, grips can be eroded to a 20ft span and 24ft depth. As these 'scars' deepen more substrate is exposed and this can cause oxidation and issues of discolouration and silt in watercourses. The re-profiling of such exposed edges is required and this is tackled using specialist equipment and techniques designed to cause minimum impact to the surrounding sensitive vegetation. After re-profiling, existing vegetation can be 'keyed on' to the earth or peat to encourage it to spread. With many years experience of this type of project DMS is an established specialist in environmental reinstatement and re-creation of wet mire areas, dwarf shrub heath and heather moorland.

• **Bare peat restoration** - DMS offers a total package from site analysis to restoration on the moorland. The need for regeneration of the exposed peat is very important as it reduces erosion, improves water quality and recreates the unique habitat that has taken thousands of years to form. Each site requires a different approach for its successful regeneration and DMS can help develop a targeted conservation plan. Recently, working together with Natural England and United Utilities DMS has successfully undertaken restoration of bare peat across a 600 hectare site.

Techniques that DMS can advise on and employ on a regular basis include:

- turf trans-location
- geo-jute/geogute application & installation
- heather brash cutting & application
- coir logs installation
- site fertilisation
- aerial and terrestrial heather seeding
- total project management



5 & 6. Areas of bare peat at Chew Reservoir, Saddleworth Moor before and after regeneration;
7. Excavator engaged in grip blocking on Stean Moor, Upper Nidderdale;
8. Langdon Head on Hawthornthwaite Fell, Forest of Bowland showing land before and after restoration using geogute netting and a brash mulch on the ground.

• **Blanket Bog Restoration** - Sometimes the major factor in reinstatement is to encourage the ground to retain more water so that mosses can take hold. To revive blanket bog, one of the most environmentally and ecologically sensitive parts of the moor, the water level often has to be raised in order to re-wet the surrounding area. Using peat/clay dams topped off with vegetation from the grip sides is one tried and tested method. On the steeper slopes, peat dams with overflows to the bottom side can be constructed at close intervals to re-wet the area below without causing any eroded overflow channels. Plastic piling dams can also be considered for these types of project.

Lowland Services

DMS also has extensive experience in the restoration and regeneration of lowland bog and mire habitats:

• **Lowland bog restoration** - Lowland moss and mire can become dry beneath the surface, resulting in the loss of a fragile habitat. Whatever the cause of the habitat decline, DMS has a portfolio of techniques and experience to re-wet the affected areas so that the moss and associated invertebrates can quickly re-establish. One technique is to build peat bunds to create level and enclosed areas that allow water retention to increase. The bunds can be arranged in various ways, eg. to create a number of different levels, or stepped to retain water on the top side of a re-profiled peat edge. The addition of mulch to the newly wetted areas and of matting to the bunds assists with a quick establishment of the desired mosses and other species. DMS uses specially adapted excavating machinery for working on very soft ground, enabling operators to level areas and build bunding systems to suit the site and the project's objectives.

Case Study

Regeneration of Glasson Moss, South Solway Mosses National Nature Reserve (NNR), Cumbria
Client: Natural England

The South Solway Mosses NNR is a composite of three large lowland raised bogs. All three sites have been substantially affected by domestic cutting, drainage and commercial peat harvesting. Local plant life includes a range of sphagnum species, hare's-tail cotton grass, bog rosemary, cranberry, and cross-leaved heath. All three native sundew species are present. Breeding birds to be found on the reserve include sparrowhawk, curlew, snipe, sedge warblers and grasshopper warblers. Invertebrates found on the reserve include large heath butterfly, bog bush cricket and banded demoiselle dragonfly.

Natural England commissioned DMS to regenerate a 15 hectare area of Glasson Moss, a designated Site of Special Scientific Interest (SSSI), to restore the hydrology to its previous condition. The approach to this site was to increase the water table as much as possible, the exact restoration techniques being decided on-site by DMS experts as the works progressed. Work on-site included:

- re-profiling peat cut edges;
- straight bunding, particularly required when working around peat cuttings;
- horseshoe bunding, an excellent technique for minimising wave action and one which allows a tied-in approach for water management;
- grip blocking (running water channels erode and dry out the peat cuttings but blocking these up creates large pools of water which wet the surrounding areas with the minimum of disturbance to vegetation).

The project utilised 360° excavators fitted with low ground pressure tracks that enabled DMS operators to access very fragile, sensitive habitat and minimised potential damage to the land.



9. Gully blocking on Stean Moor, Upper Nidderdale, North Yorkshire;
10. Foxglove Covert Nature Reserve near Catterick Garrison, North Yorkshire where land was developed into a wet meadows site for UK breeding wading birds;
11 & 12. Glasson Moss, Cumbria during and after regeneration works.