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This guidance is intended to help plan scrub clearance work and to encourage good practice in carrying out scrub removal for contractors and land managers.



Birch regenerating on a bog

Scrub encroachment onto peatlands is linked primarily with changes in the water table due to drainage. Changes in land management practice and surface disturbance also have an influence. Established trees and scrub draw water out of the peat and also intercept rainfall in the canopy, some of which is lost to the atmosphere through evaporation. The drier peat then encourages the establishment of further scrub and trees, the release of nutrients from the peat and also captures nutrients from the atmosphere. So the whole process is self-perpetuating unless the peat become wetter.

You will need to plan the areas of scrub to be cleared and together with details of method and timing.

We advise working through the following points when planning scrub control:

- Note the species of scrub and its location
- Extent of cover (total area and percentage cover)
- Nature of cover (light, intermediate, heavy)
- Age of scrub (young, mature, old)
- Method of control
- Treatment of the cut material
- Follow up treatment (e.g. application of herbicides to cut stumps or grazing)
- The presence of any notified features (if it is a protected site) or species of conservation interest (e.g. Biodiversity Action Plan species) that may be reliant on scrub, with a note of areas not to be cut.
- Make a plan/timetable to indicate what will happen, where and when.
- Maps to identify features of interest, scrub control operations, sensitive and dangerous areas.

Approaching the task

Planning of the operation is important to ensure that the right areas are cut, at the right time, with consideration for other operations on the site. For example, scrub should be cleared before dams are installed. If the cut material is placed in ditches, leave gaps in the disposed material to allow the installation of dams.

What to cut and what to leave?

Trees in the bog centre pose the greatest threat. If possible, mature trees around the edges of the bog should also be removed to prevent them seeding onto the bog. Removal of birch and Scots pine is a high priority because they are invasive, set seed readily and quickly dry the moss surface. Mature Scot's pine can add aesthetic value to an otherwise open landscape; however around 10 seedlings can establish every year from one tree. Gorse and Rhododendron generally grow at the bog edge but can also spread insidiously. Willow are less of a problem as they are usually confined to localised areas of nutrient or base enrichment and do not spread rapidly. Willows are therefore left in groups felling only the outliers.

Recommended methods of control are spraying, hand pulling, cutting, and flailing

Hand pulling

Hand pulling can cause ground disturbance that encourages germination of scrub species. Therefore this technique is only appropriate where seedlings are small and too diffuse to make spraying worthwhile. Likewise hand cutting and lopping is only appropriate for small areas of small trees, but with a motivated team and small trees large areas have been treated.

Brush cutter or chainsaw

Both brush cutters and chainsaws are effective for cutting scrub on bogs. However, the difficult bog terrain accentuates the need for all operators to have relevant certificates of competence and be aware of the specific dangers likely to be encountered.



Cutting light scrub with a chainsaw

Brush cutters should be used on scrub with a basal diameter up to 5cm, thereafter cutting is more efficient using a chainsaw. Choice of machine is also influenced by the density of lower branches. Clear stems are quickly cut using the chainsaw, whilst access to densely branched scrub is severely restricted and best cut with a brush cutter.

- As there is a low risk of blunting saws in the peat, cut stems as near to the base as possible. This reduces regrowth from the cut stem and allows bog mosses to quickly smother the stump, reducing the stimulus for shoot regrowth.
- With intermediate or heavy scrub, cut stumps should be treated immediately with a 10% solution of Glyphosate. Water soluble coloured dye must be used with the chemical to mark treated stumps to help to ensure complete coverage. To reduce opportunities for chemical spills, the chemical should be applied by spot gun or small hand held sprayer on the solid jet setting.
- Stumps of conifers do not need to be treated if the stump is cut below the lowest living branch.
- It is assumed that removal of all cut material will not be required. In most cases, the benefits of avoiding damage to the bog vegetation will be greater than the threat of nutrient enrichment. Felled material should be cut into 1 metre sections and left touching the bog surface, as this encourages rapid inclusion into the bog. Branches of Scots pine will often stick up vertically above the vegetation, and should be cut off. Cut material may be used to infill ditches, using the trunks to weigh down the bouncy brush in the bottom of the ditch.
- Timing of work: 1 August to 28 February (to avoid cutting scrub during bird nesting season and because translocating herbicides will not be effective when sap is rising).
- Any willow that is cut must be removed because otherwise it will regenerate.
- Take care when using chainsaws for this type of work on still days. The combination of stillness, exhaust fumes, regular revving and operators head working close to the saw can lead to increased carbon monoxide in operator's blood.

Flailing:

In the case of gorse and sometimes rhododendron, it may be possible to flail dense scrub at the edges of a site. Ideally in such cases, arisings should be collected and either burnt/composted off site or on site on corrugated sheets.

Herbicide Application:

Stands of scrub over 1.2 metres high should generally be cut, as over this height there is increased risk of spray drift and operator contamination.

Spraying of foliage in early summer is a possibility for small areas where cutting is not feasible, e.g. for scrub regrowth from previously cut stumps or young seedlings. Weed wiping rather than spraying would be preferable because of risk to surrounding vegetation, but will only be effective with light birch regrowth. Some collateral damage to surrounding vegetation is inevitable, to minimise the risk, spray only on calm days. Optimum time for spraying is from May to September. On some sites beetles will eat birch leaves during the summer, reducing the effectiveness of late summer sprayings.



Beetle damage on birch

Herbicide can be applied by a pneumatic sprayer or a low volume sprayer. Most woody species found on bogs are vulnerable to Glyphosate, which also has a low environmental impact. Formulations vary and label recommendations should be followed at all times.

Where scrub is dense, as often in the case with gorse and rhododendron, it is possible to spray in year 1 followed by a second spraying of the impenetrable stands once the edge bushes/branches have died. Alternatively, paths can be cut into stands from which spraying can safely be accomplished.



Treating Rhododendron (with optional midge net)

Organic Farms

Organic farms will not be able to treat stumps, spray scrub or regrowth. Instead, following scrub cutting, a grazing regime must be immediately instituted to check scrub regrowth. Timing, breeds and stage of scrub growth are all important in aftercare management. Details of aftercare by grazing are given below.

Aftercare

All too often, areas have been cleared only to become dense impenetrable scrub within a few years, with the added disadvantage that single stemmed scrub, once cut, can become multi-stemmed and harder to clear. Therefore follow up treatment is essential to ensure regrowth is reduced.

Aftercare involves treating any regrowth from cut stumps and subsequent regeneration with Glyphosate. Regrowth is best treated when it is higher than the surrounding vegetation, but no taller than waist height.

Grazing management can be used as a tool to check regrowth, although this is not often enough to kill scrub. Most cattle breeds have little impact on regrowth but Highlanders and Galloway are good browsers. Four sheep breeds, Hebridean, Herdwick, Scottish Blackface and Soay are all known to browse shrubby material. To manage scrub regrowth stock should be put onto the moss during the late spring and summer and again in the autumn. To achieve an effective growth check, stock must be introduced in the year following scrub cutting.

For all work:

- Low ground pressure machines will be required on wet sites.
- Operate in appropriate weather conditions to minimise habitat damage.
- Machinery on the moss surface can cause damage to the vegetation. Therefore machinery routes should go through drier areas, preferably vegetated with taller heather or rushes. The track should be re-routed before the peat surface is broken. Brash may be used to cover a machinery route to protect the surface of the bog.

- Note that if trunks are wider than 15cm diameter breast height, or if greater than 5m³ of timber is felled in any calendar quarter, a felling licence may be required.
- Take before and after photos and keep a record of how the work was carried out for your project report. Information on what does and does not work is very useful for future projects.
- If you are spraying within 5m of water you should discuss your plans with your local SEPA office.

Scrub types and appropriate treatments

Light scrub control/ fell to waste: where the scrub is young and appropriate for recent scrub encroachment, or regrowth which had not been tackled from previous control efforts. Scrub of this type, where stems are no more than 7.5cm thick can be cut by a brush cutter. Stump treatment is advised for stems greater than 1.5cm in diameter. It is assumed that cuttings will be left on site. Willow would not be appropriate for this category due to the possibility of regrowth from the cuttings.

Chemical treatment of light scrub: this is an alternative to felling to waste, this rate will be appropriate for light scrub of up to 4' or 1.2m high.

Intermediate scrub fell to waste: it is difficult to define this category other than saying that a judgement would have to be made that it sits in neither the light or heavy categories. It is likely that you would just be able to walk through the scrub. Using a chainsaw cut the scrub into 1 metre lengths. Stump treatment would be required.

Heavy scrub fell to waste: this rate will be appropriate where the scrub is old, very difficult to walk through, and would require significant effort to clear. Scrub would be cut by chainsaw and chopped into 1 metre sections with the underside branches snedded to ensure the trunk has ground contact. In addition, brash and trunks can be placed in ditches to assist in blocking. Stump treatment would be required. If the brash is dense and to allow sufficient bog vegetation regeneration, it may be considered appropriate to remove the felled material and dealt with through a woodland removal contract.