

# Twm-Barlwm Mound and Bailey Castle

## Scheduled Monument MM044

### Specification for Emergency Works



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##### **Context**

This specification for emergency works is prepared at the request of Cadw and the Cymdeithas Twmbarlwm Society following fires during July 2018 that have had a significant adverse effect on the conservation of the Twm-Barlwm Mound and Castle Scheduled Monument MM044, located at grid reference E 324222, N 192610 in the community of Risca, Caerphilly County Borough.

This specification for emergency works is intended only to address those matters considered to have a potential immediate or short-term adverse effect on the conservation of the Scheduled Monument.

More detailed proposals, to address medium- and long- term management of the Scheduled Monument are to be prepared in due course.

##### **Evaluation of the effect of the fires**

There are believed to have been two fire episodes in July 2018, affecting almost two-thirds of the Scheduled Monument, most significantly the north-eastern flank of the mound; and, the banks and ditches of the ramparts- and the interior- in the eastern two-thirds.

For the most part, the burns appear to have been hot, but rapid and have taken advantage of the undoubted, significant 'fuel burden' on site and its very dry state because of the unusually high summer temperatures in 2018. Unburnt areas in the west of the site are characterised by a rank sward of tussocky grass and bilberry (locally known as whinberry) *Vaccinium myrtillus* L. that are indicative of the nature of the vegetation formerly existing across the Scheduled Monument.

While the condition of management of the sward has undoubtedly provided the fuel for the fire, the dense sward mat can also be seen to have afforded some protection to the archaeological remains.

Beneath the surface layer of heavily-charred material a turf mat can be seen to have survived across much of the burnt area of the Scheduled Monument. The expectation is that the rootstock of grasses and bilberry have largely survived and, too, the seed bank, where it has been protected beneath the surviving turf mat.

At the time of site inspection (Tuesday, 28 August 2018), there was clear evidence of natural regeneration, particularly in lower-lying areas where the intensity of the burn may be expected to have been reduced; and, where there may be higher levels of soil moisture.

Condensation, in the form of early morning dew and some episodes of rainfall since the fires are undoubtedly assisting natural regeneration. This suggests that the generally dry conditions may be the principal factor inhibiting natural regeneration across most of the Scheduled Monument where the turf mat survives.

In other areas, notably on the steep slopes of the mound and ramparts and on the crests of the latter, the fires have fully consumed surface organic material down to the underlying mineral substrate.

In these locations it may be assumed that the severity of the burn has been such as to consume any organic matter within the mineral substrate, including any seed bank, although this has not been formally evaluated.

The steep slopes and crests of the ramparts may be expected to have supported a less vigorous and dense sward mat, with compaction from footfall by sheep and visitors inhibiting the build-up of organic material.

It is to be noted that some heavily-compacted areas, used as paths, escaped being burnt even though areas immediately adjoining them were burnt.

It is the slopes and crests that are the greatest cause of concern for the immediate conservation of the Scheduled Monument; and, that are the principal subject of this specification for emergency works.

With the approaching autumn and winter, there is a significant risk of erosion damage to areas of the exposed mineral substrate through wind- and rain- action.

### **Recommended emergency works (principal)**

The following principal emergency works are recommended to achieve the short-term conservation of the Scheduled Monument:

1. Re-seeding of those areas of the Scheduled Monument indicated on Plan 1 at the end of this specification.

While recognising that it is best, in the long-term, to regenerate a sward of locally-native species, it is imperative in the short-term to secure a close-knit sward to protect the archaeological remains from wind- and rain- erosion over the autumn and winter months.

To achieve this, it is recommended that a standard, drought-tolerant lawn grass seed mix be used, based on dwarf perennial ryegrass (e.g. Lawnsmith's STAYGREEN Grass Seed <https://www.lawnsmith.co.uk/prod/lawn-grass-seed/staygreen-lawn-grass-seed.htm#description>).

Experience shows that such a mix establishes quickly but then, being generally unsuited to impoverished conditions, progressively declines in the sward, giving way to locally-native species. In doing so, it acts as a 'nurse', stabilising the substrate and moderating micro-environmental conditions while slower germinating and growing locally-native species become established by in-seeding from surrounding areas.

It is considered preferable to use non-native species for emergency works, for their speed of establishment; and, because a locally-native species mix is likely to be slower to establish and has associated issues around genetic pollution. Seed is unlikely to be of local or, even, UK provenance.

It is recognised that this approach may be considered controversial and it is therefore imperative that it be approved by Alison Jones, Ecologist, Caerphilly County Borough Council (E: [jonesa2@caerphilly.gov.uk](mailto:jonesa2@caerphilly.gov.uk); T: 01443 866615).

### Specification for principal emergency works

The following specification is recommended for the above, principal emergency works. This approach is applicable irrespective of the particular grass seed mix used:

2. Preferably, use a grass seed mix comprising dwarf perennial ryegrass *Lolium perenne*, rhizomatous tall fescue *Festuca arundinacea* Barenbrug UK, and tall fescue *Festuca arundinacea*, e.g. Lawnsmith's STAYGREEN Grass Seed <https://www.lawnsmith.co.uk/prod/lawn-grass-seed/staygreen-lawn-grass-seed.htm#description>;
3. This grass seed mix to be approved by Alison Jones, Ecologist, Caerphilly County Borough Council (E: [jonesa2@caerphilly.gov.uk](mailto:jonesa2@caerphilly.gov.uk); T: 01443 866615) before use;
4. Grass seed to be surface applied to the specified area by hand broadcasting at a rate of no less than 35 grams per square metre;
5. Ensure that grass seed is spread evenly across the substrate. Overly densely seeded areas are preferable to bare areas, however;
6. Personnel must not walk on slopes or on the crests of ramparts when hand broadcasting the grass seed;
7. No raking or other surface disturbance should be undertaken either before or after seed broadcasting;
8. Grass seeding to be undertaken in September or early October 2018;
9. Allow at least two weeks following initial re-seeding before evaluating effectiveness. This period may need to be extended if there has been no rain. Carry out a secondary re-seeding of areas where the initial re-seeding has failed or is considered weak. This secondary re-seeding should, ideally, be undertaken in October 2018, but may be undertaken later where average day-time temperatures remain above 5°C.

### Risks

For seed to establish successfully, it requires a stable substrate during the critical germination phase. Any root shear in the early days will kill grass seedlings. Ideally, grass seed would be applied and the surface then stabilised beneath a biodegradable geotextile matting, or similar, to counter the effects of wind- and rain- action.

The use of such matting is not considered to be a viable option at Twm-Barlwm, because of the high risk of vandalism or arson. This means that the substrate may be prone to movement during seed establishment.

Ordinarily, it is also common practice to lightly rake grass seed into the substrate surface where a surface matting is not used. This creates an intimate contact between the seed and the substrate, facilitating water uptake and germination. It also reduces the visibility of the grass seed and thereby reduces predation by birds, etc.

Surface raking is not recommended at Twm-Barlwm because it may damage surface archaeological remains and increase the risk and severity of wind- and rain- erosion. It also requires personnel to move across vulnerable slopes and crests of ramparts, thereby exacerbating erosion risks. Not raking in the grass seed, however, may increase the risk of seed predation.

Because of these factors it must be accepted that a secondary re-seeding may be required where failure results because of substrate movement or predation.

### **Seed quantities and costs**

Approximate area to be treated = 1,500 square metres.

On the above basis it is assumed that a minimum of 52.5 kilograms of grass seed is required for the initial re-seeding at an approximate cost of £296.

It may be considered desirable to double this quantity so as to hold some grass seed in reserve for a secondary re-seeding; and, to ensure that over-application at the initial re-seeding does not exhaust stocks before the principal work is completed.

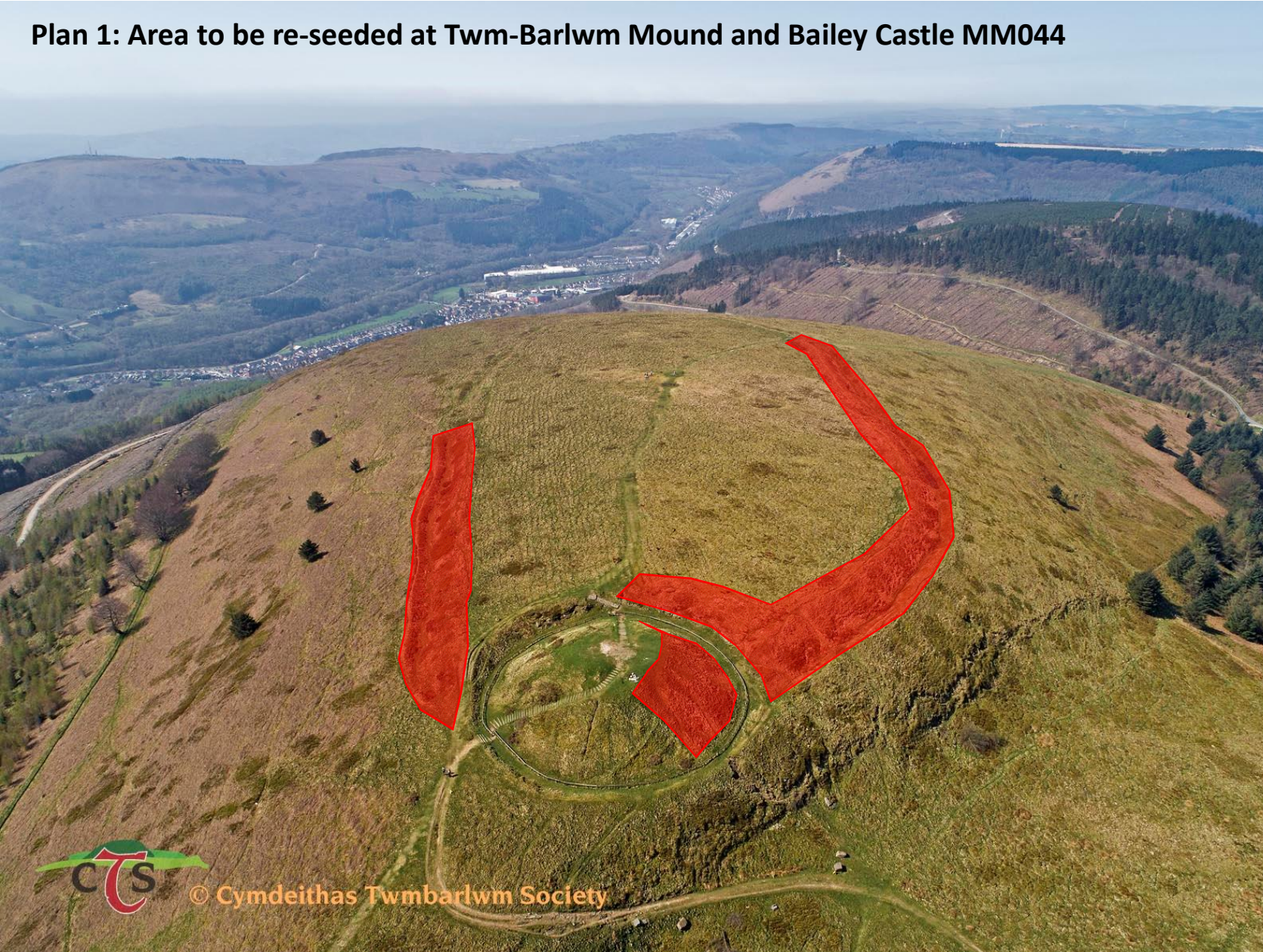
### **Recommended emergency works (ancillary)**

The following ancillary emergency works are recommended to support the short-term conservation of the Scheduled Monument:

10. Ensure the field parcel within which the Scheduled Monument is located is stock proof, repairing boundary fencing as required;
11. Exclude all livestock from the area of the Scheduled Monument until at least spring 2019. The decision to reintroduce grazing by livestock in spring 2019 to be subject to site evaluation. The small number of sheep on the Scheduled Monument at the time of the visit on Tuesday, 28 August 2018 were seen to be causing surface poaching and erosion on burnt slopes and rampart crests. As it is not possible or desirable to roll re-seed areas, established grass is likely to be less-firmly secured in the substrate. Too early grazing by livestock may therefore result in new grass plants being pulled out by their roots, rather than being chewed off to encourage tillering;

12. Remove all broken glass from the Scheduled Monument, where it can be identified. This poses a health and safety risk to visitors and may be a cause of future fires. The visit on Tuesday, 28 August 2018 identified a number of occurrences of broken glass across burnt areas.
13. Repeat 3D modelling (textured) by UAV (drone) is recommended as a matter of urgency to accurately record areas of burn, before they regenerate, so as to inform future management planning and site survey, and identify and record archaeological features formerly subsumed beneath the sward.

## Plan 1: Area to be re-seeded at Twm-Barlwm Mound and Bailey Castle MM044



 Area to be re-seeded (approximate)

**Nb:** The need to rapidly set out a specification for emergency works means that it has not been possible to accurately define areas for re-seeding in the time available.

The area indicated for re-seeding is therefore approximate and includes some patches of unburnt vegetation; and, areas where the former turf mat survives and may be regenerating naturally.

Such areas do not require re-seeding.

**Total area (approximate) = 1,500 sq.m.**

**Grass seed @ 35g per sq.m. = 52.5 kg  
- per application**



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