

Bracken control at Moelyci Farm: case study for Bracken Control Group

The farm

Moelyci Farm, Tregarth, Gwynedd, was a commercial sheep farm until 2002 when it was bought by a new charity established to maintain the farm as a community asset. Grazing became more haphazard after 2002 and several areas of pasture were lost to tree planting. From 2005 much of the farm was recognised as exceptionally rich in waxcaps and other grassland fungi. In 2017 the charity got into financial difficulties and there was a risk of the farm falling into unsympathetic management. This prompted Natural Resources Wales to designate the surviving unimproved grassland as SSSI. The charity went bankrupt in 2018 and the farm was split between 13 buyers.

History of bracken control

Aerial photos show very little bracken on the farm in 2005. Since then bracken has invaded much of the pasture, apparently spreading out from the ungrazed plantations established around 2003.

Since 2018 there has been a concerted effort to control bracken, focusing initially where bracken has recently invaded and is still sparse with waxcap-rich and flower-rich turf surviving underneath.

Methods

Control has consisted of cutting by hand. Various methods have been used.

Cutting with secateurs produces a clean turf but is too slow for large areas.

A weed slasher is effective early in the growth season when bracken stems are soft and brittle but becomes ineffective as the stalks toughen from June onwards.

The favoured method is scything.

Small areas of difficult terrain or sparse fronds are cleared by pulling the fronds up one at a time. Wear tough gloves with a good grip (not leather - too smooth to grip) because a split bracken stem can be extremely sharp.

Early in the growing season (May), the cut bracken can be left on the turf where it shrivels and soon disappears. As the bracken matures, the cut material is too plentiful and woody to be left, and it is raked up and barrowed to piles where it rots down. The time spent breaks down as 40% scything, 40% raking, 20% carting raked material to permanent piles.

Methods not used

Herbicide has never been used because of the SSSI status and because there are 17 other species of fern on the site which would be vulnerable to Asulox spray drift.

Cutting by tractor has not been used because grassland fungi are harmed by soil compression; much of the SSSI is inaccessible to vehicles; it would be impossible to avoid the abundant ant hills if using a large mower; it would also kill the amphibians and reptiles which are found among the bracken in summer; and the mower would be damaged by the numerous boulders.

Rolling has been rejected for the same reasons.

Strimming could avoid the ant hills and boulders but the reptiles and amphibians would be vulnerable to strimming. It is doubtful whether strimming is significantly faster than scything, especially where the aftermath has to be raked up and barrowed away: if strimming is twice as fast in terms of square metres cut per minute, that would only speed

up the total operation of cutting, raking and barrowing by 20%. Also I have no wish to be exposed to the noise of a strimmer for days at a time.

Pigs are often suggested and I have been assured the only way to get rid of bracken is to dig out the roots. Neither method is appropriate where the aim is to conserve ancient turf.

Timing

Bracken fronds begin to emerge in April. These early fronds may be killed by a late frost. Cutting begins in mid-May when fronds are dense enough to be worth cutting, to take advantage of the short period when they are insubstantial enough to not need raking up. Until late August, cut fronds will be quickly replaced by growth of new ones. The number of cuts between May and September depends on the manpower available, the value of the turf and the size of the clearing. A small patch of high-value turf (e.g. a colony of adder's tongue fern) may be cut monthly, so five times. Larger areas may only be cut twice, in mid-summer and early autumn.

After 2-3 years of multiple cuts per year, the fronds become sparser and stunted and more difficult to scythe. Pulling them by hand may then become the more efficient method.

There are two benefits from cutting bracken. Repeatedly removing the new growth weakens the plant by depleting its resources and lessening its ability to replace them by photosynthesis, so will eventually lead to lower levels of bracken infestation. However, it isn't the living bracken which harms the turf. It is the build-up of dead bracken litter over several years which does the damage. So if you only have the resources to do a single cut, do this in late August or September. Such a late cut will do the bracken plant little harm - by then it has carried out the bulk of its photosynthesis and growth. But by removing all the year's above-ground material too late in the year for new fronds to be produced, no bracken litter is left to smother the turf over the winter and the grass has eight months of admittedly slow growth before the new bracken canopy appears the next spring. This late cut is a holding strategy to maintain the turf in the hope that more resources will be available in future years.

Future plans

The SSSI has been grazed by sheep since 2018, except for two fields permanently grazed by donkeys. Neither of these animals is effective at controlling bracken. In 2024 it is intended to add cattle to the sheep grazing, primarily to control Himalayan balsam but they will hopefully also impact the bracken.

Knowledge gap

Given that bracken spreads mainly by rhizomes and a single clone can cover hectares, there seems to be little research into the degree of resource translocation among different parts of the clone. In other words, if you want to control a patch of bracken 20 metres diameter, to what extent will bracken in the surrounding area feed the rhizomes in the cut area? How broad a buffer zone needs to be cut around the 20 metres target patch? The answer is partly dependent on how fragmented the clone is, but also on the behaviour of the rhizomes wrt moving nutrients into rhizomes which are not able to photosynthesize their own. Milligan et al. 2016 (Weed Research 56: 247-257. DOI: 10.1111/wre12203) goes some way to answering this question.

There also seems to be little information on when during the year the growth of the rhizomes, meaning their expansion into new areas, occurs.

Canol y Ffridd is the Moelyci field with the most species of grassland fungi. Broad bands of bracken along the west and north edge were occupying about half the field so bracken cutting began in 2018 in order to maximise the area of grass turf.



Canol y Ffridd, Moelyci, 17 August 2017

Bracken patches were scythed twice per year starting in 2018 with a third cut in 2022.



Canol y Ffridd, Moelyci, 13 July 2022

Eleven cuts later, bracken appears to be largely eradicated from the edges of the field, but this is misleading. Any piece of land looks clear if photographed after it has been cut, but it doesn't show how strongly the bracken will come back. It would be more meaningful to leave the field uncut until August then rephotograph it, but that would reverse some of the progress made by cutting.

Progress would be better assessed by measuring number of fronds per square metre, weight of fronds per square metre and mean size of fronds. I haven't collected any of these data because they would take too much time that is better spent on scything. While it would be good to have better measures of progress, it would be a luxury.

The Moelyci ffridd includes large areas of dense long-established bracken with little surviving underneath. In 2023, a new clearing was begun to see whether grass turf would re-establish.



NW corner of Moelyci ffridd, 24 January 2023

Brambles and accumulated dead bracken were cleared in January 2023 and new growth of bracken was cut six times through the summer. Each cut took about an hour with another hour for raking up after the later cuts.



NW corner of ffridd, 9 October 2023 after six cuts of bracken.

By the end of summer, grass had re-established sufficiently to attract the sheep.

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