Browsing for scrub control

Bill Grayson

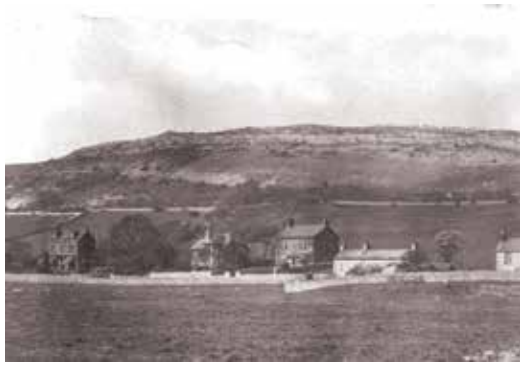
A part-time National Trust farm tenancy on the edge of Morecambe Bay gave my wife and me the opportunity to start a conservation grazing business in 1992. The Trust especially wanted their new tenant to set out grazing regimes for some of their other local properties, including popular nature reserves such as Arnside Knott and Jack Scout SSSIs. Other conservation bodies in the area, including both Cumbria and Lancashire Wildlife Trusts, had also struggled to secure appropriate grazing for some of their reserves, many of which had remained ungrazed for decades, so they too were keen to use this new local grazing service.

To stock the farm, we bought the outgoing tenant's herd of 15 Hereford x Friesian organically certified suckler cows, together with half a dozen Red Poll heifer calves from a local dairy herd to provide breeding replacements for future years. We also bought a Devon bull to sire hardier cross-bred calves that would be better suited to out-wintering on the limestone hills around the farm.

The launch of the first Countryside Stewardship scheme in 1992 was very timely, providing grants to make boundaries stock-proof and revenue payments to enhance the management of wildlife habitats such as limestone grassland, which is such a notable feature locally. Years of agricultural abandonment had allowed much of this priority habitat to succeed to scrub and secondary woodland. The National Trust required us to run the farm organically, which meant that all the associated reserves also had to be certified, preventing any use of herbicides in managing their habitats – quite a controversial strategy in some nature conservation circles.

Meeting the challenge

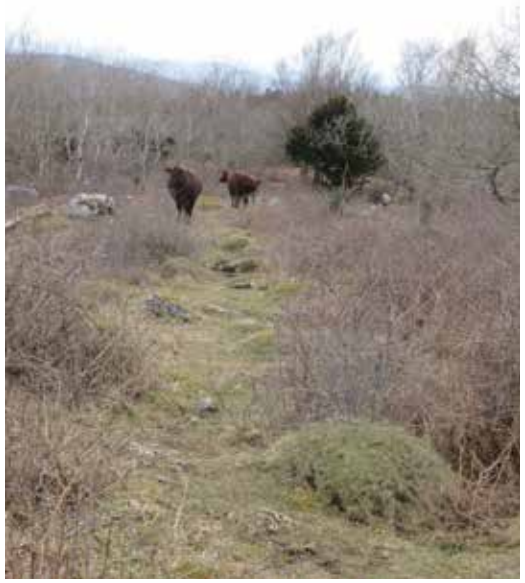
Tree and shrub cover had been expanding on the ungrazed reserves at an accelerating rate since the 1970s, with the grassland itself becoming quite rank and species poor. However, along with this successional change, a number of priority species that relied on a more sheltered habitat mix had established good populations on many of the



Warton Crag was virtually devoid of scrub in 1910. Photographer unknown

sites. The most notable among these species were the high brown and pearl-bordered fritillary butterflies, which, although maintaining strong populations locally, were undergoing sharp declines elsewhere in England. Neither butterfly favours open expanses of grassland, both preferring sheltered, sunlit glades within a mosaic of low scrub or bracken affording good supplies of common dog-violet, the food-plant for their caterpillars. Meeting the complex ecological needs of these species presents a difficult balancing act for the grazier, in terms of effecting a regime that is intense enough to contain the spread of scrub yet sufficiently relaxed to produce the necessary diversity of structure and species composition within the ground flora.

We have now been grazing these previously abandoned grasslands around Morecambe Bay for 25 years, during which time the operation has expanded to include more than 1,000ha of nature reserve, extending northward into the Lake District and eastward to the Yorkshire Dales. It has evolved using home-bred cattle, mainly Red Polls and Shorthorns, two of England's traditional dual-purpose cattle breeds. Several of the Red Poll lines can be traced back to our original batch of purchased heifer calves, their calves being selected as breeding replacements over several generations on the basis of their ability to perform well under the challenging conditions. All these home-bred calves learn directly from their mothers the skills they need to graze a range of semi-natural habitats, before using that experience on more challenging sites in the company of their peers. Growth rates on the year-round diet of rough grazing plus browse are much lower than those



Browsing by livestock is less effective at suppressing thorny species such as blackthorn, which makes up a large proportion of the encroaching scrub. Bill Grayson

found in more conventional systems, so the cattle are not ready for slaughter until four to six years old. Although these extended rearing times would not be considered economically viable for commercial beef animals, they can be justified here because the extra time allows the cattle to improve as conservation grazers. Pushing them to finish sooner would not only require higher feed costs but would also deprive us of their best grazing years.

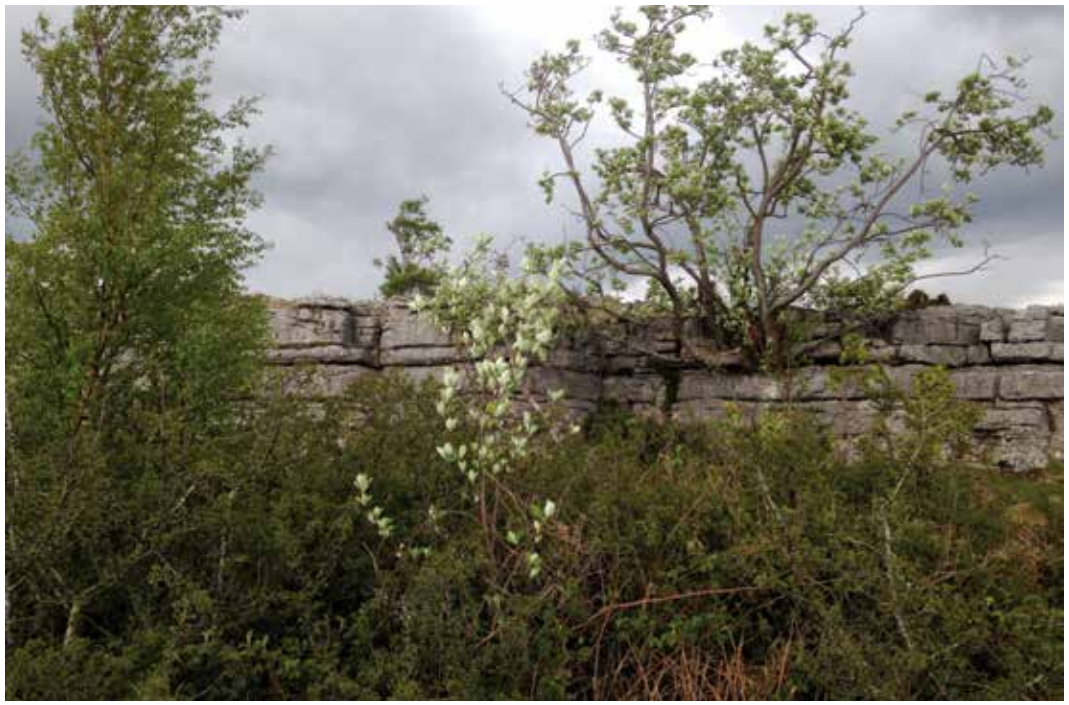
Has grazing worked?

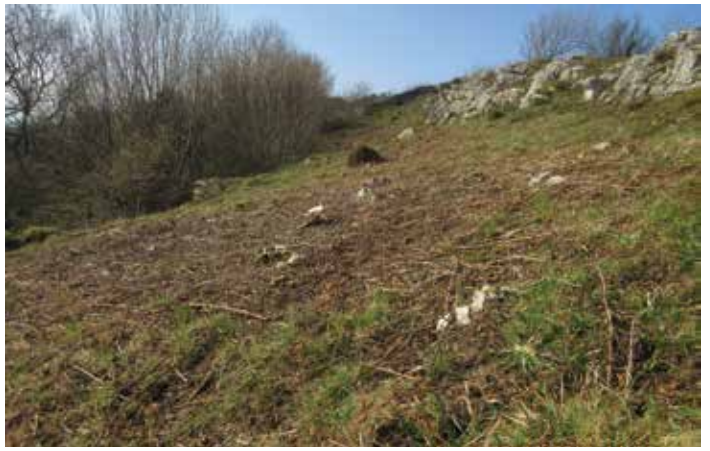
When we began grazing these sites in the mid-1990s, scrub and woodland occupied as much as half the area of many of them, with the limestone grassland often reduced to a few scattered fragments. Concerns about potentially adverse impacts for priority species such as the fritillary butterflies and nesting warblers led most site managers to insist that the grazing be deferred until later on in the summer. Such late-season grazing has helped achieve the grassland management objectives quite well, with much of the original rank thatch having been replaced by a shorter, more open sward structure, along with an increasingly species-rich and colourful display of flowers, which is so typical of limestone during the summer. Such a positive outcome has been confirmed by Natural England's condition assessment process, which has assessed the limestone grassland SSSI units as having attained either 'favourable' or 'recovering' status in terms of their structure and species composition.

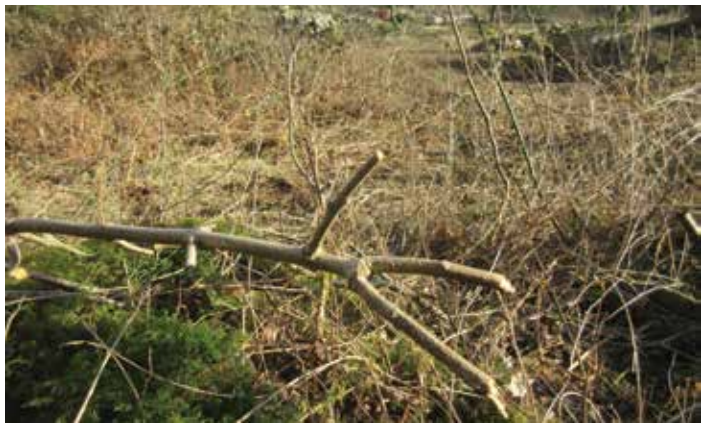
The original issue of scrub encroachment, however, receives little mention in any of these condition assessments, perhaps because their methodology is not designed to detect larger-scale changes within a mosaic of habitats. Further difficulties might stem from some of the administrative and budgetary changes that have affected Natural England in these more stringent times, leading to higher rates of staff turnover and reductions in monitoring effort. So, while the grassland itself may possess all the required features qualifying it as being in good condition, its overall integrity may be threatened by continuing scrub encroachment at the margins.

This is certainly my own, admittedly somewhat subjective assessment of the situation, at least for some, if not most of the sites we graze. This view has been formed while ranging across these reserves, searching out the cattle among the mix of habitats and noting their interactions with the different types of vegetation. Repeating this informal monitoring as part of routine management of the grazing has, over the years, led me to conclude that scrub encroachment continues to threaten much of the limestone grassland. It especially concerns me that although, in the last few years, considerable effort has been invested in cutting back large swathes of scrub, there is little prospect of restoring these cut-over areas to grassland solely on the basis of the grazing impact. Much of the regeneration in these areas consists of bramble, blackthorn and hawthorn, the scrub components that are most intransigent and difficult to suppress with livestock. Their control without chemicals will rely on a protracted and persistent programme of mechanical re-cutting, something that calls for considerable investment of time and effort – resources that are always stretched in nature conservation. If, however, sufficient resources can be mustered to contain the regenerating scrub in the immediate aftermath of clearance, a self-maintaining sward can, at least in theory, be re-established over time. Success here depends on quickly re-establishing a vigorous enough pasture over the cleared ground to ensure that livestock commit to grazing it with sufficient intensity.

A whitebeam sapling, protected from browsing by a dense stand of blackthorn. Bill Grayson







Top Browsing is used in combination with mechanical clearance of species such as bramble, which are mostly avoided by cattle. Bottom An ash twig that has been browsed by the cattle. Bill Grayson

Monitoring progress

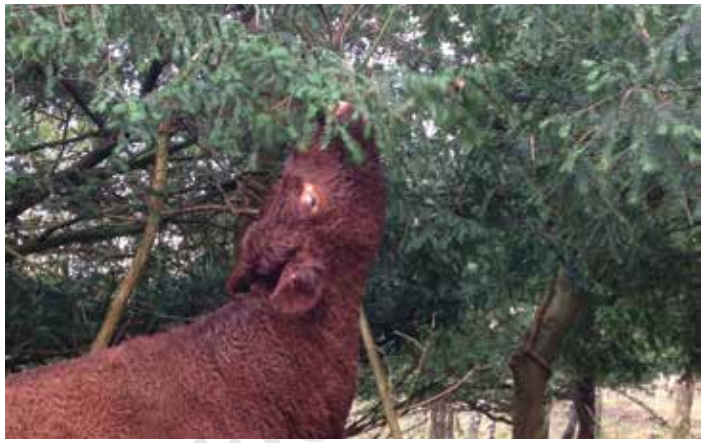
Maps derived from aerial photographs or satellite images are an effective way of assessing overall vegetational trends. The map of Warton Crag on the 'Magic' website (https://magic.defra.gov.uk) indicates that the current extent of tree and shrub cover is very similar to that in 1988, some four years before grazing was reinstated. This would suggest that the restoration of grazing may indeed have contained further scrub encroachment.

However, closer inspection at ground level reveals that many of the best areas of limestone grassland continue to be threatened by advancing scrub. Bramble and blackthorn are the main protagonists, their sharp thorns providing an effective defence against browsing of their above-ground shoots, while their roots and runners continue the advance from below.

Tree species, such as ash and sycamore, are less of a problem since, without thorns, they are more susceptible to browsing, and they lack a spreading root system, relying instead on seed to colonise grassland. Their leaves are generally more palatable, but especially so in the early part of summer. This means that timing is important, with browsing being more effective if stock are introduced earlier in the season, before tree shoots have hardened off with tannins and lignin.

This presents site managers with a dilemma. Should they defer the start of grazing till later in the summer when disturbance will be minimised for priority butterfly species such as the high brown fritillary and plants such as dark-red helleborine? Or ought they to prioritise protection of the grassland habitat itself by introducing stock earlier in the season so as to boost browsing impact, even though this risks compromising the conservation objectives for individual priority species? Warton Crag exemplifies this conundrum, with its three separately owned and managed SSSI compartments all having similar conservation objectives but pursued using three distinct grazing prescriptions according to the differing interpretations of their respective site managers.

One of these site managers installed five small, cattle-proof exclosures across their site as a way of investigating how much impact the cattle were having on the vegetation. This soon became very apparent after all the fenced-off areas had begun filling up with dense stands of bramble and/or bracken, to the almost total exclusion of grassland. This simple but effective measure has left little doubt about the contribution of grazing to keeping such sites open.



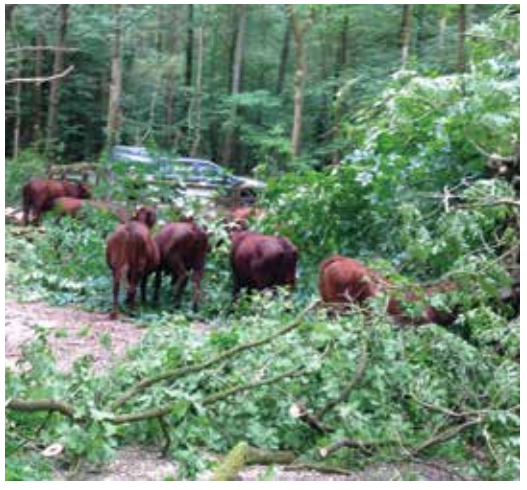
While yew is notoriously toxic to humans, it is a favourite among the cattle. Bill Grayson

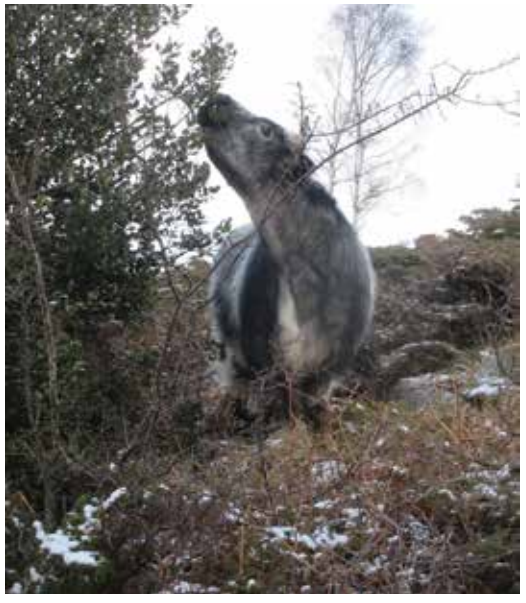
Observing browsing impacts

Although differing interpretations of the cattle's longer-term ability to control scrub encroachment still exist, these animals' propensity for inflicting damage directly on their preferred tree and shrub species is obvious: broken branches, stripped leaves, pruned twigs and shoots. Such signs are evident across all the grazed sites, seen everywhere that the cattle roam and affecting most of the woody species, albeit to varying degrees. Ash and sycamore are usually impacted most; hazel, birch, oak, beech and sallow to a lesser degree; while hawthorn, holly, blackthorn, bramble and gorse, because of their thorny defences, are only taken occasionally and then in small amounts. Yew, despite being toxic, is a particular favourite and the cattle have long since browsed out all its lower branches wherever it grows within their reach. Conversely, they completely avoid juniper, another notable native conifer. This UK BAP shrub has become more widespread on several of the reserves since the restoration of grazing. We often see juniper saplings in tracks made by the cattle, presumably having found germination niches in the scrapes left by the passage of their feet.

Browsing damage to trees and shrubs is most apparent on the larger sites, where grazing usually continues for longer periods, albeit at lower overall stocking rates. This allows the cattle to keep returning to their preferred woody species, inflicting repeated bouts of damage, which, when maintained at sufficient frequency and for long enough, eventually exhaust the plant's energy reserves. On smaller sites, however, it is more difficult to sustain this level of browsing pressure, since they can usually only be stocked for shorter

Below Cattle browsing on felled brash. Right Native cattle breeds are renowned browsers, but in this project succeeding generations have become ever-keener to eat trees and shrubs. Bill Grayson





Obvious browse lines have developed on isolated shrubs and trees, such as this crab apple. Bill Grayson

periods before they risk being overgrazed. During the intervals between grazing, scrub has time to 'harden off' by lignifying its softer tissue before the next bout. This makes it more difficult to control encroachment on the smaller sites using livestock browsing alone and they will probably require some more interventionist forms of management.

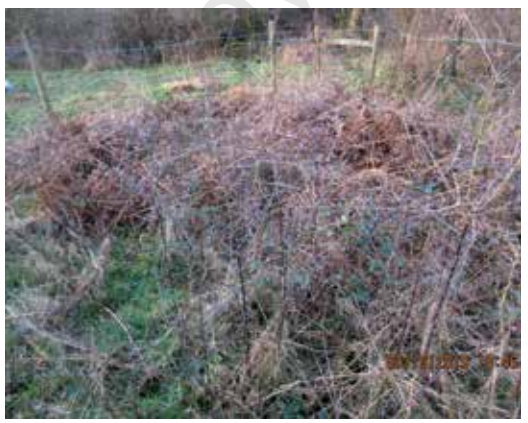
Establishing the best grazing regime for complex sites

Whatever their size, establishing the optimal grazing regime for any of these diverse sites is no easy matter: it must be lax enough to permit all the target species to thrive but sufficiently stringent to prevent the progressive advance of woody plants. Achieving the appropriate balance can be more difficult on sites like the ones here in Morecambe Bay, where complex mosaics of grassland, scrub and woodland confound the formulation of a clear and reliable grazing prescription. The grassland component often comprises a number of open glades separated by bands of scrub and interspersed with pockets of woodland, bracken and limestone pavement or scree. Our cattle have had to learn how to utilise this diversity to best effect, making good choices about where to go and what to eat, decisions that seldom confront conventionally farmed livestock.

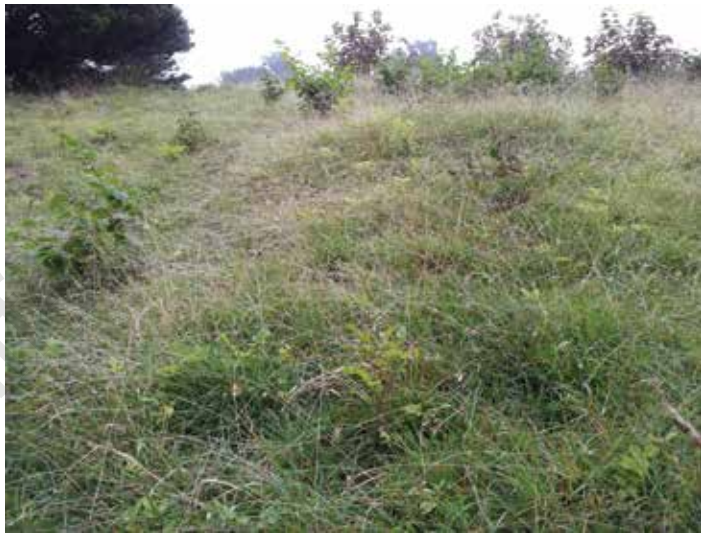
Looking back, we could be accused of having been over-optimistic in expecting farm-bred cattle to go straight into these wooded pastures and thrive from the outset. Our confidence was founded on the aurochs, their wild ancestor, having evolved to exploit this same habitat, allowing us to hope that our modern cattle would still be able instinctively to call upon many of the auroch's original behaviours and adaptations. Luckily, this optimism has been justified by the confident manner in which the novice woodland grazers have adapted to their new habitat. Furthermore, their overall health and productivity have improved over the years, based on selecting the best-performing animals to breed for the next generation.

This system probably mirrors the original wood-pasture landscape that would have occupied much of pre-agricultural Britain, and which cattle would have played a large part in shaping, based on browsing abilities that they seldom need to use in modern farming systems. We see our own cows fulfilling a similar role today, using their long, prehensile tongues, giraffe-like, to pull down otherwise out-of-reach branches, or pushing their toughened nose-pads deep into dense shrubbery to seek out the tenderest shoots without injury or discomfort. Despite its width, a cow's mouth is still capable of delicately nipping off the choicest shoots or tips of winter twigs.

Exclosures provide an indication of how the site would develop in the absence of browsing. Bill Grayson



Catering to the needs of all the various habitats within a wood-pasture landscape can pose problems for conventional conservation management planning approaches. Perhaps it requires a more naturalistic philosophy that anticipates, even welcomes, unprompted changes in both the ecological dynamics and the behaviour of grazing animals. Browsing clearly plays a fundamental role in this process. We need to learn much more about how livestock decide where to go and what to eat within such a complex, semi-natural system if we are ever going to be able to predict their behaviour well enough to reliably achieve positive outcomes for nature conservation. This is likely to require a significant shift in focus away from regarding grazing by livestock simply as a convenient tool for removing vegetation according to some pre-determined schema, calling instead for a more holistic appreciation of their role in shaping entire landscapes, within which each habitat is just one integrated element.



Limestone grassland that is left ungrazed is species-poor and dominated by coarse grasses (top), but the introduction of grazing will produce a far more species-rich sward (bottom). Bill Grayson

The sustainability of extensive grazing systems has recently been called into question with the Climate Change Committee's advice to the UK government to convert 26–36% of upland rough grazing to forestry by 2050, creating an extra 2.2–2.7 million ha of plantation woodland. They argued, somewhat controversially, that extensive, free-range grazing systems like the one described here generate too many greenhouse gases and should be curtailed. A more holistic solution, however, would be to promote wood pasture as a system that is uniquely able to deliver a suite of essential public goods, combining the delivery of a cooler climate, healthier food supply and richer diversity of wildlife.

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