HERITAGE 2022 - International Conference on Vernacular Heritage: Culture, People and Sustainability
September 15th-17th, 2022 Valencia, Spain
Doi: https://doi.org/10.4995/HERITAGE2022.2022.15636

Repair grants for historic farm buildings in Dartmoor National Park

Nils White[1]
[1]Nils White Conservation, Newton Abbot, nils@nwconservation.com

Topic: T4.1. Conservation and restoration projects of vernacular architecture

Abstract

The Historic Rural Building Pilot Scheme, launched in 2018, was a collaborative project between national cultural and natural heritage organisations, government agencies and five English National Parks. Its aim was to bring life back to traditional agricultural buildings within the boundaries of participating National Parks. Funding was available for building repairs using traditional methods and materials, with the aims of preserving the distinctive character of the areas and keeping the buildings in continued agricultural use. The Author is an independent heritage consultant employed by Dartmoor National Park Authority to oversee the 13 repair projects selected there. These ranged in size from small, isolated barns to a large, late 19th century model farmstead. Typical works included masonry and cob repairs, timber repairs, roof replacement etc. A total of £1.3m has been offered in the National Park covering 80% of the cost of eligible repairs. The paper briefly describes Dartmoor and provides an overview of the scheme. Individual case studies are considered, illustrated with photos, describing the history and significance of each building, their construction, the structural problems affecting them before repair; and the philosophy and solutions adopted.

Keywords: *dartmoor; farm buildings; grant schemes.*

1. Dartmoor National Park

Dartmoor is an area of upland, situated in the County of Devon in south-west England, with an extent of just under 1000km². It was designated a National Park in 1951, and this status provides protection to its landscape, ecology and cultural heritage. While more than half of the National Park Area is privately owned, much of the high moor is unenclosed and freely accessible to walkers.

1.1 Dartmoor Geology, Climate, and Landscape

The underlying geology of most of Dartmoor is formed of a granite intrusion dating from the Carboniferous period. Mostly, the granite is overlaid by a thick layer of peat; however, many hilltops are crowned with exposed granite outcrops known as *Tors*, which are one of the most distinctive features of the Dartmoor landscape. The geology of the moorland periphery is characterised by sandstones and mudstones dating from the Carboniferous and Devonian periods.

The mild, wet and windy climate of Dartmoor is strongly influenced by the nearby ocean and the warm currents of the Mid-Atlantic Drift. Temperatures in Princetown (418m above sea level) range from an average February minimum of 0.8°C to an average July maximum of 17.7°C. Annual rainfall is around 2000mm.

The rolling upland of the high moor is covered with hardy plants like grass, heather, bracken and gorse. It is incised by deep river valleys with woods, enclosed fields, farms and villages.

1.2 Agriculture on Dartmoor

Over a period of thousands of years, the trees that once covered the high moor were cleared by Mesolithic, Neolithic and Bronze Age settlers. From around 1000 BC, the cooling climate forced the latter group to abandon the area, leaving behind a fantastic archaeological legacy that includes remains of round houses and field boundaries, as well as earlier stone circles and funerary monuments.

The abundance of wool and tin ore on Dartmoor drove a thriving medieval economy. Transhumance was also widely practised, whereby cattle were brought up to the moor from lowland Devon farms during the summer months. Taking care of these beasts provided lucrative work for farmers on the moorland fringe (Fox, 2012).

Today, the high moor is grazed by sheep, ponies, and cattle; the valleys are also mainly pasture.

1.3 Dartmoor Vernacular Farm Buildings

Dartmoor is well known for its longhouses – where humans lived at the upper end and cattle in the *shippon* at the lower end, all under the same roof.

The earliest standing longhouses can be dated to the 14th century, though there are examples from well into the 17th century. Most standing traditional farm buildings on Dartmoor date from the 17th, 18th and 19th centuries, are usually stone-built, and most commonly would have been thatched with combed wheat straw (though in most cases thatch has been replaced with corrugated iron). Building types are often variants of those found in lowland Devon, including threshing barns (often built into the hillside), linhays, shippons, stables, ash houses and implement sheds (Beacham et al., 1990).

2. The Historic Rural Building Pilot Scheme

2.1 Overview of scheme

This grant scheme, launched in March 2018, was a three-year collaboration between Natural England and Historic England (the national public bodies responsible for the nation's natural and historic environments, respectively), five participating National Parks (Northumberland, Lake District, Yorkshire Dales, Peak District and Dartmoor),the Rural Payments Agency and DEFRA (the government Department for Environment, Food and Rural Affairs).

The stated aim was to *bring life back to traditional rural agricultural buildings within the participating National Park boundaries.* Funding was available for surveys, management plans, and restoration of historic buildings for continued agricultural use, employing traditional methods and materials, with emphasis on structural works, weatherproofing and roof coverings.

2.2 Methodology

The overall objective of the scheme was to 'halt the process of decay without damaging the historic, architectural or archaeological significance of the building, the landscape it sits in, or the wildlife habitats it provides'.

For each project, the starting point was to gain a proper understanding of the building's history, original use, construction, condition, pathologies, habitats etc. Once this was obtained, a philosophy of minimum intervention was followed, whereby existing elements were repaired or patched rather than replaced. Generally, traditional materials were required, appropriate to the building's age and condition and in accordance with the vernacular tradition of the area, though modern structural interventions, such as metal ties

or braces, were permitted where these would support the retention of historically significant features. All architects preparing management plans were required to be conservation accredited and only contractors with proven experience and ability of working on building conservation projects were used.

2.3 Budget

The total budget initially allocated to the capital repair phase of the scheme for all five National Parks was £2million, though this was eventually increased to £8million in response to the amount of interest and high costs. Grants covered the following items:

- £1,100 allocated to the National Park Authority (or an agent appointed by the applicant) for each building project. This covered preparation of the project brief, obtaining quotes from conservation-accredited architects, and provision of assistance to building owners with the application process;
- 100% grants to applicants to cover architects' fees for the production of management plans and repair schemes, wildlife and technical surveys, and overseeing tendering.
- 80% grants toward building repairs.

2.4 Grant Application and Selection Procedure

The grants were advertised and expressions of interest invited from building owners. Before being considered for grant aid, all potential projects underwent a scoring process to determine their eligibility based on significance, vulnerability and public benefit. The final selection was made by a panel consisting of representatives of the different organisations involved.

Once appointed, the project architect prepared a detailed management plan for each building including a specification for proposed repairs. Other specialists contributed a structural condition survey, an ecological survey, and a historic building appraisal. Once agreed, the architect oversaw the tendering process and appointment of building companies.

3. Case Studies

In the following pages, two of the buildings included in the scheme are briefly described, together with some of the challenges that arose during conservation works and their solutions.

3.1 Beckhams

Fig. 1. Beckhams Linhay. East elevation following repairs (Source: Copyright Historic England Archive, Davies, 2021).

The architect for this project was Martin Sturley-Hayes of Jonathan Rhind Architects. The structural engineers were Paul Carpenter Associates.. The Historic Assessment was carried out by John Thorp of Keystone Historic Building Consultants.

3.1.1 Description, Significance & Condition

The building is a lofted linhay dating from the late 18th century (Thorp, 2019). Open-fronted linhays are a distinctly Devon building type, being found only rarely elsewhere in Britain. The ground floor is a cattle shelter open on the side facing a fold yard, which allows the beasts to wander in and out of the building according to the weather, time of day etc. In this case, the linhay is built into the slope of the hillside at one end, allowing access to the *tallet* (hayloft above the shelter) from a ground-level door at the south end. The linhay walls are granite and mudstone rubble bedded in mortar consisting of lime and decayed granite sand (*growan*). The drystone foldyard walls are formed of moorstone granite

boulders. The typical, oak A-frame trussed roof is clad in corrugated iron, but would originally have been thatched, The tallet, once also open on the side facing the yard, is now clad in corrugated iron. There is an owl hole in the north gable to encourage roosting barn owls and help control rats.

Beckhams linhay is significant as a particularly fine example of its type, complete with foldyard and still in use for its original purpose. It stands adjacent to an ancient droving route leading to the high moor from the lowlands to the south-east, and its setting on the woodland edge is very picturesque. The building is not listed.

Fig. 2. Beckhams Linhay. North elevation following repairs (Source: Copyright Historic England Archive, Davies, 2021).

The structural survey found the corrugated iron roof to be corroded and leaking, and the rudimentary asbestos rainwater goods to be inadequate.

Fig. 3. Beckhams Linhay south gable before repair (Source: Jonathan Rhind Architects, 2019).

Once abundant ivy had been removed, the masonry was revealed to be generally sound, though there was a full-height vertical crack in the west wall caused by historic differential movement. In addition, significant water ingress was occurring at the base of the walls (caused in part to a natural spring) which had washed out bedding mortar and loosened the masonry. The joists and boards of the tallet floor were rotten in places, again as a result of water ingress.

The ecological report found evidence of nesting barn owls but no bat activity.

3.1.2 Repairs

The roof cladding was replaced with new corrugated galvanised steel sheeting, and new galvanised rainwater goods were installed. Reinstatement of thatch would not have been practicable due to its high cost and ongoing maintenance liability; it would not be considered a suitable material in this wooded location (with overhanging trees preventing the roof from being dried by the sun and risking drip damage). In any case, corrugated iron has essentially gained honorary vernacular status in Devon, having been the material of choice in the 20th century to replace failing thatch. It should be mentioned that thatching today is often carried out using water reed harvested overseas in Turkey, or even China, rather than wheat from Devon, and where this is so, it is clearly neither authentic nor vernacular. On the other hand, corrugated iron provides an honest, cheap and durable substitute.

To address the crack in the west wall, stitch repairs were carried out using *Helibar* ties bedded in lime mortar. Elsewhere, masonry was consolidated with lime mortar and re-used stone.

Existing bedding and pointing mortars were analysed in order to achieve as good a match as possible. The growan originally used as aggregate would have been quarried near the site, but in this case, following mortar analysis by The Cornish Lime Company, was substituted with local sands and grits matching it in colour

and grain distribution. Lime putty was used as the binder. Following replacement of rotten joists, a new floor of replacement Douglas Fir boards was laid in the tallet. The existing corrugated iron cladding was retained on the east wall of the tallet for the sake of practicality, continued wildlife use and prevention of water ingress. An owl box was introduced to encourage their continued presence in the building.

Fig. 4. Beckhams Linhay. Tallet interior looking south following repairs (Source: Copyright Historic England Archive, Davies, 2021).

3.1.3 Summary

It is very satisfying to see this traditional building consolidated and retained in its original use – as a shelter for cattle with hayloft over. It stands next to a public right of way and can be appreciated by members of the public. The building owner did raise concerns about the high cost of what was a straightforward conservation project and this was an issue that often came up on other projects as well. Inevitably, with involvement of conservation architects and other specialists, use of traditional techniques and materials, and lack of corner-cutting, the final cost of these projects tended to be higher than if grant aid had not been sought; however, the overall quality achieved was high, and the finished projects serve as an exemplar for conservation of these buildings.

3.2 Pizwell

The architect for this project was Martin Sturley-Hayes of Jonathan Rhind Architects. The structural engineers were Paul Carpenter Associates.. The Historic Assessment was carried out by John Thorp of Keystone Historic Building Consultants.

Fig. 5. Pizwell barns (north side) following repairs (Source: White, 2021).

3.2.1 Description, Significance & Condition

The ancient hamlet of Pizwell is made up of a group of three longhouses and their associated farm buildings. The earliest longhouse on the site dates to the 14th century and still has a domestic shippon; the two others are thought to be 17th century in date (Thorp, 2019). The grant-aided building comprises a pair of 17th century, conjoined threshing barns, which are recorded on the 1840 Dartmoor Forest Tithe Map as belonging to the two later longhouses, respectively. Pizwell Farm is leased by the occupants from the Duchy of Cornwall.

Fig. 6. Pizwell shown on 1840 Tithe Map (The building occupies plots 537 and 567) (Source: Devon County Council).

The barn walls are constructed of moorstone granite rubble, and the roofs are clad in corrugated iron. In the early 20th century, the building wall height was raised, and a new

kingpost truss roof introduced. A photograph of 1889 shows the building with a thatched roof before these alterations. As was usual for hand threshing barns, there are opposing doors at each side of the threshing floors (those in the south wall set much higher due to the raised ground level).

These barns show how farming practices on this ancient site evolved, with the introduction of small barns for threshing, storage and processing of crops. The barns are listed Grade II.

Fig. 7. Build-up of spoil and tree growth against south wall prior to excavation (Source: Jonathan Rhind Architects, 2019).

The buildings had suffered from the twentieth century build-up of rubble and earth spoil against their south wall. This had exacerbated water penetration, washing out pointing and bedding mortar and loosening the masonry. Furthermore, both the south and west walls had been further damaged by the roots of adjacent ash trees. A full-height vertical crack in the NW corner had been made worse by attempted repairs using Portland cement. The corrugated iron roof was rusty and let in water, and door lintels were rotten, or had been replaced with slender angle irons.

Barn owl pellets on the floor indicated use of the building as a roost, but no nest was found. There was no evidence for bat use.

3.2.2 Repairs

The first task specified was to remove the ash trees and excavate the spoil build-up on the south and west sides. This allowed a thorough inspection of their outside face and revealed the extent of damage caused by tree root penetration. In the event, part of the west gable had to be rebuilt. As at Beckhams, stainless steel Helibars were used to tie old masonry to new. Another modern intervention was the placing of a root barrier membrane between the wall and earth to help prevent root penetration from reoccurring.

The extent of repointing was greater than had been originally specified due to water damage on the south and west walls; even so, it was only carried out where absolutely necessary. As at Beckhams, Full mortar analysis was carried out and matching material specified.

Fig. 8. North side of west gable following rebuilding (Source: Jonathan Rhind Architects, 2021).

The corrugated iron roof was replaced and new seasoned oak lintels put in place. As there are no gutters or downpipes, a French drain was installed along the south wall to divert water away from the building.

Fig. 9. Sleeper walls of former suspended threshing floor (Source: White, 2021).

During the course of works, the granite sleeper walls of a rare, suspended timber threshing floor were discovered and these were duly recorded by the archaeologist. The floor have been formed of oak baulks laid over the exposed void, with granite flagstones on either side. Once recorded, the voids were back-filled with subsoil from the rest of the site to match the surrounding area.

Fig. 10. South wall following repair (Source: White, 2021).

3.2.3 Summary

The upper part of the building had become abandoned due to water ingress, and was at risk. The grant aided works have consolidated the barns, made them fully useable again by the farmer, and ensured their survival as part of this important historic group. A public bridleway passes close to the building, meaning also that it can be appreciated by the public.

4. Conclusions

The two case studies above can only touch on the wider outcomes of the scheme, but at least give a flavour of the kind of issues encountered and approaches to resolving them. The other eleven projects included a diverse range of building types, including a grand 1830s bank barn; a modest 19th century mine building now used for agriculture; a former medieval farmhouse now incorporated into a farm shed; an impeccably detailed, late 19th century hunt stable; and the grand, model farm building at Great Cator (see photo below). The last two examples cannot be described as vernacular buildings, having been designed in accordance with the latest theories and practices of agriculture that swept through much of Britain in the 19th century.

Fig. 11. Great Cator Barn during work (Source: Copyright Historic England Archive, Davies, 2021).

Each project has thrown up its own challenges, whether these were technical, philosophical, or around owner expectations. However, in all of them, repair specifications were informed by a good understanding of the buildings' original construction. For example, on sites where analysis revealed that 'hot lime' or subsoil based bedding mortars were used, this same technique was successfully replicated.

Fig. 12. Flitch plate repairs to feet of principal rafters at Great Cator (Source: White ,2021).

In all cases, an ethos of repair rather than replacement has been followed; take for example the roof at Great Cator, where only the rotten ends of the Baltic Pine principal rafters were replaced, with flitch plate repairs ensuring minimal replacement of original material.

It is notable that following repair, all these buildings continue to be in agricultural use. The grants have enabled them to be conserved without being converted to dwellings or holiday cottages – a fate that that has befallen too many farm buildings in the area.

References

Fox H., (2012). Dartmoor's Alluring Uplands – Transhumance and Pastoral Management in the Middle Ages. University of Exeter Press Ed. Exeter.

Beacham P., Child P., Cox J., Laithwaite M., Thorp J. (1990). Devon Building: An introduction to local traditions. *Devon Books,* Ed. Tiverton.

Natural England, Historic England, the Rural Payments Agency et al. (2018). *Pilot Scheme Success in Restoring Historic Barns* https://historicengland.org.uk/whats-new/news/pilot-scheme-success-restoring-historic-barns/

Rural Payments Agency, Department for Environment, Food & Rural Affairs, Forestry Commission, and Natural England (2018). *Historic buildings restoration grant: Countryside Stewardship*. https://www.gov.uk/government/publications/historic-buildings-restoration-grant-countryside-stewardship

Thorp, J.R.L. (2019). Field Barn 400m north of Beckhams, Manaton © Keystone Historic Building Consultants.

Thorp, J.R.L. (2019). Barns to west of Old Pizwell, Dartmoor Forest © Keystone Historic Building Consultants.