

The Palaeoethnobotany of *Pteridium aquilinum* (L.) Kuhn (Bracken): Myriad past and present uses from documentary evidence and the archaeobotanical record

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Introduction

Pteridium aquilinum (bracken) is one of the most widespread of all plant species, found in every continent except Antarctica (Marrs and Watt 2006). In Britain it is particularly abundant in upland areas in the west and north of the country. A perennial plant, it survives the winter as underground rhizomes. The rhizomes are highly damaging to buried archaeology (Figure 1), while above ground fronds obscure archaeological features and outcompete other vegetation (Pakeman *et al* 1995). Bracken control methods fall into two main categories:

- 1) Physical: removal by cutting, pulling, flailing, crushing and/or grazing.
- 2) Chemical: spraying with asulam or glyphosate.

Follow-up treatments and re-seeding with grass etc are also required (SEARS 2008).

The spread of bracken over the last couple of centuries is believed to result from economic changes and a decline in traditional farming methods, in particular the change from cattle to sheep rearing on marginal areas coupled with the cessation of the harvesting of bracken as a useful and valuable resource (Figure 2). The recognition that bracken contains chemicals with carcinogenic, cytotoxic, mutagenic, tumorigenic and teratogenic properties, with the quantities of toxins greatest in young emerging fronds, has further limited its use (Marrs and Watt 2006, 1306).

Once harvesting is discontinued and if no control methods are applied, bracken is able to grow unchecked. In addition the accumulation of dead fronds underneath the plants serves to smother other vegetation and protect the rhizomes and young fronds from frost damage, removing another check on its spread.



Figure 1 Bracken rhizomes exposed within a Bronze Age round-house on Dartmoor (Dartmoor Archaeology & Bracken project 1999 <http://www.acearch.org.uk/brackenreports.htm>).



Figure 2 Mowing bracken in August 1949 at Kirkstone Pass, Cumbria.

Traditional uses of bracken

The traditional uses of bracken in the medieval to post-medieval period are outlined in Table 1. It was mainly used for bedding, and was an important thatching material until the 16th/17th century when slate and other stone roofing materials became more readily available (Winchester 2006). The decline in the use of bracken for thatching however was off-set by an increase in the demand for bracken ash, principally for glass making but also in soap manufacture and as a bleaching agent (Winchester 2006; Rymer 1976). Another important use of bracken was as a packing and insulating material, although the quantities used are difficult to establish from documentary records. Green bracken fronds were used in particular to pack soft fruit and fish. When the green stems are crushed they give off cyanide which helps prevent decay whilst other bio-chemicals within the fronds act as insect repellents. Even up to the 1970s fishmongers in Britain displayed their wares on plastic green fern fronds, a modern echo of a traditional practice (Page 1988, 27, Figure 3). Ferns, including bracken, were still used to display fish until very recently in places such as the Kadikoy fish market, Istanbul (Figure 4).

Bracken was used as a packing and insulating material for keeping crops over the winter. Potatoes and other root crops were stored in root clamps after harvest until needed. A thick layer of bracken about 0.75m wide was laid down and the potatoes, as clean and dry as possible, were put on top, tightly packed together. A layer of bracken was placed over the potatoes followed by another layer of potatoes. The whole was finished off by a 15cm layer of bracken. This was then covered with a thick layer (30cm or more) of earth dug from the sides of the clamp or with turves or peat. Sometimes stakes were placed along the centre of the clamp during construction and then pulled out after the clamp was finished. The resulting holes served for ventilation, the tops being stuffed with bracken to keep the whole dry. These clamps were opened as required and the potatoes put through a coarse sieve to remove the bracken and any waste soil (Hartley 2012, 140-1; Page 1988, 27; Figure 5).



Figure 3 The fish and meat counter at Slater's, Kensington High St. in 1909. Note the fern baskets hung above the counter.



Figure 4 Fish displayed with fern at Kadikoy fish market, Istanbul.



Figure 5 Opening a potato clamp in rural Norfolk. The used bracken is seen in the foreground.

Archaeobotanical evidence from southern England

There are over 80 records of bracken in archaeobotanical assemblages from southern England. The earliest evidence comes from the South Street Neolithic long barrow, near Avebury, Wiltshire (Ashbee *et al* 1979). The buried soil sealed beneath the barrow contained charred fern tracheids and abundant bracken spores along with animal bone and flint debris within a cultivation horizon. As the monument is sited on chalk drift it is unlikely that bracken was growing *in situ*. This suggests that both burnt bracken (ash) and unburnt bracken were used as fertiliser on the cultivation plot with the unburnt bracken forming a component of re-deposited occupation debris. Similarly, bracken pinnules, preserved both by charring and mineral-replacement, were recovered from the Middle to Late Bronze Age extensive midden deposit at Potterne, Wiltshire (Carruthers 2000; Straker 2000). This material is likely to derive from disposal of animal bedding or fodder onto the midden, though bracken may have grown on the midden itself and been preserved *in situ*.

From the Iron Age onwards small amounts of bracken have been recorded in a wide variety of features and at different types of site. In most cases these records probably relate the disposal of spent animal or human bedding, thatch or flooring. Charred bracken pinnules were present within pits associated with the Early Iron Age settlement at Nettlebank Copse, Hants, and within the ditch fills of the Late Iron Age banjo enclosure at the same location (Campbell 2000). At West Hill, Uley, Gloucestershire, a Roman religious complex, the disposal of stable waste is suggested by the recovery of mineral-replaced bracken pinnules and goat droppings from a latrine pit (Girling and Straker, 1993). A few frond fragments preserved by waterlogging were found in association with numerous *Ulex* sp. (gorse) shoots in a middle Roman waterhole within a rural settlement at Thorpe Lea Nurseries, Surrey (Robinson 2012). The insect assemblage from the same deposit was more typical of old, damp hay or straw from within a building rather than foul waste, so this material could represent unused bedding that had deteriorated in storage.

The use of bracken as a component in daub is suggested by the identification of a pinnule fragment in material from an early Roman site at Newhaven, East Sussex (Arthur 1976). The use of bracken in thatching is demonstrated by the recovery of bracken within faggots of gorse forming a solid thatch roof at Stanton St John, Oxon, and as remains with medieval soot blackened thatch (Letts 1999, 16, figures 29b, 29c).

Charred rhizomes used either as food or fuel were present within Iron Age/Roman fire-ash and refuse from Wookey Hole caves, Somerset (Reid 1911). More definitive evidence for the use of bracken as fuel comes from medieval Dover, Kent at Townwall Street (Campbell 2006). Charred bracken along with *Calluna vulgaris* (heather) and gorse remains were found together with

Part/condition	Use	Harvest method/month
Young fronds (unfurled)	food: green vegetable (figure 6) fodder: boiled and fed to pigs fodder: raw for rabbits dye: light green	Cutting in April or May
Mature fronds (green)	thatch packing material including fish and soft fruit fuel for baking and brewing fuel for brick making and lime production mulch and compost under-floor insulation fodder – once dried dye: brown	Cutting or pulling from August
Mature stalks	thatch	Cutting or pulling from August
Mature fronds (brown)	bedding/litter: for humans and animals foundation for hay stacks and use in root clamps packing material including roofing slate	Mown from end of September
Ash	soap – on its own, or with tallow potash flux (alkali) in glass making fertiliser bleaching agent for wool and linen	July or August. Special braken pits were dug in some areas
Rhizomes	infusion – an anthelmintic for humans and pigs food: dried and made into flour for bread fodder: dried and made into meal for cattle dye: yellow thatch brewing as a hop substitute tanning	Digging – season not specified
Smoke	insect repellent and fumigator induces rain to fall	Not specified
Spores	makes you invisible 'We have receipt of fern-seed, we walk invisible' Henry IV, Part 1, II, i, 95	Collection on mid-summer night

Table 1 Traditional uses of bracken (sources Hartley 2012; Mabey 1977; Page 1988; Rymer 1976; Winchester 2006).

sprouted oat grain in a 12th/13th century pit fill, suggesting heathland plants were collected and used as a fuel to parch malted grain. There was good evidence for malting and brewing within other contexts at this site as well as ample evidence for fish processing, raising the possibility that bracken might also have been brought to the site for packing fish.

Use of bracken as stuffing or packing material is demonstrated by the recovery of waterlogged remains from the wreck of the Mary Rose, which sunk in the Solent in 1545 (Smith and Green 2005). Bracken was found associated with textile fragments and was abundant in samples from the Orlop deck, the main storage deck for food and equipment. Bracken from post-medieval dumps at Temple Back, in Bristol, Avon may also derive from packing. However, given the importance of soap and glass manufacturing in the city, bracken would have had many potential uses and users (Stevens in Egging Dinwiddly and Chandler 2011). Similarly, at Fore Street, Taunton, Somerset (Greig 1988), bracken remains were found associated with *Reseda luteola* (weld), possible *Linum usitatissimum* (flax) and *Dipsacus fullonum* (teasel) along with a wealth of other remains in a deep 16th century pit forming part of a pit complex connected by shallow channels. The insect remains did not suggest the presence of stable waste, so it is possible that this material maybe connected with cloth processing and/or cleaning (Greig 1988; Burrow 1990).

Bracken in the 21st Century

Currently land managers, conservationists and archaeologists are continuing to work together to control the spread of bracken and to eradicate it from sensitive areas including archaeological sites. This normally involves a combination of different control methods including grazing areas with traditional breeds of cattle; these help control re-growth by trampling or crushing emerging fronds. There is also a growing understanding of the need to remove bracken litter from a site following cutting or spraying in order to give other, more desirable, vegetation a better chance. At the same time bracken is starting to be used once again, in particular for making peat-free compost, thus using one resource to help conserve another.



Figure 6: Ferns for sale at the Ura Yachoe (festival) in central Bhutan. Lots of salt is used in cooking these ferns to leach out the harmful chemicals.

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