

Towards a Register of Exmoor's Natural Capital

Technical Appendix



Report prepared for the Exmoor Society
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Introduction

This document is the Technical Appendix for a study undertaken between October 2017 and May 2018 by Rural Focus Ltd on behalf of the Exmoor Society. The main report is titled ‘Towards a Register of Natural Capital on Exmoor’ for which the Technical Appendix provides the supporting information. Both documents are available here: <https://www.exmoorsociety.com/content/publications/reports-2>.

This Appendix contains supporting evidence and other material that was prepared during the study, for which there was not room in the main report. This includes 1) a paper written for this study by Dr Keith Howe on the economic foundations to the register of natural capital; 2) a short review of previous work on natural capital and cultural ecosystem services; 3) a summary description of the natural capital assets providing each of the key services on Exmoor; 4) the full structure of the proposed classification of natural capital assets; 5) a review of the data sources used to describe individual assets; 6) the outputs of the register for the three pilot areas (as maps and text); and finally 7) worked examples showing how the register produces metrics of natural for specific services, suitable for use in natural capital accounting.

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1. Economic Foundations

A paper by Dr Keith Howe, Senior Research Fellow in the Centre for Rural Policy Research, University of Exeter, Trustee and Vice-Chairman of the Exmoor Society and member of the Steering Group for this project.

Introduction

Natural capital is a deceptively simple concept. At one level that is an advantage, because it aids understanding; at another, its simplicity can cause problems when attempting to translate the concept and related principles into relationships to be measured with the purpose of practical application. Crucially, the concept of natural capital serves to remind us that sustaining human life depends entirely on people's ability to make use of raw materials and natural systems bequeathed to us by the universe, and which originate in processes that have existed independent of people's presence since time immemorial.

The economic problem is that raw materials provided by nature and, by association, the natural systems that depend on them, together constitute resources that are typically scarce. In contrast, people seem to have unlimited needs and wants, hence unavoidably we must make choices about how best to allocate and use those scarce resources for our benefit. Access to food, water and shelter are basic human needs. But as our standard of living improves and those needs are satisfied other wants come into play. For instance, land initially valued exclusively for agricultural production later becomes increasingly valued also for its contribution to a beautiful landscape.

The growth and global scale of people's demands on scarce resources, some of which are replaceable (e.g. forests) and others not (e.g. oil, mineral ores), currently are such that overexploitation and wastage puts the future for humanity and its quality of life in jeopardy. Unless the value of all our diverse and increasingly scarce resources is realised and sensibly measured, there is no rational basis for deciding how best to replace, enhance, foster and maintain our literally life-sustaining capacities for the long term.

A. BASIC PRINCIPLES

Natural resources and natural capital

Helm (2015) sees natural resources as part of natural capital. But in the evolution of economic ideas natural resources are land, water, flora and fauna, oil and mineral ores, all of which exist independent of human presence and intervention. The important distinction between a natural resource and capital is that capital is the result of people mobilising those resources already provided by nature to produce intermediate products used as inputs (created resources) in the process of satisfying their final demands. In other words, people take what nature provides and apply their ingenuity to transform natural resources into a more useful form, capital.

Asked what is meant by 'capital', most people probably think of financial capital, an ingenious human creation of various means (in the banking system, nowadays often electronic) to signify rights to access and use the real resources to produce the real ultimate objects of people's needs and wants. Real resources include tangible

buildings and machinery, and another is intangible human capital. For instance, when students invest their borrowed or saved money to acquire new knowledge and skills in further or higher education, their intention is to enhance their qualities as both resources and citizens.

Both dimensions of human capital are relevant to how society views the natural capital at its disposal, because people are both producers and consumers of what natural capital provides.

On the one hand, the better people are educated to understand and intervene constructively in natural processes, such as by applying scientific and technological knowledge to agricultural production, forestry, fisheries, and water, the better equipped is society to husband its natural capital assets. On the other, as people extend their horizons from all sources, potentially they acquire a better appreciation of why nature is fundamental to our human well-being. In other words, as consumers of all that nature provides, understanding in turn shapes our preferences. Moreover, people's preferences change over time, such as wanting nature more for its landscape qualities than agricultural production when we are wealthy enough not to worry about having sufficient to eat.

Public and private goods

The focus of the report is Exmoor's natural capital, which entails first defining what it produces for people's benefit as private and public goods, thus to identify its constituent parts – the individual specific assets - that as a separate exercise need to be valued in money units as a basis for policy decisions. But first another definitional issue must be addressed.

In public discourse surrounding natural capital, and especially the UK Government's "A Green Future: Our 25 Year Plan to Improve the Environment", the idea of a 'public good' is sometimes misunderstood. One source of confusion may be generic use of the word 'good', either because it suggests something morally desirable, or physical; in practice, a public good may be an intangible service (another reason for confusion¹), such as provision of a tranquil environment. Because so much focus currently is on the environment, farmers understandably (if mistakenly) assert that conventional agricultural production must not be forgotten for its contribution as a public good. However, what is good for the public is not a public good!² In economics, a public good is formally defined as one whose consumption is non-rival and non-excludable.

Cattle and sheep for meat, for example, are private goods; one butcher's purchase of live animals for slaughter and processing excludes anyone else from buying the same ones and benefitting from the income earned from selling the processed products, just as one person's consumption of meat on a dinner plate excludes someone else from eating and enjoying the same portion. For such private goods, normal market prices usually take care of people's valuations of the products at different stages of the production process from farm to fork.

¹ In economics, normally a distinction is drawn between goods (tangible) and services (intangible).

² To be pedantically correct, not only; but the point here is about the definition.

Public goods are different. For example, one person's enjoyment of an Exmoor view neither prevents others from enjoying it at the same time (non-excludable), nor typically³ diminishes the level of that one person's enjoyment (non-rival). It is because of public good characteristics that there is no incentive for the private sector to produce them. For instance, Exmoor farmers have no incentive to produce a landscape specifically for visitors to enjoy (except from their own benevolence) because they will incur the costs without recouping their outlays by a commensurate return; it is the nature of things that visitors normally would be able to enjoy the view for free. Only if it is possible to ring-fence such an area and charge admission, as National Trust properties commonly do, that the benefits are obtained from a private good instead of public. There are good practical reasons why, say, Selworthy Beacon and Foreland Point are free access. The distinction between public and private is not always unequivocal.

The state or its agencies, such as Exmoor National Park Authority, assumes responsibility for providing public goods in society's interest when the private sector will not. Importantly, absence of a market price in money terms does not mean absence of value, only that something has the kind of characteristics that preclude it from market activity. Finding ways to value non-market products is a task for environmental economists. Moreover, the things people want from a resource must be identified before it is valued, because the value of a scarce resource is related to the benefits (value) people expect to obtain from the things it produces; if in any doubt, try selling something no one wants.

The meaning of 'value'

Most people equate value with how much money they spend on something. However, money tells us something about value, but not everything. In general, the more money we are prepared to spend on something the more we must value it. But if, say, we consider something a bargain, it means that how much we spent on it was less than we would have been prepared to spend. The latter is its true value to us, not how much money we spent. Unfortunately, it is much easier to observe what is actually spent on a good or service than to discern how much people are prepared to spend; in practice, it is often impossible. To repeat, absence of a money price does not mean absence of value; rather, it is indicative of 'market failure', the fact that some things of value have characteristics which make them not amenable to market pricing, or at least not without help.

For example, quantifying the money value of Exmoor sheep output for a given year is relatively straightforward; record annual sales revenue for finished and store sheep, also breeding ewes, rams and lambs intended for breeding, adjust for opening and closing inventories, make certain other adjustments (e.g. losses from mortality), and add them up. But the value people obtain from enjoying an Exmoor view, say from Winsford Hill to Dunkery, has no monetary equivalent. The best we can hope for is to estimate a money value by some indirect method, such as calculating how much it costs people to drive to the viewpoint in terms of fuel and other directly related costs.

³ Typically, because the simultaneous arrival of a coachload of tourists at the viewpoint might well undermine the non-rivalry criterion!

Why money matters

When we spend money on something, in effect we cast a vote, express a preference for it. A difference is that, unlike in a UK general election for instance, we can cast more than one money vote (say £1) at a time. How many £'s we spend signals the strength of our preference or, when considering spending on a range of products, our relative preferences. So, if someone enjoys eating roast lamb more than roast beef, they will be expected to pay relatively more for lamb than beef for the same quantity of meat. In both cases the retail prices have derived effects down through the supply chain, from wholesale prices for processed meat to the prices received by farmers for their live animals intended for meat. If preferences change, so will prices and, as a result, the numbers of cattle and sheep produced by farmers. By association, the mix and quantities of resources used in farm cattle and sheep production will also change – the land areas devoted to their forage crops and grass, fertiliser applied, supplementary feed, labour hours expended on each, and so on.

But what of the things people value but have no money price, such as the beautiful views from Winsford Hill? For reasons given above, an erroneous interpretation would be that the view is therefore of no value. Even to recognise the error is insufficient to avoid unintended bad consequences. As Bateman and his colleagues (2013) show, summarised in Bateman and Howe (2018), unless a money value is assigned to those things for which markets do not provide a price, society gets an inefficient allocation of resources in terms of making the best use of them to obtain the highest possible level of benefits for people. A beautiful view is as much a product as are animals for meat, just two examples from many actual and potential uses of scarce resources. But even if it is delusory that public goods have zero value because they have zero money price, changes in the market prices of private goods (and of the resources used to produce them) nevertheless will have repercussions for public goods supply. A familiar illustration is the consequences of government price support for farm products, which is widely considered as being detrimental to the environment, e.g. by encouraging intensification, causing habitat loss for insects and birds, nitrate pollution of rivers, damage to soil structure, antibiotic resistance in people, and so on.

A major role for environmental economists is therefore to devise methods to elicit monetary valuations for non-market goods. If it turns out that some sources of benefit defy reliable monetary valuation, there is no alternative to concede the fact while still not forgetting that zero or undefinable money price does not necessarily mean zero value. That is why the institutional framework for decision-making is also important, so that people's different perceptions of values are debated, compromises reached, and outcomes agreed. In Exmoor, the National Park Authority, Hill Farming Network, Exmoor Society, National Trust, Royal Society for the Protection of Birds, are prominent institutions in the policy framework. In other words, political votes and money votes both have roles to play in policy decision-making.

B. EXMOOR ECONOMICS

The ideas set out above can be refined and summarised as follows. The basic economic problem is simple; people have many different needs and wants and must satisfy them as best they can by producing goods and services from limited resources. Unavoidably, choices must be made about what combination of the products

obtained is most likely to improve, preferably optimise, people's sense of well-being. The outcome of the choices made by individuals (including as members of groups) is a collective valuation by society of all the alternatives available to them given the resource constraints. It follows that decisions about how scarce resources are used depend on a) how much people value the various products obtained from their use, and b) technical relationships between things produced and scarce resources used to produce them. Benefits are the value of things to people, and costs what is foregone to obtain them.

Figure 1 illustrates the general relationships, supplemented by Exmoor as a special case. The left-hand column shows that the general context is what people want and the technical links between production and the resources used. The right-hand column shifts perspective to the context of Exmoor and natural capital, "the factor of production upon which the others – man-made capital, human capital and labour – all depend." (Helm, 2015, page 60). A caveat therefore applies to the Exmoor column. It is that natural capital is highlighted to the exclusion of explicit mention of the capital and labour resources, both dependent on natural capital, and indispensable for production.

Exmoor's ecosystem services

In Figure 1, the centre column links the general principle (left-hand column) with Exmoor (right-hand column), serving to emphasise that Exmoor is one specific instance of the general case. The National Park is a collection originally of natural resources, namely the most basic means of production nature provides, subsequently transformed by human activity into intermediate products (capital) with the objective of being used to enhance people's ultimate sense of well-being. So, Exmoor is indeed natural capital.

'Used' is meant in a broad sense. At one extreme is farm production of cattle and sheep, examples of tangible private goods destined as food for human consumption; at the other are public goods, a prominent example being people's enjoyment of an intangible service, Exmoor's beautiful landscape. All represent sources of the flows of benefits people obtain over time from natural capital, called ecosystem services. These have become conventionally classified as [provisioning services](#) such as food and water; [regulating services](#) such as regulation of floods, drought, land degradation, and disease; [supporting services](#) such as soil formation and nutrient cycling; and [cultural services](#) such as recreational, spiritual, religious and other non-material benefits.⁴ The final products obtained from Exmoor's natural capital encompass all of these.

Exmoor's natural capital

Natural capital is wanted as means to an end, obtaining ecosystem services for people's benefit, and not for its own sake. Moreover, it can depreciate with age and negligence, appreciate by net investment, or simply be maintained in its current state. But there are important implications of the ways change occurs in its specific components, the different kinds of assets that make up Exmoor's aggregate natural capital.

⁴ https://en.wikipedia.org/wiki/Ecosystem_services

In its designation as a national park Exmoor, by definition, exists to be a public good provider. It satisfies the criteria of providing sources of benefit flows that are neither excludable nor rival. Yet it has private good elements, notably its farming, tourist facilities, and paid recreational activities such as horse riding and field sports. The question arises as to how to accommodate the two dimensions simultaneously, private and public. The answer is found in the fact that people’s experience of Exmoor as a national park is an amalgam of benefits obtained from both components.

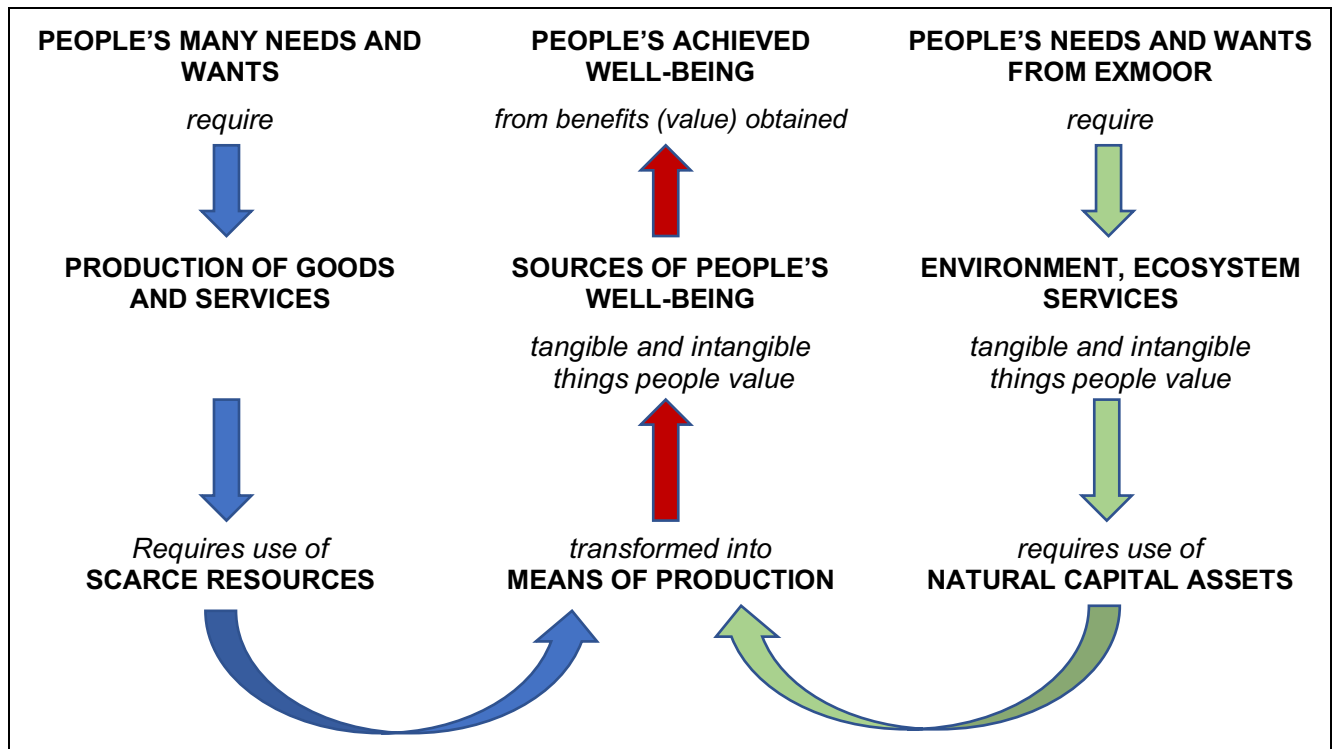


Figure 1. Exmoor’s natural capital contributes to people’s well-being

At landscape level, people enjoy what they see not because of its separate attributes, but because what they experience is more than the sum of the individual parts. Consider again the view from Winsford Hill towards Dunkery Beacon. It comprises distant views of diverse moorland, woodland, livestock farms, and of natural flora and fauna. Deer may be glimpsed. At an opposite extreme a single hedgerow may comprise, say, almost all beech or, by contrast, a highly complex mixture of vegetation (gorse, infant oak, beech, hawthorn, willow herb, etc.) known to be an exceptionally favourable habitat for small rodents and birds, i.e. especially biodiverse, and thus considered to be of special ecological importance.

What is observed is an amalgam of private and public goods; the visual aspect of the cattle and sheep in view is obtained because of market price incentives for their production from inputs also having market prices, with the farm holdings – houses, barns, equipment, cattle sheds, field crops, hedges, walls and general layout – all being the outcome of the economic fortunes of farming over time, as well as the technological possibilities becoming available to farmers.

The crucial point is that what people enjoy from the view (public good) is partly a by-product of commercial farming (private good). The woodland may similarly be a source of private goods, if established or maintained for commercial gain, perhaps as gamebird cover; it all depends on the circumstances. Deer people like to see

may be a cost to farmers if they encroach significantly on grazing land, thus competing with cattle and sheep. Yet society gets the benefit of the view for free. In economic terms it is a positive externality, a beneficial social outcome not explicitly accounted for by farmers when they take decisions in their own interest. A negative externality would be if the nature of farm price incentives underpinned by, say, the EU Common Agricultural Policy (CAP), caused Exmoor farmers to intensify their use of in-bye land for cattle and sheep to the detriment of grazed moorland.

It should be evident why it is unsatisfactory that some sources of benefit should have money valuations and others not; it affects allocation of resources, and so by implication natural capital, in ways which may lead to misallocation and consequent loss of sources of value to people which, mistakenly, are deemed worthless or so abundant that they can be exploited without constraint.

Towards an asset register

Before natural capital can be valued at all it is necessary to identify its individual asset components. Only from that basis is it possible to identify those sources of value that have money prices attached, and those which do not. For Exmoor, farming as a private good provider should not, in principle, be a problem. That said, such farm economic data as are most readily available relate only to some 15 recorded farms (Robbins and Fogerty, 2016). Their analysis on behalf of Exmoor National Park Authority and Exmoor Society show that Exmoor farms are heavily dependent on CAP money, especially direct income and environmental payments, to earn typically meagre net incomes. Post-Brexit agricultural policy needs current policy mechanisms to be reviewed and potentially radically altered to enable farmers, whose activities incidentally provide extensive public goods with no or minimal financial return, to be paid adequately for the wider benefits contributed on behalf of society.⁵ The three locations selected for the Deane and Walker for their exploration of scope for an asset register represent a major contribution to an essential task.

1. Tangible assets

At national park level Exmoor's natural capital comprises many individual components, many of them tangible and easily visible. From locations within the park, and looking inwards from places outside its boundary, its various configurations of moorland, woodland, farms, hedges, waterways and coastline that people see are the legacy of human activity from time immemorial. From its purely visual aspect, people on or near Exmoor derive value from what they literally see. The different components of its natural capital are physically present and readily observed, both those already mentioned and such ancient constructions as barrows, tumuli, old farmsteads, bridges and other typically long-established settlements with domestic and other buildings (e.g. churches) constructed from natural materials of local origin.

In the examples given, measurable physical units include, for example, stone wall and hedge lengths (metres), hedge density (cubic metres), areas (hectares) of moorland and fields, buildings density (built environment per unit of defined landscape area). Less visually obvious tangible elements include, say, numbers of species of flora and fauna present in a given area, and their density per unit area. Dispersion may be another relevant variable, such as number of farm homesteads scattered over a defined landscape area, or the number of

⁵ In other words, to internalise the externalities so that farmers are incentivised to provide all sources of social benefits.

distinct locations in which a given plant or animal species is found there. Importantly, the examples illustrate what, in principle, is required. It is not expected that the pilot study could be comprehensive.

2. Asset attributes

There are essentially two aspects to asset attributes, the factors that imbue assets with value that is not captured by quantities alone.

a) Technical

A simple example is a hectare of land (Quantity) farmed for crop or livestock production (Quality 1), which clearly has different qualities to a hectare of heather moorland (Quality 2). Clearly, such quality differentiation may reflect a whole range of still wider attributes. What matters is to identify the level of differentiation appropriate for decision-making.

For example, hedges of identical length and volume may be habitats for quite different plant and bird species; moorland may comprise heather as the dominant species, or sometimes bracken, also molinia. The crucial point is that for any given quantity of a natural capital asset there must be adjustment for quality differences which, in the case of flora and fauna, may be expressed by measures of biodiversity. Together, these may be defined as technical attributes of tangible natural capital. How far diversity is considered for monetary valuation depends on circumstances, for example accorded higher monetary worth for greater scarcity of a specific habitat (e.g. for Dartford Warbler or heath fritillary habitats), or role in a more extensive and fragile biological system. An example of the latter is wetland restoration for enhanced benefits from improved water quality and flood relief.

Similarly, if the animals include any or all of Exmoor ponies, Red deer, Red Ruby cattle and Exmoor Horn sheep, their presence may add value in the sense that they hallmark Exmoor as a very special place. Expressed another way, the presence of breed types that distinguish Exmoor as different from run-of-the-mill animal production and that people like to see are an additional source of value. They represent physical cultural artefacts of value just as much as do ancient churches, tumuli and barrows.

b) Cultural

A feature of the Exmoor Society project is the special attention paid to cultural aspects of natural capital. Ancient buildings and monuments are tangible symbols of deeper, intangible meanings. They embody things concerning ourselves, reminding us of how society has developed, and of beliefs once held or with meanings now lost to us in the passage of time. Outwardly they are physical artefacts constructed from local natural capital which, taken together, comprise Exmoor's cultural capital; but their design, construction, decoration and use are all manifestations of human activity and endeavour, enduring records of intangible societal beliefs and aptitudes evolved over long historical time.

Of a different kind, stories are told about places, such as how the 'woodman's follower' butterfly gets its name, or why an ash tree in the Brendon valley was known as a 'shrew tree' (Wilson-North, 2017). These are sources of value that transcend the physical manifestations of natural capital. By extension, the traditions and social histories of landowners, farm families and village communities are also the embodiment of what makes Exmoor special, as well as its long history of field sports and the characters involved. Regarding the latter, changing times have come to see these nowadays more often as social costs than social benefits, a negative value. Also, it does not matter that not all stories are true; Blackmore's 'Lorna Doone' attracts people to

explore Exmoor, and particularly to the fictional location of the Doone Valley in the neighbourhood of the real Badgworthy. Such intangible attributes are always associated with aspects of Exmoor's tangible environment.

3. Practical issues

Looking ahead, identifying natural capital assets as a basis for design of practical incentive systems demands answers to three key questions.

First, in conceptual terms, what level of aggregation is appropriate for decision-making? For example, an obvious distinction is between farmed land, moorland, and woodland; another is beech and non-beech hedges, the former considered symbolic of Exmoor landscape. The principle applies on any geographical scale; different landscapes may be ascribed different values according to assessment of their visual quality characteristics. These could include distance viewable, diversity of physical characteristics (topography, types of vegetation visible, aesthetic appeal of human settlements in the landscape, existence of seascape). But any such classification presumes the possibility of consensus among ecologists, archaeologists, and other interested parties, not least farmers, landowners, all people with tourism, recreational and sporting interests, and government.

Second, and self-evidently related to the above, who decides? The question echoes previous remarks about the importance of governance structures. Conflicts of interest, reflecting different subjective valuations, are inevitable. The outcomes will depend on the institutions for decision-making and the processes adopted, doubtless close to existing structures already mentioned.

Third, given data constraints, what is possible? The principles set out above serve as guidelines for setting up a natural capital asset register and a benchmark against which to assess progress. But it must be recognised that real-world constraints will force compromises to be made. That is a major consideration in Exmoor Society's exploratory project, 'Towards a Register of Exmoor's Natural Capital'. It also relates to public goods so that they are attributed monetary valuations to make them comparable with private goods as a basis for achieving more efficient outcomes in terms of higher social benefits. But measurement is for a subsequent stage, beyond the scope of the present Exmoor Society initiative. In all cases, technical and cultural, payment systems inevitably must be associated with configurations of tangible natural capital assets.

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2. Natural Capital and the Cultural Services – a short literature review

The main report states that the link between natural capital and cultural ecosystem system services is a neglected area in research which this study seeks to address (para. 1.8-1.9). However, the report also identifies that existing studies in the UK take different approaches on this topic (para. 2.14) and a consensus on the role, and definition, of natural capital in relation to the delivery of public goods and services is not yet apparent. This section provides a brief (and not comprehensive) review of existing work and identifies ongoing research.

Cultural services

There is widespread agreement that our natural environment provides society with many valued benefits that have a cultural basis. The Millenium Ecosystem Assessment (MEA) described these cultural services as “*the non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation and aesthetic experiences*”. Individual cultural services are defined in a variety of different ways but the UK National Ecosystems Assessment used the following set which has been widely accepted: Recreation & Tourism; Aesthetic values; Cultural heritage; Spiritual values; Education; Sense of place; Health benefits. As the main project report identifies, these can be set against a complementary set of provisioning and regulating services⁶.

An example of work that explored the value of these cultural services before the concept of natural capital became widely used in the UK is a project for Natural England in 2009⁷. This examined how the public viewed eight cultural services that are provided by landscapes. These services were sense of history (or heritage); sense of place (identity, home); inspiration (stimulus); calm (relaxation, tranquillity); leisure and activities (recreation); spiritual; learning (education); and escapism (getting away from it all). Through a series of individual interviews, the researchers questioned members of the public about what elements of landscape are responsible for providing the eight cultural services.

The research reached important conclusions about how cultural services are perceived by the public and what characteristics in landscapes (both natural and cultural) are responsible for providing these services. If these conclusions are viewed through the current perspective of natural capital, it is clear that cultural services depend on what the report terms ‘landscape features’ (i.e trees and woodland, boundaries, fields, industrial features, villages, water, moorland, etc) and also what it calls ‘landscape attitudes’ (such as natural versus man-made and perceptions of quality and condition). These two elements act in conjunction to inform people’s experiences and perceptions of landscape and the services and benefits they receive from it. The report states that “*people processed landscape not by picking out individual features but, rather, by absorbing a combination of features within an experience or view*”.

For some of the cultural services studied by Research Box *et al.* (2009), specific landscape features were more easily identified by interviewees as being important for their delivery (for instance a sense of history and

⁶ Paragraph 2.4 and Figure 2

⁷ Research Box *et al.* (2009) *Experiencing Landscapes: capturing the cultural services and experiential qualities of landscape*. Report to Natural England project NECR024.

recreation), whereas for others landscape attitudes and the overall character of landscapes were more significant (for instance the services of calm and escapism).

Cultural services – cultural capital?

There are often considered to be five types of sustainable capital from which society derives goods and services. These are manufactured, financial, social, human and natural capital⁸. This study is primarily interested in natural capital, but the relationship between this and the other types of capital bears scrutiny.

The concept of cultural capital does not fit neatly into the ‘five capitals’ model described above since it includes elements of both human and social capital. However, it is frequently used in the arts, heritage and museums sectors⁹ and is currently subject to discussion and research by the Department of Digital, Culture, Media and Sport in the context of the work on natural capital valuation by the Natural Capital Committee¹⁰. In relation to its use in the natural environment, cultural capital has been defined as: “*The factors that allow us to interact with each other and the environment, including values and beliefs, socially held knowledge as well as socio-political institutions*”¹¹.

This dependency between natural and cultural capital is recognised internationally (for instance in the Charter of Rome on Natural and Cultural Capital produced during the period the EU’s Italian Presidency in 2014¹²) but this has perhaps received less attention to date in the UK, particularly in relation to natural capital valuation. Cultural capital is not described separately in the work of the UK Natural Capital Committee but it points out that “*natural capital can be regarded as the source of all other types of capital: whether manufactured, financial, human or social*”¹³.

It would be tidy to define cultural capital as the assets that provide the flow of cultural ecosystem services (and natural capital as the assets that provide regulating and provisioning services). However, this is too simplistic an assumption since, as Jones *et al.* (2016) identify, cultural capital is often required to realise (or unlock) the flow of all ecosystem services. For instance, this study has shown that the knowledge and customs used by commoners to heft and shepherd their livestock is an important asset delivering services such as primary production, genetic diversity and climate regulation on Exmoor’s moorland commons. Equally, all the cultural services are reliant, to a greater or lesser extent, on natural capital assets (for instance scenic beauty being provided by landforms - both natural and man-made, different types of land cover and features such as field boundaries and rivers).

There is therefore no simple distinction between natural and cultural capital in the delivery of public goods and services from the natural environment. The two are closely intertwined. Indeed, as the main report argues (paras. 2.11-2.14), all forms of capital asset require a component of human-derived capital for them to be

⁸ Forum for the Future (undated). The Five Capitals Model – a framework for sustainability. <https://www.forumforthefuture.org/sites/default/files/project/downloads/five-capitals-model.pdf>

⁹ See for instance Arts Council England *et al.* (2010). *Cultural Capital: A Manifesto for the Future. Investing in Culture will build Britain’s Social and Economic Recovery.* https://www.nationalmuseums.org.uk/media/documents/publications/cultural_capital_manifesto.pdf

¹⁰ *Pers. comm.* Hannah Fluck, Historic England.

¹¹ Jones *et al.* (2016) Stocks and flows of natural and human-derived capital in ecosystem services. *Land Use Policy* 52 (2016) 151–162. <http://nora.nerc.ac.uk/id/eprint/512544/1/N512544JA.pdf>

¹² http://www.minambiente.it/sites/default/files/archivio/allegati/biodiversita/conference_ncc_charter_of_rome_final.pdf

¹³ Natural Capital Committee (2016). How to do it: a natural capital workbook. Page 9, second paragraph. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/608852/ncc-natural-capital-workbook.pdf

regarded as an asset that has value to society, rather than simply a resource. This has led this study to propose that natural capital assets need to be defined both by the physical environmental resources and also the human attributes (which include elements of cultural capital) (para. 2.15 and Figures 4 and 5).

Natural capital and the historic environment

Historic England has been exploring how the historic environment is represented by the concepts of ecosystem services and natural capital. Fluck and Holyoak (2017)¹⁴ describe how “*cultural services are primarily concerned with the intangible aspects of heritage (sense of place, for instance) [but that] the material role that the historic environment plays in shaping the landscapes we value is not considered*”. This expresses the concern that while knowledge and perceptions of the past are recognised in services such as cultural heritage and sense of place, the value of specific historic environment assets, as physical elements in the landscape, are not adequately captured and thus risk being excluded as natural capital assets.

A study commissioned by Historic England, report dated March 2018¹⁵, has examined how the process of natural capital accounting can be applied to the historic environment. It found that natural capital accounting can, in principle, be applied to the historic environment and the benefits it provides, particularly where it is associated with land and land management. However, based on a review of 35 natural capital accounting approaches and 21 studies, it “*found no examples that both identified the physical stocks of historic assets and then explicitly associated benefits with them*”. In other words, the way that natural capital assets are currently identified and recorded does not take adequate account of heritage assets and so does not take proper account of the value of the services they provide. The report identified a number of research priorities and actions to address this shortfall. As a result, Historic England has commissioned a suite of nine local studies examining the relationship between heritage, natural capital and ecosystem services (all in progress) and will be holding a workshop in November 2018 to review them¹⁶.

Natural capital and landscape character

Natural England’s guidance on the process of Landscape Character Assessment states that “*Landscape reflects the relationship between people and place, and the part it plays in forming the setting to our everyday lives. It is a product of the interaction of the natural and cultural components of our environment, and how they are understood and experienced by people*”¹⁷. The Natural Capital Committee, in its workbook on how to use natural capital in practice, includes ‘landscapes’ as an example of a natural capital asset¹⁸ but does not provide further guidance on how the stock of this asset can be recorded for the purpose of natural capital accounting.

¹⁴ Fluck and Holyoak (2017). Ecosystem Services, Natural Capital and the Historic Environment. Historic England Research Report Series No 19/2017. <http://research.historicengland.org.uk/Report.aspx?i=15572&ru=%2FResults.aspx%3Fp%3D1%26n%3D10%26r%3D19%26ry%3D2017%26ns%3D1>

¹⁵ RPA and LUC (2018). *Environmental Capital Accounting and the Historic Environment*, Final Report for Natural England and Historic England, March 2018, Loddon, Norfolk, UK

¹⁶ *Pers. comm.* Hannah Fluck, Historic England. These studies are located in the Peak District (focussing on stone walls), the Essex coastal grazing marshes, the Blackdown Hills AONB (boundaries and linear landscape features), the Trent Valley, the Kent Coast (marine and coastal heritage), Lower Severn Vale (field boundaries), Dorset Stour (water meadows and other water management features), Tyne to Tees (marine) and historic buildings and boundaries.

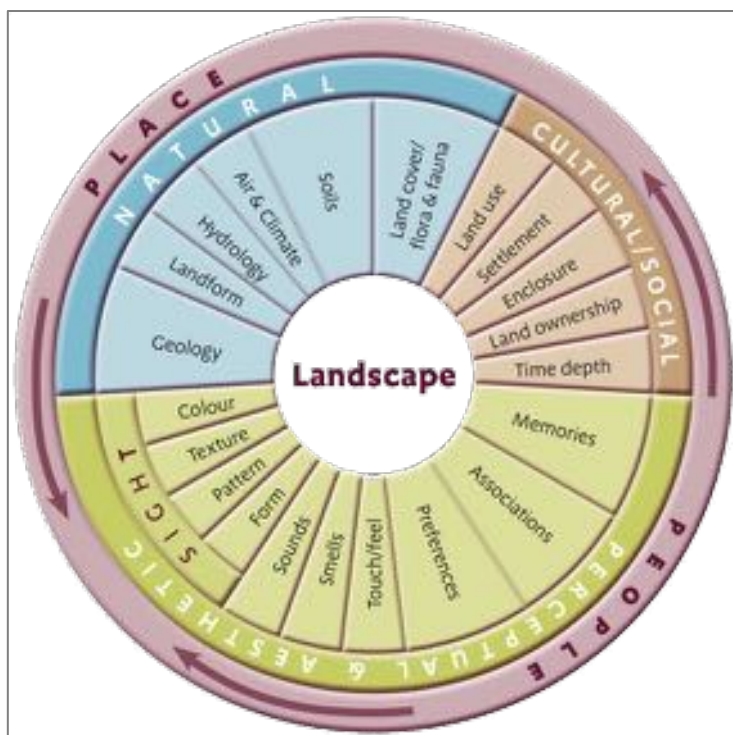
¹⁷ Natural England (2014). *An Approach to Landscape Character Assessment*. Natural England publication NE579. ISBN: 978-78367-141-0

¹⁸ Natural Capital Committee (2016). How to do it: a natural capital workbook. See Figure 2. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/608852/ncc-natural-capital-workbook.pdf

The profiles of England’s 159 National Character Areas (NCAs), updated in 2014, describe their key characteristics and assess how each area delivers 14 ecosystem services¹⁹. These profiles were prepared before the concept of natural capital was widely used in the UK but it is understood that future revisions of these profiles may include analysis of natural capital in relation to landscape character. One of Defra’s four Pioneer Projects, established to take forward the 25 Year Environment Plan, is termed ‘the Landscape Pioneer’ (located in North Devon) and is developing the natural capital approach and accounting framework in a rural landscape setting. However, we (the authors of this study) are not aware of any published work that is explicitly examining how the concept of landscape character can be applied to natural capital accounting, or vice versa.

Landscape character is not in itself a single asset (although protected landscape designations such as National Parks might be considered as a type of asset, reflecting societal preferences for an area of high landscape value). Instead, landscape character provides a way of describing the many individual assets that make places distinctive and different from one another. Natural England’s guidance on Landscape Character Assessment²⁰ distinguishes between natural, cultural/social and perceptual and aesthetic characteristics of landscapes and a total of 21 different elements that fall under these headings (Figure 2).

Figure 2. The ‘landscape wheel’, defining the elements of landscape character



Source: Natural England (2014). *An Approach to Landscape Character Assessment*

The landscape character wheel is significant because it combines both physical and non-material elements to describe what makes places special. This suggests that Landscape Character Assessments (documents prepared as evidence for Local Plans and the statutory Management Plans in protected landscapes) may provide valuable evidence on the extent and condition of natural capital assets at a local (landscape) level, particularly for non-material elements of natural capital which may not be objectively described by other sources.

¹⁹ <https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making/national-character-area-profiles>

²⁰ ²⁰ Natural England (2014). *An Approach to Landscape Character Assessment*. Natural England publication NE579. ISBN: 978-78367-141-0

3. The Natural Capital Assets delivering each Service

This section provides a summary description of the key natural capital assets present on Exmoor that are responsible for delivering the ecosystem services from Exmoor that are considered by this study to be most important to the nation. It is designed to supplement the matrix table of assets and services at Figure 8 in the main project report.

The selection of the services was based on professional judgement by the authors and project steering group rather than any quantified valuation. Future work involving natural capital valuation on Exmoor could provide a more objective assessment of the most significant services.

Similarly, the identification of the natural capital assets involved in delivering these services was based on professional judgement by the authors. The authors are aware of ongoing research in Natural England’s Natural Capital Indicators project that is developing 40 asset-to-service ‘logic chains’ which are based on the UK National Ecosystems Assessment supplemented by the professional judgement of Natural England and Environment Agency specialists. When this research is published it could provide an independent way of identifying the natural capital assets providing Exmoor’s key services.

The services covered in this section are listed in **Figure 3**, below. The order of cultural, regulating and provisioning services is deliberately reversed from that which is normally used, for reasons explained in paras. 2.5 and 2.6 in the main report.

Figure 3. The services covered in this section

Cultural services - <i>Enriching people’s lives</i>	
<ul style="list-style-type: none"> Natural beauty Wildlife Cultural heritage 	<ul style="list-style-type: none"> Recreation and wellbeing Arts and culture Education and knowledge
Regulating services - <i>Support for life-giving processes</i>	
<ul style="list-style-type: none"> Clean water Healthy soils Climate regulation 	<ul style="list-style-type: none"> Flood risk mitigation Pollination
Provisioning services - <i>Products of the environment</i>	
<ul style="list-style-type: none"> Primary production Water supply 	<ul style="list-style-type: none"> Genetic diversity

The Cultural Services

Natural beauty

Service description *The presence of characteristics and features that are perceived by people to be distinctive and typical of Exmoor, and that are judged to be in good condition.*

The natural capital assets that can provide this service The Landscape Character Assessment of Exmoor (2017) describes the wide range of distinctive characteristics and features typical of the nine landscape character types that occur in the National Park. These include the underlying geology such as the Devonian sandstones and mudstones; the landform including rounded moorland hills, incised valleys and combes, and rugged coastal cliffs; long wide views across heather and grass moorland; fast-flowing rivers and streams; rich historic landscape including sites from prehistoric, Roman, and medieval periods, as well as WW2 archaeology; ancient broadleaved woodland; beech hedgebanks; farmland (with native breeds of livestock such as Exmoor Horn sheep and North Devon cattle); sheltered villages and more isolated farmsteads; iconic species such as Exmoor ponies and red deer; cultural associations with art and literature (including the romantic poets and novels such as Lorna Doone); views and vistas; and weather conditions that can affect how the landscape is perceived and experienced.

Wildlife

Service description *Appreciation of wild species and habitats, including those that are common (regularly encountered and familiar) as well as those that are rare (giving the encounter with nature a sense of special privilege)*

The natural capital assets that can provide this service The main semi-natural habitats found on Exmoor include heather moorland, upland mire, coastal heaths and cliffs, oak woodland, scrub, rivers and streams. Wild species include mammals such as free-living Exmoor ponies and red deer, birds of moorland and farmland such as the merlin, stonechat, snipe and skylark, birds of rivers such as the dipper and kingfisher and birds of woodland and scrub such as the cuckoo and Dartford warbler. Insects include the golden ringed dragonfly and (rare) heath fritillary butterfly.

Cultural heritage

Service description *Understanding and appreciation of archaeology, buildings and landscape history*

The natural capital assets that can provide this service Exmoor's landscape of moorland, farmland and woodland is a product of thousands of years of human activity and areas of particular historic environment interest have been defined by the National Park Authority as Principal Archaeological Landscapes. There are 200 scheduled monuments including bronze age barrows and standing stones, medieval motte and bailey castles, post-medieval farmsteads, 19th century model farms and boundaries, and military structures and buildings from World War II. There are 740 listed buildings, 16 conservation areas in settlements and two registered parks and gardens. Exmoor's Historic Environment Record contains over 11,000 entries representing human activity stretching back 8,000 years.

Systems of land and water management, including livestock grazing on commons, and the knowledge of traditional practices that is retained within families and communities who have lived on Exmoor for many generations are also important assets of cultural heritage.

Recreation and wellbeing

Service description *Physical, mental and spiritual access to landscape and nature*

The natural capital assets that can provide this service

There is public open access on foot to large areas of the moorland in the National Park and also in some woodland (totalling around 18,000 ha). The National Park has some 438 km of public footpaths, 464 km of public bridleways, 64 km of other rights of way and over 40 km of permissive rights of way. Particularly popular routes include the South West Coast Path and Two Moors Way. Popular locations include Valley of Rocks, Dunkery Hill and Anstey Common. The road network provides access by vehicle and bicycle, with roadside car parks that give fine views particularly along the coast such as those at the top of Porlock Hill and at County Gate.

Specific locations are also important for recreational activities, such as the Calvert Trust centre at Kentisbury (which enables people with physical, learning, behavioural and sensory disabilities to experience outdoor recreation activities) and Lee Abbey near Lynton (a Christian retreat and conference centre). A range of businesses provide recreational activities such as off-road safaris, bike hire and river canoeing, and there are many accommodation providers in rural locations.

Different recreational activities can produce different impacts on personal wellbeing. For instance, nocturnal trips to experience Exmoor's dark night skies can produce a powerful sense of peace and wonder, whereas walks across remote and featureless moorland can provide a physical challenge and sense of personal risk against the elements.

Arts and culture

Service description *Appreciation and fostering of cultural traditions, literature and art*

The natural capital assets that can provide this service

Exmoor, and particular locations in the National Park, have strong associations with the arts, particularly the 18/19th century romantic poets, William and Dorothy Wordsworth, Samuel Taylor Coleridge and Robert Southey, the 19th century novelists Richard Blackmore (Lorna Doone) and Henry Kingsley (Ravenshoe) and 20th century novelist Henry Williamson (Tarka the Otter). The area is popular with artists and photographers, some of whom, such as Hope Bourne, have a strong local following. The coastal landscape, high moorland, rivers, Exmoor Ponies and Red Deer are popular sources of artistic inspiration. There is also a strong living culture associated with families and communities who have deep cultural roots on Exmoor. This includes local dialect words, oral history and traditional land management practices.

Education and knowledge

Service description *Understanding of the natural environment (popular & specialist)*

The natural capital assets that can provide this service

Exmoor and its natural and historic environment are a source of knowledge and learning. This includes specific locations such as the museums at Lynton, Dunster and Combe Martin, the Dulverton Heritage Centre, Exmoor Society Archive and Pinkery Centre for Outdoor Learning and Nettlecombe Court Field Studies Centre.

It also includes programmes of learning, research and knowledge transfer about the natural and historic environment for people of all ages.

The Regulating Services

Clean water

Service description *Preserving water quality for drinking and healthy ecosystems*

The natural capital assets that can provide this service Exmoor contains the headwaters of rivers such as the Exe and its tributary the Barle, the Lyn and tributaries of rivers such as the Tone. These and other rivers supply aquatic and wetland habitats downstream and are used for public water supply (including Wimbleball Reservoir in the National Park). The upland mires and peaty soils on Exmoor's moorland help to regulate the flow and quality of rivers, ensuring adequate supplies following periods of low rainfall (and also holding back flows after high rainfall – see below under flood risk mitigation).

Healthy soils

Service description *For food production and healthy ecosystems*

The natural capital assets that can provide this service Soils and their microbiomes are the basis for all terrestrial habitats on Exmoor and play an essential role in nutrient and water cycles. The biologically richest and deepest soils are likely to occur under Exmoor's ancient woodlands, agriculturally unimproved permanent pasture, mires and wetlands. See also the role of soils in storing carbon, below.

Climate regulation

Service description *Storage of carbon and cutting emissions of greenhouse gases*

The natural capital assets that can provide this service The peat and organo-mineral soils found under Exmoor's upland mires, grass and heather moorland and ancient woodlands, and the timber in its woodlands and hedges are an important reservoir of organic carbon (release of which, from drainage, cultivation or clearance, would contribute to global climate change).
Sources of renewable energy such as woodfuel from Exmoor's woodlands and hedges and hydropower from its rivers (such as the site at Beasley Wier on the Barle) can replace energy generated from fossil fuels, reducing greenhouse gas (GHG) emissions. Farming practices involving soil cultivation, livestock housing and livestock feeding can also reduce GHG emission from land and livestock.

Flood risk mitigation

Service description *Reducing the risk of flooding*

The natural capital assets that can provide this service Exmoor's rivers tend to be 'spate rivers' reacting quickly to rainfall and this can generate downstream flooding such as the catastrophic event in Lynmouth in 1952. The risks of flooding are reduced by soils and habitats that store and slowly release rainfall (such as peat bogs and mires, riparian wetland, ancient woodland and permanent grassland) and features which slow overland flow of water (such as cross-contour hedges, rough grassland and woodland).
'Natural flood management' practices such as blocking moorland drainage channels ('grips') and leaving woody debris in river channels to slow their flow can also reduce the risk of downstream flooding.

Pollination

Service description *Sustaining populations of insect pollinators*

The natural capital assets that can provide this service Insects such as honeybees, bumble bees, butterflies and moths are important pollinators of wild plants and crops. Habitats on Exmoor such as heather moorland, scrub, unimproved grassland, woodland rides and glades, orchards and gardens, and practices such as beekeeping, maintain the populations of these insects.

The Provisioning Services

Primary production

Service description *Food, materials (e.g. wool and timber) and renewable energy*

The natural capital assets that can provide this service The main agricultural outputs on Exmoor are lamb and beef (with animals sold for 'finishing' by farmers in the lowland, for breeding stock and also sold finished from Exmoor off grass and feed concentrates). Permanent pasture is the main land cover supporting this activity, with smaller areas of ley grassland (for grazing and conserved fodder) and arable (for livestock feed).

Woodland, particularly plantation forestry which is concentrated in the east of the National Park, is a source of timber and woodfuel. However, many smaller woodlands are currently not actively managed.

The inshore waters around Porlock are a source of fish and shellfish. There are a number of fish farms on the rivers.

Water supply

Service description *Maintaining water in rivers and aquifers*

The natural capital assets that can provide this service As noted under the 'clean water' service, Exmoor's rivers and the Wimbleball Reservoir are a source of drinking water for people and provide water for downstream habitats. The soils and habitats in the headwaters which receive most rainfall help to regulate downstream flows.

Genetic diversity

Service description *Conserving diversity in both farmed and native species*

The natural capital assets that can provide this service Large areas of Exmoor's heather moorland, coastal heaths and ancient semi-natural woodlands are designated as Special Areas of Conservation and/or Special Protection Areas under the EU Habitats and Birds Directives for their biodiversity and nature conservation importance. These and other sites, such as the River Barle, are designated as UK Sites of Special Scientific Interest.

As well as supporting an abundance of wild plants and animals, Exmoor is home to nationally and internationally rare species, including lichens, wax-cap fungi, Babington' leek, several types of whitebeam, white-clawed crayfish, red wood ant, the heath fritillary and brown hairstreak butterflies, and bats such as the Greater and Lesser Horseshoe.

4. The Classification of Natural Capital in the Register

The main report explained why it was necessary, in this study, to develop a new unifying classification of natural capital assets for the register (paras. 2.16-2.19). Figure 6 in the main report set out the classification to the level of categories of asset. This section shows the structure to its full depth, including sub-categories and additional fields to record, where appropriate, how assets are managed and suitable categories of their condition.

Class	Category	Sub-category	Management	Condition
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Domain: Land Cover

Unenclosed land	Heather moorland	Free living ponies	Burned (<5yrs)	Good	
				>50% bracken >25% scrub	
	Grass moorland	Free living ponies	Burned (<5yrs)	Good	
				>50% bracken >25% scrub	
	Mire		Grips active		
			Grips blocked		
	Coastal habitats	Salt marsh			
		Cliff and foreshore			
		Mudflats			
		Sand dunes			
Enclosed land	Permanent pasture (5yrs+)	Rush pasture	Cut for hay	Improved	
		Improved pasture	Cut for silage	Semi-improved	
		Semi-improved pasture	Grazed	Unimproved	
		Unimproved pasture	Ungrazed		
		Bracken dominated pasture			
	Ley grassland (<5yrs)		Cut for hay	Rye grass only	
			Cut for silage	Clover rich	
	Enclosed rough grazing		Grazed	Good	
			Ungrazed	>50% bracken >25% scrub	
	Arable crops	Cereals		Standard	
		Roots			
		Other crops		HNV	
	Other enclosed land cover	Wetland and riparian habitats			
		Parkland and field trees	Designed parkland	Ancient trees	
			Field trees		
		Woodpasture		Grazed unimpr.	
				Grazed, impr.	
			Ungrazed		
			Grazed unimpr.		
Orchard		Grazed, impr.			
		Ungrazed			
Domestic garden					
Woodland & Trees	Broadleaved woodland	Standards only	Active management	ASN	
		Coppice w standards	Pheasant pens	Secondary diverse	
		Coppice only		Secondary monocult.	
	Conifer woodland	Even aged		PAWS	
		Mixed age		Diverse	
			Monoculture		

Class	Category	Sub-category	Management	Condition	
	Mixed woodland	Even aged		PAWS	
		Mixed age		Diverse	
	Scrub				Monoculture
		Gorse	Recently cut	<50 cover	
		Gorse and thorn	Recently burned	50>75% cover	
	Specimen trees	Ancient / veteran		>75% cover	

Domain: Physical features and elements

Species	Plants	Protected spp.		
		Indicator or keystone spp.		
Animals		Other endangered or rare spp.		
		Other regionally important spp. or breeds		
Landforms	Geology / geomorphology	Quarries and stratigraphy exposures		
		Unexposed features (scarp, fault, plateau etc)		
	Human-created landforms	Historic features (barrows, standing stones, earthworks etc) Modern features (reservoirs etc)		
Water bodies	Still water (ponds/lakes)	Lake / reservoir		WFD assessment
		Pond		
	Running water (rivers/streams)	Main river		WFD assessment
		Stream		WFD assessment
Soils	Carbon-rich soils	Seasonally running water		
		Deep peat		Saturated
		Shallow peat		Vegetated
	Other significant soils	Organo-mineral soil		Exposed soil
Field boundaries	Hedgerow	Species-rich	Recently layed	>2m tall no gaps
		Beech-dominated	Recently coppiced	>2m tall with gaps
		Thorn-dominated	Banked	<2m tall no gaps
		Other	Unbanked	<2m tall with gaps
	Earth banks and stone walls	Earth bank	Relict	Bank >1m tall
		Stone wall	Gaps	Bank <1m tall
			Holding boundary feature Fenced	
	Field boundary tree	Beech	Recently planted	Stag-headed
		Oak		
		Ash		
Other				
Other boundary feature				
Other features	Buildings of note			
	Roads, tracks and paths	Public road		
		Green lane / hollow way		
		Within field path		
	Other significant features	e.g. Historic road signposts, stone styles, commemorative benches		

Class	Category	Sub-category	Management	Condition
Domain: Defined Areas				
Landscape	Protected landscapes	National Parks		
		Areas of Outstanding Natural Beauty		
		Heritage Coasts		
	Landscape character	National Character Areas		
		Local Character Types		
		Local Character Areas		
Common land	Common grazing rights		Active rights	
	Other common rights		Inactive rights	
Nature and geology	Statutory designations	SPA/SAC		NE assessment
		SSSI		NE assessment
	Non-statutory designations	CWS		
		LWS		
		LGS		
Hydrology	Statutory designations	NVZ		WFD
		SPZ		
	Non-statutory designations	Boreholes and private water supplies		
		Drinking water protected areas		
		Drinking water safeguard zone		
	Flood risk	Flood Zone 1		
		Flood Zone 2		
Flood Zone 3				
Historic environment	National statutory	Scheduled Monument		At risk register
		Registered park or garden		
	Local statutory	Conservation Area		
		Listed Building	Grade 1, 2* or 2	Condition
	Non-statutory designations	Principal Arch. Landscape		
		Historic Env. Record		
		Historic Landscape Characterisation		

Class	Category	Sub-category	Management	Condition
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Domain: Access and Recreation

Statutory access	Public Rights of Way	Public footpath	Enclosed route	ENPA assessment
			Field edge route	
			Cross field route	
		Public bridleway	Enclosed route	ENPA assessment
			Field edge route	
			Cross field route	
	Accessible to motorised traffic	BOAT	ENPA assessment	
		RUPP		
	Open access land			
	Public car park			
Permissive access	Permissive routes	Permissive footpath	Enclosed route	ENPA assessment
			Field edge route	
			Cross field route	
		Permissive bridleway	Enclosed route	ENPA assessment
			Field edge route	
			Cross field route	
	Permissive open access			
	Permissive car park			
	Recreation attraction / event	Free entry		
		Charged entry		

Domain: Perceptual and aesthetic qualities

Views and vistas	Public viewpoints		
	Informal vistas	From location	
		Into location	
Cultural associations & knowledge	Cultural associations	Art	
		Literature	
		Music	
	Memory & knowledge	Customs & traditions	
		Science	
	Antiquity		
Sensory elements	Visual		
	Soundscape		
	Scents and smells		
Perceptions	Openness		
	Wildness		
	Tranquillity		
	Challenge / risk		

5. Review of Data Sources for the Register

The following section outlines the data sources for each asset assessed within the Register. Data for many assets is available from several sources but often the data sources are conflicting or the data available is dated. Each source was assessed to determine suitability for inclusion within the Register.

Farm boundary

- Environmental Stewardship Scheme holding area, Natural England: The most accurate outline of the holding area accessible without contact with the farmer when they have agreed to work on the pilot. 'Cleaned up' to remove areas considered ineligible as part of the agri-environment scheme.

Farm area buffer

- A 250m margin surrounding the farm area to capture any additional information relevant to the management, location and importance of the holding.

Moorland (heather moorland and grass moorland)

- API: Time consuming. Accurate to 2017 AP. Subject to interpretation error. Should scrub elements be removed from the main moorland e.g. large gorse patches. Creating a new data source further complicates the number of sources available to choose from.
- Section 3 moorland: Out of date. Includes a lot of woodland edge. Provides no information about management or condition. Section 3 has basis in regulation and was therefore used for this Pilot study. Used 'moor and heath', not used 'other moor and heath'.
- NE Moorland Line: used as a means of establishing eligibility of farmers within Less Favoured Areas for the Moorland (Livestock Extensification) Regulations 1995. Moorland area is determined by the predominance of semi-natural upland vegetation used primarily for rough grazing. Includes open moorland and enclosed land on the margins. When the moorland line area was analysed against the 2017 AP for Wydon it was deemed that too much moorland area was excluded by this classification.
- Exmoor Moorland Units: based on Section 3 with reclaimed land and land which could potentially be restored to moorland included. Section 3 'moor and heath' more accurate.
- Priority habitats: not statutory, Section 3 has basis in regulation.

Heather or grass moorland

- Landscape character assessment. Priority habitats. Scale of scrub mapping.

Mires

- Exmoor Mires Project provided SWW data which was used for this Pilot.
- NE Priority habitats data.

Coastal habitats

- NE Priority habitats data.

Grassland and arable

- Field areas taken from OS Mastermap. No other data available until interviews.

Enclosed rough grazing

- Ambiguous definition, more of a management description? Data from interview.

Woodland

- FC NFI: includes woodland over 0.5ha in area with a minimum width of 20m with at least 20% canopy cover (or the potential to achieve this). Includes broadleaf, conifer and grassland categories. Some information about management and condition provided by FC forest product, but this data only pertains to woodland parcels, not the whole area identified (area, details of activity e.g. management/ establishment/ both), date and a description).
- OS Mastermap: includes woodland, scrub, hedges and bracken dominated areas. Not accurate enough for the assessment required within the Register.

- API: Time consuming. Accurate to 2017 AP. Subject to interpretation error.

Scrub

- Mapped from 2017 AP. Issue of interpretation scale.

Orchards

- ENPA orchard data: assessed and surveyed for the whole of Exmoor, so used as the most accurate source.
- NE orchard data (from ENPA): more orchards identified by ENPA data than NE data.
- OS Mastermap: orchard records available, some differences from ENPA and NE data.

Specimen trees

- Ancient/ veteran trees: ENPA records and National Trust records.
- Parkland trees, commemorative, trees of cultural significance: interview.
- Field trees: No existing data, interpreted from 2017 AP at 1:1000 scale. Only mature trees were interpreted, excluding scrub and clumps of trees. Trees on bracken slopes and moorland areas were not included. Efforts were made to include mature trees rather than scrub/ small trees. Trees on woodland edges were only included if they were distinct from the woodland area. An attempt was made to assess canopy size into small/ medium/ large/ dead and attempts were made to identify tree species. Subjective.

Field boundary trees

- Issues of definition. Time consuming. Exmoor 'tree lines'. Already mapped hedge presence. Chosen not to map for the Register.

Landforms

- Geology/ geomorphology: Definition issue. Further detail from interview. Subjective. BGS data available subject to copyright and fees.
- Human created landforms: landscape scale or individual site. To provide a record of physical field patterns and 'bumps' in the landscape that isn't necessarily captured by a designation. Further detail from interview. Subjective.

Water bodies

- Still water (lakes, ponds, etc.): data from OS Mastermap. Checked at interview.
- Running water: watercourse data from ENPA Ranger records. Some areas of watercourse omitted from records leaving gaps in watercourse lengths, these lengths were drawn from the 1:25,000 OS map. Checked at interview if the watercourse was permanently or seasonally running.

Soils

- Carbon rich soils: free CEH data on soil carbon at 1km scale. CEH's Countryside Survey measured soil carbon, used the sample data to model carbon data across the UK. Further soil data available subject to licencing and fees. Asked for a brief description at interview.

Field boundaries (hedgerows, earth banks and other boundaries)

- When the Pilot was initiated there was no existing data on boundary features on Exmoor. Main source gap of the Register. Hedgerows, earth banks and other boundary features including walls interpreted from the 2017 AP at 1:4000 scale. Interpretation error. Assessment of banked hedges from AP where possible. Some data provided on management from AP's e.g. mature, recently laid, flailed and a limited amount on condition e.g. if gaps are present. More in-depth information provided by interviews.
- OS Mastermap: doesn't differentiate hedges from other boundaries, also doesn't map all boundaries as distinct features from field areas.
- RPA: As of early 2018, after the Pilot had started, the RPA maps hedges on their land use maps using OS data. Accuracy levels need to be increased. This data became available after the boundaries had been recorded for this Pilot from 2017 Aps.

Other features

- Buildings of note: from interview.

- Roads, tracks and paths: OS MasterMap topographical line is used as a basemap for the majority of the maps produced and shows these features and buildings.

Landscape

- National Park: the pilot areas are situated within the Exmoor National Park.
- Heritage Coast: Countryside Agency 2006. Statutory but no special protection.
- Landscape Character: ENPA's Exmoor Landscape Character Assessment 2017. Splits into types and areas. Landscape Character Types are used for maps and for the initial assessment of pilot areas for suitability within the study.

Nature and Geology – statutory and non-statutory designations

- SPA/ SAC/ SSSI/ CWS/ LWS/ UWS/ LGS: Data on location of designation and designation type provided by ENPA from a variety of sources including Natural England and local Biological Record Centres. Some conditional assessment information provided, e.g. SSSI condition. More detailed information including habitat type and reasons for designation not available for this pilot. Available for a fee.

Hydrology – statutory and non-statutory designations

- Source Protection Zones (ground and surface protection zones) and Nitrate Vulnerable Zones: data from the Environment Agency.
- Boreholes and springs: private water supplies, information from interviews. Borehole data from BGS available.

Historic Environment - statutory and non-statutory designations

- Scheduled Monuments; Principle Archaeological Landscapes; Conservation Areas; Listed Buildings; Historic Environment Record: Data from ENPA and Historic England.

Common Grazing Rights

- Data from ENPA.

Public Rights of Way and Permissive Access

- Comprehensive data including management and condition of PROW in Exmoor National Park from ENPA.

Other access

- Informal routes and sites: from interview.

Open Access land

- Data from ENPA.

Car parks and facilities

- Formal car parks and toilets: included on the OS maps.
- Informal car parks: interpreted from 2017 AP at 1:1000 scale. Where possible the surface was identified and if cars were present this was recorded.

Recreation attraction/ event

- OS maps: Visitor attractions included on the OS maps.

View points

- 'Formal' viewpoints: and their orientation are included on the OS maps.

Informal vistas

- The interviewees were asked for their (and family member's) favourite views onto and from the pilot area. Subjective. Additional viewpoints can be added from the farm surveys. Other individuals would identify different views.

Moorland burning records

- An ENPA data set initiated in 1976 and update during each burning season.

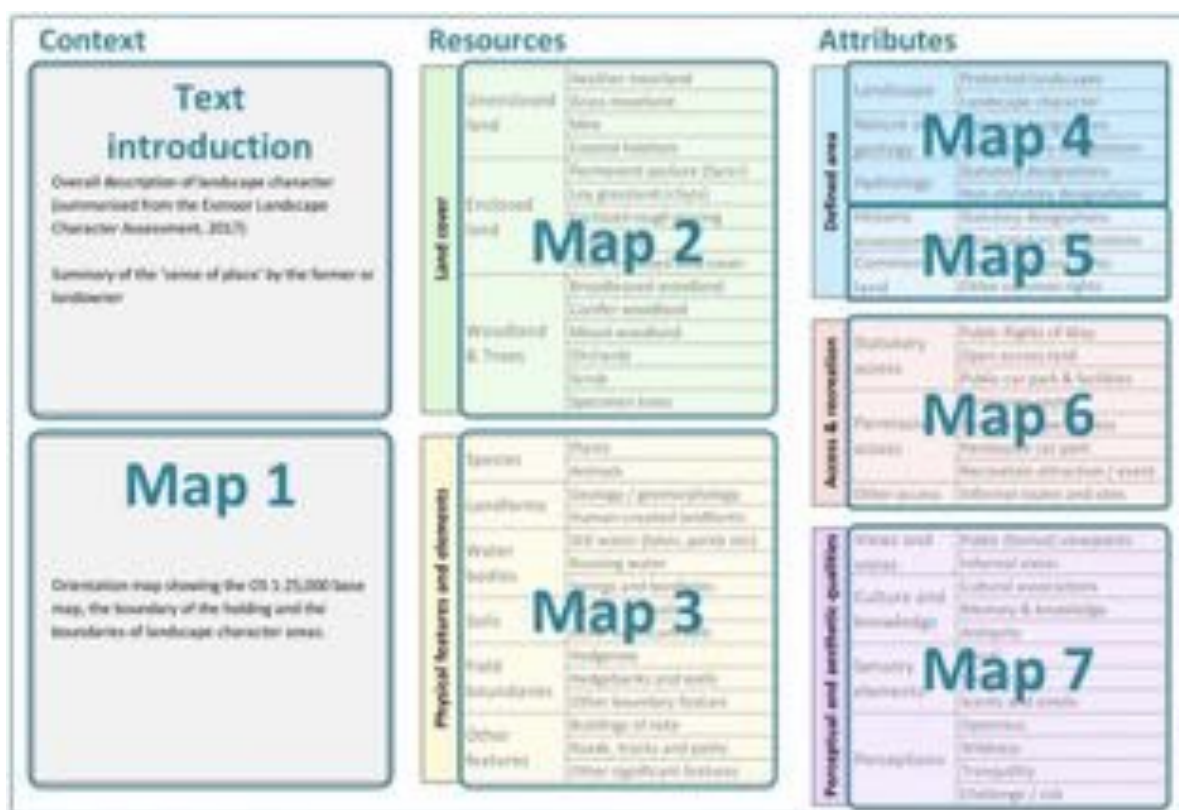
Pony herds

- Data from ENPA.

6. Register Outputs for the three Pilot Areas

The three pilot areas are a crucial aspect of this study. Having created a Register of natural capital it is important to assess the viability and usefulness of the Register by using case studies. The three pilot areas were chosen using the 2017 Landscape Character Assessment to produce three holdings representative of the majority of Exmoor’s landscape types. Using pilot areas helped to refine and develop what the Register needed to include, showed how it is possible to assess natural capital on Exmoor on a small scale, enabled more detailed data collection on those areas using interviews and facilitated a stakeholder relationship with the land managers to ensure that the Register is of value in the process of assessing natural capital on Exmoor.

This study concluded that seven maps each with a brief description, and an overall text description of the holding is appropriate to display the extent of all of the natural capital that each pilot area provides. The figure below illustrates how each map displays a different set of assets. Map 1 shows the overall spatial context, maps 2 and 3 cover the natural resources and maps 4, 5 and 6 cover the human attributes. This section includes the seven maps for each pilot area.



This section also includes the interviews conducted with the associated land managers for each pilot area. The interviews were crucial for several reasons; firstly, they provided a method by which the land managers could buy-in to the study and evaluated the studies effectiveness in a practical setting. Secondly, the interviews provided invaluable data, some of which could not be collected by other means, particularly with regards to cultural capital. The interviews were also a source of information about the some of the more detailed aspects of each asset, especially in relation to management, for instance the management of grassland or hedgerows. It also provided a means to check if the data collected from desk based assessments was accurate, particularly as some of the data available to this study was dated or some data was interpreted from aerial photography.

Pilot Area 1: Wydon Farm, and Bossington and Selworthy

Introduction

Wydon is situated on the north coast of Exmoor near to Minehead. The landscape is busy and complex and is well used by locals and tourists.

Wydon has been the most complex of the pilot areas to assess for natural capital due to the number of different landscape types, the variety of land uses and the number of natural capital assets present.

Landscape character summary

Key features to this holding are panoramic and dramatic coastal and landward views, seascape, spectacular coastline, cultural associations with Romantic poets, strong sensory perceptions, pastoral and productive agricultural land, farmed landscapes and elevated landscapes.

Landscape Character Areas covered: A2 High Coastal Heaths, B5 High Wooded Coasts, Combes and Cleaves, E1 Farmed and Settled Vale, F2 Enclosed Farmed Hills with Commons, A4 High Coastal Heaths,

Farmer's own summary description

Dry, steep, challenging, excellent sheep farm, passable cattle farm. Dry moorland, grassy, heathery.

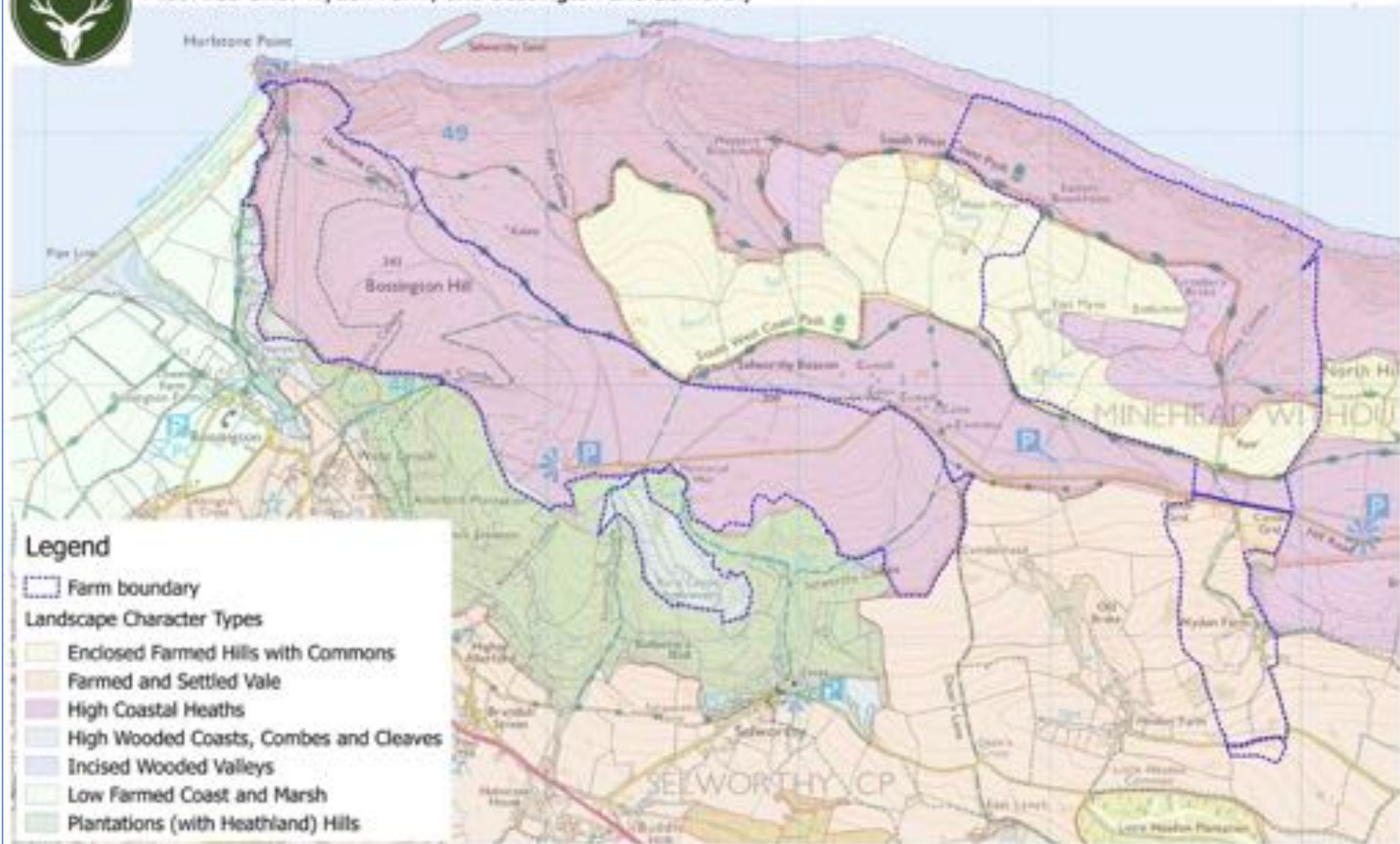
Wydon is very varied: ranges from the valley bottom, over the top, and down the other side to the coast. That's before the moorland is included.



The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area One: Wydon Farm, and Bossington and Selworthy

Orientation and landscape character



0 500 1000 m

Scale 1:18,016

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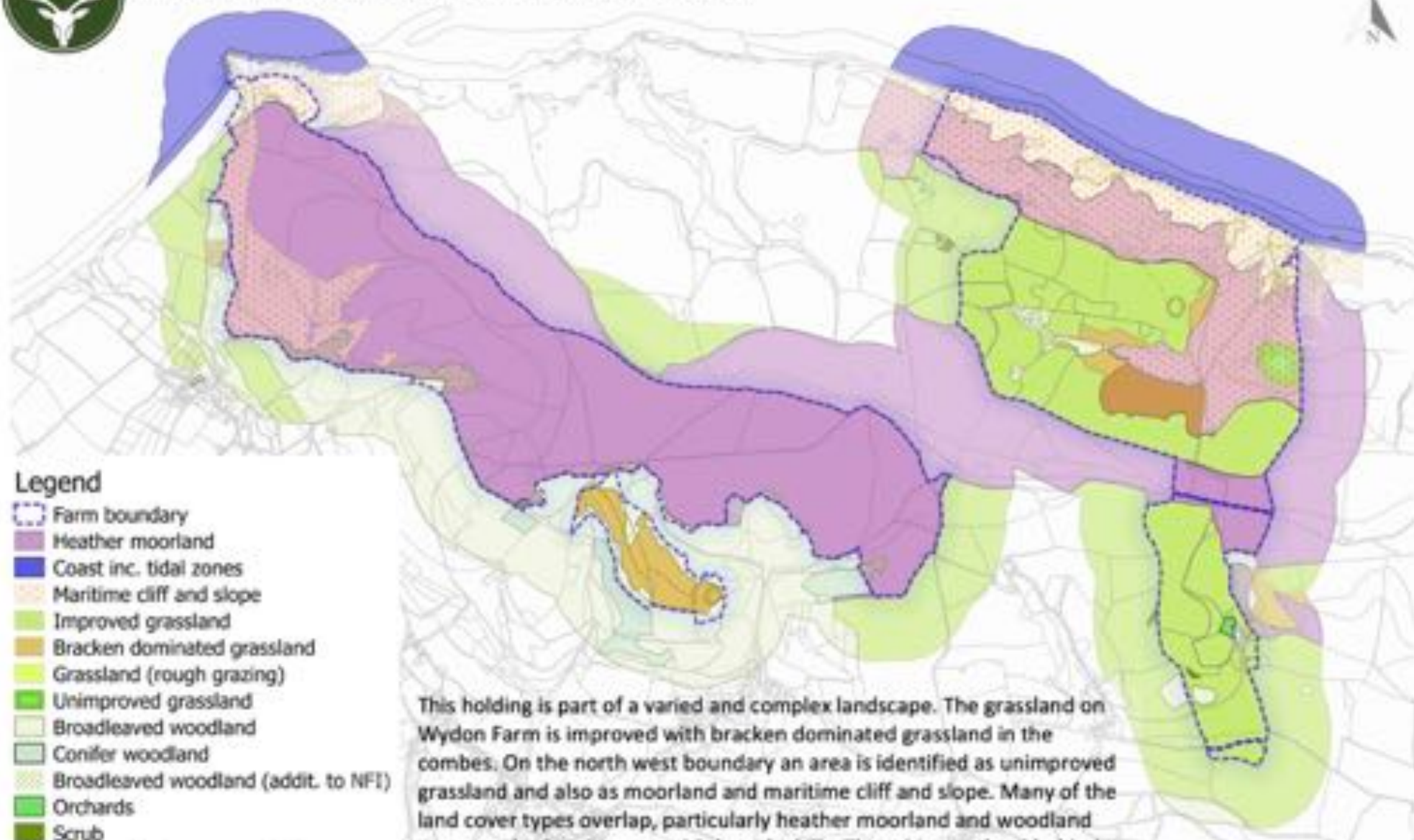
Compiled by A Walker on 5/3/2018



The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area One: Wydon Farm, and Bossington and Selworthy

Land cover: enclosed and unenclosed



Legend

- Farm boundary
- Heather moorland
- Coast inc. tidal zones
- Maritime cliff and slope
- Improved grassland
- Bracken dominated grassland
- Grassland (rough grazing)
- Unimproved grassland
- Broadleaved woodland
- Conifer woodland
- Broadleaved woodland (addit. to NFI)
- Orchards
- Scrub

This holding is part of a varied and complex landscape. The grassland on Wydon Farm is improved with bracken dominated grassland in the combs. On the north west boundary an area is identified as unimproved grassland and also as moorland and maritime cliff and slope. Many of the land cover types overlap, particularly heather moorland and woodland areas on the Bossington and Selworthy hills. There is an orchard behind the farmhouse at Wydon.

0 500 1000 m

Scale 1:19,000

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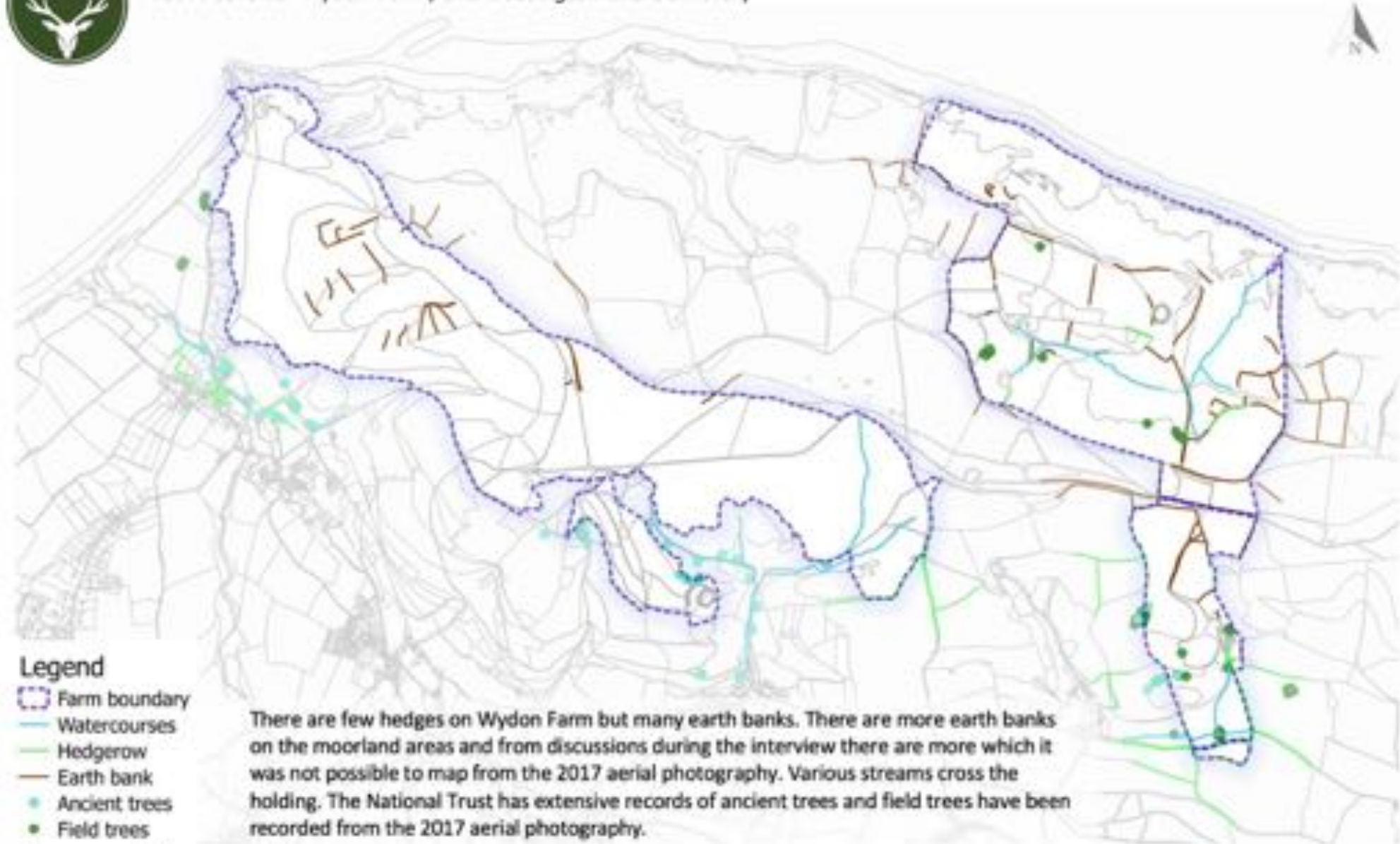
Compiled by A Walker on 1/5/2018



The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area One: Wydon Farm, and Bossington and Selworthy

Physical features and elements



Legend

- Farm boundary
- Watercourses
- Hedgerow
- Earth bank
- Ancient trees
- Field trees

There are few hedges on Wydon Farm but many earth banks. There are more earth banks on the moorland areas and from discussions during the interview there are more which it was not possible to map from the 2017 aerial photography. Various streams cross the holding. The National Trust has extensive records of ancient trees and field trees have been recorded from the 2017 aerial photography.

0 500 1000 m

Scale 1:10,000

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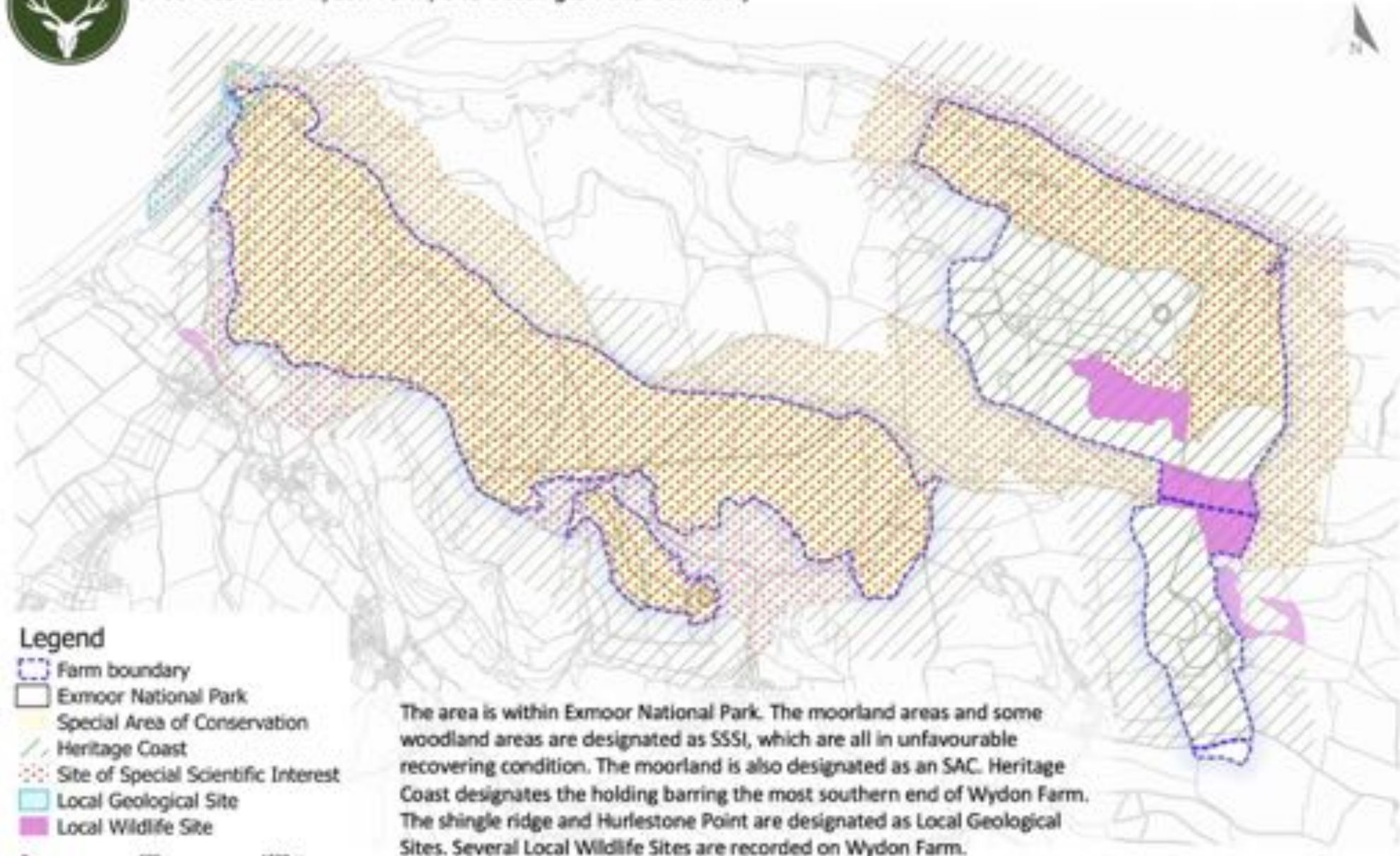
Compiled by A Walker on 7/5/2018



The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area One: Wydon Farm, and Bossington and Selworthy

Nature, geological and hydrological designations



Legend

- Farm boundary
- Exmoor National Park
- Special Area of Conservation
- Heritage Coast
- Site of Special Scientific Interest
- Local Geological Site
- Local Wildlife Site

The area is within Exmoor National Park. The moorland areas and some woodland areas are designated as SSSI, which are all in unfavourable recovering condition. The moorland is also designated as an SAC. Heritage Coast designates the holding barring the most southern end of Wydon Farm. The shingle ridge and Hurlestone Point are designated as Local Geological Sites. Several Local Wildlife Sites are recorded on Wydon Farm.

0 500 1000 m

Scale 1:19,000

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Compiled by A Walker on 7/5/2018

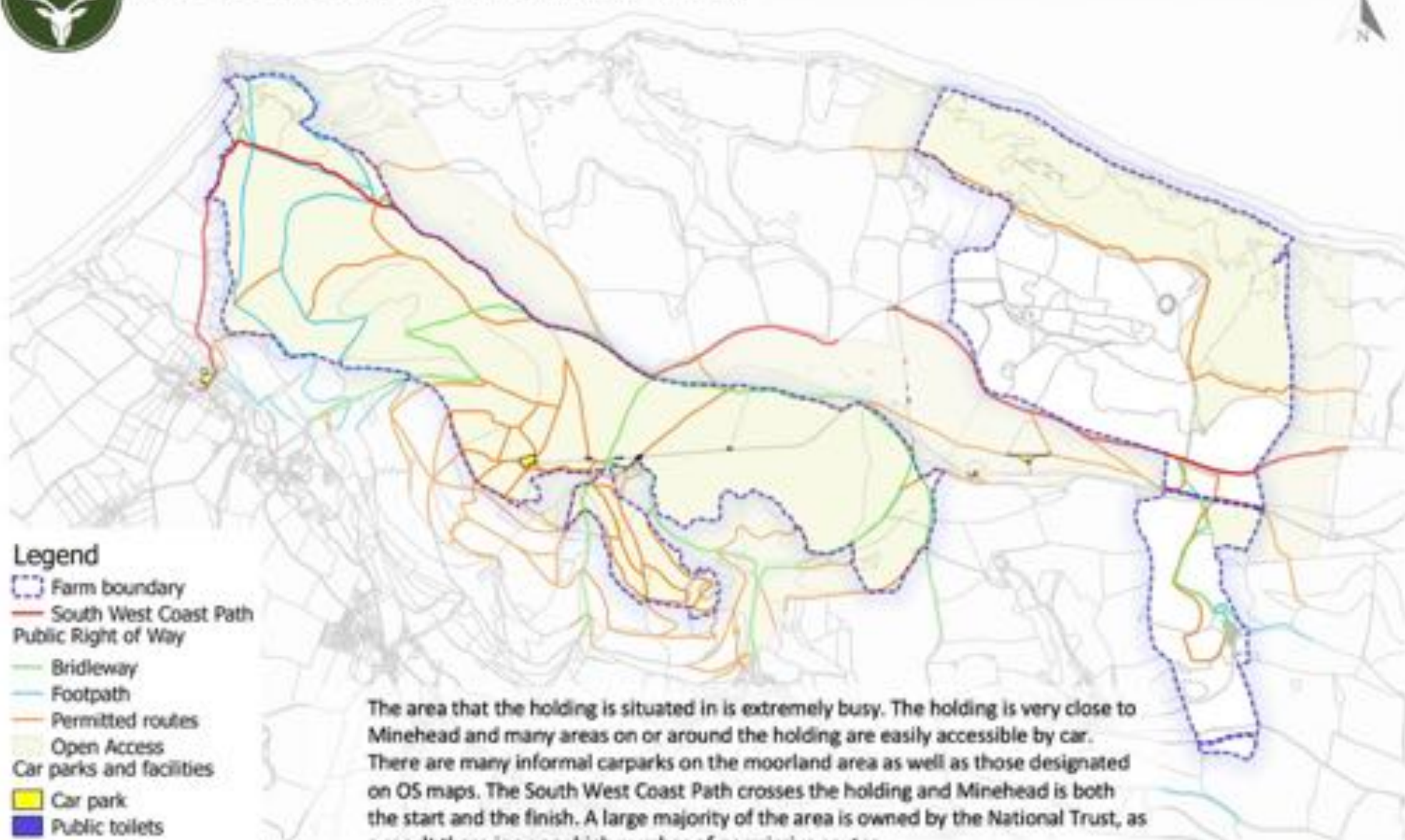




The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area One: Wydon Farm, and Bossington and Selworthy

Access and recreation



Legend

- Farm boundary
- South West Coast Path
- Public Right of Way
- Bridleway
- Footpath
- Permitted routes
- Open Access
- Car parks and facilities
- Car park
- Public toilets

0 500 1000 m

Scale 1:19,000

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Compiled by A Walker on 7/5/2018

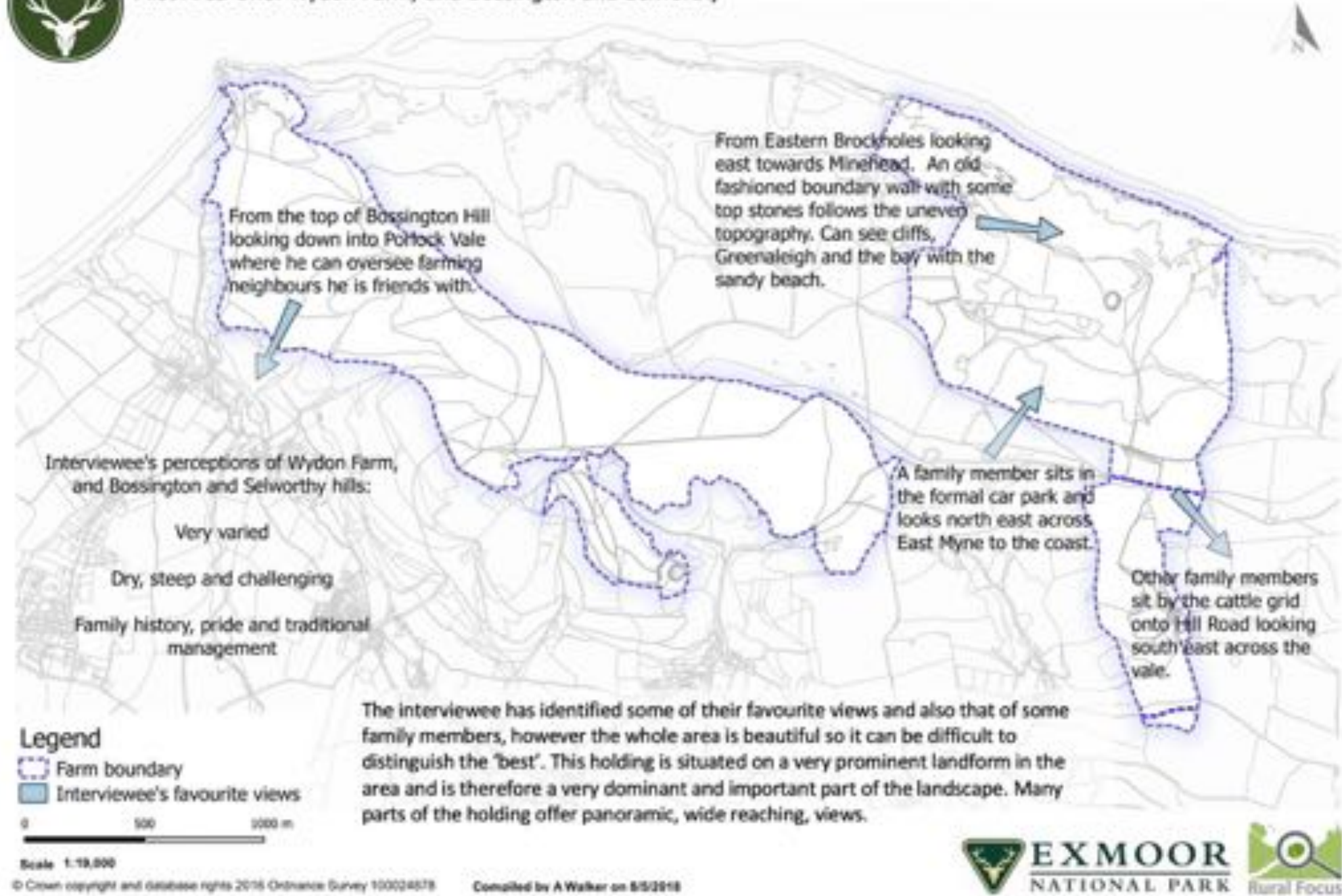
The area that the holding is situated in is extremely busy. The holding is very close to Minehead and many areas on or around the holding are easily accessible by car. There are many informal carparks on the moorland area as well as those designated on OS maps. The South West Coast Path crosses the holding and Minehead is both the start and the finish. A large majority of the area is owned by the National Trust, as a result there is a very high number of permissive routes.



The Exmoor Society: Towards a Register of Exmoor's Natural Capital

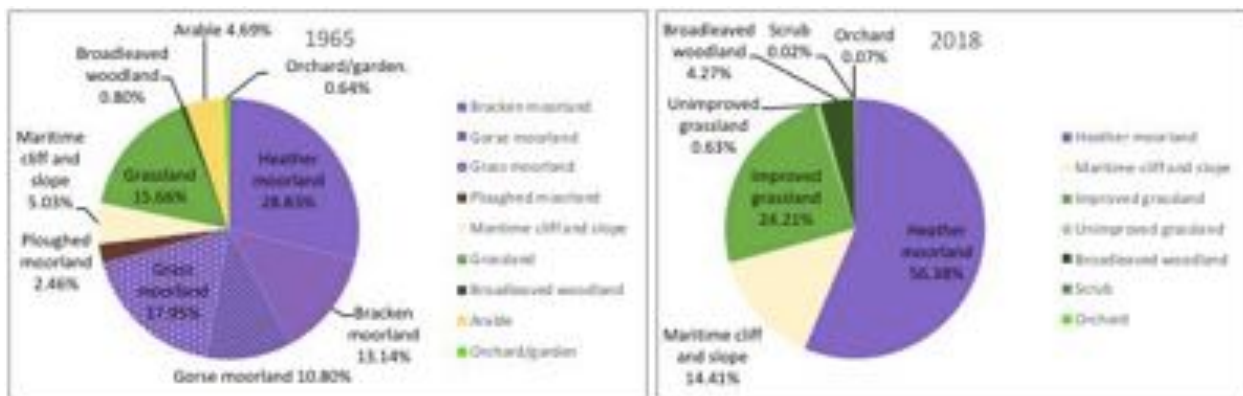
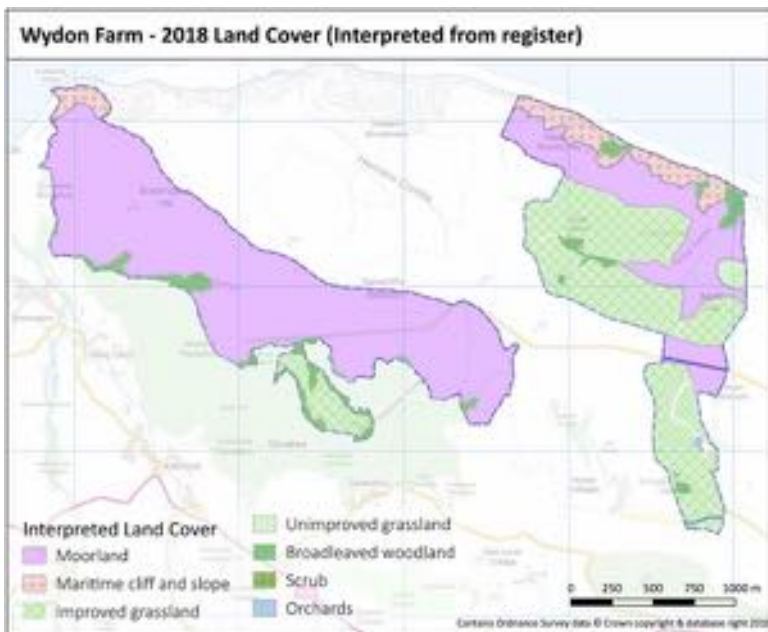
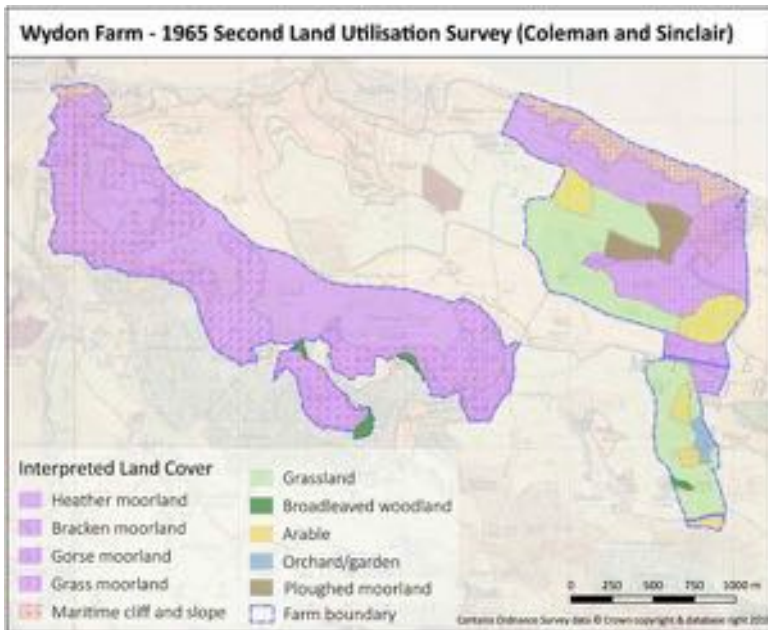
Pilot Area One: Wydon Farm, and Bossington and Selworthy

Perceptual and aesthetic capital



Land cover change

Comparing land cover in 1965 with 2018



Interview

Dave Knight. Wydon Farm, Bossington and Selworthy.

Describe the farm

'Dry, steep, challenging, excellent sheep farm, passable cattle farm. Dry moorland, grassy, heathery.'

Wydon is very varied: ranges from the valley bottom, over the top, and down the other side to the coast. That's before the moorland is included.

Perceptual and aesthetic capital

Views: from the ridgeline you can see in every direction.

Dave's favourite view: (All are good – but...) From Eastern Brockholes looking east towards Minehead. This is the in-bye boundary on the northern coastal side. An old boundary wall with some top stones follows the topography along the boundary in an uneven fashion. From there you can see the cliffs, Greenaleigh, and the bay with the sandy beach.

Another favourite view is looking from the top of Bossington Hill down into Porlock Vale where he can be nosy on farming neighbours he is friends with.

Family members favour different views. Aunties sit by the cattle grid going onto Hill Road and look across south east the vale. Another family member sits in the formal car park and looks north east across East Myne to the coast.

Farm achievements: The Knight family has a long history with the Acland's family and has farmed most of the farms within the Estate (now owned by NT) and 'has ended up with the worst one'. WW2 necessarily took over and they were away from the land for 15 years. Prior to the war the farm was well-run and well looked after. Their biggest achievement was reclaiming the farm from the training zone, for the most part you wouldn't realise it had been one. Originally NT wanted the area to revert to moorland but along with their neighbours they refused: Dave's grandfather had worked to the bone to reclaim the land before the war, creating a huge sense of family pride.

Longstanding (traditional) management practises: The only working water meadow in Exmoor and possibly further afield (Dave calls this the 'redeeming feature', i.e. what you really ought to get paid for). There are three main types of water meadow system: the first, often frowned upon, diverts acid water from moorland onto in-bye; the second diverts streams onto fields; and the third, the most highly prized, diverts water through the farmyard to collect fertiliser on-route to the fields. Wydon's water meadow is, and was, used to keep the frost of the early grass and to promote a spring growth flush. Only the master leat is used now, water is diverted around the hillside through the farmyard in autumn and winter. As it doesn't flow in summer it is not irrigation. Originally the fields would have been smaller and the leat would flow into each, since then boundaries have been removed. Before each autumn the leat is cleaned out and over the summer it grasses over again. To water a field a piece of turf is removed from the leat edge for a day to three days, and then replaced. They can't use the leat with cattle in the field as they are drawn to the water and poach the area, sometime a sacrifice strip is required.

TV/film: probably but Dave isn't aware of any. NT may not allow filming.

Books: Bernard Cornwall's series about Vikings and Saxons has a short description of the main character travelling from North Hill to Minehead. The areas are not named but Dave recognised the description.

Access and recreation

PROW: The South West Coast Path has two promoted routes over the Bossington and Selworthy moorland area. One along the old military road and the other along the coastline, both are currently very busy. Dave's assessment is that the coastal route is used by genuine, committed SWCP walkers and the inland route by dog walkers, he also suspects that half of the inland users made a mistake and meant to be on the coastal route. People from all over the world use the route.

The whole PROW network in the area is very busy. The area is accessible from town and there is lots of parking and lay-bys. Doesn't see desire lines and doesn't notice trespassing.

2 types of users of the area: Locals value the easily accessible beauty on their doorstep. The road, built by the army, is excellent, and the paths are well maintained (few hedges so largely self-maintaining). There's nothing tricky. SWCP users are there for the challenge and the views. Minehead is the start and the finish but most people travel east to west.

Land cover

Moorland: Grazes just over half the Bossington and Selworthy moorland area on a Farm Business Tenancy. They winter graze cattle only and have done for generations. Their neighbours summer graze Exmoor ponies via a recent tenancy agreement. Not interested in summer grazing due to bracken, dogs and calving dates.

Moorland area very confusing: WW2 earthworks, field systems including an area of neat rectangular relict boundaries near East Combe. The moorland has now reclaimed many areas that were previously farmed.

NT want sheep grazing on Bossington to control the birch colonisation. Would be a good sheep hill but dogs attack deer in that area.

Some complaints about cattle on the moorland. Minehead's population is transient, a retirement town with a high turnover. Typically, they move to the area in summer, when there are no cows on the hill, the cattle are put out in November and they think it's new management and complain. All cattle have to be polled as a public perception exercise.

The area is very dry as it is coastal and is in Dunkery's rain shadow. Grass grows into November-December and in a mild winter doesn't stop. Sheep are out-wintered on in-bye and cattle on the moorland, both with no supplementary feeding. However, June to August grass growth often stops and they have to supplementary feed.

Majority of the farm was arable after WW2 under his father's management. Not something Dave would consider, not the right type of farm.

Fields: farmed and improved. Not young or re-seeded. Limed and fertilised where they can drive. Cliffs grazed but no active management. Too dry for rush pastures. The only routinely cut field is situated below East Myne, this provides feed through March and April. The rest is cut at Brompton Regis, there is no room to routinely let up fields.

On woodland edges and cliff edges are bluebell patches, they don't graze these areas with sheep as they would be ruined. The farm is sheep grazed all the time, so it is hard to tell if the fields are species rich, Dave may not recognise special or interesting species.

Grexy Combe is a SSSI and LWS but there is no associated paperwork (i.e. management stipulations from NE). The area is very steep. In summer it's bracken dominated and in winter gorse dominated, some heather is likely to be present. Doesn't know if there are special species and may not recognise them.

Woodland management: to date very limited, only collect fallen trees and limbs. They will be installing a biomass boiler and will take a more active role. Lots of ash available to pollard.

Scrub: below East Myne and above Grexy Combe on ground disturbed by WW2 training activity such as the target railway. Cleared half of the area last year and will remove more. When Dave came home to farm he cleared all the gorse, they still spray to keep on top of it.

Orchard: behind the main house has a lot of trees. Recently planted the top corner with walnuts and would like to put in more apple trees. Sheep grazed but rarely used. Was one of three around the farmhouse at one time. May contemplate community cider making.

Physical features and elements

Species: High Brown Fritillary Butterfly is present on most of North Hill, the moorland is SSSI because of it. They control bracken for the butterflies. Heather. Red kites. North Hill is very important for Dartford Warbler, restrictions on amount of gorse cutting to favour this species.

Landforms: WW training zones (3 defined zones with 3 railways and 3 tank tracks). The farmed area. Iron Age archaeology including two hill forts. Dew ponds (stone pits to catch water), burial cairns and quarries.

Ponds: three relict ponds associated with water meadows, also used as sheep washes. Two by the East Myne ruins were filled in and the one by the house doesn't fill.

Streams: permanently running. The leat/ stream running through the yard as part of the water meadow runs as a trickle in the summer.

Soils: red, sandy, shallow, stoney. A vein of black, acid soil runs through the top of the farm.

Hedges: no hedges surrounding the farmyard. Banked hedges of elm and ash lower down in the valley. Distinct line of elms at their topographical limit. Dutch Elm Disease wiped out most of the elm hedges lower down which coincided with grants to remove boundaries. Some holly hedges at the top but very few. Porlock Hill has a similar elevation and exposure but is known for its holly hedges. Hedges not ruined by WW2 training, instead boundaries were walled ha-ha's with a scrub dead hedge on top.

Field trees: occasional ash and oak. Most are remnants of old hedges, particularly around the house. At East Myne there are beech trees which were part of hedges. Trees are mostly confined to combes, often in defined blocks following streams.

Feedback on the interview

Helpful process, similar to a HLS application which doesn't include any cultural elements. The common theme across Exmoor is the type of farming but there is a huge cultural and landscape difference across Exmoor, let alone anywhere else.

We should play on the use of natural and cultural capital, the current buzzwords, and use the information as evidence and to provide figures of what we have that is special.

Pilot Area 2: Lyshwell Farm

Introduction

Lyshwell Farm is situated on the Somerset/Devon border in the south of the Exmoor National Park.

Lyshwell is a classic example of why using a 250m buffer during the natural capital assessment process is so important. Failing to consider outlying areas to the farm in this case would ignore how the farm fits into the landscape, in particular the heather moorland and ancient broadleaved woodland.

Landscape character summary

Key features to this holding are expansive and panoramic views, permanent pasture typically enclosed by beech hedging, broad rounded hills and ridges, a dominant hedgerow network, a peaceful and tranquil character, dark skies, hunting country and strong seasonal influences.

Landscape Character Areas covered: D2 Open Moorland, F2 Enclosed Farmed Hills with Commons, G3 Incised Wooded Valleys.

Farmer's own summary description

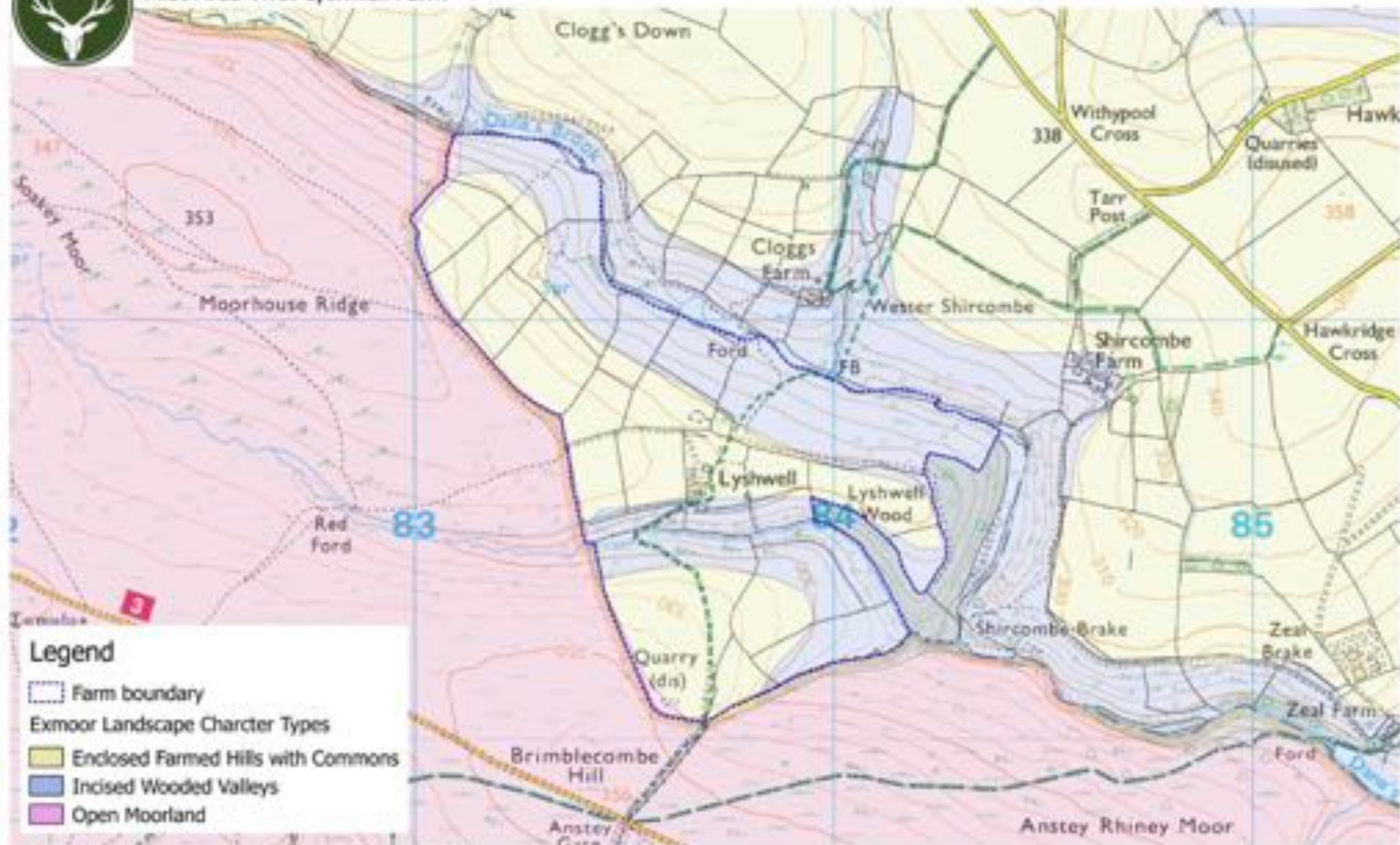
Isolated Exmoor hill farm on two valleys on the Devon and Somerset border. Steep, hardworking, predominantly north facing, with difficult access. Stands alone – doesn't touch another farm: bordered by moorland, Dane's Brook and woodland.



The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area Two: Lyshwell Farm

Orientation and landscape character



Scale 1:11,328

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The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area Two: Lyshwell Farm

Land cover: enclosed and unenclosed

Lyshwell's land cover is varied. All the grassland is permanent and the majority of fields are improved. Some areas have been identified by the 2012 HLS as good quality semi improved grassland, some of which is bracken dominated. Also, in the combes are scrub and wet

Lyshwell Wood, a broadleaved ancient woodland, is situated in the 250m buffer zone. Heather moorland, a dominant land cover in this landscape, is also adjacent to the farm.

Lyshwell is an unusual farm in that it does not border any other farms, instead it is bounded on by woodland, Danes Brook or moorland.

Legend

-  Farm boundary
-  Good quality semi-improved grassland
-  Good qual semi-improved. Bracken dominated
-  Improved grassland
-  Bracken dominated grassland
-  Rough grazing
-  Heather moorland
-  Broadleaved woodland
-  Scrub
-  Wetland and riparian habitats

0 500 1000 m

Scale 1:11,000

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The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area Two: Lyshwell Farm

Physical features and elements

Danes Brook borders the farm to the north and east and Red Ford runs through the combe in front of the farmhouse, a leat from Red Ford supplies for many of the fields.

The field boundaries are banked hedges and the earth banks recorded on the farm predominantly relate to the large number of deserted settlements in the area.

Many earth banks are recorded on the moorland area, these are mostly boundaries and enclosures which are no longer in use.

More earth banks are present which could not be recorded from the aerial photography, particularly in the fields overlooking Danes Brook.

Legend

- Davey ESS Holdings (pilot only)
- clip_Davey watercourses
- Davey hedge banks
- Davey hedges
- Davey field trees

0 500 1000 m

Scale 1:11,000

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EXMOOR
NATIONAL PARK





The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area Two: Lyshwell Farm

Nature, geological and hydrological designations

Lyshwell Farm is within Exmoor National Park. The moorland areas of Molland Moor and Anstey Common are designated as SACs. The moorland areas, and also some of Shircombe Brake are designated as part of the South Exmoor SSSI, the moorland condition is unfavourable recovering and Shircombe Brake's condition is unfavourable declining.

Lyshwell Wood and the combe in front of the house are designated as County Wildlife Sites. Lyshwell Wood is also an ancient broadleaved woodland. Danes Brook and the land immediately surrounding it are classified as a Local Wildlife Site.

There are commoning rights on Anstey Common.

Legend

- Farm boundary
- Special Area of Conservation
- Site of Special Scientific Interest
- County Wildlife Site
- Local Wildlife Site
- Ancient woodland
- Common Land

0 500 1000 m

Scale 1:11,000

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EXMOOR
NATIONAL PARK





The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area Two: Lyshwell Farm





Historic environment designations

There are 12 records in the Exmoor Historic Environment Record on Lyshwell Farm, and other records present in the 250m buffer. Full details for each can be obtained from the HER but to summarise: a water meadow of probable 19th Century date, a leat (still in use) former field boundaries, embanked quarries and trackways, collections of earthworks forming the deserted post-medieval farmstead of Moorhouse, remains of a deserted farmstead (unnamed), the deserted farmstead Landcombe of probable post medieval date, a well preserved leat or carriage gutter, a second water meadow, a deserted farmstead 120m north of Lyshwell Farm, the deserted farmstead of North Lyshwell and the possible site of a farmstead mentioned in the 13th Century.

There are two Principle Archaeological Landscapes recorded, the first, no. 49, Cloggs and surrounding deserted farmsteads encompasses Lyshwell and the second, no. 29, Molland Common covers Molland Moor in the 250m buffer. Clogg's Farmhouse and abutting buildings, in the 250m buffer of Lyshwell Farm, are Grade 2 listed.

The farmstead at Lyshwell was built as a model farm in the C19th century

Legend

-  Farm boundary
-  Exmoor Historic Environment Record
-  Principal Archaeological Landscape
-  Listed building

0 500 1000 m

Scale 1:11,000

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The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area Two: Lyshwell Farm

Access and recreation



Legend

- Farm boundary
- Public Right of Way
- Bridleway
- Footpath
- Open access

0 500 1000 m

Scale 1:11,000

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The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area Two: Lyshwell Farm

Aesthetic and perceptual capital

Interviewee's perceptions of Lyshwell Farm:

Pride
Traditional management
Visitors like views, wildlife and tranquility

One favourite is to stand in the field above Danes Brook, near to Molland Common, and look down the combe. The opposing view is to look back up at Molland Common up the combe

Standing above Wester Shircombe and looking back onto Lyshwell Farm and down to Shircombe Brake past Lyshwell Wood

The interviewees identified various favourite or special views from the farm and also one looking into the farm. The views on this holding tend to be directed by the topography, so many of the views are directed through combes and then widen into the surrounding landscape. It is possible to look into Lyshwell Farm from many places on the surrounding moorland and farmland.

From the track entering the farm looking down to Shircombe Brake past Lyshwell Wood

Legend

- Farm boundary
- Interviewee's favourite views

0 500 1000 m

Scale 1:11,000

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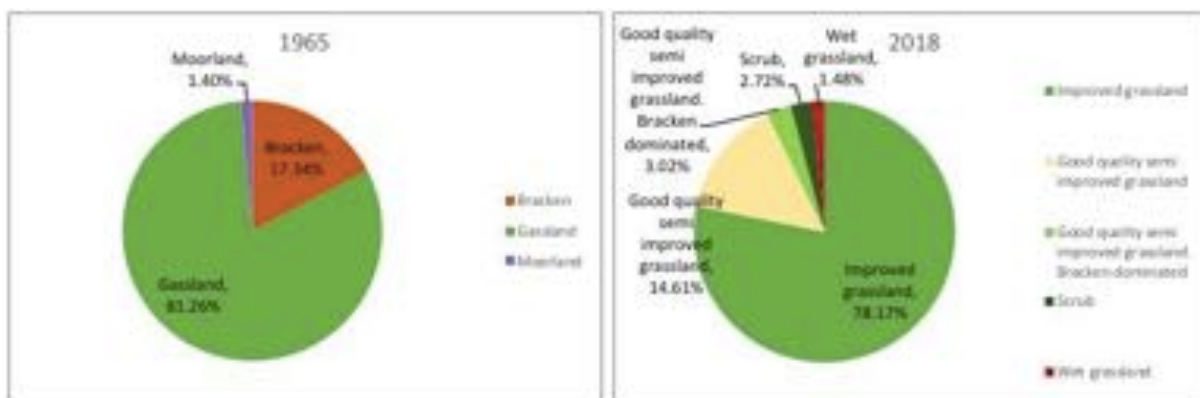
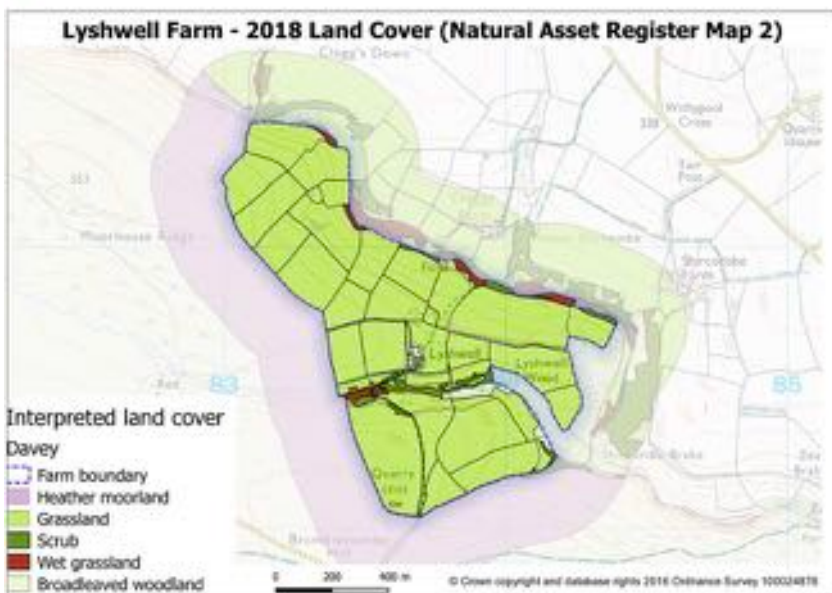
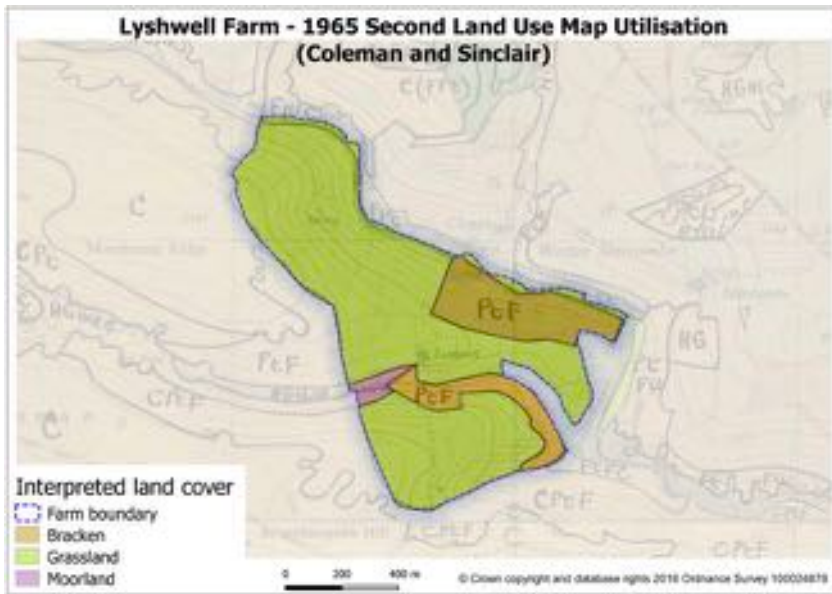


EXMOOR
NATIONAL PARK



Land cover change

Comparing land cover in 1965 with 2018



Interview

Raymond and Sarah Davey. Lyshwell Farm.

Describe the farm

Isolated Exmoor hill farm on two valleys on the Devon and Somerset border. Steep, hardworking, predominantly north facing, with difficult access. Stands alone – doesn't touch another farm: bordered by moorland, Dane's Brook and woodland.

The traditional outbuildings are no longer used because they don't meet the FABBL requirements. Fields have no water unless they have a spring or river running through them. Electric from a generator.

Perceptual and aesthetic capital

When the HLS scheme started beech hedges were included, however this was soon changed to include hedges with 6 species or more thereby excluding the majority of hedges on Exmoor. The argument for this was that beech hedges are not natural to Exmoor, however the Davey's feel that this is inaccurate and that beech hedges are enjoyed by walkers and visitors, the hedges are laid as part of traditional management and the changing leaf colours enhance the area. The National Park scheme did include beech hedge management.

Livestock are the reason that the landscape looks the way that it does. The farmer doesn't create the landscape he just chooses when to put livestock in and when to take them out.

Views: They have no favourite view as such, there are nice views from lots of places. To a certain extent they feel that the views have become a part of daily life. The deer are also a part of daily life, as they are always on the farm. One favourite view is to stand in the fields above Danes Brook, near to Molland Moor and look down the combe. The opposing view is from the other end of the farm looking back to Molland Moor up the same combe. Another favourite is from where the track enters the farm looking down over Shircombe Brake to Zeal. They also rent ground at Wester Shircombe and enjoy looking back onto Lyshwell Farm and down to Shircombe Brake past Lyshwell Wood.

Farm achievements: They are proud of the National Park scheme and what it achieved. Under that scheme they fenced every hedge on the farm and then in the traditional way let them grow up and laid them. They tend to keep the north-south facing hedges low as the shadows and shade cast by them affects how the hay dries.

Proud of the hedges.

Proud of the fields, they have done their best to protect them and to keep the ground in good condition without ploughing. Old grass produces less growth but the different grass species and flowers benefit the stock.

Proud of the stock they produce – a closed flock of Exmoor Horn and Exmoor mule sheep. It isn't an easy landscape to farm. They used to graze Molland Moor with Hereford cattle but when ESA came in and the moorland grazing stopped they changed their management to a softer, bigger Belgium Blue X herd and calve earlier. The stock do better when they know the farm, hefting. At the local Cutcombe suckled calf sale they won the cup. They have also won various ribbons and cups at a local level from Exmoor Horn Breed Society.

Longstanding (traditional) management practises: in the old days they made their own bales but now use contractors but still cut and turn themselves. In the old days they would hire lorries to transport stock but as machinery and vehicles have increased in size they now transport their own stock as their access is restrictive. Always use the local markets at Cutcombe and Blackmoor Gate.

Try to do most things in a traditional manner. The sheep are kept out all year, they don't have the shed space but during lambing they are brought in overnight.

Literature/ film: 1991 television series 'Secrets of the Moor' by Chris Chapman. Each episode of the single series explored the landscape, history and culture of the area (<http://www.chrischapmanphotography.co.uk/history2.htm>) and consisted of several walks across Exmoor, one of which was across Lyshwell. Raymond Davey was filmed as part of this series showing what was being done on Lyshwell Farm: haymaking and shearing. He helped the neighbours with shearing and the neighbours helped with their shearing.

They hosted National Hedge Week at Lyshwell Farm. They also hosted a group of students to study archaeology and Rob Wilson-North, ENPA, taught them about the archaeology on the farm, explained what was there and brought it to life. Before it has just been mounds.

Countryfile has filmed on the farm twice over the years, once to film the deer.

Richard Eales, ENPA Ranger, for many years led a public walk during the deer rut.

Access and recreation

PROW: a footpath goes right through the middle of the farm and past the farmyard. There can be some trouble with dogs.

The Ridge Road over Anstey Common and Molland Moor was made into National Cycle Route 3 in recent years. As a result, some cyclists use the footpath running across the farm, even though it isn't a bridlepath. Stock are unused to cyclists and are often spooked.

Most users of the footpath are understanding when they cross paths during farm operations. Some ask questions about what they are doing on the farm and show an interest, they are happy to educate and speak to them.

Visitors come to the area for views, peace, wildlife and tranquillity. The footpath through the farm goes to Tarr Steps, a honeypot destination. They feel that walking is fashionable, along with an increased drive for exercise. People want to get away from hustle and bustle.

People pay for hobbies such as horse racing, football and other sports but don't pay to go for a walk which is also a hobby. Some people would pay to walk in the countryside and others wouldn't.

When Right to Roam first came in they had a lot of issues with people walking all over the farm.

Friends, family and footpath users come to hear the cuckoo and to see the red deer and take photos of them. In the past they have had issues with people wandering off the footpath to look for deer.

They have found that the deer are tamer now than before, they are used to the footpath and them working and are only startled if something unusual occurs.

Watching deer has become more popular. Some visitors have suggested that the Davey's charge to allow access to the deer on their farm, however the deer can be viewed from the moor above the farm. The rut attracts locals and visitors.

Land cover

Moorland: Molland Moor was traditionally stocked by cattle, the ESA required that all cattle be removed. Gorse has since increased, and the Graze the Moor Project requires cattle grazing on the moorland.

Grassland: old permanent pasture. Only 2 fields have been ploughed during their time at Lyshwell but the numerous deer on the farm pulled out the establishing young plants. Limed. Cut 50 acres of hay and silage dependent upon the weather. The hay fields are fertilised along with some of the others.

Scrub: mainly gorse and bracken with some hawthorn in the cleave. Issues of cutting scrub on steep banks.

Under HLS they were required to remove large gorse patches on steep ground. Conflicting advice from the Headwaters of the Exe project recommended growing trees and scrub to hold the water on steep ground would improve water quality and prevent runoff.

Physical features and elements

Species: a species list is included as part of the old National Park agri-environment scheme (the interviewer was directed to the reports held by ENPA for further information). Species include (list not exhaustive): waxcaps, kingfishers, dippers, kestrels (which live and breed on the farm), buzzards, tits, sparrows, chaffinch, lesser spotted woodpeckers, green woodpeckers, nuthatches, goldfinch and snipe.

Hares, which they never used to see, are now in both valleys. Foxes, badgers and otters. Dormice are resident in Shircombe Brake below Lyshwell Wood.

Electrofishing, conducted by the bridge in the combe below the house, by Exeter University 30 years ago. Exeter University's Geography Department also had a weather station measuring humidity, rainfall and temperature.

Landforms: the field systems. The quarry; the stone for the house and building is thought to have come from quarries on the farm or just outside the farm boundary on the moorland edge.

Waterbodies: a leat supplies water to 5 fields from Red Ford on Molland Moor, but currently is damaged and leaking onto the moor. There are two springs on the farm, one above Danes Brook which rarely dries up and the other by the disused quarry which does dry up each year. The second, near the quarry, is thought to have been the main supply for the house at one time. The house is now supplied by a bore hole but previously via a well and open gutter.

Hedges and earth banks: the maps of earth banks, stone walls and hedges are all documented as part of the National Park agri-environment scheme (follow up for further detail). Laid a hedge outside the house this year.

Field trees: by the spring above Danes Brook, in Shircombe Brake and the big beech in the combe outside the house.

Designations

CWS: didn't know that it had been designated for a while.

Feedback on the interview

Useful. Promoting the farm to go into another scheme. Show people what you've got. Promote yourself – farmers are good at farming but aren't necessarily good at promoting themselves.

Useful to include cultural elements.

Useful process which gives the farmer a chance to put their side across. Will Governments listen? With previous schemes Governments have failed to listen to the farmers who know the land best and often have many years' experience working in that area and has local knowledge. The Government focusses on a whole country scheme, the National Park focussed on a local scheme. Schemes should be local. They should also be flexible and allow the opportunity for potential changes to a scheme to be discussed and implemented as appropriate.

Pilot Area 3: Aclands and Chapman Barrows

Introduction

Aclands and Chapman Barrows are farmed together, Aclands is situated to the mid west of the National Park and Chapman Barrows is situated in the north western corner of the Exmoor National Park. Aclands is a remote purple moor grass dominated moorland farm with some improved permanent pasture and Chapman Barrows is an improved permanent pasture farm. The two farms vary significantly in character and in how they sit within the landscape. For this pilot they have been assessed individually.

Landscape character summary

Key features to this holding include improved enclosed moorland, elevated open moorland, rounded summits and smooth uncluttered skylines, vast views, dark skies, wild landscapes, sense of remoteness, very sparse isolated settlements/ farmsteads, atmospheric, hunting country.

Landscape Character Areas covered: D2 Open Moorland, F1 and F2 Enclosed Farmed Hills with Commons.

Farmer's own summary description

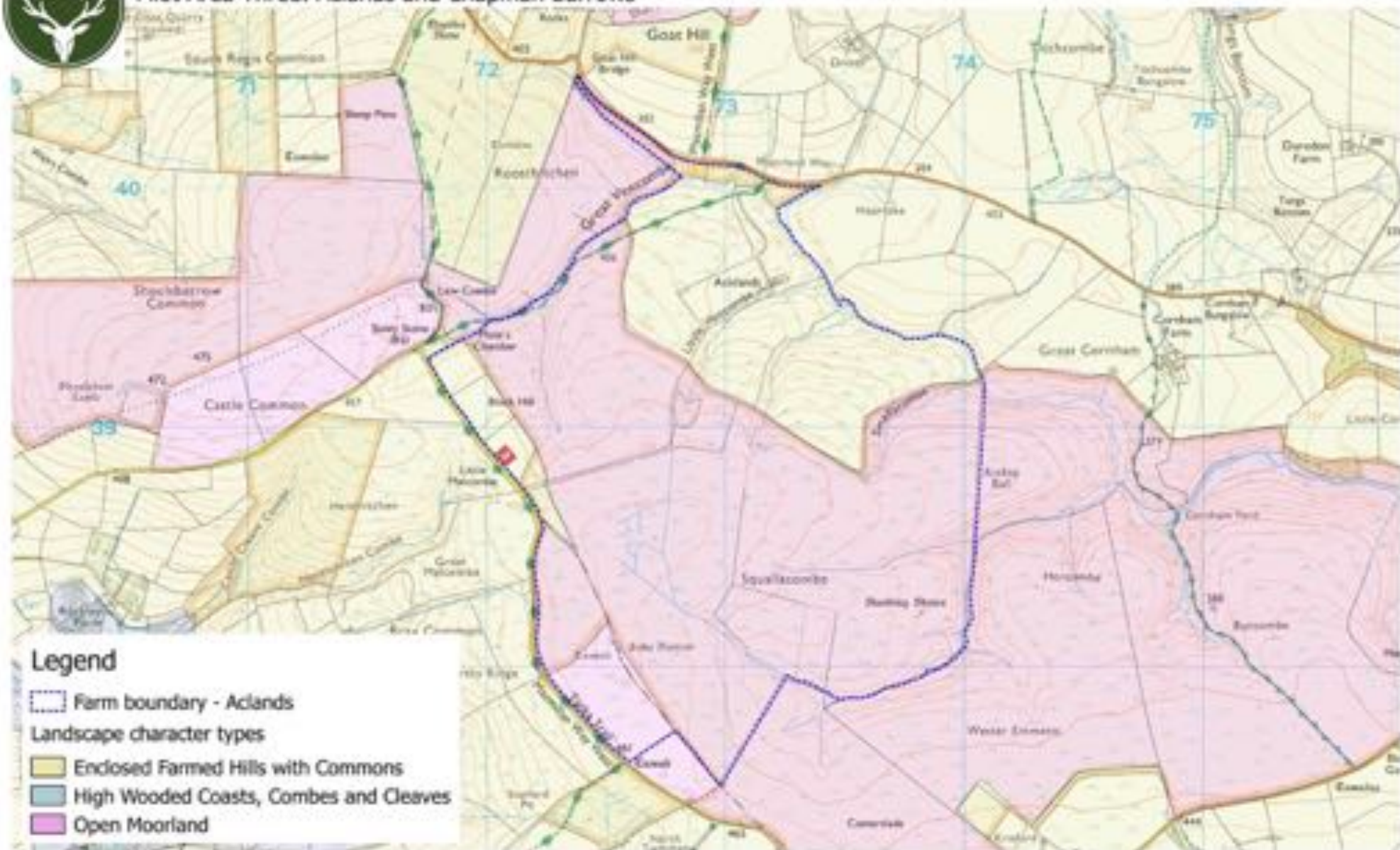
Simple moorland farm producing sheep and cattle. Production and output limited by weather and wintering facilities. 'Wild, bleak and wonderful'



The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Orientation and landscape character

Pilot Area Three: Aclands and Chapman Barrows



Legend

- Farm boundary - Aclands
- Landscape character types
 - Enclosed Farmed Hills with Commons
 - High Wooded Coasts, Combes and Cleaves
 - Open Moorland

Scale 1:25,000

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The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area Three: Aclands and Chapman Barrows

Land cover: enclosed and unenclosed land

Many areas of the purple grassland dominated moorland are also mires, which is where ditch blocking has occurred in recent years. A small area of beech broadleaved woodland, now established, had to be planted several times. The fields are all improved.

Legend

-  Farm boundary - Aclands
-  Mires
-  Permanent grassland
-  Broadleaved woodland
-  Grass moorland

0 500 1000 m

Scale 1:20,000

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The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area Three: Aclands and Chapman Barrows

Physical features and elements

Ditch blocking conducted by the Exmoor Mires Project corresponds with the mire areas. The River Barle, which runs along the north and east side of the holding, is designated as a SSSI and many streams feed off Aclands into it. There are several beech hedges and many more earth banks. A stone wall, a relic of the Knight's Estate, is situated on the south east boundary. Field trees are predominantly shrubby species such as hawthorn.

Legend

-  Farm boundary
-  Main river
-  Stream
-  Hedgerow
-  Earth banks
-  Boundary (stone wall)
-  Blocked ditches
-  Field trees

0 500 1000 m

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EXMOOR
NATIONAL PARK



Rural Focus







The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area Three: Aclands and Chapman Barrows

Nature, geological and hydrological designations

Aclands is within Exmoor National Park. The moorland area is designated as SSSI and its condition is unfavourable no change and unfavourable recovering. An area of moorland within the 250m buffer to the north west of Aclands is in favourable condition. The River Barle, also a SSSI, is in favourable condition. Several County Wildlife Sites are situated in the 250m buffer as well as an Unconfirmed Wildlife Site.

Legend

-  Farm boundary - Aclands
-  Site of Special Scientific Interest
-  County Wildlife Site
-  Unconfirmed Wildlife Site

0 500 1000 m

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EXMOOR
NATIONAL PARK





The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area Three: Aclands and Chapman Barrows

Historic environment designations

Features are recorded on the Exmoor Historic Environment Record within the Aclands boundary and include archaeology such as earthworks, post medieval ditches, quarries, Bronze age barrows, peat cuttings, the Royal Forest, Aclands farmstead built in the 20th Century, traces of narrow rig ploughing, a packhorse track and small irregular mounds. Reference should be made to the HER for full details of each record and for details of records within the 250m buffer area.

A Principle Archaeological Landscape, no. 8 the Setta Barrow, Five Barrows and Two Barrows complex, is situated on the southern edge of the holding. 2 Scheduled Monuments, each comprising of several barrows, are recorded within the Aclands boundary (DV 208 and DV 209). Within the 250m buffer two more Scheduled Monuments are recorded which are four round barrows and a stone row (DV 468 and DV 975).

Legend

- Farm boundary - Aclands
- Scheduled Monument
- Exmoor Historic Environment Record
- Principle Archaeological Landscape (no. 8)

0 500 1000 m

Scale 1:20,000

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EXMOOR
NATIONAL PARK



Rural Focus



The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area Three: Aclands and Chapman Barrows

Access and recreation

Open Access covers all the moorland area. The Tarka Trail uses the road on the south west boundary of Aclands. A bridleway runs from the main drive entrance up to Moles Chamber, at one time this was used as a privateer's route to access the now disused pub at Moles Chamber.

A permissive route follows the top of the River Barle and is infrequently used, although it was used by the Exmoor Challenge this year.

The interviewee believes that Aclands is not particularly well used for recreation other than by the hunts.

Legend

-  Farm boundary - Aclands
-  Public Right of Way
-  Bridleway
-  Footpath
-  Permitted footpath
-  Tarka Trail
-  Car parks
-  Open Access

0 100 200 m

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EXMOOR
NATIONAL PARK





The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area Three: Aclands and Chapman Barrows

Perceptual and aesthetic capital

Interviewees perceptions of Aclands and Chapman Barrows:

Vastness
Space
Lack of neighbours
Far reaching views
Pastoral ambience
Feeling of freedom and seclusion
Wild
Bleak

The interviewee identified two favourite views from Aclands. The views from the ridge road on the south side of the holding are wide and expansive, on a good day it is possible to see Dartmoor and the coast. The views to the north are more enclosed and look onto improved ground and further grass moorland.

From the fenceline at the top of Smallacombe looking over Cornham and Titchcombe

From the ridge road looking towards Barnstaple and South Molton

Legend

- Farm boundary - Aclands
- Interviewees favorite views

0 500 1000 m

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EXMOOR
NATIONAL PARK





The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area Three: Aclands and Chapman Barrows

Orientation and landscape character



Legend

- Farm boundary - Chapman Barrows
- Landscape Character Types**
- Enclosed Farmed Hills with Commons
- High Wooded Coasts, Combes and Cleaves



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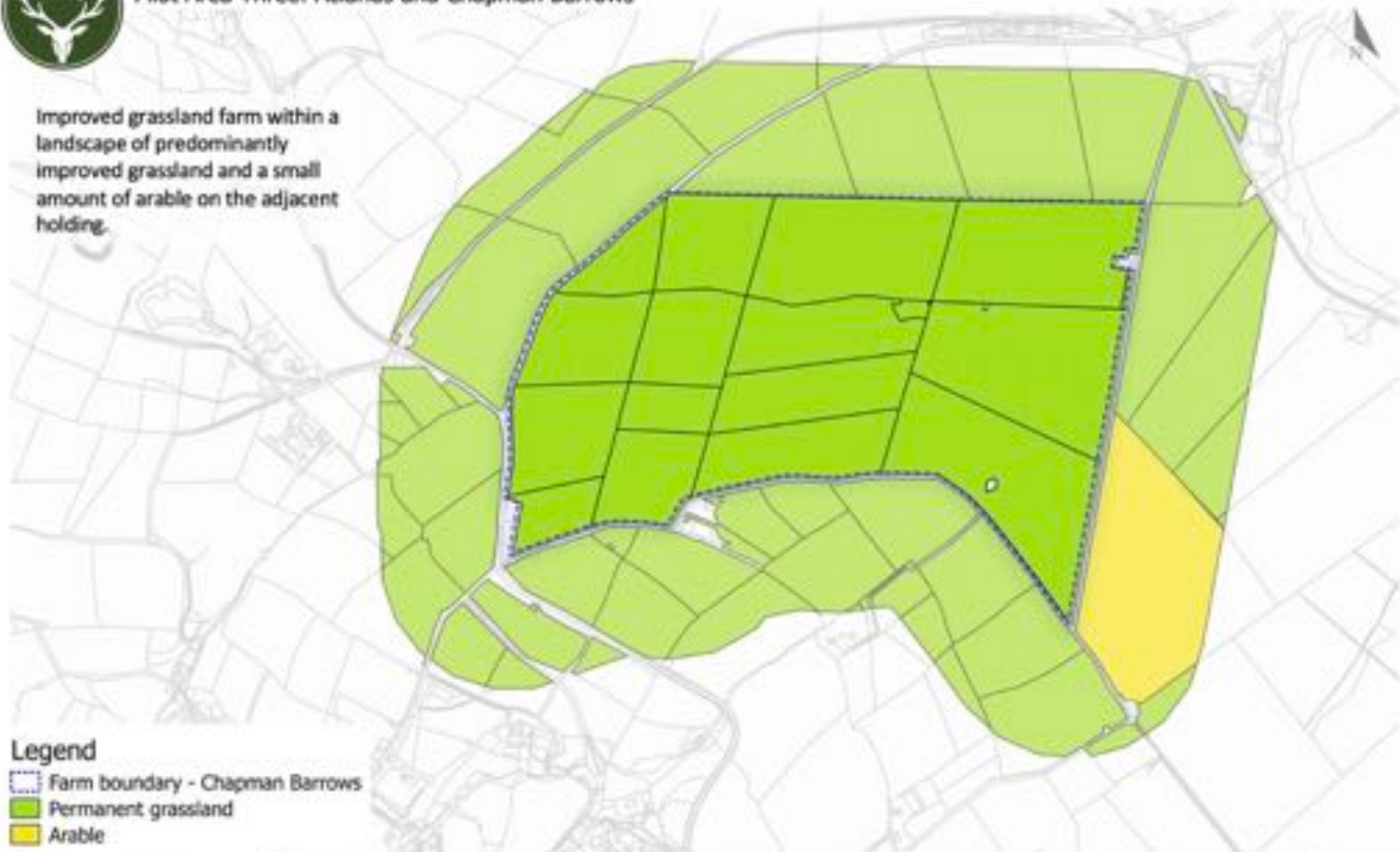


The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area Three: Aclands and Chapman Barrows

Land cover: enclosed and unenclosed land

Improved grassland farm within a landscape of predominantly improved grassland and a small amount of arable on the adjacent holding.



Legend

- Farm boundary - Chapman Barrows
- Permanent grassland
- Arable

0 500 1000 m

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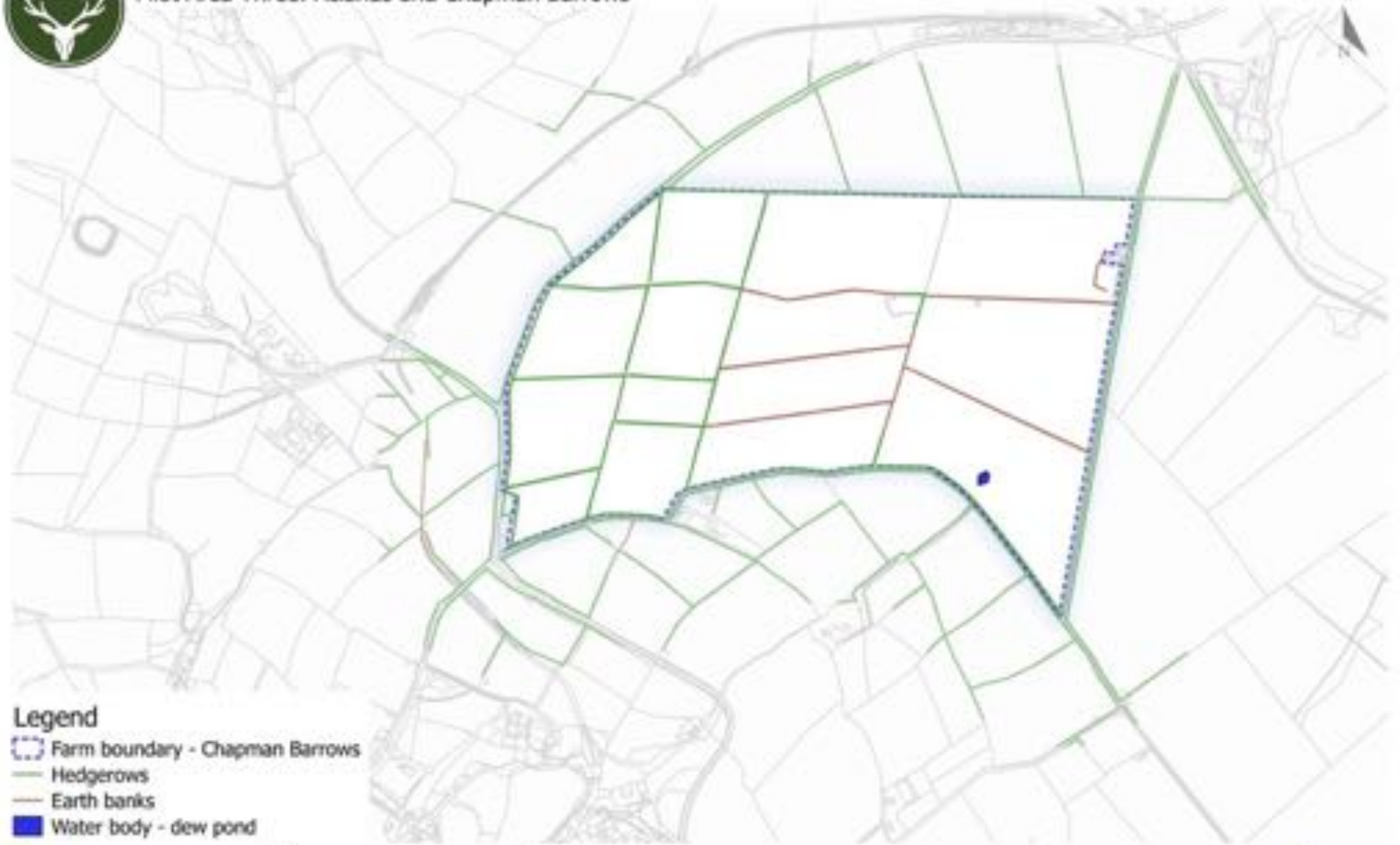
Compiled by A Walker on 27/4/2018



The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area Three: Aclands and Chapman Barrows

Physical features and elements



Legend

- Farm boundary - Chapman Barrows
- Hedgerows
- Earth banks
- Water body - dew pond

0 500 1000 m

Scale 1:5,000

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EXMOOR
NATIONAL PARK



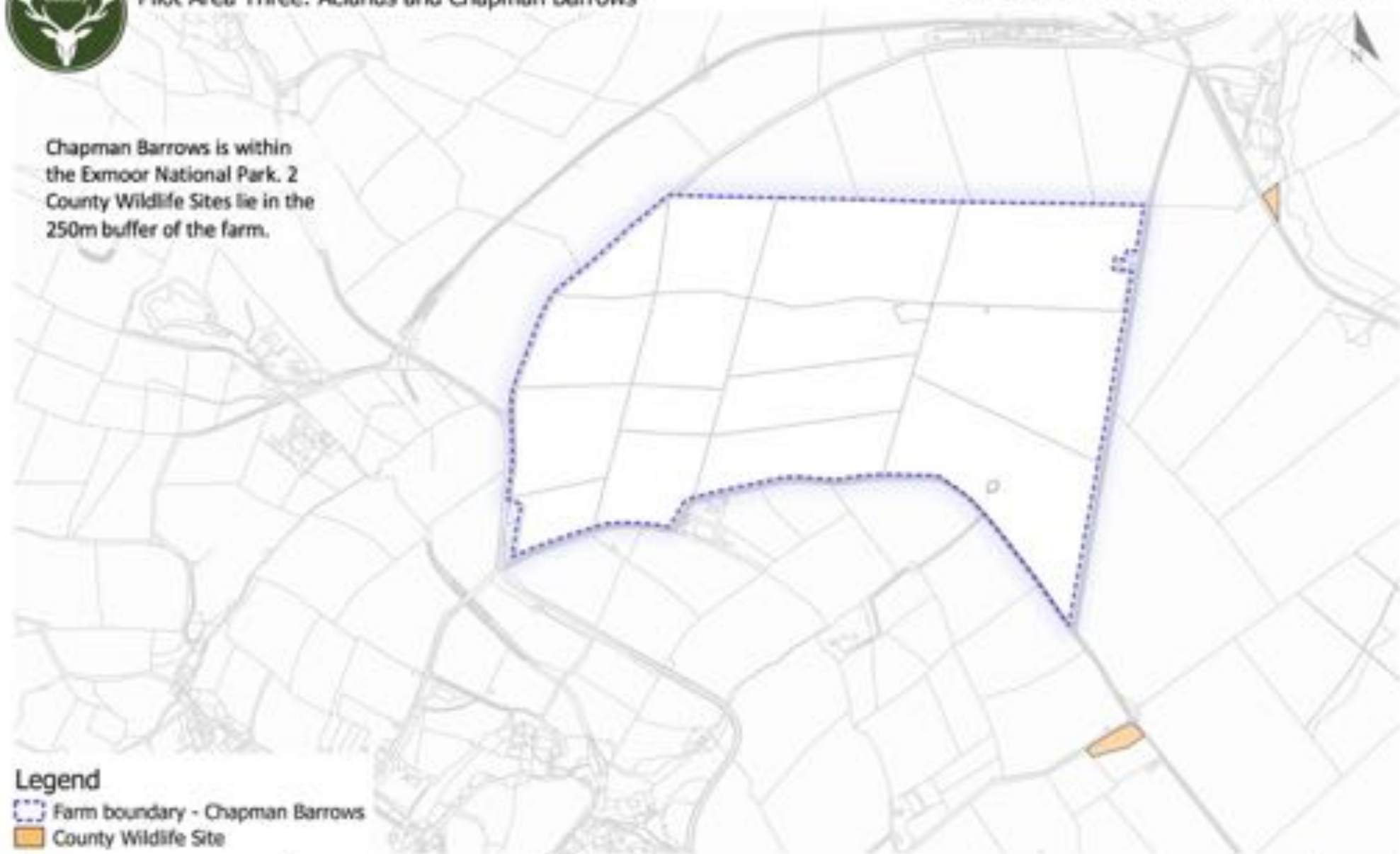


The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area Three: Aclands and Chapman Barrows

Nature, geological and hydrological designations

Chapman Barrows is within the Exmoor National Park. 2 County Wildlife Sites lie in the 250m buffer of the farm.



Legend

- Farm boundary - Chapman Barrows
- County Wildlife Site

0 500 1000 m

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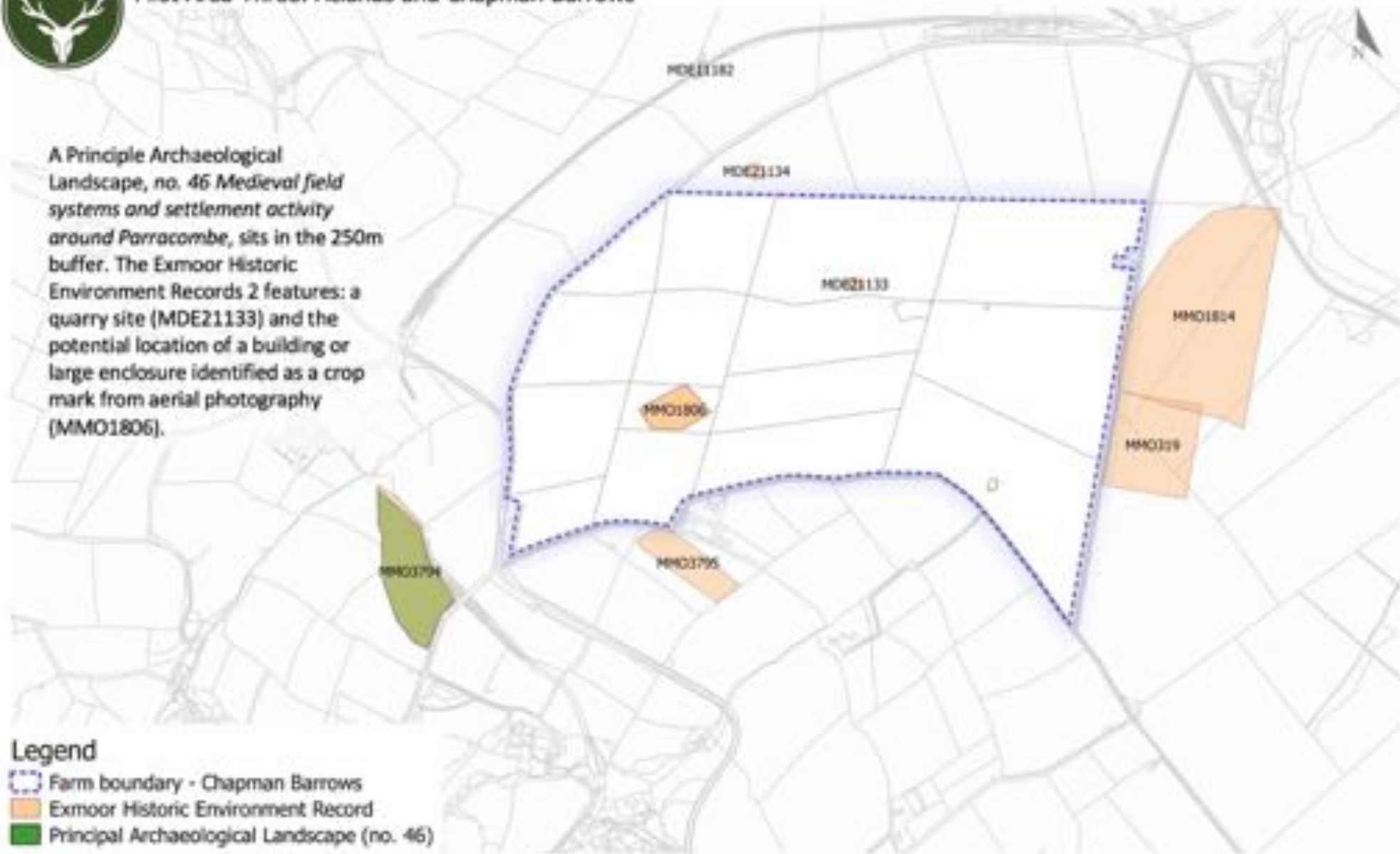


The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area Three: Aclands and Chapman Barrows

Historic environment designations

A Principle Archaeological Landscape, no. 46 Medieval field systems and settlement activity around Parracombe, sits in the 250m buffer. The Exmoor Historic Environment Records 2 features: a quarry site (MDE21133) and the potential location of a building or large enclosure identified as a crop mark from aerial photography (MMO1806).



Legend

- Farm boundary - Chapman Barrows
- Exmoor Historic Environment Record
- Principal Archaeological Landscape (no. 46)

0 500 1000 m

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The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area Three: Aclands and Chapman Barrows

Access and recreation

Chapman Barrows is an isolated farm bounded on three sides by roads, the holding contains no public rights of way or open access and is only occasionally used by hunts.

Legend

- Farm boundary - Chapman Barrows
- Public Right of Way
- Bridleway
- Footpath
- Permitted bridleway
- Recreation attraction event - Lynton and Barnstaple Railway

0 500 1000 m

Scale 1:3,000

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The Exmoor Society: Towards a Register of Exmoor's Natural Capital

Pilot Area Three: Aclands and Chapman Barrows

Aesthetic and perceptual capital

Interviewees perceptions of Aclands and Chapman Barrows:

Vastness
Space
Lack of neighbours
Far reaching views
Pastoral ambience
Feeling of freedom and seclusion
Wild
Bleak

Looking from the top of the farm towards the sea and Slattenslade Farm

Looking over Parracombe Lane Head as the view is "busier" and there are more people [farms] to 'spy' on

Two views were identified by the interviewee as special to them. Chapman Barrows is situated on one of the higher points of the surrounding landscape and from many places there are near 360-degree views. Due to topography the entirety of Chapman Barrows is difficult to identify when looking in from outside of the holding. There are no dominant features to distinguish it from the surrounding landscape which is predominantly beech hedged permanent grassland.

Legend

- Farm boundary - Chapman Barrows
- Interviewee's favourite views

0 500 1000 m

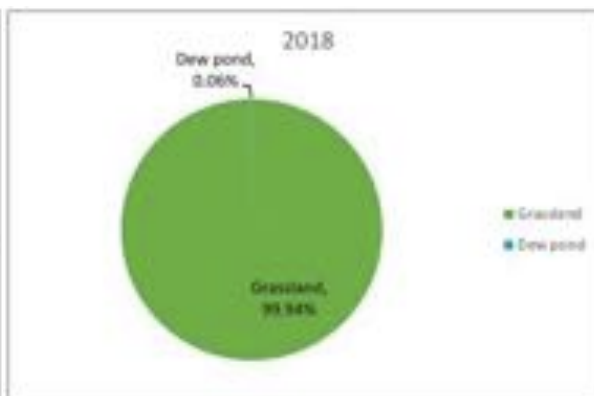
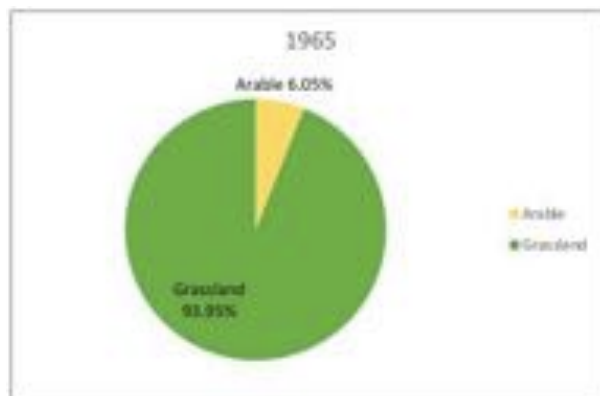
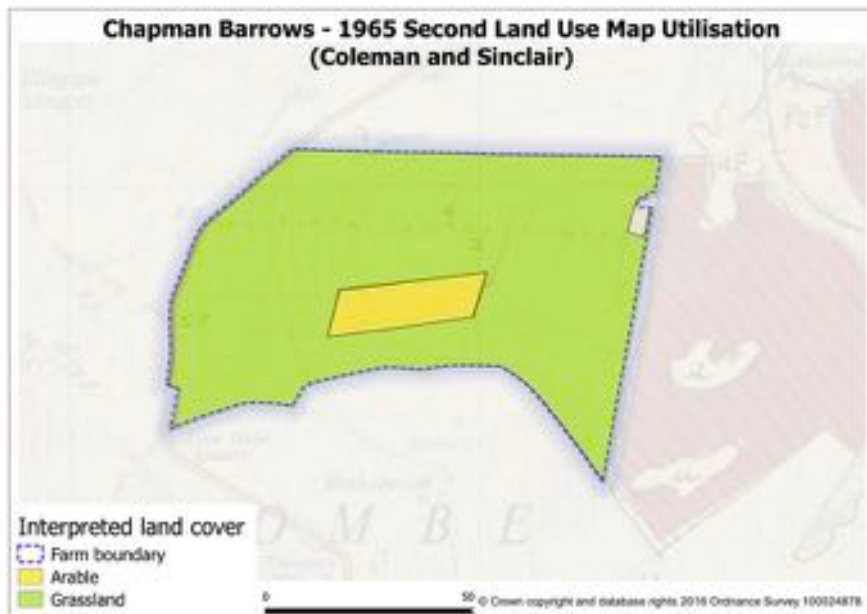
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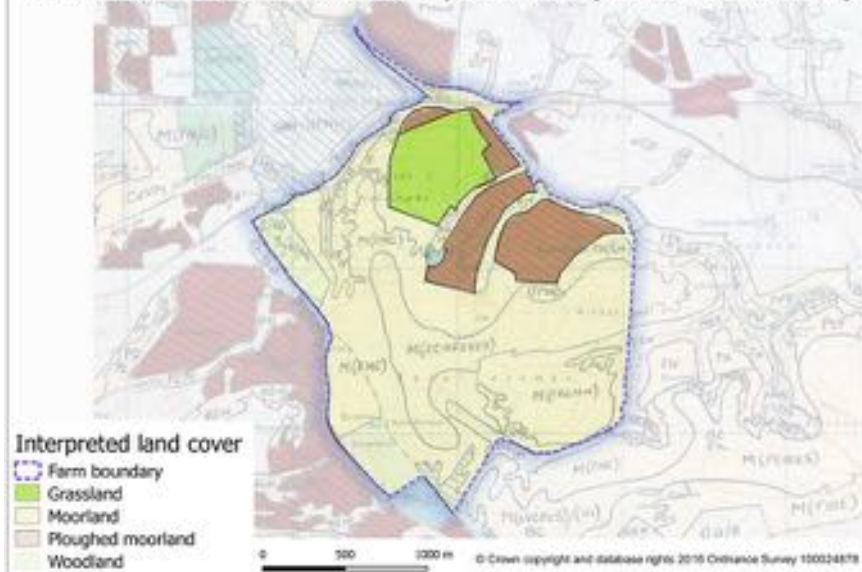
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Land cover change

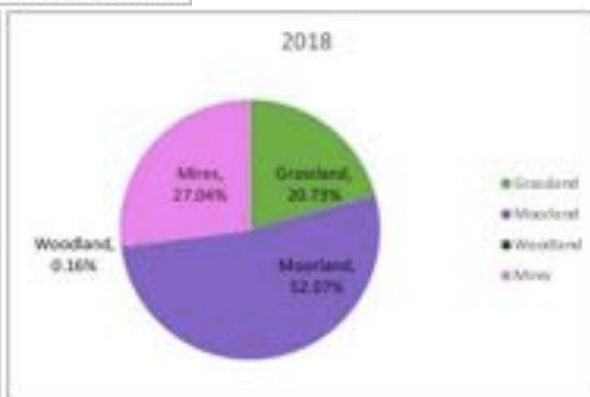
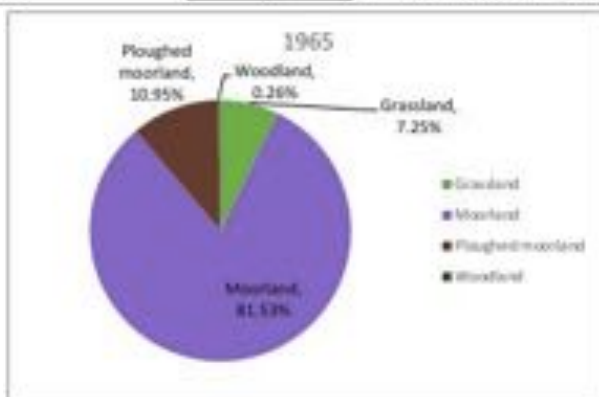
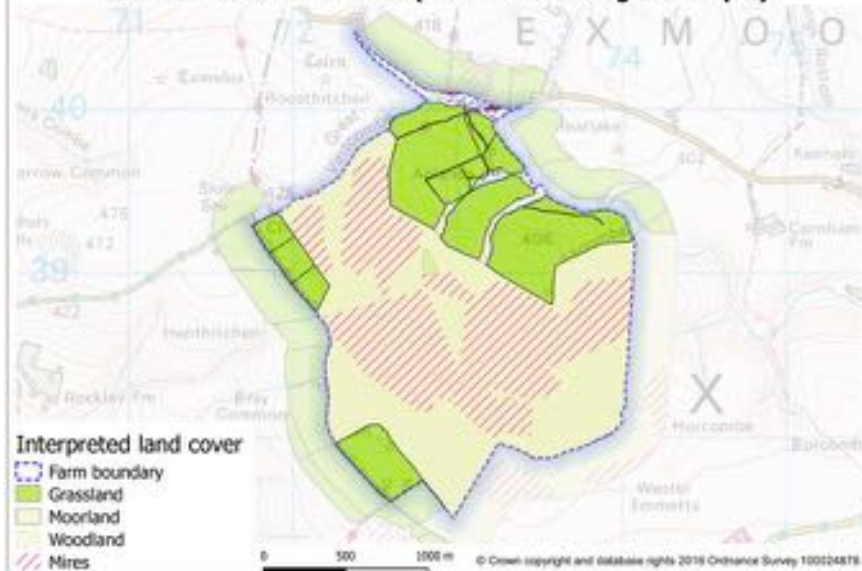
Comparing land cover in 1965 with 2018



Aclands - 1965 Second Land Use Map Utilisation (Coleman and Sinclair)



Aclands - 2018 Land Cover (Natural Asset Register Map 2)



Interview

Robin May (May Brothers). Aclands and Chapman Barrows.

Describe the farm

'Simple moorland farm producing sheep and cattle. Production and output limited by weather and wintering facilities. Wild, bleak and wonderful.'

Perceptual and cultural capital

Pristine environments have a cost to the farmer. ENPA has put a value on the landscape natural capital by refusing to allow wind turbines.

Views: From both Aclands and Chapman Barrows there are far reaching views. Robin loves the vastness, space and lack of neighbours.

Robin's favourite view on Chapman Barrows is looking from the top of the farm towards the sea and Slattenslade Farm. Another favourite is looking over Parracombe Lane Head as the view is 'busier' and there are more people [farms] to 'spy' on. On Aclands his favourite view is from the ridge road looking towards Barnstaple and South Molton. Another is from the fenceline at the top of the fields above Smallacombe looking over Cornham and Titchcombe.

Visitors value the space but when they have the opportunity to walk they don't go very far and seem to keep to the roads and byways. He doesn't see them on the open access ground. Visitors have confidence on the road but lack security out of their cars.

Farm achievements: Robin is proud that they have followed the ebb and flow of agri-environment policy. At Acland's the schemes have been a success as they have righted the wrongs of the 1970's in drainage and landscape terms. The environment is more important and modern technology would be inappropriate and damaging. However, at Chapman Barrows the agri-environment policies are limiting output as modern technology should be used. On the holding as a whole, the environmental payments to protect and enhance Acland's have helped to develop Chapman Barrows and to make the whole holding a more viable unit.

The holding is now self-reliant and winters all of their own cattle. Years ago, all of the cattle were wintered away but due to bTB this is no longer appropriate.

Longstanding (traditional) management practises: Hedge laying, subject to grant aid. The ESA was helpful as it created skilled winter employment that justified the workers in the summer. Rushes have always been cut and sprayed and in the 'good old days' they burnt sedge.

In 1978 20 Galloway cows grazed the moorland and every year previous to that. This hasn't occurred since Robin came home from college.

On Exmoor, when beech hedges were planted in the 1860's wattle hurdles were used to protect them from the weather and rabbits. This isn't practised on the holding now.

Literature/art/etc: Robin doesn't know of anything which directly relates to Aclands or Chapman Barrows.

Access and recreation

PROW: Acland's is well used; Chapman Barrows is not. There used to be a pub at Moles Chamber on the pack horse way which became a privateer's route. It was the last pub on the Devon border before Aclands became part of Somerset and the police couldn't get up there.

The Open Access areas are not well used, except by the hunts.

Robin doesn't see many people on the permissive route, but it has been used this year for the 2018 Startrek Challenge.

Chapman Barrows is probably only used by the beagles. The land is surrounded by roads and there are few people around it.

There are no desire lines, but people get lost and go to Acland's House.

Land Cover

Grassland: Chapman Barrows is all improved permanent pasture. Years ago, there were grants for tilling swedes and putting grass in afterwards, this stopped and payments were for putting in permanent pasture. It has now reverted to acid grassland.

Robin would call the hay field species rich, he thinks this is the best field of them all but the others are good. (Follow up surveying would be required later in the spring/summer to determine this).

Aclands was ploughed, reclaimed and tilled to grass in the 1940s-60s. Robin questions the definition of rush pasture. He categories the fields as improved permanent pastures since the fields are dry, not mire pasture, and the rushes behave like weeds

Woodland: On Acland's a small area of woodland is recorded by the FC NFI in Little Vintcombe. The theory was that the original woodland was burnt down in WW2 when it was either shot at or bombed by American Forces. Therefore, it was deemed significant enough to plant again. It has been planted 2 or 3 times and now has 10 foot deer fencing surrounding it and the trees are living and growing. Beech trees will always struggle at that height.

Scrub: none.

Physical features and elements

Species: there is a huge amount written about the flora of Acland's already (the interviewer was directed towards the detailed reports held by ENPA). On Chapman Barrows Robin feels it would be nice to have longer and stronger beech hedges.

Hares are unique on Chapman Barrows. Red deer on Aclands. There must be potential for ground nesting birds if the habitat is right.

Landforms: there has been very little human activity apart from hedges at Chapman Barrows. Both areas are relatively untouched by human hand which is what makes them so attractive.

Waterbodies: the Dew Pond at Chapman Barrows always has water in it. Chapman Barrows has a borehole to water the livestock and Acland's House and shed are spring fed.

Soils: at Aclands the soils are peat based and shallow. At Chapman Barrows it is a red sandstone base with well drained, stony red soils and some patches of black peat.

Common grazing rights: none on Aclands, never has been.

Feedback on the interview

Look at the process another way and get feedback from the tourism industry including both tourism providers and tourists. Find out why people come to Exmoor and why it is important to them. Farmers provide Exmoor and the pastoral views that it has to offer for the holiday trade, therefore it needs to be 'sold' to people in order to attract government funding.

The National Park designation maintains a beautiful living area with planning restrictions and other management which is available to the general public.

The Register is good but needs public input.

For example: the Exmoor Mires Project and hydrology needs the advantages to be sold to government to prove that it is worth a subsidy scheme. There are also a lot of private bodies which benefit from the Mires Project:

- water companies benefit from mire restoration
- county councils benefit from reduced flooding and reduced damage to road infrastructure
- the holiday trade benefits from pastoral views,
- insurance companies and network rail benefit from less flooding

Money should be drawn from companies and organisations by Act of Parliament or Act of Compulsion, but until then the government has to be relied upon to fund these benefits.

The Register is useful and a wonderful resource. The Register should be used to expand knowledge of the benefits provided by Exmoor in the huge variety of natural and cultural capital in order to engage with government and private bodies.

The process: some of the questions are ethereal rather than factual, which makes them hard to answer. (Robin is referring to the questions relating to cultural capital and prefers the questions relating to natural capital). However, the cultural aspects are very useful, despite their ethereal nature, as 'the ethereal is why people go there: pastoral ambiance, views, feeling of freedom and seclusion'.

7. Examples of Register Outputs for selected Services

Assets to services tables

Towards the end of the Main Report (pages 18 and 19), an example is given of how the information collected in the register can be extracted to show the stock of natural capital assets that are delivering a specific service (Figure 18 in the main report, which is repeated below). This section provides two further worked examples.

The natural capital providing genetic diversity at Lyshwell

Assets	Extent	Condition	Notes
Wet grassland	1.2 ha	1	Some designated as LWS.
Good quality semi-improved grassland	12.2 ha	2	Some designated as CWS. Likely to have a higher number of plant species present.
Good quality semi-improved grassland. Bracken dominated	2.5 ha	3	Likely to have a higher number of plant species present but probably less than non bracken dominated grassland of the same type. Useful if fritillaries present. Some designated as CWS
Scrub	2.3 ha	1	Mix of gorse & shrubby trees. Some designated as CWS.
Broadleaved woodland	1.2 ha	1	Native tree species of mixed age. Ground flora.
Hedgerows	8.0 km	1	Mixed ages & heights. Dense. Some recently laid. Predom. beech.
Waterbodies	2.7 km	1	Good water quality.
Breeding birds	N/A	N/A	Data not available
Exmoor Horn sheep	N/A	N/A	Closed, breeding flock. Win local Society prizes.
Assets to consider outside of the farm boundary			
Heather moorland	67.0 ha		SAC, SSSI
Broadleaved woodland	10.1 ha		Ancient woodland. CWS.

Condition scoring: 1 = good, 2 = fair, 3 = poor and 4 = bad.

The natural capital providing cultural heritage at Aclands

Assets	Extent	Condition	Notes
Grass moorland	260.16ha	2	Part of Royal Forest. Traditional grazing. Subject to historic drainage.
Mire	135.09ha	3	Drainage, reclamation and peat cutting. Recently rewetted.
Perm. pasture (5+ yrs)	103.55ha	2	Reclamation and history of Exmoor.
Broadleaved woodland	0.79ha	2	Replanted several times, original believed to have been used as WW2 target practise.
Hedgerows	3072.91m	1	Traditional practises, banked hedges localised to South West.
Earth banks	7939m	1	Trad. practises. Extinct settlements and land management.
Boundary (stone wall)	242m	2	Relict of Knight Estate.
Waterbodies	8908.20m	3	One of the reasons it was possible to settle the area.
Soils		3/4	
Public access		4	Provides access to the area for cultural learning. The interviewee believes the area is not well used.
- Tarka Trail	2001m		
- Bridleway	1445m		
	1326m		

- Permitted footpath			
Landscape			
Natural landforms			
Manmade landforms	2		Royal Forest and historic settlement, various types of recorded archaeology
Historic environment designations	N/A		Exmoor Historic Environment Record (HER). Scheduled Monuments (SM). Principle Archaeological Landscapes (PAL).
- HER records	26		
- SM	2		
- PAL	1		
View points and vistas			Pastural, managed and farmed landscape.
Culture and knowledge	1		Trad. management, family history, social and Exmoor history.
Perceptions	2		Individual opinions will differ. May provide non recorded info.

Condition scoring: 1 = good, 2 = fair, 3 = poor and 4 = bad.

Natural capital providing scenic beauty at Wydon Farm, Bossington and Selwothy

Assets	Extent	Condition	Notes
Heather moorland	243 ha	1	Dependant upon moorland condition. Characteristic of Exmoor.
Coastal habitats	93 ha	1	Holding bounded by coastline to the north providing far reaching views
Permanent pasture	107 ha	3	Characteristic landscape component, especially when grazed by livestock
Broadleaved woodland	18 ha	1	Native species and ground flora. Also species planted by the Acland family on the Holnicote Estate which provide further interest.
Orchards	0.32 ha	2	Currently managed, requires further enhancement.
Scrub	0.09 ha	2	Within combes, native species.
Species	N/A	N/A	No species lists available.
Landform - natural	N/A	1	Prominent landforms with far reaching views, described in Landscape Character Assessment.
Landform – man made	N/A	2/3	Lots of archaeology and WW2 history present, also management affecting the landscape conducted by this farming family e.g. water meadows and moorland reclamation.
Hedgerows		1	Mixed ages, heights and management styles. Some traditional laying.
Earth banks		1	Earth banks and banked hedges localised to South West.
Landscape		1	5 Landscape Character Types cover this holding.
Nature and geology designations		2/3	Coastal Heritage Site, SAC, SSSI, CWS, LWS
Historic environment designations		2/3	Exmoor Historic Environment Record (HER). Scheduled Monuments (SM). Principle Archaeological Landscapes (PAL).
View points and vistas		1	Popular tourist destination. From interview: 'From the ridgeline you can see in every direction.' and favourite views of the interviewee '(All are good – but...)...'. and people come for '...easily accessible beauty...'
Culture and knowledge		2/3	Longstanding connections of the farming family to the land. Lots of archaeology from many time periods. Traditional management. Promotes understanding of the scenic beauty.
Sensory elements			Described in the Landscape Character Assessment.
Perceptions			Described in the Landscape Character Assessment. Owned by the National Trust.