Energy crops and the historic environment

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English Heritage

English Heritage is the Government's adviser on the historic environment, with a statutory duty to promote the conservation of historic places and features and the public's understanding and enjoyment of their heritage.

In contrast to the other government-sponsored environmental and conservation agencies, English Heritage reports to the Department for Culture Media and Sport. We do, however, work closely with these agencies sponsored by the Department for the Environment, Food and Rural Affairs, seeking to promote a holistic approach to environmental protection.

In using the term "historic environment", I refer to archaeological sites and monuments, historic buildings, designed landscapes such as parks and gardens, historic townscapes, historically significant locations such as battlefields, and the historic aspects of the wider landscape.

For the purposes of this presentation, I will be concentrating particularly on the potential impact of energy crops on archaeological sites, as well as touching very briefly on the wider landscape implications.

Working with landscape change

In considering the implications of energy crops for the historic environment, it is essential to recognise that the diverse and closely managed present-day landscape of Britain is the result of many centuries of interaction between natural and human influences. Throughout this period our countryside has changed continuously, with many of our landscapes having page after page of detail added to create extremely complex stories.

Landscape historians and archaeologists are generally better placed than most to understand this continuing cycle of change in the countryside. English Heritage certainly recognises that the landscape must continue to evolve if rural communities are to prosper in the future, and we accept that energy crops represent just one more page to add to the story. We also recognise that the cultural heritage is under as much threat as any other aspect of the environment as a result of climate instability, and therefore have no doubt that energy crops will provide an essential environmental benefit.

Given this acceptance of change and recognition of the need to ameliorate the impacts of climate change, why do we still have concerns about the implications of energy crops?

The first reason is that over the last half-century, our mechanised, intensified, globalised and development-led society has become capable of damaging our fragile and non-renewable historic assets far more extensively, thoroughly and quickly than ever before. The proposed scale and pace of energy crop planting is the latest manifestation of our ability to radically and rapidly engineer landscape change. For example, calculations suggest that proposed new planting will occupy about one half of one percent of the 30-mile radius catchment area for the new power station projects at Eye and Cricklade. Even more significantly, given the DTI's indicative figure that 125 kilohectares of planting will be required in order to "provide a significant fraction" of the Government's target of generating 10% of electricity from renewable sources by 2010 (DTI 1999) it can be calculated that 1.4% of the total area of farmland in England would need to be converted to energy crop production. These are major land-use changes by any measure and must therefore be carefully evaluated in terms of impact.

A second reason for concern is that we are not dealing simply with the potential erosion of our history. There are also important economic implications as well. In the wake of the Foot and Mouth outbreak, we understand, better than ever before, the pivotal importance of our scenically, historically, and biologically rich landscape in terms of sustaining the rural economy. Our partners in the National Trust have recently commissioned a series of regional research projects that demonstrate that economic value of a high-quality landscape. In Cumbria in 2000, for example, tourism primarily stimulated by landscape quality generated £812 million and, it is estimated, generated 15,000 Full Time Equivalent (FTE) jobs (National Trust 2001).

It is clear, therefore, that if we are to conserve the most valued aspects of our past in order to aid the understanding, enjoyment and prosperity of future generations, we must carefully monitor this new development, strive to understand its implications, and proactively seek to manage its impacts.

Potential impacts on archaeological remains

I want to turn now to the implications of energy crop planting on archaeological remains, first of all by considering the *nature* of possible impacts, and then by considering their *scale*.

In broad terms, the most appropriate management regime for archaeological remains is to maintain them under well-managed improved or unimproved grassland. A high water table will additionally permit the exceptional preservation of organic materials.

Most other land uses, including tree planting, will be more detrimental to the survival of archaeological remains. The recent England-wide Monuments at Risk Survey, for example, demonstrated that one ancient monument has been destroyed every day between 1945 and 1995 and that forestry was a substantive contributor to this destruction. In Scotland forestry impacts have been even more severe.

Short Rotation Coppice planted directly on archaeological remains could cause a variety of adverse mechanical, chemical and hydrological impacts. Ground preparation for planting, planting itself, root growth, and later grubbing-up of SRC could all disrupt archaeological stratigraphy and dislocate artefacts. Exudates from growing roots could also cause chemical deterioration of preserved materials. In addition, the growing crop's demand for water could locally lower water tables and cause the rapid deterioration of any remains preserved by the anaerobic conditions which pertain in waterlogged areas.

The potential impacts of *Miscanthus* are less well understood, as little work appears to have been carried out on its below-ground characteristics. Even where detailed research has been carried out, for example MAFF's otherwise very detailed scientific report on *Miscanthus* agronomy (MAFF, not dated), no attention has been paid to the reporting of below ground attributes.

In addition to the choice of crop type, the severity of damage caused by energy crop growth would depend on a number of additional factors, particularly previous land use and current state of survival. For example, sites deeply buried beneath alluvium could possibly be protected from root or rhizome damage, and already desiccated remains need not be particularly affected by further changes in the water table.

Attempts to assess potential impacts, and therefore the acceptability of planting proposals, will often turn on the *relative impacts* of different land uses. It would be easy for an archaeological adviser to conclude that the planting of SRC on permanent pasture would be detrimental to archaeological remains. In contrast, it would be far more difficult to take a view on the respective merits of conversion to *Miscanthus* cropping compared with continued cultivation for potatoes.

It is clear that far more research is needed on the respective impacts of different agri- and silvi-cultural land uses in terms of archaeological remains. It is also clear that this research should be carried out in the near future, if these considerations are not to impede progress in attaining planting targets. This is an area where DEFRA's Research and Development programme could make an important contribution, not least by simply by acknowledging the need to consider below-ground impacts in crop trials.

Potential scale of the impacts

There are nearly one million records of historic sites recorded in a network of local authority-based Sites and Monuments Records in England. It is estimated that around 300,000 of these are substantive archaeological sites, covering some 6.5% of England's land area, with an average density of 2.25 sites per square kilometre. As a high proportion of archaeological sites remain undiscovered, it must be recognised that this figure represents a minimum density of sites.

The planting targets already announced for the Energy Crop Scheme as part of the England Rural Development Programme, would suggest that a minimum of 488 archaeological sites could be affected by 2006/07. On the other hand, the DTI's indicative figures for energy crop planting by 2010 (see above) suggest that a minimum of 2,800 sites could potentially be affected.

Avoiding problems

Government policy with respect to significant historic remains is to seek their preservation wherever feasible. In the development sector this is achieved by *consultation* with the network of local authority archaeological advisers, increasingly sophisticated desk and site *assessment* procedures, and *mitigation* through re-design or excavation in advance of development. This system is well suited to the development sector, where opportunities for project relocation are often limited and where profit margins are high. In the case of energy crop projects – with far greater flexibility in planting locations, but marginal economic returns – there will be little scope for field assessment and none for expensive mitigation. Instead, the key issue will be the need for *avoidance of impact*. In recent years, the Forestry Commission has established consultative and desk-based assessment procedures, in order to assess the archaeological impacts of planting, both on their own estate and through schemes such as the Woodland Grant Scheme. English Heritage is, therefore, extremely pleased that a requirement for similar procedures has been built into the new Energy Crops Scheme of the England Rural Development Programme.

With these procedures in place, it should be possible to avoid damage to significant archaeological sites *already recorded in local authority Sites and Monuments Records*. However, it is likely that there will continue to be serious difficulties in assessing the impact of planting where archaeological potential is high, but the existing record of sites is poor. This will be particularly acute where planting is proposed on grassland rather than arable land, or an alluvium or colluvium rather than on thinner soils. Unfortunately these landscapes - where site detection is most challenging - tend to coincide with those where remains are generally better preserved.

While the consultative process will not remove all problems, it will at least provide a framework for negotiating their resolution. Allied with the proposed new Environmental Impact regime for uncultivated land and semi-natural areas, it should help to avoid problems in the most archaeological sensitive areas of

grassland. There is, however, a pressing need for research on the cost- effective detection of previously unrecorded sites and English Heritage, the Forestry Commission and DEFRA should all have a role in taking this forward.

Landscape issues

I want to turn finally to the even more complex issue of the landscape impacts of energy crops.

In the view of English Heritage, the landscape impacts of extensive new planting are potentially more significant than the visual impacts of the power stations themselves. We therefore believe that these impacts should be assessed as thoroughly and as early as possible, with the most obvious opportunity being provided by the initial Environmental Impact Assessment which must accompany planning applications for new power stations.

No one can pretend that the assessment of landscape impacts, particularly over large areas, is an exact science. We are, however, fortunate that powerful new tools have recently been developed which can make this sort of strategic landscape assessment possible - a few years ago they were simply not available to us. The first and most familiar tool is the Countryside Agency's Landscape Character Map, which tends to operate at the "macro-scale", allowing a broad assessment of character over large areas. The second is the product of an ongoing programme of co-operation between English Heritage and our local authority partners, to produce a detailed assessment of the historic component of the present-day landscape (English Heritage 1999). This Historic Landscape Character assessment operates at the land-parcel level and, where completed, is increasingly being incorporated into the planning process. This could usefully provide the level of resolution required to assess landscape-level impacts, but its use needs to be formalised in Forestry Commission and energy crop project appraisal procedures.

As I indicated at the start of my presentation, in order to conserve the best of the historic character of the landscape, change should be managed and worked with, rather than opposed. Energy crops may present us with some difficult problems, but also with the opportunity to create bold new landscapes, particularly in areas already degraded by intensive agriculture or industrial dereliction. We must, however, be aware that in the race to establish the environmental benefits of energy crops, we do not damage irreplaceable historic and economic landscape assets. The first key to achieving this is to ensure proper consultation with the appropriate statutory heritage agencies and local authority archaeological advisers. The second is for DEFRA, its agencies, and the heritage sector to undertake more research on the environmental implications – both natural and historic - of this new agricultural revolution.

References

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