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## Landscape Domestication and Archaeology

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### Introduction

The term “landscape domestication” has become increasingly visible within the last decade or so. Some find this use of “domestication” to be inappropriate, however, as domestication is often associated with Charles Darwin and his theory of evolution. A glance at a dictionary dispels confusion, as there are no mentions of evolution or selection or genetics in the definitions. The term comes from the Latin *domesticāre* to dwell in a house, to accustom (Harlan 1992). A house is a built environment and has been part of our experience since people started constructing their own shelters from the elements. The house in the countryside is surrounded by a garden, which also has a dump heap, both of which are intimately involved in the domestication of plants. Hence, there is a strong relationship between landscape domestication and plant or animal domestication, as pointed out by Rindos (1984), although he preferred the “developing agroecology” to landscape domestication.

There is, however, a relationship with evolution. Both domestication and evolution are processes. In evolution, natural selection is the primary agent, while in landscape domestication, culture is the primary agent. As geographer Carl Sauer (1925) wrote, “The cultural landscape is fashioned from the natural landscape by a culture group. Culture is the agent, the natural area is the medium, the cultural landscape the result.” Hence, “Human actions over time are manifested in landscapes that retain physical evidence of cultural practices, decisions, and ideas” (Crumley 1994: 9). It is now well accepted that hunter-gatherer societies consciously and unconsciously manage individual plants and plant populations in the landscape, as well as managing groups of animals and taming individuals (Harlan 1992; Harris 2012). These actions leave traces that can be read in the landscape, the physical evidence mentioned by Crumley. Sometimes, hunter-gatherer societies altered the course of streams by changing local relief, generally with temporary effect but occasionally with more durable results (Harris 2012). These actions also leave traces. As food production became more important during the Holocene and farming societies emerged in many parts of the world, the degree and tempo of landscape domestication increased, generating a strong positive feedback loop with human population expansion (Rindos 1984; Tudge 1998). These actions leave even more traces, which landscape and other archaeologists use to study the origins, development, and spread of food-producing societies (Piperno & Pearsall 1998; Zeder et al. 2006).

When local societies expanded, nature contracted; when local societies contracted, nature returned, but landscapes maintained the imprint of previous human domesticatory actions, making them more attractive for the next local expansion. It follows that “Landscapes are the infrastructural legacies of past human action and contain cultural or social ‘capital’ to be exploited by succeeding human populations” (Erickson 2003: 456). As our species spread across the planet, we preferentially occupied the richest landscapes and then continually more marginal ones, domesticating and

redomesticating landscapes to greater or lesser extent as time went on. It follows that landscape domestication has much to teach us about the human endeavor since the appearance of *Homo sapiens* and perhaps even earlier.

## Definition

Landscape domestication is a process in which human intervention in the landscape and manipulation of landscape components result in changes in landscape ecology and in the demographics of its plant and animal populations, resulting in a landscape more productive and congenial for humans (Clement 1999: 191-2). Human intervention is initially unconscious, mere presence being an intervention, but becomes conscious when humans remain in a landscape and start to manipulate its components (Rindos 1984). It is important to recognize that humans do not set out to domesticate their landscapes; rather, they concentrate on opening space for themselves, e.g., camps and settlements, and enhancing the spaces of their plants and animals, both native to the landscape and introduced from elsewhere.

Since domestication is a process and the intensity of intervention and manipulation may vary considerably, there is a continuum of change from pristine to a city. It is worthwhile to identify some sections of the continuum for analytical convenience. See Clement (1999) for supporting references.

*Pristine* – a landscape in which humans have not intervened or manipulated plant or animal populations.

*Promoted* – a landscape in which desirable plant populations and individuals are encouraged through seed dispersal, minimal ecosystem clearance, e.g., around campsites and along trails, and expansion of the edges between ecosystems, as ecotones tend to be more productive. Fire is frequently an important tool for these activities. Even though there may have been a low level of human manipulation, the biotic components of this landscape may remain modified long after humans have abandoned the area, e.g., when

humans introduce new species or expand populations of useful species. Promoted landscapes differ mostly in their biotic composition and may be difficult for archaeologists to identify without the aid of botanists and ecologists, although increased charcoal abundance may offer a clue. It is in this category of landscape domestication that Rindos (1984: 154-8) hypothesized that the incidental domestication of plant populations begins.

*Managed* – a landscape in which the abundance and diversity of food and other useful plant populations is further encouraged through partial ecosystem clearance by burning, expansion of ecotones, transplanting of desirable individual plants or planting of individual seeds, addition of amendments to enhance plant growth, reduction of competition from non-useful plants, and management of water via irrigation. Again, the biotic components of this landscape may remain long after humans have abandoned the area. The difference between promoted and managed is one of degree, with more conscious application of certain practices. As with promoted landscapes, managed landscapes may be difficult for archaeologists to identify without assistance but are becoming increasingly studied in the context of pre-domestication cultivation in Southwest Asia (Harris 2012) and forest management in the Neotropics (Peters 2000) and Southeast Asia (Michon 2005). It is in this category of landscape domestication that Rindos (1984: 158-64) hypothesized that the specialized domestication of plant populations begins.

*Cultivated* – a manipulation that involves the complete transformation of the biotic landscape to favor the growth of one or a few selected food plants, both domesticated and not, and other useful plant and animal populations, through ecosystem clearance and burning, localized or extensive tillage, seedbed preparation, weeding, pruning, manuring, mulching, fencing, and irrigation in any combination. These dramatic manipulations create a landscape that has little relationship with the surrounding ecosystem, so that it may be called an artificial construct. The biotic components of this very artificial landscape do not survive long after human abandonment because the changes

that favor the growth of the human selected populations also favor the growth of weeds and the invasion of other pioneer species; however, it takes a long time to return to a natural state. The abiotic transformations practiced in this landscape often survive for long periods, e.g., earthworks for irrigation or planting, such as mounds and furrows. Other activities may also leave clear evidence for archaeologists, such as charcoal from the clearing and burning of the original ecosystem, soil modifications due to tillage, long-term management, including creation of anthropogenic soils (Woods et al. 2009), and phytoliths from cultivated plants (Piperno & Pearsall 1998).

*Swidden/Fallow* – this analytical construct is the combination of cultivation and management, in that order. The swidden is a cultivated landscape, which yields well for a few years but becomes progressively more difficult to weed and tend as soil fertility declines. Useful weeds and volunteer or transplanted shrubs and trees are managed at progressively lower intensities until a managed secondary forest results (the fallow) (Denevan & Padoch 1988). This is the most visible sequence of indigenous landscape domestication in the tropics today. The managed fallow remains long after humans have abandoned it and is easily identified by the abundance of useful tree species. Archaeologists can also easily identify these domesticated landscapes, as charcoal and phytoliths of useful plants tend to be abundant.

*Settlements* – as in the cultivated landscape, this manipulation involves the elimination of a section of a preexisting ecosystem, followed by the construction of the settlement, be it a camp or a city. This landscape is constructed from locally available materials, including wood, earth, and stone and often involves considerable reworking of the local relief. It also includes gardens and dump heaps. This type of landscape has been intensively studied by archaeologists since the birth of the discipline, thus needing little explanation here.

## Historical Background

The domestication of landscapes has attracted a wide range of scholars for a long time, although

with widely varying terminology. Cultural landscapes have been studied since before Sauer's (1925) classic article on the morphology of landscapes. Harlan (1992), Denevan (2011), and Harris (2012) provide good reviews of recent work. Both Harlan and Harris examine the topic as a component of the origins of food-producing systems, while Denevan argues that the process has been under way so long that it is difficult to identify pristine landscapes in any part of the world where humans have lived for any appreciable time, even the Neotropics where our species arrived only 20–15,000 yB.P. Rindos (1984) and Tudge (1998) would have agreed with Denevan.

### Key Issues/Current Debates

Perhaps the most important current debate is the extent of landscape domestication in different biomes. Denevan's (2011) argument about the myth of the pristine is questioned in Amazonia, for example, where ecologists and archaeologists argue that prequest human manipulation of Amazonian landscapes was variable across the biome, with negligible modification of interfluvial forests (Bush & Silman 2007), hence of the basin in general. The definitions provided above help explain why archaeologists have difficulty finding evidence of landscape domestication away from the settlements along rivers. Additionally, too many ecologists fail to consider prequest manipulations of landscapes as explanations for unexpected abundances of useful species. Historical ecologists are more likely to correctly interpret these signatures in the landscape. Stahl (2008) reviewed Amazonian studies that demonstrate how the cumulative historical impact of small bands of hunter-gatherers is probably greater than that of traditional farmers, although the latter also manipulate the forests available to them near their settlements. Contemporary hunter-gatherers are sophisticated and dynamic managers of forest landscapes, subtly thinning some areas to make space for their preferred resources, creating "wild orchards" (Politis 1996: 508). They exploit temporary gaps, disperse fruit trees and palms, and move

their camps regularly, concentrating resources at preferred locations over wide areas of forest landscapes. Over thousands of years, the results are dramatic, but the forests look mature, untouched, pristine to the untrained eye.

The current debate seems to be driven more by the limitations of methods than by the lack of signatures in the landscape, because a careful look is quite likely to identify a signature. For example, McMichael et al. (2012) looked for charcoal and phytoliths along the central section of the Purus-Madeira interfluvial and concluded that human impact was negligible, but Levis (2012) examined the useful tree and palm communities in forests along the central and northern section of the same interfluvial and found considerable evidence of increased abundance of useful species, whose abundance declined as the distance from the river edge increased, as hypothesized by Bush & Silman (2007), but extended further into the interfluvial than expected by McMichael et al. (2012). Levis' study essentially supports Stahl's (2008) review, although Levis did not study hunter-gatherers themselves, only the signatures that they and others left in the forest landscapes of the interfluvial. These signatures are typical of those expected in promoted landscapes, which is why they were not detected by McMichael et al.'s methods for studying cultivated landscapes. As Stahl (2008: 9) concludes,

Any conditions that are appropriate for supporting human population increase are to be found as physical signatures within the landscape, which represent the historically accumulated capital of previous human generations. It is the human landscape which can create the conditions that can promote human population growth. It is precisely this historical capital that we should be studying.

Another current debate is about the nature of progress in human history and, by extension, in analysis of domesticated landscapes. The sequence of categories of landscape domestication defined above can be read as progress from simple manipulations to more complex manipulations, requiring more knowledge, more energy, larger populations to supply the energy, and producing more food to fuel the population growth. The same is true of the sequence of plant

population domestication (Rindos 1984; Clement 1999), as plants become continually more coevolved with their human mutualists. Many theorists assume that human populations progress from simple social systems, with simple food procurement strategies, to complex social systems, with sophisticated food production systems. As Rindos (1984) was careful to point out, however, evolution is not about progress, but about change for better adaptation to shifting environments, including landscapes that humans have domesticated to any degree. Modern food-producing societies, such as those that support academics, view the sequence of landscape domestication presented here and concomitant plant and animal population domestication as progress. Is this necessarily true of all human societies? Rival (2007) argues convincingly that this is not true, that some human societies prefer to keep it simple. Many of the examples of hunter-gatherers cited by Harlan (1992), Stahl (2008), and Harris (2012) support Rival's analysis. What are the consequences of these decisions across landscapes? It appears obvious that a mosaic of landscapes with different degrees of domestication should be expected. And, in fact, this is what is found on all continents with human societies. Members of modern food-producing societies look down upon members of societies that only promote or manage landscapes, while members of these landscape managing societies wonder why the food producers want to be slaves to their domesticated plants, animals, and landscapes. What does this mean for archaeology? It means that archaeologists must also learn to read the signatures of promoted and managed landscapes, rather than concentrate only on cultivated landscapes and settlements.

### **International Perspectives**

Although the terminology varies, landscape domestication is being intensively studied on all habitable continents, although emphasis is placed on cultivated landscapes, since these came to support modern food-producing

societies. Australia provides an emblematic contrasting case study, since Native Australians extensively domesticated their landscapes without domesticating plants or animals (Harlan 1992; Harris 2012), and provides the examples that justify distinguishing conceptually between landscape domestication and plant population domestication, even though native peoples do not recognize the distinction (Clement 1999). Harris (2012) provides an up-to-date introduction to this Australian literature.

The humid forests of Southeast Asia and near Oceania are also the subject of increasing investigation, parts of which are also analyzed by Harris (2012). However, in this region, two intertwined traditions exist: a tradition that developed efficient open-field food production systems and a tradition that developed complex forest food production systems. Michon (2005) provides an introduction to these two traditions, concentrating on the forest resources, rather than the open-field systems, which provides a welcome difference in focus. While the open-field systems came to dominate world food production (Harlan 1992; Harris 2012), numerous less-dominant societies throughout the world humid tropics appear to have developed more complex systems, similar to the intertwined systems of Borneo and adjacent areas of Southeast Asia and near Oceania. The large number of fruit trees and palms domesticated in Amazonia (Clement 1999) suggests that something similar occurred there. Worldwide, there are an increasing number of studies examining tree crops and this trend will certainly continue.

This short entry is not the place to review the growing worldwide literature on landscape domestication, so the reader is directed to Harlan (1992), Denevan (2011), and Harris (2012), references therein, and Further Reading (below).

### **Future Directions**

The study of landscape domestication by existing and prehistorical societies worldwide is expanding.

Given the definitions presented here, it seems self-evident that archaeologists need to expand their collaborations even more than has been the case recently (e.g., Zeder et al. 2006). Landscape and other archaeologists need to recognize that human manipulation of the landscape does not cease at the edges of settled and cultivated landscapes but continues through managed landscapes into promoted landscapes. With increased attention to subtler modifications, the extent of landscape domestication practiced by prehistorical societies will be clearer and may push back the beginning of the Anthropocene from 1750 CE to much earlier, as suggested by Certini and Scalenghe (2011) based on anthropogenic soils, a component of settled and cultivated landscapes.

### Cross-References

- ▶ Agrarian Landscapes: Environmental Archaeological Studies
- ▶ Agroforestry: Environmental Archaeological Approaches
- ▶ Amazonian Dark Earths: Geoarchaeology
- ▶ Animal Domestication and Pastoralism: Socio-Environmental Contexts
- ▶ Anthropogenic Environments, Archaeology of
- ▶ Anthropogenic Sediments and Soils: Geoarchaeology
- ▶ Archaeobotany
- ▶ Archaeobotany of Agricultural Intensification
- ▶ Complex Hunter-Gatherers
- ▶ Cultural Landscapes: Conservation and Preservation
- ▶ Harris, David Russell
- ▶ Historical Ecology in Archaeology
- ▶ Human Evolution: Use of Fire
- ▶ Hunter-Gatherers, Archaeology of
- ▶ Landscape Archaeology
- ▶ Midden Cultivation
- ▶ Near East (Including Anatolia): Origins and Development of Agriculture
- ▶ Northern Asia: Origins and Development of Agriculture
- ▶ People as Agents of Environmental Change
- ▶ Plant Domestication and Cultivation in Archaeology
- ▶ Southern Africa: Origins and Development of Agriculture

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## Landscape Mapping at West Heslerton

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### Introduction

Archaeological research at West Heslerton, Yorkshire, England, began in 1978, following the chance discovery of Early Anglo-Saxon burials during sand quarrying (Powlesland et al. 1986). Subsequent excavations in advance of quarrying and plowing covered some 35 ha of the Vale of Pickering, exposing prehistoric, Roman and Anglo-Saxon settlements and cemeteries (Figs. 1 and 2). Revealing a portion of ancient landscape at such a large scale emphasized that the narrative of human occupation was expressed by a continuum of activity rather than