The etymology of the word wetland shows that it is relatively modern, originating in the middle of the 20th century in the United States as a generic term signifying landscapes that support migratory bird populations, and it was internationalized at the UNESCO-sponsored International Convention on Wetlands in Ramsar, Iran, in 1970. The Ramsar Convention defines wetlands as "areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed 6 meters"; this definition is widely accepted by archaeologists around the world. However, some wetland archaeologists (e.g., Nicholas 2001) distinguish between "wet sites" (as locales where wet-preservation occurs) and "wetland sites" (as archaeological sites in ecological units that are wetlands), but the usefulness of this distinction has been questioned by others—including me—because it promotes the concept that past peoples' chosen interaction with wetlands was restricted to the economically functional character of the landscape, frequently leading to overtly environmental deterministic approaches. It is unquestionable that people in the past would not have recognized a broad definition of wetlands; rather, native ecologies would have defined specific topographical wetland features or places (e.g., Bradley 2000; Harris 1998; Ingold 1995; Lopez 1986). This is shown, for example, in English place names with suffixes such as "-ings," "-hay," "-moor," "-dyke," "-fen," "-levels," "-fleet," "-pool," "-mere," "-beach," "-ford," "-bridge," or "-on-the-water," and "-on-the-Marsh," recognizing specific values and functions in the landscape including, but not exclusively, economic values and functions.

Nevertheless, there are good reasons for archaeologists to consider wetlands as an entity in their approach to landscapes. The effect of high groundwater tables on burial environments and archaeological preservation is common to all types of wetlands, albeit to varying degrees, and the study of this creates research opportunities that can be realized only through the application of particular techniques and methodologies. These, in turn, have led to the development of the field of wetland archaeology (e.g., Coles 1984, 2001). More recently, it has been argued that wetland archaeology has become too isolated and that future research must be more contextualized and theorized, addressing major questions in landscape research; this new approach includes the deconstruction of the concept of wetlands as a meta-narrative (Van de Noort and O’Sullivan 2006 and below). Past wetland research has also been accused of being too focused on the economic relationship of people...
with their environment, and a better understanding of the diversity of these relationships is now required.

This chapter considers the research potentials in wetland research, the wetland-specific methods and techniques employed in current research, and the changing theoretical agenda of wetland archaeology at the beginning of the 21st century.

### Research Potentials

In landscapes where the water table is permanently high and soils are saturated with water, oxygen is largely absent, and reducing (as opposed to oxidizing) conditions prevail. Under such conditions, the microbial and chemical processes contributing to humification of organic matter is decelerated, and dead organic remains may survive for millennia. A true equilibrium is never achieved, but the pace of change can be so slow that 3,000-year-old timbers look as if these were cut down the previous day. Alongside the wooden structures and artifacts, woven baskets, and leather objects created by people in the (distant) past, environmental macro- and microfossils, including tree and plant remains, pollen, insect, diatoms, testate amoebae, and foraminifera, all have a greater change of long-term survival in wetlands. In exceptional circumstances, such as in an acidic raised bog, human skin, hair, and nails may be preserved as well. This better-than-normal preservation of organic remains presents three, wide-ranging, research opportunities.

The first lies in the prospect of studying organic material culture, which is on the whole impossible in archaeological studies of free-draining landscapes. It has been argued, on the basis of cross-cultural comparisons, that the invisibility of women and children in much archaeological research from drylands relates directly to the dearth of organic artifacts, which are used predominantly by them, especially in nomadic societies (e.g., Soffer, Adovasio, and Hyland 2001). Similarly, organic material culture, such as baskets, may tell us more about the everyday life of “ordinary” past people than the study of stone and metal artifacts, or earthen monuments, will ever be able to achieve. The research of the Bronze Age timber circle at Holme in Norfolk, England, popularly known as “Seahenge,” illustrates this potential and tells us something about the carpenters’ skill and agency in the construction of the site, with 50 different axes used, and split timbers placed on opposite sides of the circle, perhaps to balance the personalities of the builders (Brennand and Taylor 2003).

The second research opportunity lies in the (natural) landscape to a degree that is unimaginable elsewhere. This integration is realized, especially, where a range of environmental proxies is used, which provide perspectives on the human-environment interaction on different geographical scales. Thus, the regional, off-site, environmental reconstruction based on pollen evidence can be enhanced by local, on-site, information from plant and insect macrofossils (Figure 47.1). An example of such research is the study of the peatlands in the Dümmers region of Lower Saxony, Germany (Bauerochse 2003). Here, the integrated analysis of pollen and plant macrofossils, linked to excavations of prehistoric trackways and settlements, and a radiocarbon program, showed that climate changes did not affect the settlement pattern, but did influence the construction and lifespan of trackways.

The third research opportunity, and possibly the most important, lies in the potential to date artifacts, deposits, and archaeological phases through radiocarbon and dendrochronological assay with much higher resolution and greater precision than is possible on non-wetland sites and, thus, can reveal something of the real-time dynamic of prehistoric life. For example, dendrochronology revealed the dynamic sequence of site construction, occupation, and contraction of a Neolithic lake village at Charvines, Lac de Paladru, France (Bacquet and Houot 1994: 21–24; Figure 47.2), and many other wetland sites, such as the crannogs in Scotland (Crone 2000), show patterns of occupation and abandonment each lasting several years or a few decades. We can assume that many non-wetland sites experienced similar dynamic patterns but, without high-resolution dating, this cannot be shown and phases tend to extend over centuries.

### Wetland Archaeological Methods and Techniques

The high water table, and the concealment of archaeology beneath waterlain sediments of younger date, prevent identification of most wetland sites through aerial photography, geophysical survey or surface investigations, such as field walking (see Van de Noort 2002). The principal archaeological tool for investigating wetland landscapes is through the multiproxy palaeoenvironmental analysis from samples taken from boreholes, which can be used to reconstruct past environments and some aspects of the impact of humans on that landscape, such as woodland clearance as evidenced by pollen (e.g., French 2002). It is, therefore, unsurprising that the overwhelming
discovered through activities unrelated to archaeology. Prominent examples include peat extraction (for example, the Sweet Track in the United Kingdom; the many bog bodies from Denmark, Ireland, Germany, the Netherlands, and the United Kingdom), drainage works (for instance, Star Carr and Flag Fen in the United Kingdom; Freisack in Germany), ploughing or construction work in former wetland landscapes, (for example, Windover in the United States; many urban wetland sites across the world), or through natural erosion of coasts, lakes, and riverbanks, and in estuaries (for instance, “Seahenge” and the Ferriby Bronze Age boats in the United Kingdom; the Alpine lake settlements; the crannogs in Ireland and Scotland; Ozette in the United States).

Nevertheless, the majority of wetlands across the world, still widely perceived as unusable wildernesses despite the recent work by nature conservation organizations, are currently threatened by drainage and are converted into farmland or urban and industrial landscapes. These developments are usually accompanied by the digging of of the desiccated organic sediments, which create opportunities for systematic survey and prospection, through surface collection of material, dike/drain survey, aerial photography of soil marks of former river beds, and resistivity and magnetometer survey of the drying landscape. There are also a number of promising, but not yet widely used, survey techniques that may be able to identify archaeological wetland sites before the remains are at or near the surface, such as multispectral aerial reconnaissance (e.g., Donoghue 2001), the use of ground-penetrating radar (e.g., Clarke et al. 2001), and micro-topography survey using differential GPS (e.g., Chapman and Van de Noort 2001). We should also recognize the early drainage of wetlands as historic relics, and the medieval and early modern archaeology of wetland exploitation and inhabitation can be investigated through analysis of maps and the current landscapes (e.g., Rippon 2005).

There are many good examples of landscape-scale archaeological studies of wetlands, which have frequently taken a compare-and-contrast

![Figure 47.1](image-url)
Figure 47.2 Charavines, Lac de Paladru, France. Reconstruction sequence of this Neolithic lake-settlement as revealed by dendrochronology. Top left: years 1 and 2; top right: years 3 to 8; bottom left: years 9 to 17; bottom right: years 18 to 22 (after Bocquet and Houet 1994: 21–24; drawn by Sean Goddard).

understand the greater diversity of past peoples lives—for example, the prolonged existence of hunter-gatherer types of subsistence in resource-rich wetlands such as the Ertebolle in Denmark and the Swifterband complexes in the western Netherlands. Within Europe, the most notable projects include those of the Dutch Delta (Louwe Kooijmans 1993), the Assendelver Polder in the Netherlands (Brandt, Groenman-van Waateringe, and Van der Leeuws 1987), the Somerset Levels (Coles and Coles 1994), and the landscape-scale excavations in Fengate and at Flag Fen (Pryor 2001), the North West Wetlands and the Humber Wetlands (Van de Noort 2004) in England, the Severn Estuary (published in the Severn Estuary Levels Research Committee papers), the extended surveys of the Irish Midlands (e.g., Gowen, Ó Néill, and Phillips 2005; Raftery 1990) and the Shannon Estuary (O'Sullivan 2001a), and a range of projects in

notable wetland landscape projects include studies of the Great Basin wetland in North America (Kelly 2001) and in northern Australia (Haynes, Ridpath, and Williams 1991; Williams 1988).

Excavations of wetland sites tend to be small-scale operations. The size of the trenches is limited by several factors, including the friable nature of the organic materials, which must be kept wet throughout the period of exposure, the need to recover all organic remains once exposed to oxygen, and the habitually unstable nature of the surrounding soils (typically peat or alluvial sediments). Digging with metal tools should be avoided when dealing with organic remains, and wooden spatulas or water jets or sprays should be used instead. On-site or nearby wet-tanks should be available for the temporary storage of organic remains once taken out of context. The use of motorized pumps on wetland excavations should be avoided, as this will draw-down the water from the area out-
through desiccation of un-excavated remains will be the consequence. All wetland excavations need to include integrated palaeoenvironmental research and, as a minimum, relevant specialists in geoarchaeology, palynology, plant and insect macrofossils, dendrology, and dendrochronology should be included, ideally from the onset of the design of the project and throughout the excavation and post-excavation stages. It is often argued that wetland excavations are expensive because of high conservation costs and involvement of many specialists. The director of excavation must therefore ensure that the different aspects of the work are closely integrated in order to achieve an overall result that is greater than the individual parts of the research.

**Challenges for the 21st Century**

Despite the significant results to date and future research potentials, wetland archaeology has essentially failed to influence mainstream archaeology, and thus the great promise of wetland archaeology remains to a large extent unfulfilled (Coles 2001). This failure to influence and inform the broader archaeological debates can be attributed to three aspects of current research in the landscape archaeology of wetlands (see Evans 1990; Gearey 2002; Haselgrove et al. 2001; Scarre 1989; Tilley 1991). First, many research projects remain decontextualized geographically, as if wetlands were islands rather than surrounded by non-wetland landscapes. Second, wetland archaeology frequently appears as being decontextualized in time, as if wetlands were timeless landscapes, disconnected from the changes surrounding them. Third, most wetland landscape projects are disconnected from current theoretical debates in archaeology. The aim of this section is to consider how such a (re-)engagement with mainstream landscape archaeology could be achieved, and it is based on the recent publication *Rethinking Wetland Archaeology* (Van de Noort and O'Sullivan 2006). It suggests seven changes to the present way of doing wetland landscape archaeology.

First, the landscape archaeology of wetlands has to be contextualized. This includes geographical contextualization, since interactions between wetland and non-wetland landscapes are omnipresent, both in the physical (for example, the run-off of nutrients-rich water from hills into a bog) and cultural (for instance, the use of stone axes to build trackways) spheres. Contextualization should extend to include the passing of time and the cultural changes surrounding them, and it the researchers, who should make their theoretical stance explicit, since we always interpret our data through a “cloud of theory” (Johnson 1999). It should also be recognized that landscapes cannot be simply “read”—landscape archaeology, and thus wetland archaeology, is hermeneutic. Recent studies that present genuinely contextualized wetland studies include Francis Pryor's (2001) work on Flag Fen in the Fenlands of England and Helmut Schlichtherle's (1997) work on the Alpine lake settlements. Martin Bell's research in the Severn Estuary merits also citing (Bell, Caseldine, and Neumann 2000).

Second, the meta-narrative of wetlands must be deconstructed, accepting that this term had no significance for people in the past. The term is useful as a shorthand for the mosaic of ecosystems of wet and damp places, or for defining the area where wet-preserved archaeological and palaeoenvironmental remains may survive, but this should not become the basis for cultural analysis. Instead, the type of wetland should be defined, such as raised mire, valley floodplain, or alder carrland. Studies from continental Europe, where the generic concept of "wetlands" has not been established as well as in other parts of the world, provide some good examples of the focus on specific types of wetland landscapes (e.g., Besteman 1990; Brinkkemper 1991; Koch 1999; Larsson 2001).

Third, the significance of approaching landscapes from the perspective of the people we study should be recognized (e.g., Lopez 1986). Developing a cultural understanding of the significance and meaning of trackways, bog bodies, lake settlements, and so forth cannot be based on a modern Western, functionalist, perspective. Furthermore, it must also be recognized that the perception of wetlands (and other type of landscapes) differs between insiders and outsiders. Two recent studies, both on Ireland, that have put the perception of past people central are Christine Fredengren’s (2002) work on crannogs and Aidan O’Sullivan’s (2001a) study of fishing in the Shannon estuary.

Fourth, nature-culture interactions should be recognized more clearly. For example, enculturing nature (and the spirits within them) forms a key theme of human behavior, which can be favorably studied in wetland landscapes with its high-resolution dating and close association with palaeoenvironmental source material (e.g., Ingold 1995; Nelson 1983; Tilley 1994). The best example of a study in wetlands that develops this theme is the most recent work on Star Carr in the Vale of Pickering in north-
Fifth, special attention should be given to the boundaries and edges of the landscapes. From our observations of the perceived dynamic nature of the natural environment, it follows that the boundaries of edges of these landscapes are often given particular significance, for example, as “natural places” in the sense used by Richard Bradley (2000). A wonderful example of the way in which such boundaries retained their significance for millennia is presented by David Stocker and Paul Everson (2003) for the Witham valley in Lincolnshire, England. Similarly, Naomi Field and Mike Parker Pearson’s (2003) work on the trackways in the same valley shows remarkable insights into the events that reinforced the ritual meanings of this wetland as a natural place. Wijnand van der Sanden’s (1996) study of bog bodies must also be mentioned in this context.

Sixth, marginality and liminality should not be coalesced. The concept of liminality is frequently invoked where wetlands are traversed. Liminality is a notoriously fluid concept. Originally proposed by Van Gennep (1908), the concept is linked to “rites of passage” to describe the formalized rituals and practices that accompany one’s transition from one particular state into another, especially the rites associated with birth, reaching adulthood, marriage, and death. As part of these rituals, symbolic or real “thresholds” needed to be crossed, with the thresholds constituting liminal zones. As economic and ritual activities are not, on a landscape level, mutually exclusive, the recurrent equation of liminality with marginality is often mistaken. Although some liminal zones were to be found in what were considered marginal landscapes, others are located within settlements or within areas in economic use.

To date, few wetland studies have made the explicit distinction between the two concepts, but I have sought to develop this issue explicitly in the study of the Humber Wetlands (Van de Noort 2004).

Seventh, the importance of many wetland landscapes as taskscapes, areas where the rhythm of daily life determines the significance of how these wetland landscapes are perceived, should not be underplayed. The phrase “taskscape” was coined by Tim Ingold (1993) to focus on the concept that the manner in which landscapes are experienced and perceived is closely related to the activities or tasks that are undertaken in particular landscapes at particular times. The insiders’ view of wetlands is one that offers myriad resources, ranging from eels, fish, and shellfish, to peat for fuel, reed for roofing, to summer pastures and haylands. Raised bogs can also be used intermittently for short-term seasonal grazing by burning the top layer of the peat to market the organic matter for use for fuel, reed for roofing, and the curing of leather. It should be recognized that these activities, though seemingly economic practices, are things that people do every day, albeit in specific cultural and social conditions. Few wetland studies have used the concept of taskscape explicitly, but North American studies, especially those looking at the role of fishing for local communities, have addressed this aspect of research well (e.g., Croes 2001), and this theme has also been brought out in some recent studies and reappraisals of lake-settlements in the Alpine region (e.g., Arnold 1986; Bouquet and Huot 1994; Magny 1993; Menotti 2003), Scotland (e.g., Crone 2000), and Ireland (e.g., O’Sullivan 2000, 2001b).

Conclusions
The archaeological study of wetland landscapes offers three major advantages over non-wetland landscapes: the survival of organic material culture, which has the potential to address existing gender and status biases in archaeological research; the coexistence of archaeological and palaeoenvironmental data, which provides opportunities for the closely integrated study of nature-culture interrelationships; and the high-resolution and precision dating of organic remains, especially through dendrochronology, which offers opportunities for the study of real-time dynamics as experienced by people in the past. However, these research potentials can be realized only if and when wetland archaeology becomes fully geographically and theoretically contextualized.

References


Part V: Characterizing Landscapes


