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PIERRE CORBOUD AND MARGARET GOWEN

PROTECTION OF THE WORLD HERITAGE AGAINST ARCHAEOLOGICAL RESEARCH: THE CASE OF THE PREHISTORIC PILE DWELLINGS AROUND THE ALPS REGISTERED AT UNESCO

Keywords: Weltkulturerbe, Seeufersiedlungen, Schutz, archäologische Forschung. – Patrimoine mondial, sites palafittiques, protection, recherche archéologique. – patrimonio mondiale, palafitte, protezione, ricerca archeologica. – Protection.

Abstract

In 2004, preparation for the nomination of the Prehistoric Pile Dwellings around the Alps to the UNESCO World Heritage List identified several specific objectives. The main objective was to obtain national and international recognition for the importance of this outstanding heritage and its contribution to knowledge of the Neolithic and the Bronze Age. These sites represent critical periods in the prehistoric development of regional cultures around the Alps. Inscription was sought to ensure better protection and conservation of these very fragile archaeological sites, which are increasingly threatened by natural phenomena and human activities. In addition, preparation for nomination to the World Heritage List focused on synthesising and disseminating knowledge of this heritage while promoting collaboration between researchers working on new and existing areas of research

in the six countries engaged in this project. The balance required between the conservation of the integrity of the sites and further enquiry-based research was soon at the centre of discussions and emerged as an area of potential conflicting interests and viewpoints. UNESCO World Heritage inscription requires the protection of integrity (wholeness and intactness), yet there is a need to continue the excavation and sampling of these sites, not just to monitor their state of conservation but also to improve existing knowledge and clarify interpretation. This article seeks to examine and provide a potential basis to resolve this contradiction and to propose a new management model to reconcile protection of heritage and archaeological research.

Résumé

En 2004, la préparation de la candidature des sites palafittiques préhistoriques autour de l'Arc alpin au Patrimoine mondial de l'UNESCO a identifié plusieurs objectifs spécifiques. L'objectif principal était d'obtenir une reconnaissance nationale et internationale de l'importance de ce patrimoine exceptionnel et de sa contribution à la connaissance du Néolithique et de l'âge du Bronze. Ces sites représentent des périodes critiques dans le développement des cultures préhistorique autour des Alpes. Cette inscription doit aussi assurer une meilleure protection et conservation de ces sites archéologiques très fragiles, toujours plus menacés par des phénomènes naturels mais aussi par les activités humaines. En outre, la préparation de la proposition d'inscription sur la liste du Patrimoine mondial avait aussi pour but d'accroître nos connaissances sur ce patrimoine et de favoriser la collaboration entre tous les chercheurs qui travaillent dans des domaines

de recherches existants ou nouveau dans les six pays engagés dans ce projet. L'équilibre nécessaire entre la conservation de l'intégrité des sites et la poursuite de la recherche archéologique sur le terrain a très tôt été au centre des discussions et est apparu comme une source de conflits d'intérêts et de points de vue. L'inscription au Patrimoine mondial de l'UNESCO exige la protection de l'intégrité globale des sites classés, pourtant il est nécessaire de poursuivre les fouilles et les prélèvements sur ces sites, non seulement pour surveiller leur état de conservation mais aussi pour en améliorer les connaissances et préciser leur interprétation. Cet article vise à fournir une base de discussion pour résoudre cette contradiction et proposer un nouveau modèle de gestion pour concilier la protection du patrimoine et la recherche archéologique.

1. Introduction

In June 2011, the UNESCO World Heritage Committee accepted the nomination of «The Prehistoric Pile Dwellings around the Alps» and inscribed them on the World Heritage List. This uniquely large, serial transnational property includes 111 exceptional prehistoric sites in the six Alpine countries (Switzerland, France, Germany, Austria, Italy and Slovenia). The Swiss Federal Office of Culture, together

with some key research organisations must be credited with the initiative and the development of this immense project (Suter/Schlüchterle 2009). The objectives of the nomination were: to increase the recognition, protection and conservation of the exceptional heritage of these sites; to encourage and promote coordination between researchers from the six countries involved; and to ensure the continuity of research and interpretation of the remains. In addition, the project sought to promote the cultural value of the

sites, encourage presentation and ensure increased dissemination of knowledge of this unique heritage to the public. The prehistoric pile dwellings around the Alps are atypical «monuments», among the World Heritage sites registered by UNESCO. Their location in underwater and waterlogged environments ensures the remarkable preservation of all their material remains. However, the materials that they are composed of are often very fragile. The sites are composed of extensive and remarkably well-preserved wooden structural remains, complex well-preserved sequences of rich organic habitation layers and uniquely well-preserved artefacts of everyday life. The waterlogged environment also ensures that a myriad of contemporary natural remains also survive, including wood, plants remains, seeds and pollen, faunal remains, micro-fauna and sediments. With scientific study, each of these provides outstanding and uniquely accurate, datable evidence about the nature of the environment in the past. Consequently, there are very specific approaches, and issues, for their study and their conservation. All of the archaeologists and researchers charged with the study and management of these remarkable lacustrine and wetland sites face the following contradiction: how to study and understand their particular «pasts» and the conditions of their establishment, while preserving their integrity.

From the inception of preparation for World Heritage nomination in 2004, this issue was identified. As the work of preparation for nomination progressed, it was later repeatedly returned to by the experts involved in the project and it lay at the heart of the concerns and discussions about management. The guiding principles required for inscription to the World Heritage List include the preservation of the integrity of inscribed sites. However, the understanding of these sites and their presentation requires continuity of research, analysis and interpretation. In the case of wetland prehistoric sites, the challenge is daunting. As is the case for most archaeological sites, and especially those that are formed by organic structures and habitat layers, investigation by archaeological excavation presupposes at least some destruction, even if that is carefully planned and conducted in an entirely scientific and controlled manner.

Five years after inscription on the World Heritage List, it is time to make a first assessment of the consequences of the nomination for archaeological research. The future of research direction and existing gaps in knowledge must now be considered together with the appropriate methodologies for further investigation. While it is clear that the integrity of the sites must be maintained, there is an urgent need to find an alternative to the existing contradiction between preservation of sites, as a static heritage management approach, and the need to continue and refine research knowledge of them. This is especially so in circumstances where sites are subject to incremental erosion, material degradation and loss from natural and human causes.

2. What is a pile dwelling site?

Prehistoric pile dwelling sites all occur in lakes or wetlands. The majority can be found submerged in lakes and on lake-shores but a significant number occur in peat bogs and marshlands. Each situation presents very diverse conditions of deposition, preservation and conservation. Much depends on the physical characteristics of the environment, but it also depends on the natural and human history that has affected that environment and the survival of the sites. As stated above, the main components of these complex habitation sites are wooden structures and related sequences of archaeological occupation layers and natural layers of deposition. These remains provide outstanding testimony to every day human and social life in prehistory. The provide information on domestic architecture, activity, industry, craft, and agriculture, and the social organisation of settlements (villages), together with their particular cultural identities, trading and cultural connections and even some evidence of their belief systems, conflicts and rituals. Of equal importance however, is that these sites possess unrivalled evidence for the natural and human transformation of the environment around them.

Architectural structures, where they survive, are often limited to the remnants of foundations and walls of houses and whole villages. They often simply survive as piles (posts) of wood driven into the substrate providing foundations for houses and the main structural supports for perimeter enclosures, where these existed. In many cases, elements of superstructure also survive, with horizontal wood remains representing different architectural elements of collapsed and ruined structures. These provide unusually clear evidence for reconstruction. The research interest in so much well-preserved wood (piles or horizontal elements) lies not only in the architectural information that they can deliver, but also in their ability to provide extremely accurate dating by dendrochronology.

To date, thousands of prehistoric wood samples have been retrieved and studied by dendrochronology. Samples of the correct size provide astonishing accuracy and extremely precise relative chronologies for successive structures and occupation levels at individual sites. These, in turn, have facilitated the creation of a cultural «master chronology» for pile dwelling sites around the Alps. Cultural comparison can therefore be achieved between the sites in the Alpine region and further afield, while providing evidence for comparison with other types of sites of similar periods in prehistory in discrete regions around the Alps.

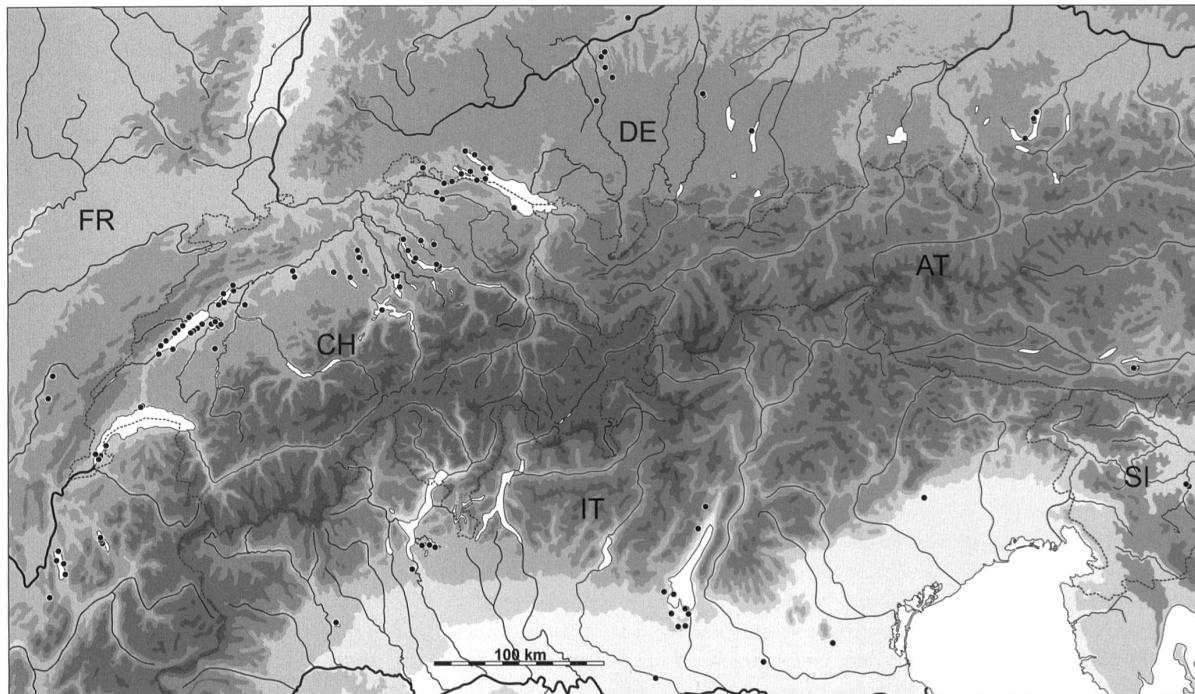


Fig. 1. Map of the pile dwelling sites in the Alpine region nominated by UNESCO in the six states of the project.

3. The objectives of securing the inscription of the prehistoric pile dwellings around the Alps by on the UNESCO World Heritage List

In 2004, when a project team assembled to prepare the nomination of the prehistoric pile dwellings around the Alps to the UNESCO World Heritage List, specific objectives were identified to ensure that the nomination would be justified.

The first objective was to obtain national and international recognition for the importance of the sites, their heritage and the nature of the cultural evidence they possess. The sites provide uniquely detailed evidence for periods in the development of the cultures of the Neolithic and the Bronze Age in the regions bordering the Alps. Recognition was also sought to assist in the second objective, which was to promote and provide greater protection and conservation of these fragile archaeological sites. The sites are increasingly threatened by natural erosion phenomena and by human development and activity. *A priori*, however, all nominated pile dwelling sites are protected under law.

In Switzerland, the sites are protected at cantonal and/or at national level. Experience prior to and since inscription in 2011, however, has demonstrated that such protection is sometimes insufficient in the face of the pressure of development and intensification of use of the Swiss lakes. Increasing urbanization and infrastructure development is a challenge, while the lakes and lake shores are subjected to

increased use for leisure boating and other activities. In 2011, the progression from cantonal and national heritage to World Heritage status committed the Swiss Confederation and the collaborating countries to actively protect and manage these sites for «humanity as a whole». It was a significant lever that helped ensure prevention of the removal of protection and/or the «decommissioning» of protected sites in circumstances where an area was coveted for waterfront development (Corboud 2015).

The third objective was to improve public knowledge and understanding of this vast cultural heritage resource. The project sought to promote communication and collaboration between researchers working on the sites in the six participating countries and sought to seek new and better ways to disseminate the knowledge and interpretation of them. There are gaps in existing knowledge, however. It follows, therefore, that research on sites should continue, not just in museums and libraries but also on the sites themselves.

The selection of 111 sites for nomination went through a rigorous and challenging process within the six countries around the Alps. With over one thousand recorded sites, the initial selection focused on the quality of conservation of the remains and the contribution of each site to the cultural record of prehistory around the Alps. The number was first limited to 794 locations worthy of interest. This was then refined and reduced, using a variety of considerations and by strictly applying the criteria for World Heritage. Finally, in order to achieve the selection of 111 candidate sites, the concept of «associated sites» was introduced (fig. 1). Such sites are not candidates for World Heritage

nomination, but they are associated with the inscription and in the sense that they are complementary to those sites selected, but do not have the same level of protection afforded to those inscribed by UNESCO on the World Heritage List. In Switzerland, 56 sites were nominated as part of the serial World Heritage property and 407 other pile dwellings settlements belong to the described category.

4. A heritage threatened: permanent controls, integrated management and safeguard actions

Waterlogged archaeological sites and the remains of past wetland habitats, including the shores of lakes and marshes, are threatened by sources and actions that are both natural and anthropogenic. *A priori*, any World Heritage site should not be affected by anthropogenic threats. Heritage laws and their strict legal enforcement should ensure that inscribed sites are safeguarded and managed in a stable condition. The protected sites and their settings require active monitoring to ensure adequate development control and the control of other activities. It is accepted that any works and planned works or activities that could negatively affect the sites and their surroundings are not allowed. Threats derived from natural sources also have to be monitored, but in an entirely different manner, preferably in collaboration with agencies charged with the protection and management of the natural environment.

Many sites located on the submerged banks of the great lakes of Switzerland, and in the partner states also, are subject to natural erosion and loss due to wave action, some of which is exacerbated by the stern waves of leisure boats and freight carriers and other large motorboats. Storm waves, however, are the main cause of erosion, loss and alteration of submerged lacustrine sites. Sometimes, a single storm over a few days can result in significant erosion on a particularly exposed shore. Loss of archaeological deposits can occur within a few hours without any possibility of rescue. An example of such an event was wind storm Lothar, on the 26th of December 1999. Westerly winds from the Atlantic crossed Brittany and Germany and swept across the Swiss plateau at speeds of more than 100 km/h on the plains and 200 km/h in the mountains. A day later, another wind storm, Martin, took over and caused comparable, or greater, damage. While such storms are exceptional, every winter has episodes of very strong wind, which continue for two, three or more days. Their cumulative impact, in the long term, is therefore comparable to the strongest wind storms.

Prehistoric settlements in former wetlands that survive as marsh or bog areas suffer from other types of threats, mostly linked to agricultural and other human development. Drainage of wetlands, in particular, leads to the drying and the rapid destruction of formerly anaerobic and/or waterlogged archaeological sites, together with their structural and other remains and occupation layers that they

retain. These threats are often not «visible» and are therefore more pernicious because the buried archaeological remains (and the nature of their remarkable preservation) are often not fully understood. Alteration to the hydrology of sites in this type of environment can result in rapidly accelerated deterioration and loss of archaeological remains, without notice. In addition, where wetlands are cultivated or planted with trees, the action of ploughing and deep ploughing, planting and root growth, can also cause irreparable damage to remains located less than one meter below the surface.

Overall, beyond the existing systems of heritage management applied to land-use planning and development control, two approaches are used in the management of the threats to pile dwelling sites. The first is regular monitoring (monitoring programmes) of all sites, using repeated measurements and observations to verify if some sectors of submerged sites are affected more than others by erosion. The second includes the stabilisation of lakeshores and lakebeds by the establishment of structures and/or planting regimes for their protection. Submerged offshore sites can also be covered and «capped» to limit the erosive action of storm waves on the sub-lacustrine lakebed and on buried underwater archaeological remains. The project «Erosion and Archaeological Heritage Protection on Lake Constance and Lake Zürich», in the frame of Interreg IV programs, conducted 2008-2011 by an international and multidisciplinary group of archaeologists, conservationists, experts for museums, limnologists and ecologists, worked out a range of different approaches to establish monitoring systems and measures against erosion (Brem/Eberschweiler et al. 2013). Exemplary projects of monitoring and measures of protection underwater and in marshy wetlands have been recently presented at the third «rencontre internationale archéologie et érosion» (Brem/Ramseyer et al. 2015). These projects showed clearly, that the measures taken are not always entirely effective or sufficient to ensure the total security of remains, particularly on very exposed shores and in shallow waters. In such cases, one is faced with the following alternatives: simply describe the most vulnerable remains and the rate at which they are being dismantled by the waves; or study them with the most appropriate methods before they disappear?

5. Five years after the World Heritage nomination, what benefits, what disabilities?

After five years, it is time to assess of the impact of inscription on the management of the prehistoric pile dwellings around the Alps and evaluate how the objectives that were set in place for this nomination have been progressed. In Switzerland, one of the benefits of the nomination and inscription was the creation of the «Swiss Coordination Group Pile Dwellings UNESCO». This group consists of representatives from each canton with inscribed sites. The

cantonal archaeologist or another expert is mandated for the purpose. The General Secretary of Swiss Archaeology and a representative from the Cultural Heritage and Historic Monuments section of the Swiss Federal Office of Culture are also members.

The group convenes twice a year and its mission is to coordinate the management and protection of the sites. It also seeks to develop and promote dissemination initiatives and the improvement of archaeological knowledge about these sites. One of the benefits of this structure, in a federal State like Switzerland, is that the protection the sites (which lie with the cantons) is co-ordinated with the overarching input of the Swiss Federal Office of Culture.

While there is active exchange of information within the group on approaches to protection of sites, it has had a very modest impact on the general public dissemination of knowledge since inscription. An exception is the Guide of the Pile Dwellings of Switzerland, published by the Society for the History of Swiss Art SHSA/GSK in 2016 (Corboud/Swiss Coordination Group UNESCO Palafittes 2016). The group has had very little impact on the general development of research on pile dwelling sites, however.

The collation of all the data for the nomination proposal and dossier was a singular achievement. It also constitutes a significant resource for new opportunities in research, and the careful planning of appropriate field investigation programs on both the inscribed sites and the associated sites. Currently, all resources are focused on monitoring sites and assessing the effectiveness of methods of protection for sites threatened by erosion. There has been a consequent hiatus in scientific research with the exception of rescue excavation on associated sites threatened by development or erosion. This break in the continuity of enquiry-based and synthetic research is a negative outcome, which is hopefully temporary.

6. How to continue the study of underwater Pile Dwelling sites?

Among the commitments of partner countries to the nomination of World Heritage properties is the commitment to research: «States Parties are also encouraged to make resources available to undertake research, since knowledge and understanding are fundamental to the identification, management and monitoring of World Heritage properties.» (UNESCO 2012, § 215; Gowen 2015).

In the case of prehistoric pile dwellings around the Alps, preparation of the nomination dossier mobilized researchers to assess their state of knowledge and contribute to synthetic research. There were associated publications and museum exhibition displays linked to that purpose. Five years after inscription however, there is a concern that the synthetic research undertaken for inscription, while immensely successful, may have been achieved at the cost of continuing field investigations, especially on actively eroding sites.



Fig. 2. Horizontal eroded wood preserved on the surface of the soil, Vully-les-Lacs VD-Montbec. Photo by Olivier Zimmermann.

The concern arises, firstly, for those remains in shallow water, where they are exposed above the substrate and decaying gradually or subject to erosion. If a program of protection, for example using the installation of a geotextile and granular material cover is not always possible, the solution is structured investigation, documentation, sample collection and study before they disappear gradually or rapidly during future storms. Such a program is currently underway on a site at Lake Neuchâtel (municipality of Vully-les-Lacs VD-Montbec I; fig. 2), canton of Vaud. The research is very limited and focused on the study and collection of horizontal wood visible on the surface of the eroded soil (Corboud 2014).

For those remains, where preservation *in situ* is not compromised in the short or medium term, the situation is very different. In these situations the integrity of the site is assured, but knowledge gain is compromised if research is discontinued. «The past is what has been; it does not exist anymore, and archaeology is the study of that past and its imperfect and partial re-creation by research of surviving material evidence in the same way as history does with written sources.» (Willems 2014, p. 107). On many sites, archaeological knowledge can only be gained by intrusive excavation and sampling.

At the time of the nomination, there was considerable variation in the levels of study and degree of knowledge of the 56 sites in Switzerland. Some had been excavated and studied, to an extent that understanding of them was sufficiently advanced to precisely articulate their outstanding heritage value and to develop the findings for presentation to the public and the scientific community. This was the case at a number of sites including: Zürich-Kleiner Hafner, studied between 1981 and 1984 (Suter/Jacomet et al. 1987; Ruoff 1990); partial rescue excavation on the site of Concise VD-Sous-Colachoz 1995 to 2000 along the new Rail 2000 line (Burri 2007; Winiger/Burri et al. 2008; 2010; Chiquet/Oppliger. 2012; Winiger/Burri-Wyser 2012). Other sites, based on their size and their excellent preservation were registered and subject to preliminary survey and recording without excavation and sampling of structures. This is the case, for example, at the Late Bronze Age site of Versoix le Bourg GE, which has proven to be the largest site of this period on the Swiss plateau (area of 3 hectares). Dating of the site to the Late Bronze Age was based, in this instance, solely on the pottery that was collected on the site surface, during dive survey. This is an example where sampling for dendrochronological analysis and dating could determine the precise occupation period of the site, serving an important purpose in the comparison with other sites in the region. A single sampling exercise could suffice to provide the basis for dating that would fill a major gap in the knowledge of this exceptional settlement.

In other cases, limited archaeological investigation of small areas would provide a record of the stratigraphic sequence and thus provide essential information about the chronology of the site. Here, the question arises whether it is more appropriate to focus on the absolute integrity of a site or to seek to improve the integrity of knowledge about it, using limited intervention and resources.

7. The conflict between integrity of a wetland site and scientific research

In practice, the current approach to the management and conservation of the Swiss archaeological sites nominated for inscription appears to be frustrating the development of further scientific research at these sites. It can be argued, however, that the outstanding universal value of any archaeological property inscribed by UNESCO includes not only the material remains of the property, but also the cultural knowledge embodied in its material remains. It is therefore useful to recall the principles of integrity and authenticity that are part of the requirements of the nomination of a property to the World Heritage List. In the case of prehistoric pile dwellings around the Alps, the principle of authenticity is proven without question. Maintaining a site's authenticity is easily achieved as the sites themselves are not suitable for reconstruction. The authenticity of interpretation and reconstruction in museum settings is therefore critical and is inextricably linked to accurate research knowledge.

The principle of integrity as it applies to these sites is more complex to define. «Integrity is a measure of the wholeness and intactness of the natural and/or cultural heritage and its attributes. Examining the conditions of integrity, therefore requires assessment of the extent to which the property: a) includes all elements necessary to express its Outstanding Universal Value; b) is of adequate size to ensure the complete representation of the features and processes which convey the property's significance; c) suffers from adverse effects of development and/or neglect.» (UNESCO 2012, § 88, p. 23). The definition of the integrity of a World Heritage property therefore involves a subjective assessment of what can be regarded as «sufficient integrity», to deserve nomination. It follows that the assessment of outstanding universal value should take into account not only the surviving material remains but also the cultural knowledge gained through investigation and research. Prior to nomination, much of the international research effort was focused on demonstrating and justification of the outstanding universal value of the nominated sites. Following nomination there is a danger that there is a sense that the «job was done» with acknowledgment of the remarkable achievement of coordinated research across the six states involved in the nomination. There is now a realisation that without significant effort and coordination (as well adequate funding support) future research may not be conducted and developed in a similar manner.

It has been demonstrated that the acquisition of cultural or historic knowledge of a nominated World Heritage property reinforces the outstanding universal value of that property. On archaeological sites that knowledge and understanding is often necessarily gained at the price of limited loss of material or material composition of the property. There must be a place for research on individual sites. There is demonstrably an important role for monitoring analysis. But there is also a place for rescue interventions, including excavation where this is appropriate and there are no other means of investigation where sites are actively eroding. These reactive and localised research exercises can be immensely productive, providing very valuable new insights and supporting interpretations of increased integrity about the sites concerned.

At this point, without direction provided by knowledge gap analysis, it will be difficult to define where the most significant knowledge gain can be achieved by research within the serial property of 111 sites. It will also be challenging to support the promotion of further research and acquire the necessary funding for it. Such an assessment must be made, however, before research direction can be confidently supported. These were the conclusions, among others, of a workshop held during a conference in Bern 2014 on the theme of Culture, Climate and Environment: Interactions at Prehistoric Wetland Sites. The workshop, chaired by Helmut Schlichtherle and Margaret Gowen (co-author), established that research must continue, albeit with all due regard for the preservation of the integrity of the inscribed sites. As it is, there can be no argument about the necessity for monitoring, small scale interventions and the synthetic

study and re-study of existing datasets. What appears to be missing is a defined strategic direction for future research. The workshop identified other important themes. These included, but not exclusively: i) a need for leadership in research, ii) the creation of networks to acquire funding, iii) training and education for young archaeologists in specialist field research methods, iv) greater focus on the immense value of interdisciplinary engagement and exchange in research, v) a new focus on understanding these sites within their broader cultural landscapes and vi) an assessment of the value of a review of archival evidence.

The workshop concluded that a first step should be the establishment of a joint gap-analysis, beginning with a pilot study to establish the structure of the study. Eventually, the study should extend to all regions and include regions outside the Alps, integrating contributions from heritage management agencies, universities, museums and other research institutes and bodies. Co-ordination is, of course required.

8. Proposal for a new perspective on protection and valorisation of the World Heritage

On all archaeological sites, there is a contradiction between the need to conserve physical integrity and the use of intrusive methods to gain knowledge of them. At the heart of this contradiction lies the debate on the conflicting principles of conservation and management and those relating to continuing research. This is especially so in the case of archaeological World Heritage sites. Research on non-threatened sites is increasingly rare for this reason, but in these times, it is also for financial reasons.

It is essential, therefore, to consider a new model for the development of the exploration of this heritage and a new model for the promotion of building knowledge and understanding of these sites. A gap analysis, mentioned above, is a necessary first step towards defining and proposing a framework of priorities for research and preservation. It can also be used to ensure that there is an established and accepted principle of rescuing important archaeological remains and an opportunity to study them appropriately. There must also be a place for enquiry-based research on the sites inscribed on the UNESCO World Heritage List and on associated sites (fig. 3).

While the principle of integrity linked to material remains can be easily validated, it is also possible within the discipline of archaeology to confidently validate the knowledge gain of local and regional environmental and cultural information obtained by study and research. This serial World Heritage property includes sites that were partially excavated and studied prior to nomination and they were nominated for their outstanding character, composition and cultural identity. Assessment of their outstanding character was gained, on one hand, from excavation in the past and, on the other hand, by the knowledge gained from the archaeological structures that still survive intact. These, of

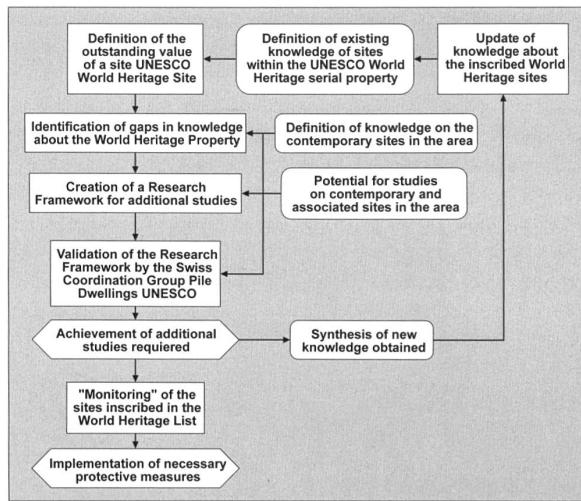


Fig. 3. Draft of the management model proposed to reactivate the archaeological research on the World Heritage sites.

course, represent unique and non-renewable material archives in their own right. Critical evaluation of scientifically analysed excavation data, material and samples clarified the significance of the nominated sites and the structures and deposits within them. Moreover, it was these analyses that illustrated and confirmed the outstanding nature of the cultural, material, paleoenvironmental and chronological significance of the sites.

The outstanding universal value of the pile dwelling sites is, of course, drawn from those materials remains that survive in situ. However, the link between these remains and the knowledge gained from archaeological research, excavation and scientific analysis is what demonstrates and supports this value. It follows, therefore, that the objectives of management must be shared between the preservation of the sites and the continuing development of knowledge about them. Once this dual principle is accepted, it remains to define what research direction and research questions are paramount and essential to resolve gaps in knowledge and the understanding of the listed sites.

The serial property has a Management Coordination Group. This consists of specialist archaeologists and others drawn from each of the six countries and their national coordination groups. While these bodies are well placed to understand the contextual research and where gaps in knowledge may exist, a concerted project is required to provide the necessary gap analysis and to identify an appropriate research framework for going forward. Such analysis requires a dedicated project, with concerted effort and appropriate funding.

World Heritage status has placed these sites in a global context. The national and regional coordinating groups can oversee such a project and its results. The Swiss Coordination Group has already been proven to be very effective. Switzerland continues to bear a particular responsibility for the management for the prehistoric pile dwellings around the Alps; this responsibility also commits Switzerland to

propose a model of management that allows solving the tension that has arisen between the requirements for conservation and the requirements of research. We can be confident that a developed management model would assist the apparent impasse that currently exists, moreover, will foster collaboration among researchers on the interpretive themes of pile dwellings, in addition to the exchanges currently reserved for protection measures. Thus, one of the stated objectives of the project for the nomination of this outstanding serial object will be attained.

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