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Preserving Rural Settlement Sites in Norway? Investigations of Archaeological Deposits in a Changing Climate

Vibeke Vandrup Martens

Summary

Since the adoption of the Malta Convention (Council of Europe 1992), the strategy of cultural heritage management in many countries has changed from *ex situ* to *in situ* preservation of archaeological remains. The question is whether this change in strategy increases the protection or the risk of losing the undocumented heritage it was meant to protect? The strategy puts a large responsibility on present and future generations, as the concept of *in situ* preservation implies that the heritage sites remain unchanged 'forever'. To ensure that *in situ* preservation may be considered a possibility, knowledge about the present state of preservation as well as the physical and chemical conditions for future preservation capacity is necessary. This accumulated knowledge is called environmental monitoring. The alternatives to *in situ* preservation are to simply let sites deteriorate and eventually disappear, or to preserve through detailed archaeological investigation and documentation, also called *ex situ* preservation or preservation by record. The possibilities, limitations and consequences of *in situ* site preservation are main topics of this work.

The focus of this thesis is on three complex topics; *in situ* preservation of unsaturated archaeological deposits (discussed in chapters 2, 4, 5, 6 and 7), rural medieval archaeology (discussed in chapters 3, 4, 6 and 7) and effects of climate change on archaeological remains (discussed in chapters 2, 4, 5, 6 and 7), all within the context of Norwegian Cultural Heritage management and research.

Chapter 1, Outline and Scope of this Thesis, introduces the central questions and problems, study methods, case sites, project framework and project partners, the legal and management framework and conventions. Specific aims of the present study are;

- To which extent is archaeological contextual readability retained in rural archaeological deposits at different stages of degradation?
- Which are the possible effects of the rates of degradation on their contextual readability?
- Is it possible to define threshold levels in the archaeological deposits?
- When archaeological observations are coupled with environmental parameters, can one define which parameters most affect the present conservation state and conditions for future *in situ* preservation of archaeological deposits in the unsaturated zone?
- What may be the effects of climate change on these parameters?
- How can studies of artefact preservation and microscopic and macroscopic microfossils contribute to evaluations of state of preservation?
- Can degradation processes be curbed or mitigated? If so, which mitigation strategies may be required for the investigated sites?
- How may this contribute to a decision support system for cultural heritage management?

Chapter 2, General Introduction, briefly discusses the background for evaluations of *in situ* preservation of archaeological sites, includes an introduction to rural medieval archaeology in Norway, the North Norwegian farm mounds as archaeological monuments, and discusses their role compared to that of the medieval towns. Modern Norwegian cultural heritage management adheres at least partly to the Malta Convention, though within the set time frames of the Norwegian Heritage Act, meaning that the intention is to preserve as many archaeological sites and as much of each individual site as possible *in situ*. Heritage evaluation and climate change is also discussed, with a brief overview of predicted climate change for the study area of Northern Norway. The chapter includes suggestions for threshold levels and some possible mitigating actions.

Chapter 3, North Norwegian Farm Mounds - landscape conditions and assumed agrarian technologies required for their existence, is a paper on farm mounds as an archaeological object. It puts the farm mounds into a research context and discusses the parameters that have affected their existence over time.

Chapter 4, The Magnate Farm of Åker. Past, present and future of a farm with central functions, presents a south Norwegian farm mound as comparative material to those in northern Norway. This particular farm mound has played an important role as a central place in southern Norway for centuries, and it has been exposed to severe infringement and changes from modern infrastructure projects. Probes monitoring temperature and moisture were installed at the site in 2007, and the monitoring has continued since then, with a few breaks because of battery failure.

Chapter 5, In situ site preservation in the unsaturated zone: case Avaldsnes, gives a thorough description of the methods and equipment used in the monitoring projects, and an explanation of the methods and requirements advocated by the Norwegian Standard concerning deposit monitoring, and potential problems following that. This is another type of comparative site on the west coast of Norway with preserved rural archaeological deposits, in a climate that differs from the ones presented in chapters three and four, and gives some insight into how archaeological remains are preserved in a wet and wild climate.

Chapter 6, Research and monitoring on conservation state and preservation conditions in unsaturated archaeological deposits of a medieval farm mound in Troms and a late Stone Age midden in Finnmark, Northern Norway, contains the results from farm mounds and high north investigations, archaeological, geophysical, and geochemical and palaeobotanic analyses written with InSituFarms project partners. It also includes laboratory experiments on preservation of deposits in different temperature and moisture scenarios to give input to possible climate change effects, tying together the theories and heritage management aspects.

Chapter 7, Synthesis; Implications for archaeological heritage management, discusses the lessons learned from the thesis work and the InSituFarms research project. It is structured in accordance with the research questions posed in Chapter 1, on how climate changes may affect the studied objects (through decay studies and climate predictions), aspects of preservation, and ultimately the implications for archaeological heritage management of these sites and all rural archaeological sites with preserved deposits, independent of site type or dating. This chapter exemplifies definitions of threshold levels for different types of threats to continued preservation and suggests an improvement to the national heritage database including these considerations.

Chapter 8, Conclusion and Further Perspectives. This final chapter gathers the findings of the previous ones and points to future work. The results of the research presented here have demonstrated that it is possible to define parameters that most affect preservation of archaeological sites and it is possible to see effects of climate change on these parameters. That accentuates the importance of preparing strategies to deal with the effects of climate change on the preservation of cultural heritage sites. Focus for future research should be on refining these threshold levels and corresponding mitigating actions to enable defining a point when one should go from *in situ* to *ex situ* preservation. The threshold levels suggested in this thesis should be tested further through laboratory and on site experiments. This work advocates the necessity for the development of sustainable mitigating actions for a number of different threat situations as exemplified in the threshold levels, and to evaluate the scientific potential of sites chosen for *in situ* preservation.