

## **LAND: Towards a new framework for the management of cultural and natural heritage in upland Landscape Conservation Areas (LCA) in Norway.**

**Summary:** The inherent dynamism of upland landscapes challenges scientists and land managers to secure the right balance of conservation and management measures against a backdrop of complex and changing socio-economic drivers, and a rapidly evolving evidence base. This interdisciplinary project will develop an evidence-based framework to underpin the sustainable management of both cultural and natural heritage in Norwegian upland landscape conservation areas (LCAs). The project is organised into four interrelated work packages (Fig. 1): (WP1) Examine the long-term natural and cultural variability in cultural LCAs in four upland regions in Norway at both small (WP1a) and large scale (WP1b). A crucial task assigned WP1 is to identify major driving forces underpinning landscape dynamics, and cultural and natural conservation objectives inherent at each time stage. (WP2a) Examine the stakeholder perspectives involved in the management of upland landscapes and (WP2b) examine the evidence basis for the management of LCAs. (WP3) Examine the valuation of cultural and natural heritage in relation to land use history and conservation philosophies in an international perspective by a comparative study of regions in UK and Norway. (WP4) Develop new guidelines for the management and conservation of these dynamic landscapes based on WP1-3. By this approach, our project will provide new research-based knowledge to promote sustainable use and management of both culture heritage and landscape which is defined as the main aim in Miljø2015 (Land).

**Background:** In a recent environmental investigation, *“The authorities’ efforts to survey and monitor biological diversity and to manage protected areas”*,<sup>1</sup> the Office of the Auditor General revealed weaknesses in the management of protected areas in Norway. One third of Norway’s protected areas are threatened. The main threat is forest succession in semi-natural habitats, previously used for fuel-wood cutting, livestock grazing and haymaking, and forty-five percent of all alpine red-listed species are mainly occurring in semi-natural grasslands<sup>2</sup>.

Mixed agricultural land uses were important in the marginal outlying land in Norway until the mid 20<sup>th</sup> century, and several LCAs are protected due to these cultural conditions. However, the purpose for the conservation of cultural landscape areas is not clear; e.g. Budalen (Table 1) is protected to “preserve a distinctive natural- and cultural landscape and its vegetation, where the summer farming landscape with its houses, infields and cultural monuments form a substantial part of the landscape”<sup>3</sup>. Summer mountain farming was an important part of a mixed agricultural system in the uplands in Southern Norway; i.e. in the taiga-tundra ecotone and below<sup>4</sup>, and several summer farming landscapes in this region are designated as LCAs. In central and northern Norway, upland landscapes are shaped by the meeting of several ethnic groups, among them the Saami culture. These upland cultural landscapes are exceptional in an international perspective<sup>5</sup>. However, cultural landscapes are highly dynamic, and reflect changing land use regimes during several centuries, and paleoecological and archaeological investigations reveal that other land uses such as mining, iron-making and hunting as well as climatic variations were important prehistoric drivers<sup>6</sup>. Long term records thus need to be used to address specific conservation issues related to natural and cultural variability, and provide guidelines for long-term management and conservation<sup>7</sup>.

In addition to the temporal variation, general conservation guidelines have to take into account regional variation among upland landscape conservation areas. Sub-alpine and alpine lands dominate in the Norwegian landscape (cover c. 50%) with large variations in both culture and nature. Revised conservation guidelines need to be based on an overall evaluation

of the heterogeneity in upland LCAs to ensure that this cultural and natural diversity is maintained, and to provide national statistics and key-numbers for international reporting (CBD, EU, and EEA). Since management objectives for especially semi-natural landscapes are vague, it is difficult to even evaluate whether the LCAs are satisfactorily managed. The development of general conservation guidelines is thus important also from an economic perspective, as it gives the basis for adapting the management towards a more accurate decision making in the future. One could also argue that the management of upland LCAs to a large extent affects the activity in alpine conservation areas, as these mostly sub-alpine valleys border large alpine nature reserves and represents the main entrance for e.g. hikers, hunters, and snow-mobiles.

LCAs are the responsibility of the Directorate for nature management (DN), while the Directorate for cultural heritage (RA) is responsible for the cultural heritage from different time periods (and thus different landscape contexts) found in LCAs. Even if the landscape in itself with meadows and pastures could be perceived as a cultural heritage<sup>8</sup> and encroachment is considered to be the main threat to cultural heritage objects in outlying land, a common management of cultural and natural heritage in conservation areas is rare. **We believe that an interdisciplinary approach (drawing together culture, agriculture, environment) for both managers and researchers, in dialogue with different stakeholders, is needed for the development of common and sustainable conservation and management guidelines, which are locally acceptable (WP4).** Guidelines should be based on interdisciplinary developed knowledge of the natural and cultural variability in each area (WP1) as well as an understanding of the conservation rationale both on a national (WP2) and international scale (WP3) (See Fig.1 for overview). University museums in Norway cover relevant disciplines (e.g. archaeology, palaeoecology, biology) needed for organising an interdisciplinary network as well as housing Sections for external services, and should thus form a firm and integrated basis for both the research and communication of the research which affect the management and conservation of dynamic landscapes.

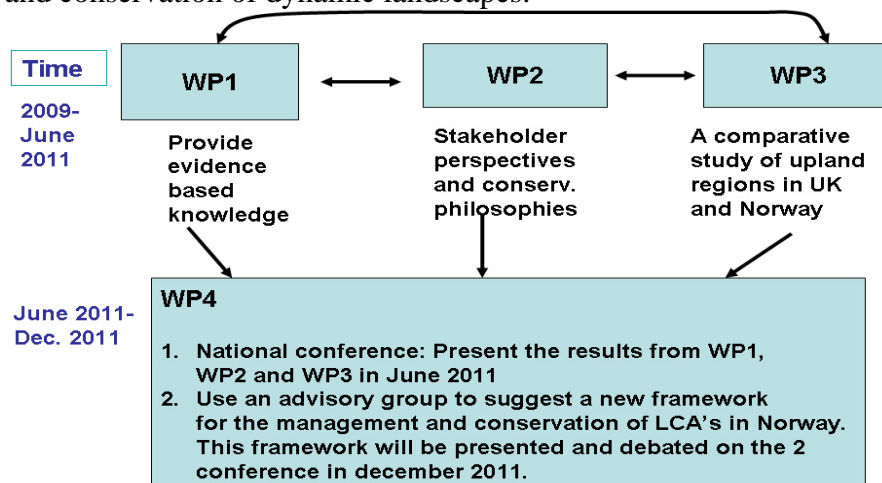


Fig.1 An overview of how the 4 WPs are integrated in the project

**WP1: Long-term natural and cultural variability in cultural landscape conservation areas in four upland regions in Norway.** Large Nordic projects have shown that studies of the long term relations between land use and landscapes are depending on an interdisciplinary approach<sup>9,10</sup>. For example palaeoecology, archaeology, history and ethnology are necessary to understand how land uses such as livestock farming and agriculture affected the vegetation in historic times<sup>9,11</sup>, while studies on the ecological effects of land use often are needed to understand the mechanisms behind the dynamics shown by a pollendiagram<sup>7</sup>. Although the

upland landscape is harsh and often envisaged as remote wilderness, human utilisation of natural resources has strong traditions in this system. Reindeer hunting has probably affected upland ecosystems since the beginning of Holocene. Grazing indicating plants in pollen diagrams, bones and archaeological findings suggest grazing in upland areas as early as the Late Neolithic<sup>12</sup>, but data on the densities and regional distribution of prehistoric livestock farming is insufficient, and the relative importance of hunting vs. farming likely varied with the environment. Early upland livestock farming is believed to be connected to a nomadic system (mountain transhumance), and seasonal farms are so far only dated back to the Roman Iron Age<sup>13,14</sup>. Livestock farming strongly increased through the Roman and Migration Periods as shown by pollen diagrams. Iron making which depended on vast amounts of fuel-wood, was also important in several upland landscapes in the same period, and most likely increased the area of open grasslands, while forest and fuel-wood resources may have been in short supply. Land use history (type and intensity) of upland landscapes further varied due to both cultural and natural factors such as climate, diseases, social organisation of communities, and pollen analysis reflect both depressions due to major catastrophes (e.g. the black death) and gradual increase in land use intensity from the 17<sup>th</sup> century. The intensity in upland land use probably peaked in the mid 19<sup>th</sup> century as indicated by the high number of mountain summer-farms, and lack of fuel wood limited the processing of dairy products in some areas<sup>4,15</sup>. However, to understand the effect of summer-farming on the landscape, it is important to take into consideration the large regional variation in summer farming and the strong temporal changes in land use type and intensity, especially during the latest 150 yr<sup>16,17</sup>. In addition, summer farms were mainly found in southern Norway. Livestock farming probably had low importance in most inland areas in the north (at least until the 18<sup>th</sup> century). Reindeer-nomadism has prehistoric traditions especially in the northern part of Norway and was further developed in the 16<sup>th</sup> and 17<sup>th</sup> centuries as Saami reindeer nomadism<sup>18</sup>. Today's subalpine landscape is in a process of forest succession. With the exception of free ranging sheep, wild browsers/grazers like moose and red deer are the dominating herbivores, and the few summer farms left only use fodder and fuel wood in limited amounts. However, semi-domestic reindeer still have a strong impact on upland ecosystems in northern Norway<sup>19</sup>, but today reindeer herding is mainly based on permanent settlements. **Aims & methods WP1a:** The main aim is to present a coarse chronology of the upland landscape in the Holocene (c. 10000 BP up to present), based on palaeoecological, archaeological, historical and ecological data in 4 LCAs with a different natural and cultural environment (Table 1). These interdisciplinary studies will be conducted at 3 definite study sites (c. 1 km<sup>2</sup>), within each LCA and 4-6 images representing different time stages will be produced for each site (e.g. Fig. 2). Selection of sites will be based on site representativity and the availability of previously collected data. Specific aims at each site: (a) Vegetation history; i) quantify the relative amount of open habitats (grassland, heathland) vs. sub-alpine forest at different times, ii) estimate the intensity and duration of livestock grazing through the quantification of grazing indicating plants and faeces-specific fungi, iii) identify the intensity and type of human activity through charcoal analysis. (b) Zoo-archaeology: Examine the importance of pit-falls or alternative hunting systems at different times and indirectly the density of large game such as moose and reindeer. (c) Archaeology, history, geography, ethnology: Identify and date cultural remains, estimate the importance of different cultural activities at different times. (d) Biology: Examine habitat composition and the abundance and distribution of red-listed species (focusing on vascular plants and bryophytes). Identify important environmental variables responsible for structuring both habitats and populations of species. Data on both cultural and natural environment will be integrated into a geographic information system (GIS) as a basis for landscape change analysis. This GIS will include layers with spatially explicit data such as pit-falls, tar- and charcoal kilns, stoves for iron-making, summer farms,

in- and outfields, as well as vulnerable vegetation types and species with separate digital topographic maps and vegetation maps. Palaeodata make the basis for reconstructions of past landscapes for selected time layers by using modelling and comparing simulated pollen data from maps and modelled landscapes with the actual pollen data from different time periods<sup>20,21</sup>. Backtracking and analysis of recent landscape change will be done through comparative assessment of older aerial photos (typically mid 1960ies) and orthophotos (“Norge i bilder“) by the use of program packages like “Definiens”<sup>22</sup>. Analyses on land use changes (1963-93) are already available in a GIS from Budal<sup>17</sup>. Environmental attributes (e.g. soil humidity, habitat) will be important to examine the interaction between the cultural and natural environment. The University-museums presently manage huge databases on cultural and natural heritage in Norway, which will be included in the GIS. National databases (Naturbase, Askeladden and SEFRAX) will be checked and updated. The Norwegian Red list<sup>2</sup> will be consulted to identify red listed species and their main habitats, and “Naturetypes in Norway”<sup>24</sup> for endangered nature types. A main challenge for the historical landscape analysis will be to uncover the most important drivers (both cultural and natural) for landscape dynamics which is also the key for predicting future landscapes given alternative land uses. This will be done by examination of conceptual models and correlations between land use and landscape dynamics, while layers of palaeodata and more recent landscape changes will be used more directly to construct alternative landscape scenarios using programs such as HUMPOL<sup>21</sup> and “Definiens”<sup>22</sup>. In order to illustrate the potential of scenario methodology as a support tool for decision-making and management, scenario analysis will be carried out in one of the study areas.

Although several disciplines have worked on the processes and patterns of culture and nature also in alpine areas (Table 1), a common research agenda for the uplands of Scandinavia is rare. Besides describing and dating cultural and natural heritage at each LCA within a common framework, we will focus on a few central questions in the intersection between culture and nature: (1) What was the relative importance of different land uses such as livestock farming, reindeer-nomadism, iron making, hunting at different times and regions, and how is land use history affected by cultural and natural environmental variables? (2) How has different land uses and given natural factors affected the relative importance of open habitats vs. sub-alpine forests over time? (3) What is the extent and continuity of semi-natural habitats important for a majority of red listed species? (4) What can the relation between pre-historic and historic land use and landscape tell us about future landscape and vegetation dynamics? **Aims & methods WP1b:** The main aim is to register previously monitored data on vulnerable habitats, red-listed species and cultural heritage on a large scale GIS in upland LCAs. As most cultural and natural heritage in all 4 LCAs examined are rare (and likely only partly included in the study sites selected for WP1a), more monitoring data at a larger scale (whole LCA) are needed to give basic information for the development of conservation guidelines in WP3 (while interpretation of cultural data from each LCA is depending on data from a more regional scale). This includes the extent and state of vulnerable habitats, the abundances and distributions of red-listed species, type and state of cultural heritage etc. Any new survey of red-listed species will focus on vascular plants which represent 20 % of the red-listed species in the alpine region<sup>2</sup>. A general problem for evaluating both natural and cultural heritage data, is that monitoring methods may differ between areas. Where supplementing monitoring is needed, a common methodology based on the “guidelines for management and monitoring of upland landscapes” developed for Joint Nature Conservation Committee (UK)<sup>25</sup>, will be consulted for the monitoring of both habitats and species. Similar monitoring techniques are presently being developed for monitoring cultural heritage at a landscape scale<sup>22,26</sup>, and these methods will further be tested within the selected LCA where

supplementing data on cultural heritage is needed. By including both natural and cultural heritage in a GIS, with digital maps and corresponding databases of environmental factors (e.g. natural environment, land use), relevant information will be included in a common framework as a basis for developing conservation guidelines (WP4). The research-groups at each University museum will interact in a network with common workshops during the project in 2009, 2010 and spring 2011, and in close connection with WP2 and WP3, and the advisory group.

Table 1. Study areas chosen for each region, with a description of the main heritages.

Region	Study-area	Cultural heritage	Natural heritage
E-Norway	Grimsdalen LCA, Area: 122,5 km <sup>2</sup>	Pit-falls (reindeer), large-scale trapping systems (reindeer), grave mounds, house-sites, permanent settlement based on hunting and farming during The Late Iron Age and early Middle Age, summer-farms, mining activity. <sup>27-30., 33</sup>	Species-rich semi-natural grasslands. Red-listed species especially vascular plants, bryophytes and fungi <sup>27,28.,31-33</sup>
W-Norway	Sunndalen, Erdalen, Bødalen within Jostedalbreen National Park. Area 40 km <sup>2</sup>	House remains from deserted summer farms, grave mounds, grave finds, charcoal kilns, track ways <sup>34</sup> , grazed forest from the Bronze Age, and establishment of summer farm pastures in the Iron Age <sup>6, 35</sup> . Summer farms with clustered buildings <sup>35</sup>	Semi-natural grasslands <sup>40</sup> . Glacier forelands and summer farming, large variations in species diversity related to altitude gradients of 2000m, mixture of continental and western species <sup>36,37</sup>
C-Norway	Budalen LCA. Area 33.8 km <sup>2</sup>	Pit-falls (moose), ironmaking and smithing, grave mound, charcoal kilns, tarkilns, <sup>38</sup> mountain summer farming system with in- and outfields (pastures and former hey-making fields) <sup>39,40</sup> , semi-domestic reindeer herding <sup>41</sup>	Species-rich semi-natural grasslands; large variations related to altitude, land-use, soil pH. Red-listed species especially vascular plants, bryophytes and fungi <sup>39-41</sup>
N-Norway	Dividalen LCA. Area 19 km <sup>2</sup> Parts of Øvre Dividalen NP will be included.	Mixed Sami and "Døla" culture. Pitfalls, homestead remains, turf hut sites, saami fire place (arran), sacrificial place, semi-domestic reindeer herding <sup>42-44</sup> , hunting cottages, tarkilns <sup>45,46</sup> , partly grazed and previously mown forest <sup>46</sup> .	Old Pine forest (traditionally used and harvested) <sup>44,47</sup> , diverse river bank vegetation. Diverse flora including red-listed species of vascular plants, fungi and beetles <sup>48,49</sup> .

### WP2a: Stakeholder perspectives

The management of LCAs involves multiple objectives, and decisions have to be made on the basis of trade-offs such as cultural vs. natural heritage in landscape conservation areas, cultural landscapes from different time periods, and the importance of different land-uses and corresponding landscape patterns. Different stakeholders in the management often represent different viewpoints on the management of the LCA but are often unaware of possible synergies involved due to e.g. limited communication in the management process.

**Aims and methods in WP2a:** Identify the conservation philosophy of different stakeholders involved in the management process; managers from cultural, agricultural and natural heritage, land-owners, NGOs. To achieve this, a focus group with stakeholders for each LCA study site will be established. The stakeholders will present their view on the conservation and management of the upland landscape in their own region, and participate on common regional workshops with the researcher team in WP 1 during 2009 & 2011. These workshops will function as a forum to identify cultural and natural heritage and the evidence base that is needed to underpin the sustainable management in this specific region, as well as potential changes in values ascribed by the different stakeholders during the process towards the management guidelines defined at the end of the process. The process in each regional focus group will be organised by a professional facilitator experienced with similar processes. By using a broad representatively selected focus group, we recognize the fact that landscapes are

perceived as common good according to the European Landscape Convention<sup>63</sup>. Focus groups have also been used with great success for solving other management challenges with conflicting opinions<sup>64</sup>.

### WP2b: Conservation philosophies in cultural landscape management.

Environmental management is a practice which in its self is *creating knowledge*. This point of view is based on a perspective on knowledge as something we *create* rather than *discover*. Within the humanities (e.g. Archaeology<sup>50,51</sup>) natural and social sciences<sup>52,53,54</sup> this way of perceiving knowledge has been debated for the last three decades (and researchers from different disciplines in this project thus also contributes to this creation of knowledge).

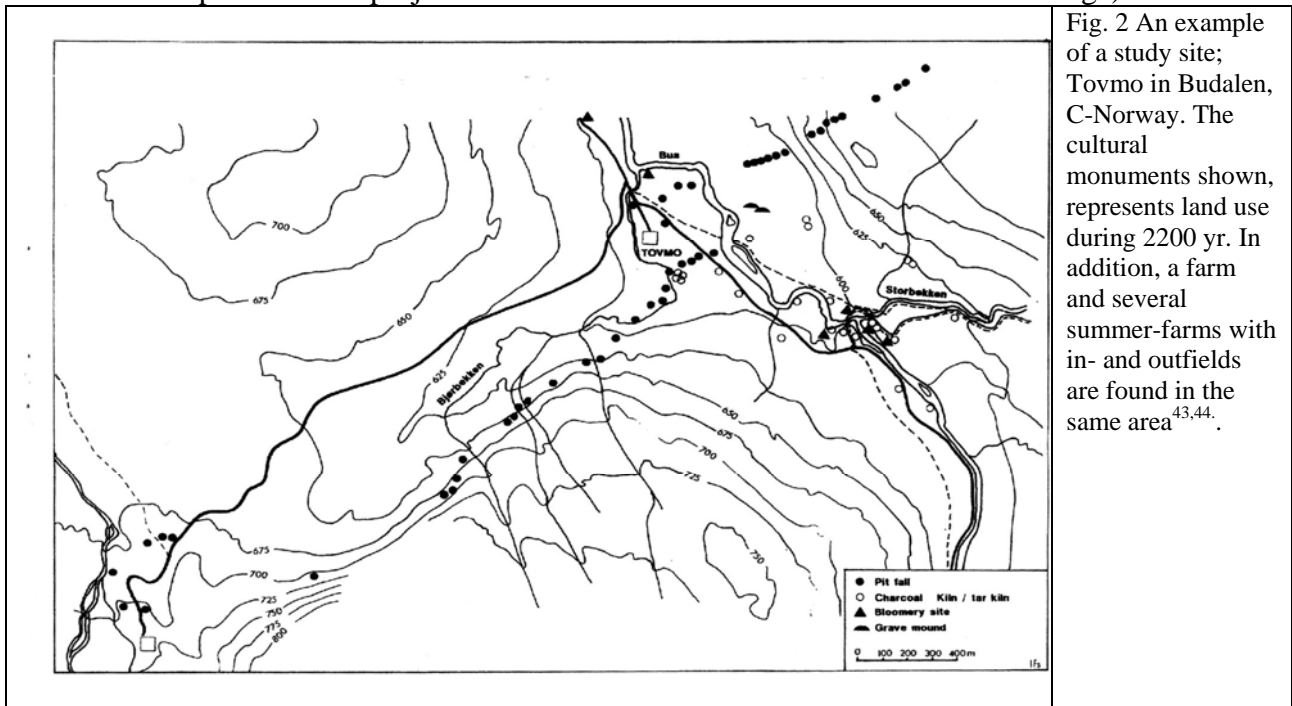


Fig. 2 An example of a study site; Tovmo in Budalen, C-Norway. The cultural monuments shown, represents land use during 2200 yr. In addition, a farm and several summer-farms with in- and outfields are found in the same area<sup>43,44</sup>.

Attention has been given to the formation of ideas and practice within the public environmental management<sup>56,57</sup>. WP2b focuses on mechanisms for the construction of knowledge within the environmental management specifically related to research-based studies in natural sciences and humanities. A recent study<sup>55</sup> uncovers how cultural heritage management (through its practice) influences basic definitions of the past and the monuments and landscapes it is set to manage. It is pointed out that the management of the past is entangled with several present conditions such as research (humanities and science), politics, law, and technology. This implies that the past managed by the heritage management is (1) to a large extent based in a present situation, and thus (2) broader than the understanding of the past constituted by humanities and science alone. Somewhat similar mechanisms are reported from the natural heritage management. Boulton et al.<sup>58</sup> find that politicians, planners and bureaucrats not only have their own concepts on what constitutes knowledge, but also bring in to the discourse their own *structures of knowledge*. In that sense we move from one constitutive field of knowledge (humanities and science) to a different field (the environmental management). This impression of a two folded production of knowledge is also supported by a recent study from the UK which shows that 90% of the decisions taken by conservation managers are based on other factors than evidence-based facts, although relevant evidence often exist<sup>59</sup>. Within the field of environmental management, archaeology and biology face some common challenges. It is decisive for any project on environmental management to identify, describe and analyse mechanisms working in this field. When we often experience lack of communication and common understanding with the conservation

managers, it may be because neither of us has taken the implications of transformation from evidence-based knowledge to management seriously enough. The different phenomena that are subject to management does not necessarily appear similar for an archaeologist and biologist on the one hand and a civil servant in the Ministry of environment on the other. Hence, an important task for conservation and management philosophy must be to understand this process from science to management. **Aims & methods WP2b:** The main aim is to examine (1) how knowledge is constituted within environmental management, and further (2) how knowledge is communicated to related management, scientific communities and the public at large. This implies an identification of the mechanisms that constitute management both as a way of thinking and as practice, and more specifically how the “cultural landscape” in the LCA is conceptualised within the management system. These questions will be addressed by examining relevant documents on environmental management issued by the central authorities such as government propositions and reports, acts and regulations, circulars, consultation papers and official Norwegian reports (including local management plans for the 4 LCAs). The relationship between the documents issued by the central authorities and the local management will be an important issue. Brattli<sup>55</sup> has shown that studies on this type can give insight in ontological and epistemological conditions, premises for ascribing values and politics included. The methodical approach will take form as a discourse analysis<sup>60</sup>, which supplements a qualitative perspective to the project. The analysis will thus complement the stakeholder perspectives examined in WP2a. Both stakeholder perspectives (WP2a) and conservation philosophy (WP2b) will be linked to WP3 in a comparative study with UK.

### **WP3 Cultural and natural heritage in relation to land use history and conservation philosophies. A comparative study of regions in UK and Norway.**

The conservation philosophies and specifically our evaluation of elements of the cultural and natural heritage differ between regions due to both cultural and natural factors. This will be examined within Norway in WP2. In an international perspective, the Norwegian concern for encroachment and reduced areas of open semi-natural habitats is contrasted by the view of maintaining and restoring natural habitats which have been tree-felled, burned and heavily grazed. This is the case for many conservation areas in UK, where strong grazing pressure by sheep and deer, burning, and anthropogenic nutrient deposition have been identified as key drivers of habitat degradation<sup>5</sup>. Woodland encroachment is thus not an issue in the UK, where land-use factors still favour the suppression of woodland regeneration, and even of dwarf shrub vegetation in some areas. For Norway, a comparative study with the UK will tease out the ecological, economic and social factors underlying the relationship between woodland and open heath expansion. Guidelines for the management and conservation of Norwegian LCAs have to take into consideration international obligations (e.g. the European Landscape Convention, Emerald Network, and Valetta Convention) as well as a management that corresponds to “Natura 2000” (EU). A further important reason for comparing Norway and UK is that Norway is currently developing a system for managing and monitoring conservation areas, which is based on “Common standard monitoring” originally developed by JNCC in UK. We have already discussed the UK methodologies with UK conservation and science staff, and have identified opportunities to develop these across Norway, in ways which address cultural as well as natural heritage elements. **Aims & methods WP3:** Examine the evaluation criteria for cultural and natural heritage areas and elements in relation to land use history and conservation philosophies in different regions within UK and Norway. We will achieve this by conducting a comparative study of our 4 Norwegian regions and 3 upland regions in England (Lake District), Scotland (the Cairngorms) and Wales (Snowdonia).

#### **WP4 Towards a new framework for the management of both cultural and natural heritage in upland Landscape Conservation Areas**

Based on the critique from the Office of the Auditor General<sup>1</sup>, which was repeated by an external expert-group in 2007<sup>61</sup>, Norwegian ministry of environment (MD) has stated that “Norwegian conservation areas should be managed more in correspondence with the EU system; Natura 2000”<sup>62</sup>. This basically implies that most guidelines for conservation areas in Norway must be revised. The Norwegian Directorate for nature management (DN) suggests a new framework for management and monitoring of conservation areas that specifically addresses some key issues: (1) Identification of conservation objectives, (2) selection of parameters which could be used for monitoring to ensure that the areas are protected according to the purpose, and (3) defining acceptable dynamics/disturbances in correspondence with the conservation objectives in the area (workshop presentation at DN in 2007). However, the development of a new framework for the management of upland LCAs requires consensus on the range of goods and services provided by the uplands, and a quantification of their ranked importance. It’s thus not given which guidelines that should be implemented, and basic knowledge on cultural and natural heritage necessary to underpin these guidelines are poorly developed in several LCAs at present. **Aims & methods WP4:** The aim in WP4 is to develop new general guidelines for the conservation and management of upland LCAs, based on: (1) relevant knowledge on landscape chronologies as well as the regional variation of cultural and natural heritage (WP1a), extent and state of vulnerable habitats, the abundances and distributions of red-listed species, type and state of cultural heritage (WP1b), (2) the stakeholder perspectives (WP2a) and an analysis of the conservation philosophies (WP2b). (3) A comparative study on the management and conservation of the uplands in Norway and UK (WP3) will provide an international perspective on guidelines based on the “Natura 2000”. The evidence-based framework developed in WP 1-3 will be presented at an open national conference in spring yr 2011. In order to develop common and sustainable conservation and management guidelines, a broad advisory group with “experts” from WP1-3, representatives from the agricultural, cultural and environmental authorities, politicians, as well as NGOs and landowners will be responsible for suggesting new guidelines for upland LCAs. To secure an open and thorough process, the suggested guidelines will be presented and debated on a second conference in December 2011.

**Organization and collaboration:** Project leader: Dr. Gunnar Austrheim, VM, NTNU. The leaders for each WP are situated at VM, NTNU. WP1: Dr. Thyra Solem, WP2: Dr. Terje Brattli, WP3: Gunnar Austrheim in cooperation with Post doc. WP4: Prof. Reidar Andersen. Active partners: Museum of Cultural History & Museum Natural History, UIO, Bergen Museum, UIB, Tromsø Museum, UIT, Birgitte Skar & Anne Sætren, NIKU, Prof. Des Thompson, SNH, JNCC, UK & Prof. Tim S. Hall, UCL, UK. An interdisciplinary group of researchers, technicians and communicators in archaeology, biology, palaeoecology, agro-history, ethnology, geography and GIS-technology at each museum (supplemented with external employees) will cooperate in a national network among university museums in Norway. A post doc. financed by this proposal will serve on all WPs. William Fagerheim will serve as a facilitator for focus groups in WP2a. An advisory group of national and international experts in ecology (Dr. J. A. Kålås, Artsdatabanken, NO, Prof. D. Thompson, Scottish Natural Heritage, UK), landscape archaeology (Dr. B. Skar, NIKU, NO), archaeology (Prof. T. S. Hall, UK, Prof. R. Bertelsen, UIT, NO, fil dr. E. Svensson, Karlstad University, S), palaeoecology (Prof. H.J.B. Birks, UIB, NO & UCL, UK, Prof. B. Odgaard, Aarhus University, DK), history (Dr. A. M. Tretvik, NTNU) and geography (Ass. Prof. G. Setten, Prof. M. Jones, NTNU, NO) will be connected to the project and invited for all major meetings. Environmental and ethical issues: Recent data from interview surveys have to be

approved by Norwegian Social Science Data Services Gender issues: One of five project leaders, four of ten members of the advisory group, and c. 1/3 of 36 persons in the research groups are female. Gender is also an issue for several other aspects of this project such as the composition of focus groups and the interpretation of historical data.

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