

Mobile Pastoralism and the World Heritage Convention

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Mobile Pastoralism and the World Heritage Convention

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SEPTEMBER 2019

The following paper is a report for Roads Less Travelled, a global partnership of DiversEarth, Yolda Initiative and Trashumancia y Naturaleza, which makes the case for mobile pastoralism (transhumance, nomadic and semi-nomadic pastoralism) at a global scale, through new research, support to pastoral communities, and through creative celebration of their knowledge and ways of life. This paper contributes to a stream of work by Roads Less Travelled on mobile pastoralists and protected areas.

The paper is a scoping study; part of a multi-year project looking at mobile pastoralism and conservation. It is not attempting to be comprehensive or offer a detailed analysis of the situation in the various case studies described, nor at this stage to provide concrete suggestions for ways forward. Rather, it is using World Heritage sites as a vehicle to identify some of the key issues regarding the inter-relationship between mobile pastoralists and conservation objectives, along with some tentative next steps.

THE PAPER AIMS TO:

Introduce concepts of mobile pastoralism and its interaction with conservation

Discuss the role of World Heritage and the Advisory Bodies

List key World Heritage sites where mobile pastoralism occurs

Provide some brief case studies of mobile pastoralism within individual World Heritage sites

Draw some very preliminary conclusions, recommendations and suggestions for next steps

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African woman shepherd from the Samburu tribe in Marsabit Kenya.

Overview:

Mobile pastoralism in World Heritage

The following paper provides a brief overview of the importance, status and future of mobile pastoralism in natural and cultural World Heritage sites around the world, illustrated by a series of case studies. For those with little time, the following overview provides a summary of findings.

1 The World Heritage Convention's focus on protecting both natural and cultural values gives it a unique perspective and practical experience amongst site-based conservation approaches, which can be usefully applied to considering the sustainability and future of mobile pastoralism.

2 There are major differences within World Heritage sites in terms of how mobile pastoralists are perceived and dealt with. In some sites, pastoralism of different types is cited as integral to the successful stewardship and conservation of the site. In other cases, herders are blamed for land degradation, or deemed incompatible with areas of 'pristine wilderness', which leads to forced or coerced removal of these traditional users and managers of the landscape.

3 Clear safeguards and guidance specifically on mobile pastoralism are required for World Heritage sites. These should be in line with international law, norms and standards concerning human rights, including the rights of indigenous peoples, albeit not all mobile pastoralists identify as indigenous. Such a development should build on the existing positive work by the UNESCO secretariat and Advisory Committees and would have value in the wider world of natural and cultural heritage. Indeed, protected areas at large would benefit greatly from good practice examples and accessible guidance for managers and administrations.

- 4 Concurrently, it is important to understand more about whether mobile pastoralists see the World Heritage Convention as an opportunity for recognition and maintenance of their traditions, and if so how they could be supported in these aims.
- 5 Mobile pastoralism is declining and under pressure in large parts of the world, although important pastoralist communities remain in many places. World Heritage sites are no exception to this trend, but research and management systems are at least in some cases making efforts to consider the future of pastoralist communities living in or near World Heritage sites.
- 6 Decline in mobile pastoralism is due to both external and internal forces. Pastoralists are variously influenced by wider socio-political and economic changes and pressures; and in the cases discussed here sometimes by the management policies applied within World Heritage sites. External influences include policies that seek to sedentarise mobile communities, land grabbing and privatisation, and the steady decline of traditional migration routes; but at times attitudes and desires also change amongst pastoral communities themselves.
- 7 While mobile pastoralism can and does exist successfully alongside and as a key management element in semi-natural ecosystems, and can also sometimes actively support the survival of wild biodiversity, this is not always the case. Changes in land availability, management approaches, herd numbers and type, access to markets and external factors like changing climate can all lead to ecological degradation, particularly overgrazing, which in the long term also undermine pastoralist activities. External changes can force lifestyle changes on mobile pastoralists that lead to overgrazing and human-wildlife conflict. Pastoralist communities can often find themselves blamed for these problems without a full enquiry into their root causes.
- 8 Management of World Heritage sites therefore needs adequately to consider the ecological, social, economic and cultural aspects of mobile pastoralism. Continuing or revived pastoralist systems need not only to co-exist sustainably with the ecosystem in which they are practised, but also support genuine cultural survival or renewal and not impose systems that are no longer desired by the communities concerned.
- 9 Some World Heritage sites have explicitly or implicitly identified nomadic pastoralism as one of the values to be addressed through management and designation, and others have identified transhumance; more often issues relating to pastoralists are being considered retrospectively in sites that have been listed on World Heritage for other reasons such as biodiversity or landscape values.

- 10** In these cases, it is clear that the joint cultural and natural management that is being increasingly promoted within World Heritage can provide a framework in which mobile pastoralism is integrated into wider biological and cultural conservation aims. The case studies described in this paper provide some examples of approaches that appear to be succeeding and others where the future of mobile pastoralism remains more in doubt.
- 11** Management is further complicated because mobile pastoralist communities often do not share a common vision; some may regard pastoralism as out-dated, hard work and unnecessary while others may be passionate about its survival. This multiplicity of perspectives cuts across cultures, gender and age groups. People have moved in and out of pastoralism for millennia, sometimes using mobile pastoralism as a safety net in difficult times and there is no reason to think that this will change any time soon.
- 12** There is no single 'right' approach and management aims will always be context specific and need to evolve over time.
- 13** Further research is needed on factors like carrying capacity of herds in different ecosystems, livestock species used, access to water sources, likely impacts of climate change, integration of modern technology into pastoralist activities, the links between mobile pastoralism and wild biodiversity, the root causes of overgrazing in mobile pastoralist territories, changing pastoralist cultures, and more.
- 14** In some areas (e.g. Himalayas, Kenya), one of the main perceived threats to mobile pastoralists and their ways of life is nature conservation.
- 15** Finding a balanced approach that is respectful of human rights is clearly a priority and one in which the various actors in the World Heritage Convention must play an active role.

Key Issues Highlighted In The Case Studies Include:

Qinghai Hoh Xil, China

A controversial addition to the World Heritage List; there has been widespread concern about the eviction of nomadic pastoralists from the area. Following IUCN advice, the World Heritage Committee reinforced the importance of the integration of traditional nomadic pastoralists into conservation efforts at the site, but it is still too early to judge what the impacts of this nomination are likely to be for resident mobile pastoralists.



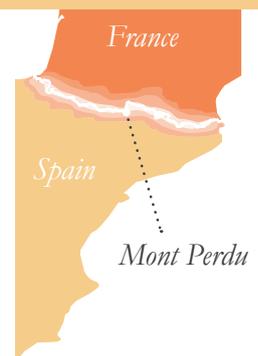
The Causses and the Cévennes, Mediterranean agro-pastoral Cultural Landscape, France

Implementation of the management plan and long-term strategies is needed to underpin the rationale for the area's identification, protection and management as a surviving and thriving agro-pastoral landscape.



Pyrénées – Mont Perdu, France and Spain

The World Heritage Committee has repeatedly noted the need to increase support for agro-pastoralism as a fundamental activity for the sustainable development of the property, however the number of people actually practising pastoralism is rapidly decreasing and much of the culture associated with pastoralism is being lost.



Khangchendzonga National Park, India

Traditional practices and knowledge have been negatively impacted by wider socio-economic changes and by policies for environmental protection, changes in lifestyle and exclusion of cultural practices such as mobile pastoralism for subsistence within the national park under Indian law.



Lake Turkana National Parks, Kenya

Centuries of mobile pastoralism in this harsh, fragile environment are under threat from unsuitable rangeland management, unregulated wood harvesting, uncontrolled livestock stocking levels leading to overgrazing, illegal hunting and upstream hydropower development impacting water levels.



Laponian Area, Sweden

Collaborative management and a balanced approach to modernity ensure preservation of the millennia-old annual migration of reindeer herds within a natural landscape by the indigenous Sámi people, whose rights to graze reindeer are enshrined in law.



Socotra Archipelago, Yemen

The World Heritage Committee has urged the government of Yemen to revive traditional land management practices including transhumance and better enforce conservation regulations to address unsustainable resource use.



Swiss Tectonic Arena Sardona, Switzerland

Typical of summer mountain grazing across the European Alps; the future of grazing and the impacts of climate change on grazing practices that go back millennia need further study from both a cultural and ecological perspective.



Uvs Nuur Basin, Mongolia and Russian Federation

Although noted for the absence of conversion or major human impacts over thousands of years, the nomadic way of life has been seriously impacted by economic and political regimes in recent years and the pastoralist way of life is now at threat.





Sheep grazing against a mountain backdrop in Romania.

Introduction

The following paper gives a short overview of mobile pastoralism and World Heritage sites, both natural and cultural. It includes a preliminary global overview of where mobile pastoralism takes place in existing World Heritage sites, looks in more detail at some of these sites through a series of case studies, draws some overall conclusions, and finally makes a series of recommendations. We have used information from World Heritage nominations and periodic reporting, the various World Heritage Outlook studies, advisory mission reports, published literature and interviews with key stakeholders.

MOBILE PASTORALISM IN THE 21ST CENTURY

Mobile pastoralism (see box for definitions) is a millennia-old approach to livestock rearing, which includes the regular movement of people with their domesticated animals, usually in search of good grazing, water and clement weather conditions. It embodies rich cultural traditions and a profound understanding of ecology in marginal ecosystems, which are often unsuitable for permanent livestock presence or other agricultural use. Herders frequently mimic, and thus sometimes compete with, wild ungulate migrations. Mobile pastoralism has over centuries often developed a rich associated biodiversity, with plant communities, for instance, adapted to occasional intense grazing, creating cultural ecosystems which will change dramatically if pastoralists disappear from the landscape.

Until recently, most historians and geographers have regarded mobile pastoralism as a single time-limited stage in human evolution, mid-way between a mobile hunter-gatherer existence and settled agriculture. As such pastoralism and pastoralists have often been dismissed as representative of old-fashioned or 'primitive' lifestyles. More recently, these opinions have been decisively challenged by growing evidence that there is no

neat transition between one approach to food production and another, and that all three have co-existed successfully for thousands of years, often within the same community. While some mobile pastoralist groups have followed a set lifestyle for many generations, others have moved into and out of a mobile way of life according to factors such as climate, political stability and socio-economic conditions.¹ Tensions between settled farmers and mobile pastoralists also stretch back millennia and have been the subject of numerous conflicts and negotiated agreements. Central governments tend to be nervous about communities that move all the time. Tensions also exist between different pastoralist groups.² These tend to increase under conditions of resource scarcity or if traditional conflict resolution mechanisms break down.³

Demographic, political, economic and climatic changes are threatening pastoralists around the world, to a greater degree than ever before with different pressures impacting on different groups.⁴ Traditional routes for herders are being blocked by barriers such as international borders, privatisation of land, transport infrastructure and protected areas. Many governments have formal

BOX: DEFINING PASTORALISM

The word pastoralism derives from the Latin *pastoralis* meaning 'of herdsmen, of shepherds'ⁱ and refers to raising livestock, mostly domesticated herbivore species. As defined here, it is an extensive livestock rearing strategy and a way of living that occurs in the world's rangelands and mountain pastures and is entirely different in essence to intensive livestock production systems that emerged in the last century. We add 'mobile' to differentiate from sedentary pastoralism, which is conducted from a permanent location. Mobile pastoralism (also often called mobile herding) therefore emphasises the mobility of people and their livestock in search of forage and water as the core feature of the practice.

There are three main forms of mobile pastoralism: nomadic, semi-nomadic and transhumant. The differences are mostly based on whether or not the entire family or community moves with the herd. In nomadic or semi-nomadic pastoralism the entire family or community moves, but in the case of transhumance only a part of the community or an individual moves during the migration period while the rest of the family or community remains at a home base.

These definitions are not static. Mobile pastoralism has always been, and remains, an adaptive livestock management and livelihood practice. If and when environmental and cultural conditions change, the communities adjust accordingly. It is a millennia-old survival strategy to ensure the sustainable use of diffuse, periodically available and scattered resources of rangeland ecosystems in arid, semi-arid and mountain regions, following temporal and spatial patterns.

Source: Yılmaz, E., Zogib, L., Urivelarrea, P. and Demirbaş, S. (PARKS Issue 25.1, 2019). *Mobile Pastoralism and Protected Areas: Conflict, Collaboration and Connectivity*, <https://parksjournal.com/parks-25-1-may-2019/>

ⁱ Online etymology dictionary: etymonline.com

sedentarisation policies. Other factors include climate and other transformative environmental changes, institutional constraints that undermine nomadic lifestyles, unfavourable development policies and the role of economic markets; against which mobile pastoralists have little to defend themselves with except millennia of adaptability.⁵ As a result of the progressive integration of animal production into the global market economy, as well as of the sedentarisation policies and institutional constraints that disfavour nomadic lifestyles, mobile pastoralism is globally declining at a rapid rate.⁶

There are nonetheless an estimated 100-200 million, perhaps as many as 500 million, pastoralists worldwide, although statistics are generally

lacking and this figure is not confined to mobile pastoralists.⁷ In some mobile pastoralist societies, numbers of both herders and livestock have increased dramatically.⁸ Mobile livestock rearing is estimated to be between two and ten times more productive per unit of land than commercial ranching. In countries such as Mongolia, Kazakhstan, Sudan, Senegal and Niger, pastoralism contributes a significant proportion of the GDP; for example rising to 84% of agricultural GDP in Niger.⁹

THE POSITIVE ROLE OF MOBILE PASTORALISM FOR NATURE AND FOR CULTURE

Increasingly, studies are showing the many positive benefits of mobile pastoralism in maintaining and even enhancing biodiversity in rangeland ecosystems around the world.^{10 11} Pastoralists have been key agents in rangeland ecosystem evolution.¹² Domestic herbivores perform the same functions as their wild relatives both on spatial and temporal scales, spreading seeds, fertilising and stabilising soils and connecting valuable habitats. The service to ecosystems provided by mobile pastoralists is of great value not least in the prevention of wildfires, the contribution to the nutrient cycle and to habitat heterogeneity. Moreover, the maintenance of carbon-rich soils is a critical service in a changing climate as pastures are amongst the largest carbon sinks on Earth.¹³ As such, when practised sustainably, mobile pastoralists and nature conservationists seem obvious partners.

While first and foremost mobile pastoralism is about survival, the harshness of this way of life has led to a cultural and spiritual richness that has been subject to less rigorous academic enquiry. Pastoralist communities have often passed down through generations a culture quite unique to their contexts, which include rituals, beliefs, ethical codes, and sometimes languages that differ from their sedentary counterparts.¹⁴ From popular transhumant festivals in the Mediterranean, to the nature-inspired dances of the Turkish nomads, to the sung poetry of the Bedouins and ingenious craftwork of women wool-workers of South America, the diverse but shared culture of the mobile pastoralist has much to offer. This pastoral cultural heritage has not gone unnoticed by UNESCO since the introduction of Intangible Cultural Heritage in 2008 where at least 22 items on the list relate to pastoralist or nomadic societies.¹⁵

MOBILE PASTORALISM IN WORLD HERITAGE

World Heritage sites include several landscapes listed for a range of both cultural and natural values. A proportion of these include mobile pastoral systems. Pastoralism within World Heritage is not

evenly spread around the world, but concentrated in a few centres of activity, which include countries within a wide economic spectrum. Mobile pastoralism occurs particularly in Europe (in the boreal, Alpine, steppe and Mediterranean regions, extending into Mediterranean North Africa); the Middle East; Central Asia and the Himalayan region; and in the Sahel and southern regions of Africa. Mobile pastoralism is less common in the Americas, in the main because of the massive decline and retreat of the original human inhabitants after colonisation; and while mobile pastoralism occurs in the Andes, few instances were found in World Heritage sites. Although we list some sites in Table 1, these are generally only borderline pastoralist.

Mobile pastoralism in World Heritage sites includes a wide variety of livestock, such as reindeer, cattle, goats, camels, yaks and sheep, focusing on seasonal movements between summering and wintering sites. Its role in World Heritage is similarly varied, in some cases being a value, or even the main value, conserved, but sometimes effectively unrecognised even if it is a key influence on management, and in some cases conversely being considered a threat.

Many other World Heritage sites exist in places where mobile pastoralism was once common but has declined for a number of reasons, including in some cases due to protected area policies. Application of the strict zapovednik system in the former Soviet Union, for example, probably eliminated pastoralism in some sites that are now World Heritage listed in Central Asia.

Table 1 below summarises the main sites of mobile pastoralism in World Heritage areas (the areas reviewed in more detail in the case studies in this report are highlighted in bold).

Table 1: Mobile pastoralist activity in World Heritage sites

CENTRE	EXAMPLES	TYPE OF ACTIVITY
Boreal	Laponian Area, Sweden	Reindeer herding
	Natural System of Wrangel Island Reserve, Russian Federation	
	Volcanoes of Kamchatka, Russian Federation High Coast / Kvarken Archipelago, Finland/Sweden	
European mountains	Pyrénées – Mont Perdu, France and Spain	Transhumance Summer grazing
	The Dolomites, Italy	
	Swiss Alps Jungfrau-Aletsch	
	Swiss Tectonic Arena Sardona, Switzerland Mount Etna, Italy Madriu-Perafita-Claror Valley, Andorra *	
Mediterranean	Costiera Amalfitana, Italy *	Transhumance Summer grazing
	The Causses and the Cévennes, France	
	Mont Perdu, France and Spain	
Central European steppe	Hortobagy National Park – the Puszta, Hungary *	Cattle grazing systems
Middle East dryland/ desert	Wadi Rum Protected Area, Jordan	Goats and camels managed through nomadic grazing
	Socotra Archipelago, Yemen	
	Tassili n'Ajjer National Park, Algeria St Catherine Area, Egypt *	

Table 1 continued on following page.

CENTRE	EXAMPLES	TYPE OF ACTIVITY
Central and West Asian steppe/dryland	Orkhon Valley Cultural Landscape, Mongolia * Silk Roads: the Routes Network of Chang'an-Tianshan Corridor, China, Kazakhstan, Kyrgyzstan * Xinjiang Tianshan, China Uvs Nuur Basin, Mongolia and Russian Federation Landscapes of Dauria, Mongolia and Russian Federation Cultural Landscape of Maymand, Iran Petroglyphic Complexes of the Mongolian Altai, Mongolia Great Burkhan Khaldun Mountain and its surrounding sacred landscape, Mongolia *	Nomadic herding. The strict zapovednik systems in the former USSR may have eliminated others
Central and West Asian Mountains	Golden Mountains of Altai, Russian Federation Qinghai Hoh Xil, China	Nomadic herding
Himalayan	Great Himalayan National Park Conservation Area, India Sagarmartha National Park, Nepal Khangchendzonga National Park, India	Nomadic herding
Sahara and Sahel region stretching into Central Africa	Ennedi Massif: Natural and Cultural Landscape, Chad Lower Valley of the Awash, Ethiopia Simien National Park, Ethiopia Manovo-Gounda St Floris National Park, Central African Republic W-Arly-Pendjari Complex, Benin, Burkina Faso, Niger Air and Ténéré Natural Reserves, Niger Ngorongoro Conservation Area, Tanzania Maloti-Drakensberg Park, Lesotho, South Africa	Pastoralism, grazing
Southern and Eastern Africa	Lake Turkana National Parks, Kenya Namib Sand Sea, Namibia Richtersveld Cultural and Botanical Landscape, South Africa	Herders Nomadic grazing
South America	Rio Abiseo National Park, Peru	

* Nominated as cultural sites, all other sites natural or mixed

THE ROLE OF THE WORLD HERITAGE CONVENTION IN SUPPORTING MOBILE PASTORALISM

Given that UNESCO has an explicit remit to consider natural and cultural sites and values, integration of mobile pastoralism into management would seem to be an obvious element. However, these issues were initially not always prioritised by UNESCO. A 2005 study pointed out that the 1994 **'Global Strategy for a Balanced, Representative and Credible World Heritage List'** had not been fully implemented: **"The wide themes defined in the 1994 report of the Global Strategy have also not been represented on the World Heritage List in their wealth and complexity. The broad theme 'movement of people (nomadism, migration)' is one example. As stressed by International Council on Monuments and Sites (ICOMOS), surviving nomadic pastoralist cultures are currently represented by a single inscription, that of the Laponian Area (Sweden). Transhumance is also still widely practiced around the world but the only landscape of this kind currently on the List is the Pyrenean transboundary region of Mont Perdu, between France and Spain."**¹⁶

Since then, several other World Heritage sites have been listed that make specific reference to mobile pastoralism, including Richtersveld Cultural and Botanical Landscape in South Africa (inscribed in 2007), the Causses and Cevennes agro-pastoral landscape in France (inscribed in 2011) and Qinghai Hoh Xil, China (inscribed in 2017).

Partly in response to recognition of this lack of attention, under the France-UNESCO Cooperation Agreement, France supported expert meetings in France (2007 and 2012) and Albania (2009) to identify the values of agro-pastoral heritage and the issues at stake in considering agro-pastoral landscapes, particularly in the Mediterranean region. UNESCO has stated its firm support for agro-pastoral systems within World Heritage sites and refers in particular to the Laponian area, the Pyrenees and Hortobagy National Park in Hungary as sites where these issues are highlighted.¹⁷

THE ROLE OF THE ADVISORY BODIES TO THE WORLD HERITAGE CONVENTION IN SUPPORTING MOBILE PASTORALISM

Natural and cultural World Heritage represents a collaboration between many actors, UNESCO as the founding convention and particularly the World Heritage secretariat in Paris, national governments who nominate and manage World Heritage sites, the three advisory bodies (International Union for Conservation of Nature (IUCN) for natural World Heritage, ICOMOS and the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) for cultural World Heritage) and numerous other stakeholders including local communities, indigenous peoples, donor agencies, non-governmental organisations and companies. Ultimately management responsibility rests with national governments and UNESCO and the international community retains some influence but no power in this respect; a situation similar in most UN interactions.

The advisory bodies provide technical evaluations to the World Heritage Committee on nominations to the World Heritage List and have developed a large body of work ranging from management advice, capacity building and assessment of sites. IUCN and ICOMOS are the two most relevant advisory bodies in terms of mobile pastoralism and the case studies (see below) include, where relevant, their specific advice to individual sites. In addition, IUCN reports on the state of conservation of listed properties and provides an overview on the conservation status of World Heritage sites in the IUCN World Heritage Outlook (Table 2 below summarises the status of those sites included in this report's case studies).¹⁸

Table 2: Summary of conservation status of case study World Heritage sitesⁱⁱ

CASE STUDY	CONSERVATION OUTLOOK 2017	CURRENT STATE OF VALUES	BREAKDOWN OF OUTLOOK ASSESSMENT		OVERALL PROTECTION AND MANAGEMENT
			CURRENT TREND OF VALUES	OVERALL THREATS	
<i>Qinghai Hoh Xil, China</i>	Good with some concerns	Low concern	Data Deficient	High threat	Some concern
<i>Pyrénées - Mont Perdu, France and Spain</i>	Good with some concerns	Good	Stable	Low threat	Effective
<i>Khangchendzonga National Park, India</i>	Good	Good	Stable	Low threat	Effective
<i>Lake Turkana National Parks, Kenya</i>	Critical (since listed on World Heritage in Danger) ¹⁹	Concern	Deteriorating	Very high	Serious concern
<i>Uvs Nuur Basin, Mongolia and Russian Federation</i>	Good with some concerns	Low concern	Data deficient	Low threat	Some concern
<i>Laponian Area, Sweden</i>	Good	Good	Stable	Very low	Highly effective
<i>Swiss Tectonic Arena Sardona, Switzerland</i>	Good	Good	Stable	Very low	Highly effective
<i>Socotra Archipelago, Yemen</i>	Significant concern	High concern	Deteriorating	High threat	Some concern

Note that this table refers to the overall status of the site and this may or may not be related to the impacts of mobile pastoralism.

ⁱⁱ The Causses and the Cévennes, Mediterranean agro-pastoral Cultural Landscape was not included in the Outlook report, which only addressed natural or mixed natural/cultural sites, and is thus not included in the table



Two sisters enjoying their day in a steppe in Mongolia

A Closer Look Through A Series Of Case Studies

In the following set of case studies, we look in more detail at some practical examples of attempts to integrate (or in some cases failure to integrate) pastoralism into World Heritage site management. These are preliminary studies of what are often complex issues, mainly drawing on desk research supported by expert review. They do not aim to be the final word on the subject, but have been carried out to highlight issues that require further investigation.

The case studies raise many important questions. These include consideration of the various roles of the World Heritage Convention, and IUCN, ICOMOS and ICCROM as advisory bodies in cases involving mobile pastoralism. They identify different attitudes towards mobile pastoralists by those responsible for management decisions in World Heritage sites, ranging from seeing them as a positive and necessary part of any management system, shaping and safeguarding cultural landscapes and biodiversity, to a management ‘problem’ that needs to be removed. It is clear that different countries and jurisdictions take very different approaches. More in-depth studies are needed to tease out these issues in greater detail.

| *Case
Studies*



Sheep grazing against snow capped mountains in the grasslands of Hoh Xil Nature Preserve.

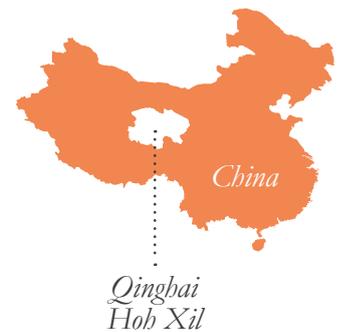
Qinghai Hoh Xil, China

A controversial and complex nomination in the Tibetan Plateau, home to nomadic herders, protectors of the environment, which raised questions regarding the human rights of indigenous nomadic herders and the World Heritage process.

AREA OVERVIEW

Newly inscribed in 2017, the Qinghai Hoh Xil 'property' is a massive area in the north eastern part of the Tibetan Plateau covering over 3.7 million ha, with a further 2.3 million ha of buffer zone. It is a remarkable landscape of high steppe, alpine mountains and grasslands, high altitude lakes, rivers and wetland systems with sub-zero temperatures year round. These conditions make way for a unique biodiversity with high levels of endemism. It is home to around 50% of the remaining wild Tibetan yak (*Bos grunniens mutus*) population²⁰ and provides the space for the formidable migration and life cycle of the Tibetan antelope (*Pantholops hodgsoni*) whose numbers reach around 40,000 in the property.²¹

The site is made up of large swathes of two protected areas: Hoh Xil National Nature Reserve and Sanjiangyuan National Nature Reserve. The buffer zone also falls within these two reserves. It borders three other protected areas: Changtang National Nature Reserve, Altun Mountain National Nature Reserve and the Golmud Kunlun Mountains National Geological Park. The property's management falls under the two administrations of Hoh Xil and Sanjiangyuan Nature Reserves. The property was nominated and inscribed under natural World Heritage criteria.



DESCRIPTION

Despite being referred to by China as a 'no man's land'²², the austere landscapes of Hoh Xil have been home to Tibetan nomadic herders for centuries, possibly millennia. The area has ancient links with Mongolia. These high-altitude mobile pastoralists have long since been the traditional stewards of the landscapes across the region, living in unfenced harmony with the wildlife and the challenging natural environment and even forming anti-poaching groups in recent years. The yak herds of the nomads are known to intermingle with the wild Tibetan antelope and other wild ungulates across the property. This is reflected in the IUCN technical evaluation of the site: **"According to the nomination, there are 35 households of 156 herders within the nominated property, and 222 households of 985 herders and 250 other residents in the buffer zone. The activities of nomadic herders are a long-standing and traditional use in the property, and have coexisted with the nature conservation values."**²³

However, contrary to this acknowledgement of harmonious co-existence, grazing practices are accused of being a threat to the grasslands and one of the causes of desertification. To quote the nomination: **"Grazing, in particular, threatens the existence of the pristine ecology and wildlife in the core zone. Grazing can deteriorate wildlife habitat and competes with wildlife for land."**²⁴ The **"adjustment of some traditional herding practices to release grazing space for wildlife"** has been cited in the Chinese nomination as a successful element of a **"community-based participatory approach"**²⁵ in the Sanjiangyuan Nature Reserve. Indeed, as per Article 26 of the Regulations of the People's Republic of China on Nature Reserves, activities such as grazing are simply prohibited.²⁶ In the buffer zone areas problems of fencing for animal husbandry and overgrazing are cited, but although the IUCN evaluation commends management for reducing grazing pressures, it stresses the distinction that needs to be made between these types of intensive grazing practices and **"support for long-standing traditional grazing at intensities that can be supported by the natural ecosystem,**

in order to respect and protect legitimate traditional use and the rights associated with it". The evaluation goes on to state that levels of community involvement in the nomination process **"seem(ed) limited and unstructured"**. As per the nomination, the solution to the perceived overgrazing is to **"gradually impose a ban on herding among sparse residences in the resettlement area and further consider specific voluntary resettlement policies, locations, compensation mechanisms and other measures that can promote the wellbeing of the resettlements"**.²⁷ The management plan further notes the encouragement of **"local transition of lifestyles"**.

The International Campaign for Tibet (ICT) sees these evictions as a next step in a determined Chinese policy to settle nomads – this time in the name of nature conservation. Prior to nominating Hoh Xil for World Heritage status, many nomads were already settled in the industrial city of Golmud/Gormo. The ICT states that official policies aimed at displacing nomadic pastoralists and alienating them from their traditional lands and therefore lifestyles and livelihoods affords authorities a greater control of the people. They claim that **"since 1999-2000, tens of thousands of Tibetan pastoralists have been compelled to slaughter their livestock and move into newly built housing colonies in or near towns, abandoning their traditional way of life"**.²⁸ One such policy was called 'Retreating from the pastures to bring the grass back'. The International Campaign for Tibet received a first-hand account of the effects of this policy concluding that all it has done is to **"cut off the lifeblood of the people"**.²⁹

The effects of settling a traditionally mobile community can be tragic. This is apparent in the high incidence of self-immolations amongst Tibetan nomads in recent years. A recent analysis criticises IUCN for recommending inscription where such issues are known and documented, noting the **"tragic element of compulsory settlement"** and referring to the 153 cases of self-immolation amongst Tibetan nomads, one of which occurred within the property.³⁰

IUCN's evaluation mission did bring up concerns but they were assured by the State Party that **"there will be no forced relocation or exclusion of the traditional users of the nominated site, whether before or after succeeding in the application for World Heritage site"**. Additionally the nomination decision also **"Commends the State Party and all stakeholders involved for their commitment to the protection of the large-scale conservation values of the Qinghai-Tibet Plateau including the integration of traditional nomadic pastoralists into conservation efforts and welcomes the commitment made by the State Party that no forced relocation or exclusion of the traditional users of the property will be undertaken or pursued"** (our emphasis).³¹ While this in theory could be quite a substantial 'win' for the nomads, in practice it remains difficult to verify these assurances and the evaluation mission was not informed that many nomads were actually relocated prior to the World Heritage nomination process.

Ironically, the flagship species of the Hoh Xil inscription, the Tibetan antelope, has been protected from hunters by the nomads themselves, a fact that is both acknowledged and encouraged in the management plan. In his extensive blog for Rukor.org, Gabriel Lafitte underscores the fact that Hoh Xil is indeed a 'human landscape' and explains that for the last 30 years the nomadic pastoralists have been working hard to protect the landscape and its wildlife. He states that: **"In three decades of campaigning for the animals, sacred mountains and innumerable lakes of this land of frigid lakes, Tibetans have risked their lives to detain poachers, and lost lives to violent hunters and gold miners."**³² He goes on to highlight the irony of the nomination, which revolves around the very species that the nomads have been protecting.

Hoh Xil or Kekexili in Chinese or Achen Gangyap in Tibetan is not only an area rich in biodiversity but also in culture, history and spirituality related to Tibetan people. The area hosts many sacred natural sites of extreme importance to Tibetan nomads. It is the home of ancestors and a mythical hunting ground for Tibetans. Yet there is no mention of these in the property's management plan. The

government has pledged, in writing and verbally in front of the World Heritage Committee, that no resettlement will take place, but human rights groups have expressed fears that recognition by World Heritage may provide an excuse to resettle nomads in the future.³³ Resettlement uproots the cultural and spiritual underpinnings of people's lives as well as their livelihoods. Some analysts fear that inscribing the property under natural heritage could paradoxically undermine the cultural and spiritual richness of Hoh Xil and cause damage.³⁴

World Heritage status will help ensure the interest of the domestic tourism market. The Qinghai-Tibet Highway and Railway, which bisect Hoh Xil are already in place; in fact some national level nature reserves within the area apparently had a travel ban imposed in June 2018 due to damage through increased visitation.³⁵

The Qinghai Hoh Xil inscription has been highly controversial in some quarters, both because of what has happened to mobile pastoralists before inscription and due to fears of what might happen in the future. If China follows its own management plan then the future of those mobile pastoralists currently resident may be secured. But if the area becomes subject to mass tourism, and if previous resettlement policies resurface, local communities will again lose out and UNESCO will be faced with a World Heritage site which breaks many of the UN's own rights policies. Careful scrutiny from the international community will be important in helping to ensure this does not happen.

OBSERVATIONS

The Hoh Xil case shows that the debates surrounding World Heritage nominations can result in concrete changes in government policy towards issues like mobile pastoralism. In this case, monitoring whether or not agreements are kept to is now a critical element in the future of mobile pastoralism in the area, and there are continuing concerns about how this will be achieved.



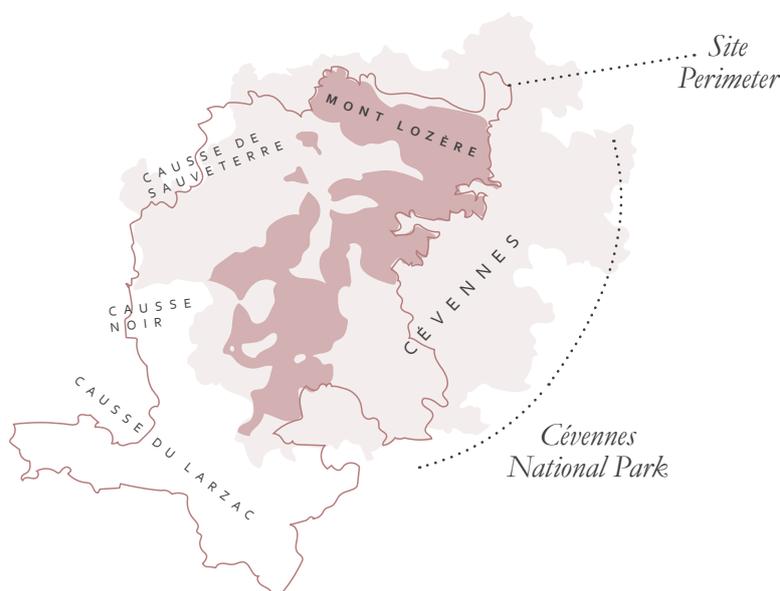
Cows grazing in the Cevennes mountains in France.

The Causses and the Cévennes, Mediterranean agro- pastoral Cultural Landscape, France

A viable example of Mediterranean agro-pastoralism, or an attempt to turn back the clock?

AREA OVERVIEW

Made up of two distinct areas in Languedoc in the south of France, management of the pastoral rangelands of the Cévennes mountains and the limestone plateaus known as 'the Causses',³⁶ demonstrates almost every type of pastoral system found around the Mediterranean (e.g. agro-pastoralism, silvi-pastoralism, transhumance and sedentary pastoralism – note that the World Heritage inscription is using 'agro-pastoralism' here in the same way as 'mobile pastoralism' is used in this paper).³⁷ Cultural traditions based on pastoralism are reflected across the landscape, especially in the pattern of field, farm and settlement development as well as water management, drovers' roads (*drailles*) and grazed common land.³⁸ However, there has been rural depopulation in this region since the 19th century and this way of life almost ceased to exist in recent decades as land management systems responded to national and regional European agricultural policies and globalised markets.³⁹



Added to the World Heritage List in 2011, the area, which covers 302,319 ha with a buffer zone of 312,425 ha, testifies to cultural practices that have developed over millennia, but most specifically since the 12th century. The initial nomination of the site was referred back to the State Party with a request for a nomination dossier that focused on agro-pastoralism and its manifestations.⁴⁰ The inscription decision came with further requests to ensure that the implementation of the management plan⁴¹ included processes and practices related to agro-pastoralism and that the State Party continues working internationally to better document the cultural landscapes of agro-pastoralism in order to promote nominations of other sites associated with different types of Mediterranean pastoralism.⁴²

The whole area is protected either for natural or cultural heritage and has been a biosphere reserve since 1985; however only the core of the Cévennes National Park, until recently the only inhabited French national park, is protected for both.^{43 44}

DESCRIPTION

Transhumance in Europe faces many challenges. Agricultural intensification (supported by European Union agricultural policies) has had a dramatic impact, particularly in the lowlands, encouraging high-yielding livestock breeds unsuited to mobile pastoralism. There have been major changes in land tenure; a decline in rural infrastructure (e.g. processing facilities, shops) and services (e.g. veterinary and agricultural extension); and lack of vocational training. Pastoral work has also carried low prestige, being regarded as old-fashioned and outmoded, and this combination of constraints has led to outmigration and the alteration and/or abandonment of many agro-pastoralism systems. Impacts include a natural succession back to native forest, reforestation of non-native softwood, loss of biodiversity associated with pasture (although forest-related biodiversity may increase), and increasing risks of natural hazards such as forest fires.^{45 46 47}

These impacts were clear in the Causses and the Cévennes. Years of abandonment meant that

although the structures of this cultural landscape had survived, such as terraces, irrigation systems and trails, little of the management reflected the long-held traditions. Few of the terraces and water systems were actively managed and the systems of transhumance along drovers' roads barely survived.⁴⁸ Traditional breeds of sheep and goat breeds had been replaced with more modern breeds⁴⁹ (sheep numbers have increased by 38% since 1970, with systems based on bought-in or self-produced fodder and concentrates rather than on rangeland resources⁵⁰) and small herds had drastically declined (in Causse de Blandas herds declined from over a hundred in the early 20th century to 29 in 1954⁵¹).

Current management is focused on maintaining and supporting these traditional activities and there is increasing attention being paid to reviving these processes, which have a range of benefits.⁵² Along with shepherds and agricultural partners, the Park has revived transhumance activities on the Aigoual and Mount Lozère massif. The population of transhumant sheep increased from 18,000 in the 1980s to 23,000 in 2005 and some 100 breeders now send their flocks to about 20 collective mountain pastures, covering nearly 6,000 ha.⁵³ The current Management Plan (2015 to 2021) has a primary aim to help maintain agro-pastoral activity, achieved through a number of objectives including: deepening knowledge on agro-pastoralism and its links with its natural, economic and social environment, assisting in the establishment and transmission of agro-pastoral activities; strengthening and developing agro-pastoral areas and maintaining and reinforcing agro-pastoral activity.⁵⁴ Conservation activities have balanced local knowledge with scientific research; successful activities include the rehabilitation of terraces; the renewal of chestnut groves; and the recovery of pasture, which includes the revival of transhumance and the preservation of open spaces.⁵⁵

Conservation is as much about people, culture and society as it is about species, habitats and ecosystems. A key factor in the nomination of the World Heritage site and the continued support for its management rests in the support of the

local community for the continuation of rangeland grazing to maintain an open landscape. In addition to the biodiversity, cultural and historical benefits associated with these open landscapes, local people recognise their importance in preventing fire, as grazing prevents the accumulation of herbaceous dry matter in summer.⁵⁶

The landscape and its multiple attributes are also an asset for rural tourism,⁵⁷ although some commentators feel that the cultural landscape is in the process of becoming part of the area's heritage rather than a productive entity. Concerns that the past is being turned into a folklore that never existed is exemplified in the Fête de la Transhumance à l'Espérou en Cévennes,^{58,59} with some of the older generation noting that the moving of animals to summer pastures was a difficult and anxious time of year which does not correspond with what has become a popular tourist event.⁶⁰ Some local sheep farmers also feel that the various extensification incentives on offer are a backwards step involving time consuming shepherding, which is no longer socially acceptable, and the management of poor rangelands.⁶¹

One key issue in Languedoc is the survival of the drailles, the drovers' roads which allow access to summer pastures. Most of the drailles are seen as belonging to the owners of the abutting land, but herders may use them for free, based on historical easement or 'right of way' rule. This policy has sometimes caused friction: landowners whose land neighbours the drailles have occasionally tried to annex them. In other cases, the drailles have been afforested by France's forestry department following a few years of disuse. The drailles that remain in use are maintained either by associations of livestock keepers or by individual livestock keepers.⁶²

Balancing these challenges and opportunities is a delicate task for the Causses and the Cévennes. A working group has been set up to identify compatible landscape management activities, which balance the needs of modern agro-pastoral activity and the conservation of World Heritage attributes.⁶³ The area has also been actively involved in the implementation of

the global strategy to promote Mediterranean agro-pastoral Cultural Landscapes, which is considering issues such as: the definition of agro-pastoralism as it is understood today, further identifying the protection and development challenges of agro-pastoral cultural landscapes, and developing guidelines and future prospects for agro-pastoralism focusing on topics such as public policies, environmental change, knowledge transmission and planning that favours agro-pastoralism.⁶⁴

OBSERVATIONS

This example shows that mobile pastoralism can be revived to some extent, by positive policy changes and support, and that World Heritage status can help to achieve this. But whether or not this is 'real' transhumance or something more closely related to tourism is difficult to judge.



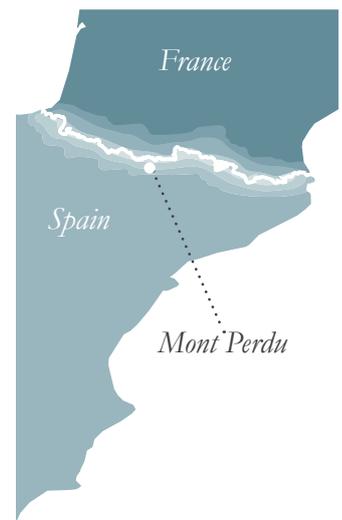
Sheep grazing in pastures in the French Pyrenees.

Pyrénées - Mont Perdu, France & Spain

A mixed cultural and natural site, listed for outstanding universal values linked to geological features and cross-border mountain pasture transhumance.

AREA OVERVIEW

Covering over 20 km² of the high Pyrénées, the calcareous massif of Mont Perdu is the focus of the World Heritage site, which straddles the international boundary between the Department of Hautes-Pyrénées in France and the Aragonese province of Huesco in Spain.⁶⁵ At over 3,000 metres, Mont Perdu in French (Monte Perdido in Spanish, Mont Perdito in Aragonese and Mont Perdut in Catalan – all meaning lost mountain) is the third highest mountain in the Pyrenees. Encompassing a landscape of meadows, lakes, caves and forests, the site has a humid maritime climate in the north and drier Mediterranean climate in the south⁶⁶ and is a major water source.⁶⁷ The site supports 32 mammal species, however the Spanish ibex (*Capra pyrenaica*) became extinct in 2000 and the last native brown bear (*Ursus arctos*) was shot in 2004, despite hunting being banned since 1979. There is now a small population of bears imported from Slovenia.⁶⁸ The area is also known for supporting one of the highest rare plant densities in the Pyrénées.⁶⁹ The main pressures on the site are the impacts of climate change, demand for tourism infrastructure and changes in agro-pastoral activities.



Inscribed in 1997, this mixed and transboundary site overlaps primarily (about two-thirds of the site) with the Parque Nacional de Ordesa y Monte Perdido in Spain; the majority of the French side (60%) is located in the core zone of the Pyrénées National Park.⁷⁰ In France, the land is mainly owned by the communities of the Barèges and Aure valleys; in Spain, five local municipalities are the main landowners. Close to the parks, there are two villages in France and five in Spain; there are also several abandoned villages.⁷¹

Human settlement dates back to the Upper Palaeolithic period (40,000 – 10,000 BC). The World Heritage values include recognition of the pastoral landscape, which reflects a way of life that was once widespread in the upland regions of Europe, but is now lost.⁷²

DESCRIPTION

Transhumance has been practised in the area for centuries necessitated by the contrasting climates in the north and south and made possible by the valleys and passes linking pastoralist communities in France and Spain.⁷³ Nineteen ecosystem services have been identified as linked to the tradition.⁷⁴ Agreements to permit and regulate transhumance across the mountain were created during the Middle Ages, for example the '**Paso a Francia**' allows grazing of the richer French pastures by Spanish pastoralists.^{75 76} Although cited as a rare survivor of pastoralism in Europe, in part due to the late development of the area in terms of road building etc., whether a true pastoralist tradition survives is debatable. Traditional ecological knowledge is declining among younger pastoralists.⁷⁷ One researcher commented, after discussion with communities on the Spanish side in 2012, that "**agropastoral activities were no longer 'traditional' and that the type of livestock breeding has changed significantly in the last 50 years. The cattle are generally composed of cows and not so much of sheep or goats, as was traditionally the case. ... Contrary to what has been stated in the World Heritage nomination file, traditional transhumance and agropastoralism are no longer practiced.**" An observation shared by one of the interviewees

discussing the former management of the mountain: "History cannot be fixed. It has been neglected for too long and now, it is ... destroyed."⁷⁸

Although trans-Pyrenean grazing still occurs with animals from Spain being grazed on the more productive northern pastures of France in summer, the number of people involved in transhumance is declining. In 2014, it was reported there were at most 40 pastoralists in the larger Spanish section of the site,⁷⁹ compared with about two million tourists visiting the site annually.⁸⁰ Indeed, transhumance has become a tourist attraction. Shepherd shelters are rented, concessions for tourism and transport and road systems have improved whilst the cattle trails have been either damaged or destroyed. One of the few routes that is still in use is central to the annual '**Paso a Francia**' when cattle are moved from Spain to France. However herders do not remain in France and only visit their cattle from time to time using motorised vehicles, only walking with their herds on the day of the '**Paso**', which has become a tourist event. This decline in the numbers of people practising transhumance is not necessarily linked to reduced stock numbers. On the Spanish side of the site, the number of cattle has remained fairly constant.⁸¹

Depopulation of mountain areas, mechanisation of agriculture and stockbreeding, prioritisation of urban-industrialised centres and development of tourism have all impacted traditional ways of life. Pastoralism was part of a subsistence way of life which no longer exists in Europe; the lowlands were used to produce grain and vegetable crops, necessitating less productive lands to be used for extensive grazing. The industrialisation of agriculture and development of national, regional and international markets meant crop production moved to more productive areas and only animal production remained in upland areas.⁸²

Against these realities, ensuring the survival of long-held traditions in Mont Perdu is challenging. Pastoralists across the Pyrenees benefit from support for infrastructure (e.g. rehabilitation of pastoral huts, paths, cattle grids, watering

places), grants to breeders and through the use of helicopters to enable transport (e.g. of salt, construction material, first aid equipment) to places with difficult access.⁸³ However, consecutive World Heritage Committee decisions have stated this is inadequate to ensure the survival of the pastoral culture in the site.⁸⁴ As pastoralism declines, landscape impacts are inevitable. Vegetation has evolved with the clearing of the forests to open land for pastures, as well as the use of these pastures and natural meadows for livestock.⁸⁵ Changes in agro-pastoral activities lead to changes in vegetation types in higher areas and modify some habitats for local species.⁸⁶ There is a debate throughout upland Europe on conservation strategies in these situations: should the return to more 'natural' conditions be welcomed even if this leads to the loss of some of the culturally-associated biodiversity, or should cultural conditions be maintained through conscious management policies?

Signed in 1988, the Mont Perdu Joint Steering Committee and Charter aims to ensure cooperative management and regulation between the two countries to ensure the World Heritage values are conserved. However, repeated World Heritage State of Conservation reports have noted the slow progress made in implementing the agreement and developing a joint management vision.⁸⁷ A transboundary management board was finally established in 2012 bringing together representatives of the two State Parties, National Parks and local livestock farmers.⁸⁸ The latest World Heritage Committee decision on the site in 2014 recommended **"...agropastoral activities in the property should be reinforced and sustainable to ensure the long-term maintenance of the pastoral units that are fundamental for the sustainable management of the landscape"**. Furthermore the committee remained **"concerned by the lack of specific support for agropastoral activities within the boundaries of the property and reiterates its request to the two State Parties to consider agropastoralism as a fundamental activity for the sustainable development of the property that supports its Outstanding Universal Value"**. The next State of Conservation Report

has been requested in 2019; at which time the likelihood of pastoralism having a future in Mont Perdu should be clearer.⁸⁹

OBSERVATIONS

Support for mobile pastoralism through World Heritage is not preventing a continuing steady decline, and where transhumance occurs it is far from the traditional methods. Changes in ecosystems are already being observed as a result; monitoring is needed to see if these increase over time and whether further action is needed to maintain existing ecosystem values.



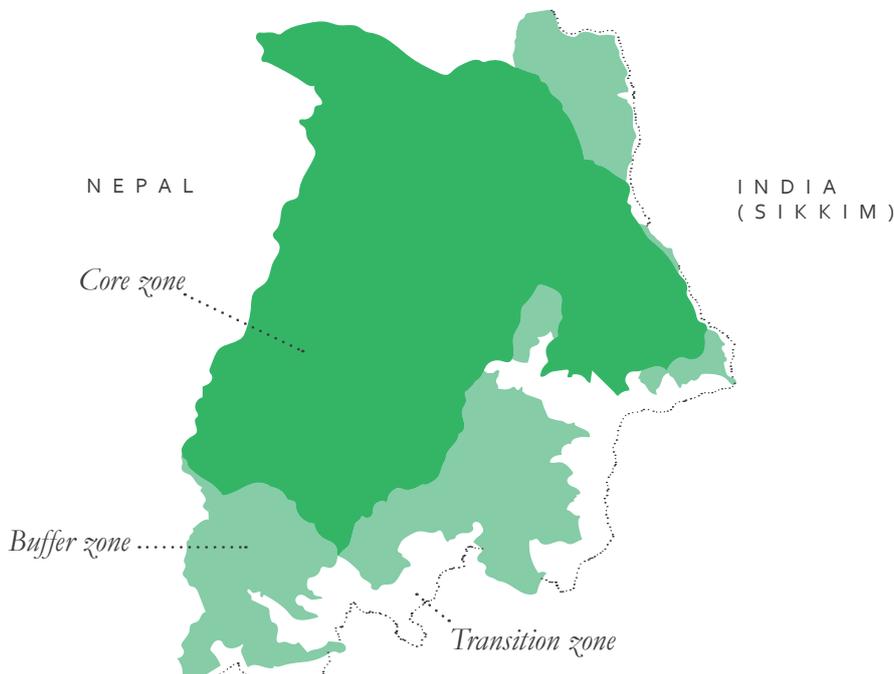
Kangchendzonga mountain at sunrise.

Khang- chendzonga National Park, India

Changes in livestock breeds and husbandry and a ban on grazing have resulted in the loss of longstanding interaction between pastoralists and the mountains of Sikkim.

AREA OVERVIEW

In the Himalayan range of northern India, Khangchendzonga National Park (KNP) covers 25% of the state of Sikkim. It has an altitudinal range of more than seven kilometres and encompasses plains, valleys, lakes, glaciers and snow-capped mountains, including the world's third highest peak Mount Khangchendzonga, which is partly in Nepal and is one of twenty peaks measuring over 6,000 m in the park. The mountain and other natural features have major religious values for all spiritual traditions in the state. They are worshiped by the indigenous people of Sikkim, have been integrated into Buddhist beliefs and constitute the basis for Sikkimese identity.⁹⁰



KNP has one of the highest numbers of plant, bird and mammal species recorded in the Central/High Asian Mountains, and includes rare intact old-growth forests. Government-led management of the area goes back to 1909 (before Sikkim was part of India), with the demarcation of protected forests to meet the firewood and fodder needs of the villagers, and reserve forests were managed for long-term ecological security.⁹¹ KNP was established in 1977 and expanded in 1997. It was inscribed on the World Heritage List in 2016. The area covers 178,400 ha with a buffer zone of 114,712 ha; the latter overlaps the larger Khangchendzonga Biosphere Reserve.⁹² The Forest, Environment and Wildlife Management Department of the Government of Sikkim is the primary management authority, through its KNP administration unit.⁹³

DESCRIPTION

Indigenous communities in Sikkim include the Gurungs and Mangers, who were traditionally shepherds; the Bhutias who were traders and yak herders; the Lepchas and the Limbus, traditionally hunter-gatherers and shifting cultivators; the Chhetris and Bahuns who were agro-pastoralists rearing cattle; and the Tibetan Drokpas, nomadic yak herders in the trans-Himalaya.⁹⁴ Historically, pastoralists grazed an indigenous breed of sheep, **banpaala**, and trans-Himalayan yaks (Tibetan breed) in alpine meadows in the summer and then descended to the fallow farmers' fields in winter, when the farmers provided shepherds with shelter and rations in return for the sheep manuring their fields. The system had a low ecological impact and was equally beneficial to both settled farmers and pastoralists. However, the advent of large cardamom agro-forestry and intensive farming systems reduced access to winter pastures, forcing the shepherds to reduce the herd size and shift to more sedentary farming.^{95/96} The closing of the Tibetan border in 1962 eliminated important trade routes for many pastoralists and increased settlement in the area.⁹⁷ In 1989, a local tax (which varied depending on livestock type) paid by herders for grazing animals in the forest was terminated.⁹⁸ This combination of events led to changes in livestock populations, with larger cows, buffaloes,

yaks (Nepalese breed), female yak-cow crossbreeds (urang or dzomo) and horses replacing sheep. Although the total livestock population in the area fell from over 11,000 animals in 1950 to 3,710 in 2004, livestock biomass increased from 608 tonnes in 1950 to 763 tonnes in 2004.⁹⁹

These changes in livestock husbandry, along with a growing local population, resulted in increased pressure on natural resources through clearing and burning of forests, localised extraction of firewood from slow-growing juniper and rhododendron, and the spread of plants unpalatable to herbivores.¹⁰⁰ The declaration of KNP brought into force the Wildlife (Protection) Act, 1972 which prohibits grazing in national parks, and in 1998 the government of Sikkim banned the practice of open grazing in reserved forest areas, plantations and near water sources. As a result, some 300 agro-pastoralists owning about 6,000 cows were evicted from the reserve forests adjacent to KNP,¹⁰¹ nearly 100 yaks which had been grazing inside the park were translocated and some 600 cattle sheds were removed.¹⁰²

These actions have strained the relationship between KNP managers and local communities,¹⁰³ and are in marked contrast with the protected area across the border in Nepal, where mobile pastoralism is accommodated in the management. It is also clear, however, that the pressures on the area were building before the declaration of the park, and at least some local people are noting the benefits of protection. One study documented that the local community generally appreciated the policy impacts on the ecosystem despite incurring economic losses through reduced income and crop damages. Most people felt that they now had a life of fewer hardships and better access to health and education.^{104 105} However, these views were not shared by the majority of pastoralists¹⁰⁶ and the deeper cultural ties to the local environment, and the transmission of local traditional knowledge to younger generations are being weakened.¹⁰⁷

In particular, the culture of the indigenous groups in the area is on the verge of disappearing,¹⁰⁸ with the loss of the ancient nomadic lifestyle of the Drokpas and major changes in the resource use of

the transhumant Bhutias.¹⁰⁹ ¹¹⁰ Militarisation of the Chinese border causes further problems for the Drokpas, who used to spend part of the year in Tibet. Traditional resource use policies that were supportive of conservation are also in danger of disappearing.¹¹¹ This poses a major challenge to the governance and management of KNP. There is a contradiction between the legal ban on resource use and the vision of “**ensuring sustainable flow of resources for traditional livelihood**” and the objective “**to allow controlled use of the Park and its resources by local people**”, which are both stated in the management plan.¹¹² Reports, however, indicate that there does seem to be some flexibility in accepting sustainable use at the local level¹¹³ and the government of India has advised that the traditional system of rotational alpine grazing by the Drokpa people will be integrated into the management plan.¹¹⁴

It is fair to say that the future of any kind of pastoralism in KNP hangs in the balance. KNP is the first mixed cultural and natural World Heritage site in India, and the intertwined natural and cultural values warrant a more integrated approach to management than is currently evident, or even possible given the legislative basis of Indian protected areas. Ideally, legal protection, policy and management should be progressively reformed and improved to ensure an appropriate balance between the natural, cultural and spiritual values of the area.¹¹⁵ However, by the time such changes are made the traditional lives of communities around KNP may already be little more than folk memory. Cultural survival has not been helped by an apparent bias in local consultation during the nomination process; with the indigenous Lepcha community feeling excluded and their long fought campaign against hydroelectricity and its impacts on the area being ignored. As one local leader put it: “**We were never informed about the UNESCO World Heritage nomination process or else we could have presented our concerns.**”¹¹⁶

Urgent actions suggested include an analysis of options to understand the sustainable levels of resource use that would not affect nature conservation values;¹¹⁷ empowerment of local people and other stakeholders in decision-making

related to management; better integration of cultural and spiritual values and attributes – both of which are core to traditional pastoral activity – into existing management;¹¹⁸ and proper zonation of KNP to allow traditional and participatory management in the buffer and transition zones.¹¹⁹ ¹²⁰ The latter only exist under the biosphere designation and are not recognised by World Heritage; it will be important to integrate management prescriptions following the terms of these two quite different UNESCO conservation programmes. All such actions would greatly assist the protection of the area’s cultural values and reinforce the traditional knowledge and cultural ties of the local communities with their environment.

OBSERVATIONS

Removal of mobile pastoralists from the World Heritage area has caused tensions with local communities; the site also faces multiple additional pressures. There are signs that the government is relaxing its policy towards mobile pastoralists, but it is unclear whether this will come quickly enough to maintain traditional transhumance patterns and much has already been lost.



A Turkana tribe shepherd with his camels.

Lake Turkana National Parks, Kenya

The sustainability of millennia of co-existing wild and farmed grazing animals around Lake Turkana has been under assault from multiple pressures.

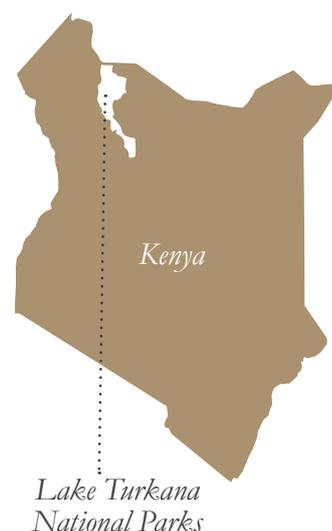
AREA OVERVIEW

Lake Turkana National Parks in northern Kenya include Sibiloi National Park, South Island and Central Island National Park, covering a total area of 161,485 ha located within the Lake Turkana basin, which has a total surface area of 7 million ha. Lake Turkana is the most saline lake in East Africa and the largest desert lake in the world.¹²¹ This is one of the oldest inhabited places on Earth, with human and pre-human fossils including the remains of five species, *Australopithecus anamensis*, *Homo habilis/rudolfensis*, *Paranthropus boisei*, *H. erectus* and *H. sapiens*, all found locally.¹²² The area includes breeding habitat of the Nile crocodile (*Crocodylus niloticus*), the hippopotamus (*Hippopotamus amphibius*) and several snake species and is an important flyway stopover for Palaearctic migrant birds.¹²³

The property is co-managed by Kenya Wildlife Service (KWS) and the National Museums of Kenya (NMK) under two State Acts, which aim to ensure the protection, conservation and sustainability of the area.¹²⁴ Management of the World Heritage site has not been effective however, and the World Heritage Committee has noted a variety of defects and lack of response to recommendations from several expert missions;^{125 126} in 2018, it was inscribed on the List of World Heritage in Danger.¹²⁷

Four communities live around the lake: the Daasanach community to the north of Sibiloi National Park, the Gabra and Turkana communities in the east and south-east and the Elmolo in the south. The Daasanach and Gabra are predominantly nomadic pastoralists. The Turkana depend on both nomadic pastoralism and increasingly on fishing as their main source of livelihood, while the Elmolo are predominantly fishers.¹²⁸

Esther Epoet: "When the lake overflows then recedes, grass grows on the lake shores, and we take the animals there to feed." ¹²⁹



DESCRIPTION

The area's remoteness has meant that until fairly recently there had been relatively little direct pressure on the environment. However social, cultural, economic and environmental changes are now having major impacts on the area and the people living around it.¹³⁰ Regional changes include massive dam construction, which will impact on fluctuations in the lake level, increased irrigation and wind farm developments.¹³¹

Pastoralism has ancient roots in the counties (Turkana, Marsabit and Samburu) that surround Lake Turkana, for example, the current practice of decorating animal coats with specific patterns, horn deformations and body modifications are all similar to images present in numerous Neolithic rock art scenes.¹³² For centuries local tribes have practised widespread mobility in an attempt to secure dwindling natural resources against threats such as multi-decadal drought, animal disease and war.¹³³

This way of life has been impacted by a range of pressures over the last century. Changes in government land policies have progressively discouraged pastoralism and promoted privatisation of land tenure, land subdivision, sedentarisation, cultivation and diversification of livelihoods.¹³⁴ Other impacts include loss of pastoral lands to conservation, cattle rustling, ecological changes, such as bush encroachment and invasive alien species, and the effects of protracted population growth. (Kenya's population grew nearly five-fold from 8.1 million people in 1960 to 44.4 million in 2013, and the pastoral population was projected to double between 1990 and 2015.)¹³⁵¹³⁶ Climate change and variability has led to declining rainfall and increases in the minimum and maximum temperatures.¹³⁷

Together these pressures are pushing pastoral households of northern Kenya to diversify in a number of ways. Herds are becoming dominated by camels, sheep and goats, which suffer relatively less mortality due to starvation and dehydration during droughts than cattle (see figure 1)¹³⁸ and crop farming is being practised by former pastoralists who have dropped out of pastoralism after losing

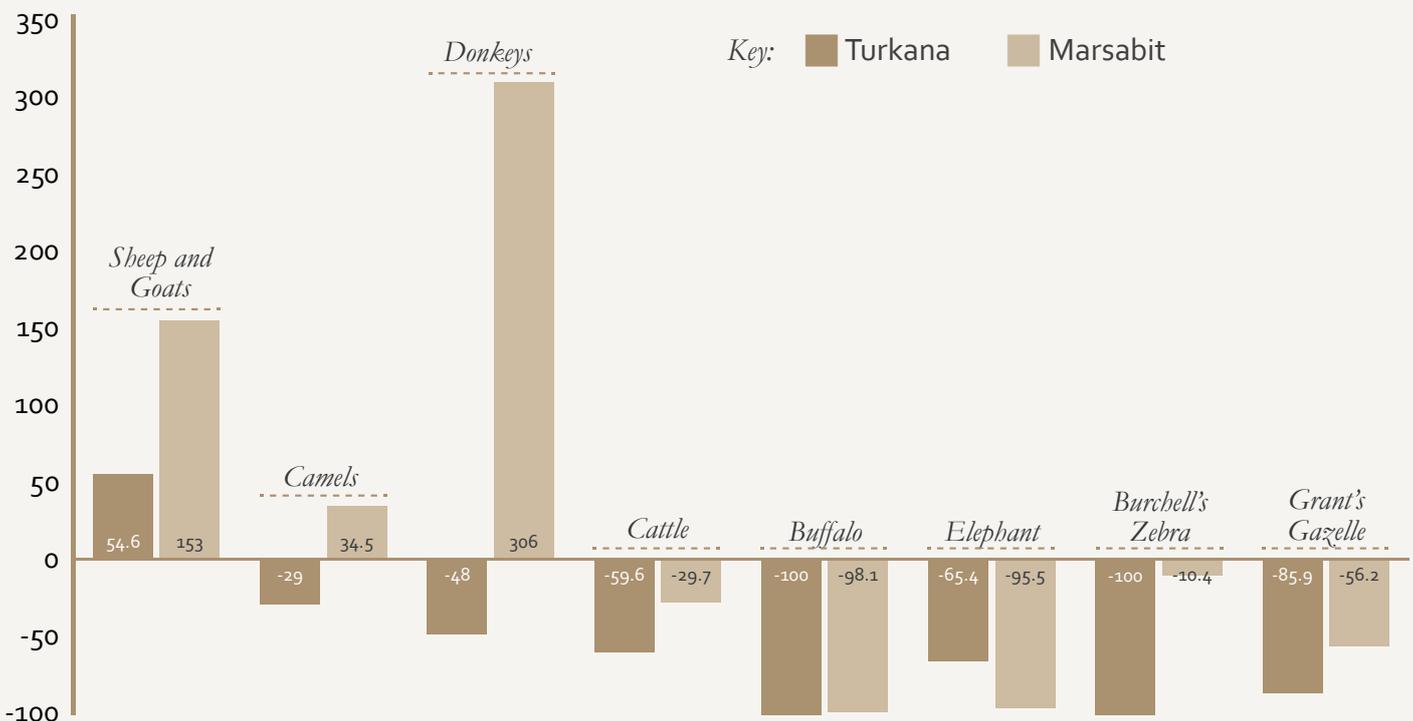
viable livestock herds.¹³⁹ While historical baseline data on past wildlife is lacking, anecdotal historical accounts and photographs seem to indicate that the area has been subject to substantial defaunation,¹⁴⁰¹⁴¹ including of fish resources in the lake.¹⁴² Hunting by pastoralists appears to be increasing and has eliminated most large mammals in the property over the past twenty years.¹⁴³ Poverty among the pastoralist communities is increasing and alternative income sources, such as charcoal burning and opportunistic dryland cultivation, are exacerbating degradation.¹⁴⁴

Although no-one lives in Sibiloi and Central Island National Parks, the World Heritage nomination noted that local pastoralists were allowed access rights to graze and water livestock "**in case of difficulties**". Regulation of this access has, however, not been effective and the parks are used by pastoralists throughout the year;¹⁴⁵ a factor which should be seen within the whole context of pressures on pastoralism around the lake. Grazing pressures from domestic stock are leading to degradation of pastures to the point where the ecosystem is suffering long-term damage and is not recovering. Wide grasslands are being replaced by patches of weed, and in some places rangelands are being encroached by invasive species like the mesquite tree (*Prosopis juliflora*).¹⁴⁶ There is a lack of monitoring data in the parks.¹⁴⁷ Local people talk about the disappearance of large animals like rhinos in Sibiloi National Park during the period of their lifetimes and hunting pressure has increased, with wild game being a significant food source. It is not clear whether hunting has always been part of society or if it is a reaction to decreased agricultural productivity.¹⁴⁸ Data from the two main counties that surround the lake, Turkana and Marsabit, which includes Sibiloi National Park, show major changes in both domestic stock and wild species (see figure 1).¹⁴⁹

Hydropower development, and abstraction for irrigation,¹⁵⁰ are having a major impact on the lake, and oil exploration is causing further concern.¹⁵¹¹⁵² The Omo River, which runs through Ethiopia, accounts for 90% of the lake's inflow.¹⁵³ The water level of the lake has been dropping

steadily for some years: a decline of 10 m was recorded between 1975 and 1993, primarily due to reduced inflow from the Omo.¹⁵⁴ A cascade of five hydropower projects, named Gibe I to V, on the Omo is further reducing the flow of freshwater to the lake. Gibe I - III have been completed and work on Gibe IV has begun. The dams, one of the largest hydroelectric projects in Africa, could decrease the flow to the lake by 85% and lower the shoreline by up to 12 metres. The lake level fell by over two metres during the filling of the Gibe III dam reservoir from 2015 to end 2016. Whilst this fall in lake level can be claimed to be within the lake's natural fluctuation range, it has been demonstrated that without the Gibe III filling, the lake would otherwise have risen.¹⁵⁵ As well as having major impacts on fisheries, the changes in the lake, along with protracted droughts from 1999 to 2000 and from 2007 to 2009, have also led to severe losses of livestock and wildlife, to tribal conflicts and to starvation.¹⁵⁶

Figure 1: Percentage changes in domestic stock and wild animals in Turkana and Marsabit during 1977-80 and 2011-2016.¹⁶⁰



The future of Lake Turkana is uncertain as the magnitude of pressures is great. An array of management strategies is called for across a suite of issues and threats, in terms of pastoralism the recommendation of IUCN's 2012 reactive monitoring issue is still crucial: "**Develop in close consultation with representatives of the local pastoralist communities a strategy to reduce grazing pressure in the property, by identifying grazing areas outside the property and providing them with access to water.**"¹⁵⁷ Recent work by the University of Helsinki, Finland, with the Daasanach pastoralists in Sibilo National Park, encouraging young pastoralists to document wildlife stories from their elders in order to retain traditional ecological knowledge,¹⁵⁸ is one of the encouraging steps towards fulfilling this need.¹⁵⁹

OBSERVATIONS

The site faces multiple challenges including pressure from mobile pastoralists, which is currently degrading vegetation and contributing to decline in wildlife. Better communication and relationships with herders are both urgently required if management changes needed to maintain both biodiversity and traditional livelihoods are to be achieved.



A herd of reindeer grazing on the mountainside in Swedish Lapland.

Laponian Area, Sweden

One of the few World Heritage sites explicitly listed for its ancient transhumance landscapes and an example of ‘decolonialisation’.

AREA OVERVIEW

Home of the Sámi people, the boreal region of northern Sweden is globally significant as an area where an ancestral way of life dominates, based on the seasonal movement of livestock. Pastoral transhumance landscapes were once common throughout the northern hemisphere. In the boreal region, the domestication of reindeer probably began about two thousand years ago, evolving gradually until around 300 years ago when the annual Sámi migration with reindeer herds became fully established.¹⁶¹

Added to the World Heritage List in 1996, the area covers 9,334.08 km²¹⁶² and is home to about 1,140 Sámi who use the area to graze some 65,000 reindeer¹⁶³ in nine active reindeer-herding communities (*samebys*).¹⁶⁴ No one lives permanently in the World Heritage site, but each summer reindeer herders move with their families from the populated areas into the mountains to be close to the reindeer and their summer pastures.¹⁶⁵ The site is 99% state-owned and composed of four national parks (Stora Sjöfallet, Sarek, Padjelanta and Muddus) and two nature reserves (Saunja and Stubba). Inscribed for both natural and cultural criteria, the living cultural heritage of the reindeer-herding Sámi was a central argument for nomination and inscription¹⁶⁶ (notably an earlier, solely natural nomination was rejected in 1990¹⁶⁷).

DISCUSSION

The Sámi culture is based on the concept of ‘maintenance of life’ (*birgejupmi*), which combines people (both individuals and collectives), natural resources, spiritual and psychological health, and implies a close connection between landscape, environment and ecosystems and social and spiritual development and identity. The Sámi view humans as an integral part of nature; the weakening of this reciprocal relationship may decrease the strength of humans.¹⁶⁸



The continued survival of the cultural and natural environment of Lapponia can be credited in great part to a management approach that has attempted to integrate conservation with Sámi herder perspectives. But this did not happen easily. During the second nomination process, none of the seven Sámi villages or the Sámi Parliament in Sweden were included as partners, according to Sámi sources.¹⁶⁹ After almost 15 years of conflict¹⁷⁰ and negotiation however, the Sámi communities were able to secure significant influence and control over the management of Lapponia.¹⁷¹

Although reindeer husbandry is a right guaranteed to the Sámi people by Swedish law¹⁷² (albeit with some restrictions such as hunting rights in most Swedish protected areas), the Swedish state does not recognise any general Sámi ownership of land.¹⁷³ Management of protected areas is mostly centralised in Sweden, with relatively low levels of local influence and control.¹⁷⁴ Thus, although listed as a World Heritage site in 1996, it was only between 2006 and 2010 that a negotiation process to develop suitable governance systems began between local, regional and national authorities and representatives of the Sámi people, through an institutionalised framework called the 'Lapponia Process'. This led to a collaborative management structure being established in 2011. Since then, the non-profit, locally based 'Lapponiatjuottjudus Association', made up of five representatives from Sámi reindeer herding communities and four protected area representatives from the state, region and two municipalities, has managed the area according to a management plan.¹⁷⁵ This was adopted by consensus in 2012, and stresses the historical presence and living Sámi culture as important conditions for the World Heritage listing.¹⁷⁶ The whole process of developing this collaborative management approach was described by one local person as "**an example of decolonisation**".¹⁷⁷

"Sámi organisations have described it [the management model] as a victory for Sámi political struggle for land rights and influence, and as an important step in the Sámi people's decolonisation process."¹⁷⁸

Issues around the maintenance of an effective transhumance system have been addressed at the site. The management plan reflects traditional knowledge on reindeer herding¹⁷⁹ and aims to maintain the sustainable management of the area while allowing modernisation of herding techniques in harmony with the conservation objectives.¹⁸⁰ The IUCN World Heritage nomination summary noted issues of integrity related to "**the use of technology in the husbandry activity**",¹⁸¹ i.e. the increasing use of aircraft, helicopters, motorcycles and snowmobiles to move herds between pastures, which the herders have rights to use within the protected area.¹⁸² This remains a concern and the evaluations carried out for the European Diploma for Protected Areas, noted "**rising problems according to the motorizing of the reindeer herding ... [which] make wear and tear, followed by erosion, on the vegetation cover**" as an issue in Sarek and Padjelanta National Parks.¹⁸³

Grazing, and particularly overgrazing, is a concern in many transhumance areas. It is recognised that reindeer herding, particularly using intensive systems, results in changes in vegetation.¹⁸⁴ In the late 1980s and early 1990s, high reindeer densities throughout Fennoscandia resulted in overgrazing, reduced lichen cover and also changes in species composition; recovery can take decades.¹⁸⁵

OBSERVATIONS

World Heritage nomination was regarded as a major step in achieving greater rights for Sámi people in the region, particularly related to mobile pastoralism. In the long term, monitoring and further management negotiations will be needed to ensure that changes in livestock management, including total numbers of reindeer and increasing mechanisation, do not undermine the area's ecology.



Homhil Plateau, a protected area on the Socotra Archipelago in Yemen.

Socotra Archipelago, Yemen

The breakdown of millennia-old traditional land use is threatening the survival of the culture and biodiversity of this unique archipelago.

AREA OVERVIEW

The Socotra Archipelago encompasses four islands and two rocky islets in the northwest Indian Ocean near the Gulf of Aden. The archipelago lies between three biogeographic regions, African, Oriental and Palaeartic, and its long isolation has preserved a unique assemblage of endemic ecosystems and species, relict and adapted;¹⁸⁶ as a result 37% of Socotra's 825 plant species, 90% of its reptile species and 95% of its land snail species are endemic, but many are also endangered.¹⁸⁸ The area was inscribed on the World Heritage List in 2008 and is under the management of the Socotra branch of the Environment Protection Authority (EPA) of the Yemeni Ministry of Water and Environment.¹⁸⁹

Inhabited for six millennia,¹⁹⁰ the islands' isolation, due to the violence of the southeast monsoon for five months of the year and its harsh climate, alternating between heat and drought, have led to a Bedouin culture developing focused on protecting natural resources. Traditional terrestrial management practices included restricted timber harvesting, grazing and browsing by rotation and transhumance, and sustainable harvesting of medicinal plants.¹⁹¹ These resources were all regulated by tribal elders.¹⁹²

DESCRIPTION

For centuries Socotra's main economic activity was animal husbandry, predominantly goats, as well as sheep on the limestone plateaus and dwarf cattle in the mountains. Transhumance was necessary given the islands' topographical and climatic diversity and the land tenure system was characterised by overlapping grazing claims.¹⁹³ Herders moved frequently in pursuit of grazing and water for their animals and in the dry season gathered foliage and dried herbage for fodder.¹⁹⁴

This management of the main island Socotra, which constitutes around 95% of the landmass of the archipelago, only began to change in recent decades. Since the 1970s, the capital, Hadibu, grew from 500 to 10,000 inhabitants,¹⁹⁵ in



1999 the first airport was built and in 2001 the first paved roads. Tourism is developing. Although the war and cholera outbreak, which are both having devastating impacts on mainland Yemen, have not had a direct impact on Socotra,¹⁹⁶ some of the millions of Yemenis displaced from their homes on the mainland¹⁹⁷ have travelled to Socotra, adding to its rapidly growing population. The United Arab Emirates are playing an increasingly influential role in the islands, adding to regional tensions. Given that today 90% of the islanders are dependent on the mainland for their food supply,¹⁹⁸ these impacts are putting the long-term survival of the islands' unique heritage at risk,¹⁹⁹ to an extent that much of the traditional way of life is now already lost.²⁰⁰

The sustainability, past, present and future, of transhumance grazing on the islands is not clear. Some authors note that the considerable human impact on the islands has led to rivers and wetlands, endemic trees and abundant pasture disappearing.²⁰¹ Others argue that the landscape and unique vegetation of Socotra have evolved with goats for millennia, and have traditionally been managed sustainably.²⁰² One author argues that the listing of Socotra as a World Heritage site has actually exacerbated the disparagement of the Bedouin identity of the islands' pastoralists and that the challenge for pastoralists is how to remain 'Bedouin' or how to return to being 'authentically' Bedouin.²⁰³

Although these traditional land use rights are recognised by the management of the islands,²⁰⁴ increasingly tourism demands are resulting in exclusive land rights being claimed, which are often a source of conflict.²⁰⁵ Changes in animal management (e.g. water provision, supplementary fodder, transport) and the abandonment of the customary slaughtering of new-born male goats, new-born bull calves and male lambs to maximise milk production have also greatly increased the survival of livestock.²⁰⁶ Along with changes such as less movement of livestock and walled enclosures,²⁰⁷ this has led to grazing and fodder use becoming unsustainable, causing soil erosion and habitat degradation.²⁰⁸

Attempts to secure a more sustainable future for pastoralism on the islands have focused on

building cooperation with traditional pastoralists; with conservationists arguing that reduced grazing management was degrading the environment, not the grazing itself.²⁰⁹ A Conservation Zoning Plan following the Biosphere Reserve Concept (e.g. of core conservation areas and multiple use zones) was developed with the support of local communities to help conserve traditional land use. Approved after intensive negotiations in 2000, it was the first of its kind in the Arabian region and became the legal base for conservation on the archipelago. Over the following few years management plans were developed for the nature sanctuaries and surrounding national parks. Communities agreed on the designation of nature sanctuaries based on the understanding that they would be assisted in tapping into funds stemming from ecotourism, as a trade-off for restricted use for agriculture. In contrast to local communities, compliance from governmental services to the zoning plans has been more difficult to achieve. For example, although road construction in nature sanctuaries is banned by law, there are now several examples of roads being planned to go through sanctuaries, causing international outcry.²¹⁰

Thus, although grazing is deeply anchored in local history and traditional practices, it is moving from being a subsistence based activity to a commercial activity and impacting sustainability.²¹¹ In 2016, the World Heritage Committee urged Yemen to promote the revival of traditional land management practices, including seasonal transhumance, in an effort to reduce threats from overgrazing, and to ensure the enforcement of the archipelago's protected area regulations and its zoning plan, in order to address threats from unsustainable resource use.²¹²

OBSERVATIONS

Socotra has multiple and serious problems facing both its ecology and local communities; World Heritage status is probably not the main concern of major stakeholders at the moment. Changes in mobile pastoralism, including increasing commercialisation, are amongst the factors that need to be taken into consideration in management as soon as the political situation stabilises.



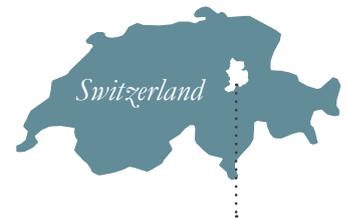
Cows on the outskirts of the Braunwald area in the Swiss canton of Glarus.

Swiss Tectonic Arena Sardona (‘Glarus Overthrust’), Switzerland

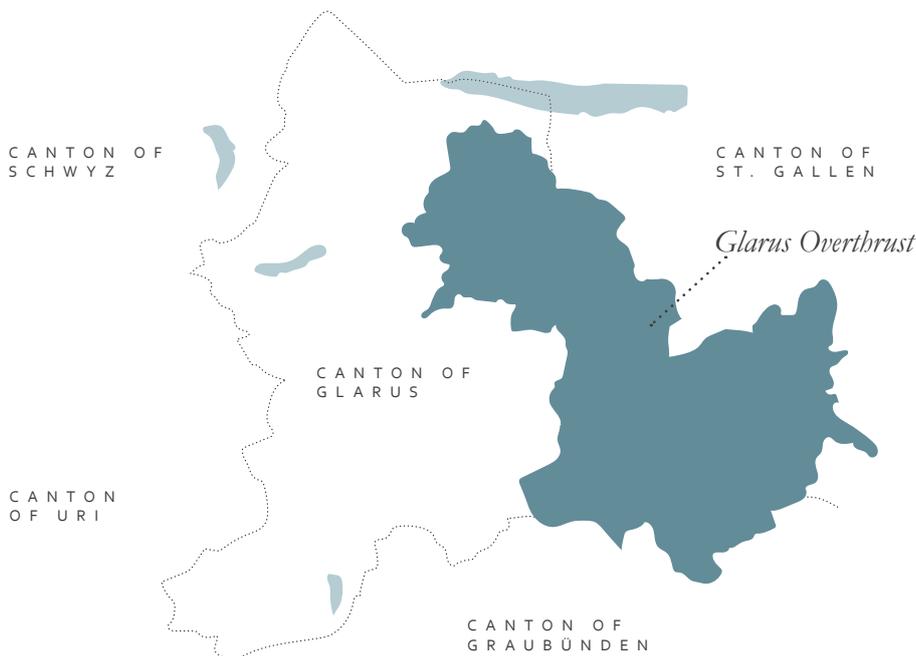
Listed for its geological features, this site includes typical areas of summer grazing, which has a long and continuing tradition throughout Switzerland.

AREA OVERVIEW

Nominated in 2008, this 328.5 km² site²¹³ lies in alpine and mountainous territory in the Alps of eastern Switzerland. The property combines glacial landscapes, alpine plateaus and valleys, with characteristic flora and fauna associated with each altitude; the foremost feature is the Glarus overthrust, a geological monument of international importance.²¹⁴



*Swiss Tectonic
Arena Sardona*



There are no permanent inhabitants, but at the time of nomination around a hundred people worked in the mountain cabins or pastures during the summer months.²¹⁵ Summer grazing (Sömmerung) usually takes place for around a hundred days²¹⁶ during June to September. The property includes 56 mountain farming enterprises and borders on another 12 whose holdings lie largely outside the site. At the time of nomination, livestock numbers were: 2,700 cattle plus 5,300 young, almost 7,000 sheep plus some goats, horses and donkeys.²¹⁷

DESCRIPTION

Alpine meadows account for roughly half of the site. The great majority of these grasslands are used for summer grazing, which probably dates back to the Bronze Age (3rd millennium BC).²¹⁸ The first written record of the common uses of alpine land (the **Acta Murensia**) was produced in 1160²¹⁹ and regulations concerning mountain grazing in Switzerland generally go back hundreds of years.²²⁰ The ancient pastures were situated on the slopes up to an altitude of 2,500 m, above the treeline. Grazing expanded in the thirteenth century when forests on south-facing slopes were clear-felled; the pastures that originated at that time have been in constant use ever since. The original natural treeline on shaded and inaccessible slopes lies at an altitude of 1,700 to almost 2,000 m, in the cleared areas it is 100 - 200 m lower.²²¹ In addition to animal husbandry, pastoralism helps to prevent the development of scrub and consequently species diversity is particularly high in the extensively grazed areas around the treeline and on higher-lying grass slopes,²²² likely enhanced through dispersal by livestock.²²³

At and above the treeline a few hay meadows exist, but most of the grassland is used for mountain grazing. These ecosystems are generally very species-rich, with numerous alpine flowers; there are also some rare and protected species such as edelweiss (*Leontopodium alpinum*).²²⁴

The rearing of dairy cattle and the summer pasturing of beef cattle is declining;²²⁵ as a result the steeper and less valuable areas of the World Heritage site are no longer being grazed.

The trajectory of this trend is unclear. Due to the diversity of services it provides for society, mountain grazing remains widely appreciated and subsidised in Swiss society and the ideal of transhumance is a part of the national identity. To keep these traditions alive in some parts of the country, non-Alpine residents, including young city dwellers from a variety of countries, are spending summers in the grazing areas to care for livestock and to help produce dairy products such as cheese. Support for transhumance is also evident due to its importance to the tourism sector.²²⁶

The changes in traditional agriculture and the exact extent and net impact of this trend on the cultural and biodiversity values of the site require further study.²²⁷ The main impact of the decline in grazing is meadows being taken over by scrublands.^{228,229} Shrub succession and reforestation can in consequence lead to intensified use of remaining areas and loss of biological diversity.²³⁰ Indeed, in some areas of the property, cattle grazing on the alpine meadows has led to trampling and slope terracing, localised removal/degradation of the vegetation cover and increased frequency of landslides.²³¹

The site was promoted for World Heritage status by the local communes and several cantons (Switzerland's administrative subdivisions, which together form the Swiss Confederation and have their own constitution, legislature, government and courts). As jurisdiction over the area was divided between so many authorities, a combined Delegates Assembly Committee was formed in 2003, with a Regional Management Secretariat, Scientific Advisory Committee and Working Groups.²³²

OBSERVATIONS

Mobile pastoralism still maintains a high degree of public support even in this very developed country, although social and economic pressures mean that it is declining at least in the more inaccessible pastures, with likely impacts on ecology.



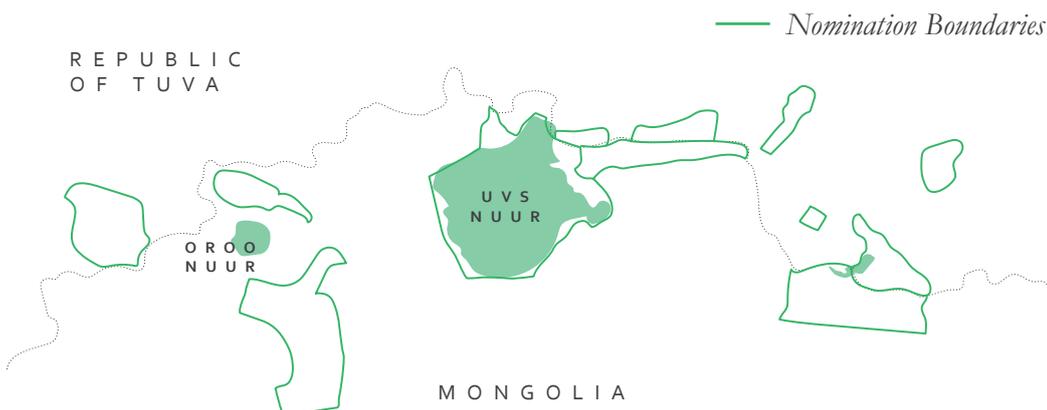
Uvs Nuur Basin in Mongolia and the Republic of Tuva.

Uvs Nuur Basin, Mongolia and the Russian Federation

A potential model of integrated and sustainable conservation and development, this harsh environment of steppe, desert and mountain has for thousands of years been used by pastoralists.

AREA OVERVIEW

Shared between Mongolia and the Republic of Tuva in the Russian Federation, the Uvs Nuur Basin is the northernmost of the enclosed basins of Central Asia. Although the World Heritage site takes its name from the central large, shallow, saline Uvs Nuur Lake, the site actually includes all the major biomes of eastern Eurasia: the steppe ecosystem, which supports a rich diversity of birds; the desert, home to a number of rare gerbils, jerboas and the marbled polecat (*Vormela peregusna*); and mountains, which are important for the vulnerable snow leopard (*Panthera uncia*), mountain sheep (argali – *Ovis ammon*) and Asiatic ibex (*Capra sibirica*). Together these elements, along with climatic extreme (temperatures range from -72oF (-57oC) during the winter up to 104oF (40oC) in the summer²³³) make up a diverse landscape ranging from cold desert to desert-steppe; steppe; conifer, deciduous and floodplain forests; wetlands and marshlands; freshwater and saltwater systems; mobile and fixed sand dunes; tundra; glaciers and snow and ice fields.²³⁴



Inscribed in 2003, this serial site is made up of twelve protected areas covering 898,063.5 ha, and buffer zones covering 170,790 ha, of the 1,068,853 ha basin. Seven components covering 810,234 ha are in Mongolia with the central Uvs Nuur Strictly Protected Area covering almost half of the entire property; the remaining five are in the Republic of Tuva²³⁵ and all are part of the Ubsunur Hollow Biosphere Reserve.²³⁶ Some components are contiguous with each other across the international border, while others are distinct units.

Nomadic pastoralism dating from Palaeolithic times has moulded the landscape. Indeed, much of the Eurasian steppe would probably have reverted to forest as the post-glacial climate became warmer without the influence of domesticated grazing animals.^{237 238} Pastoralists rely on their animals for most of their domestic subsistence needs. The culture of these nomadic Tuvan people and Mongolian herding societies is inextricably linked to their land-use, which is reflected in their stories, songs, arts and crafts and religious beliefs.²³⁹ Much of the land now in protected areas overlaps with traditionally sacred mountains, lakes, rivers and other revered landscape features.²⁴⁰

DESCRIPTION

UNESCO sums up the historical pastoral activity in the area as: **“Mobile herders have been coexisting with the diverse flora and fauna in harsh environmental conditions for thousands of years without degrading the productivity, resilience and diversity of the basin.”**²⁴¹ Building upon the existing involvement of local and indigenous communities in the area, the World Heritage nomination document noted the aim to ensure the sustainable use of pastures.²⁴² However, herding is only sustainable if practised correctly, and as with other sites in the region, there are signs of mounting pressure on pastures,²⁴³ forests and wildlife, as well as increasing occurrence of fires. There is, however, little monitoring data to assess the impacts of these changes.²⁴⁴

The re-emergence of individual farming economies after the collapse of the collectivisation of animal husbandry (and ban on Buddhism) has led to

many changes in the region.²⁴⁵ Until the twentieth century, the majority of Tuvans lived as nomadic livestock herders. The Soviet regime replaced this way of life with towns, industries and collective farms.²⁴⁶ With the collapse of the collective farming system, today the local population of over 35,000 people live in small settled cattle herding communities. This has led to the abandonment of mobile pastoralism in the remote pastures in Tuva, resulting in the destructive concentration of herds at wintering camps and around watering points.²⁴⁷ On the Mongolian side, there are around a thousand mobile pastoralists.²⁴⁸ After the collapse of the Soviet system, the traditional strategy of nomadic herding decreased.²⁴⁹ Since the privatisation of grazing herds in Mongolia in 1992, the domestic livestock population rose from 20 million to 40 million animals by 2010. In addition, the number of moves and distance between seasonal pastures has decreased substantially, resulting in the expansion of rangeland for domestic animals and consequent overgrazing and trampling, for instance in the vicinity of water sources²⁵⁰ and overgrazing of the desert steppe around Ulangom in Mongolia.²⁵¹ As a consequence, the habitat of wild ungulates, in particular the argali sheep, is being reduced,²⁵² there has been killing of wolf and snow leopard and the water level in the wetlands has lowered due to overgrazing, as well as steppe fire and disturbance of the water regime of the rivers, streams and their sources.²⁵³ The possibility of disease transmission between wild ungulates and livestock makes mobile pastoralists reluctant to let ungulates access waterholes used by livestock.²⁵⁴ Furthermore, changing macroeconomic and political circumstances are increasing concerns about poaching and illegal logging in some parts of the basin, which is likely to affect the integrity of the area in the long term.²⁵⁵ All these impacts, along with drought, exacerbated by the impacts of climate change, are putting a great strain on the mobile pastoralists and the survival of their culture.²⁵⁶

Grasslands are Mongolia's most important sustainable natural resource, so the threat of continually increasing stock numbers leading to overgrazing (and conflicts over traditional family

pasturage rights) is a very serious issue facing the country.²⁵⁷ Across the border, the post-Soviet public re-evaluation of Tuvan history and culture, motivated in part by the regional government's need to legitimate its claims for autonomy, has seen a revival and refocusing of cultural identity,²⁵⁸ but the once-dominant nomadic way of life has been all but lost.²⁵⁹

The main challenge therefore for the future of the Uvs Nuur Basin is to maintain the balance between use and conservation at the landscape level.²⁶⁰ This will include the need to support the local population wishing to regenerate elements of traditional land use and reduce biodiversity loss as a result of poaching and cattle overgrazing.²⁶¹ The extent to which this will include pastoralism is currently difficult to assess; many traditional skills have been lost. On the other hand, a revived pastoral system might help address some of the problems emerging from settled agriculture. Further research on the role that traditional pastoralist systems might continue to play in 21st century Mongolia is urgently required.

OBSERVATIONS

Mobile pastoralism is changing fast, broadly becoming more concentrated on fewer areas, which along with a doubling of livestock numbers is causing degradation in some places and potentially land abandonment in others. Many traditional skills have already been lost. Achieving a balance between production and conservation remains a challenge in this area.

Table 3: World Heritage criteria relating to the case study sites

WORLD HERITAGE CRITERIA	iv: to be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history	v: to be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change	vii: to contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance	viii: to be outstanding examples representing major stages of Earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features;	ix: to be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals;	x: to contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.
WORLD HERITAGE SITES						
<i>Qinghai Hoh Xil, China</i>			Situated on the Qinghai-Tibetan Plateau, the world's largest, highest and youngest plateau, Hoh Xil high plateau systems function unimpeded.			High levels of [flora and fauna] endemism. Large numbers of wild ungulates depend on the property including almost 40% of the world's Tibetan antelope and up to 50% of the world's wild yak.
<i>Causses and the Cévennes, France</i>		Exceptional response to the way the system has developed over time and particularly over the past millennia.				
<i>Pyrénées – Mont Perdu, France and Spain</i>	Outstanding example of a landscape shaped by a pastoral transhumance system that was developed in the Middle Ages and still exists today.	An outstanding example of a type of transhumance that was once widespread in the mountainous regions of Europe, but which today is rare.	Exceptional landscape with meadows, lakes, caves, mountains and forests. In addition, the region is of great interest for science and conservation ... one of the most important Alpine protected areas in Europe.	Distinguished by its location at the tectonic collision point between the Iberian and west European plates. The property presents an exceptional geological unity, forming a calcareous massif with Mont Perdu at its centre.		
<i>Khangchendzonga National Park, India</i>	Is the heartland of a multi-ethnic culture which has evolved over time, giving rise to a religious tradition centred on the natural environment.		Khangchendzonga Massif contributes to a landscape that is revered across several cultures and religions.			Located within a mountain range of global biodiversity conservation significance.
<i>Lake Turkana National Parks, Kenya</i>				Represents major stages of Earth's history including hominid discoveries, which have contributed more to knowledge of human ancestry and the palaeo-environment than any other site in the world; presence of recent geological process represented by volcanic, erosional and sedimentary land forms.		Diverse habitats, resulting from ecological changes over time and ranging from terrestrial and aquatic, desert to grasslands, and fauna.
<i>Uvs Nuur Basin, Mongolia and Russian Federation</i>					High degree of naturalness is of international scientific importance due to its large-scale undisturbed climatic, hydrological and ecological processes and phenomena.	Represents the major biomes of Central Asia with a corresponding floral and faunal diversity.
<i>Lapponian Area, Sweden</i>		Outstanding example of a cultural landscape reflecting the ancestral way of life of the Sámi people.	A variety of outstanding natural phenomena of glacial-related geomorphology: snow-covered mountains, lakes etc. Sámi culture, e.g. traditional birch and turf huts, cabins etc.	Exemplary processes associated with glacial activity, ice and frost action, glacial rivers and weathering. Records of humans being part of the ecosystems for seven thousand years.	The vast mire complex of Sjávnja/Sjaunja is the largest in Europe outside Russia and old-growth coniferous forest with natural succession unimpaired.	
<i>Swiss Tectonic Arena Sardona, Switzerland</i>				An exceptional display of mountain building tectonics and has been recognised as a key site for geological sciences since the 18th century.		
<i>Socotra Archipelago, Yemen</i>						Exceptional level of biodiversity and endemism in many terrestrial and marine groups of organisms.



Sheep grazing in meadows against the French Pyrenees.

Conclusions and Recommendations – a Future for Pastoralism in World Heritage

Mobile pastoralism is declining world-wide.^{263 264 265} But there are still millions of mobile pastoralists; they and their ancestors have faced pressures and opposition for thousands of years and have proven extremely adaptable and resilient. There is no reason to assume that they are going to disappear. Indeed, some developments, like a changing and more unstable climate, while adding to the pressures on pastoralists,²⁶⁶ may also make pastoralism a necessity in some places.

For protected areas, pastoralism is both an opportunity and a potential problem. Mobile pastoralism has been an element in the landscape for so long in many places that it plays a key role in shaping and maintaining the ecosystem, and its removal brings changes that are often detrimental to the very wild species for which a protected area has been designated. Conversely, unsustainable pastoralism, including factors such as overgrazing, undergrazing, new livestock breeds, incidental wildlife hunting and the spread of diseases, can all undermine conservation aims. Conflicts between pastoralists and settled farmers are becoming increasingly bitter and violent in some parts of the world; similar tensions occur in some protected areas.

World Heritage has stated its strong commitment to the integration of mobile pastoralism into suitable World Heritage sites and potentially offers a much needed support mechanism for sites where mobile pastoralism is practised. IUCN and ICOMOS have a clear role in providing technical support to underpin such policies. But this support will only be as good as the processes developed to nominate and evaluate sites and to monitor that the decisions made by the World Heritage Committee in relation to these sites are honoured. Some of the case studies (e.g. China and India) above illustrate the strong feelings that arise during the nomination process when local people are not effectively engaged in decision making, and others (e.g. France/Spain) when calls for action from the committee are paid little attention.

As Christoph Brumann and David Berline state **“there is little that the World Heritage Committee can impose upon a recalcitrant nation state, as there is also little it can offer to buy its cooperation. Government promises made before inscription are often not honoured afterwards, but there is usually only blaming and moral pressure to fear, given that sites can be deleted from the World Heritage List in theory but this has happened only twice so far.”**²⁶⁷

The dual purpose of World Heritage sites, to protect both cultural and natural heritage, makes them ideal laboratories for testing and refining a positive link between mobile pastoralism, cultural survival and nature conservation. In a minority of cases, this is reflected in the criteria for listing when mobile pastoralism is itself deemed as being of outstanding universal value; more usually it has emerged retrospectively when statements of outstanding universal value were developed which included more focus on issues such as management. In the former case, mobile pastoralism has been discussed, negotiated and planned for from the outset, while in the latter cases, recognition of its importance may mean changing management over time.

In both situations, strong interactions with mobile pastoralist communities are essential; they need to have a central role in discussions, planning and decision-making. All successful attempts to integrate mobile peoples and transhumance systems into World Heritage have featured such approaches. Such negotiations can sometimes be difficult and are always time-consuming. There may not be a common vision amongst the communities involved. Settled farming communities may be highly critical of mobile livestock herders, and vice versa, a tension that stretches back over the centuries. But there can also be disagreements within pastoralist communities themselves, with some rejecting traditional ways as outmoded and, for instance, objecting to support packages that are tied to their continuation, as has happened in some European sites.

World Heritage status is also likely to result in a rapid increase in visitor numbers. Several of the

case studies have shown the potential negative impacts from tourists, but there are also positive effects as well, including building support for the continuation of mobile pastoralism. Tourists also provide customers for niche-market goods, such as local foodstuffs and crafts that can often come from or be developed alongside nomadic herding.

Actions are not confined to mobile communities themselves, although listening to their views and knowledge is critical to making progress on this issue. Much is known already, but more work is still needed in terms of research into the impacts, positive and negative, of pastoralism in different ecosystems and under changing climatic conditions. More effective ways of monitoring long-term trends are urgently required. Changes in policy, legislation and the mechanisms of management planning may all be required. Protected area managers and others involved in management decisions will need new skills and new attitudes. Best practice guidance is needed. Facilitation of interaction between different mobile peoples around the world would help build a global consensus about viable and sustainable ways forward. At a time when pastoralism is under greater pressure than at any other period in history, surviving mobile pastoralists are looking for supporters and are interested in developing new options.

Careful use of World Heritage could help mobile pastoralists to build a viable future in key sites, which might also provide positive examples of co-management that could be applied more widely. The role of World Heritage in these situations is primarily to draw attention to the issues and provide a platform, with some limited authority, for ensuring that mobile pastoralism is treated equitably and positively within sites where it occurs.

Steps to improve the effectiveness of the Convention in this regard could include:

Development of best practice guidelines, probably in collaboration with other social and environmental groups, to provide a solid framework for action for use in individual World Heritage sites and linked to managing herds for positive environmental benefits;

Inclusion of key elements of these within World Heritage's own operational guidelines;

Strengthening existing policies towards mobile pastoralism within a broader context of World Heritage and sustainable development;

Addressing mobile pastoralism more thoroughly in nomination and monitoring procedures, including long-term monitoring of the interactions between herders and ecosystems, drawing on both traditional ecological knowledge and Western science;

Ensuring that World Heritage status is not used as an excuse for dispossessing mobile pastoralists of their traditional access to grazing;

Investigating the relationship between tourism and mobile pastoralism within World Heritage, identifying the factors that influence whether tourism helps or hinders the continuation of traditional mobile herding;

Capacity building to promote an understanding of management issues relating to mobile pastoralism for those World Heritage sites (and candidate sites) for which it is an issue;

Facilitating interaction between conservation professionals and mobile pastoralists to ensure full understanding of ways in which mobile herding can or cannot be incorporated into conservation policy;

Investigating links between mobile pastoralism and human-wildlife conflict, including a more complete understanding of ways in which this might be addressed;

Developing clear lines of communication between relevant site managers, through social media, face-to-face meetings and site visits, is an important part of this overall process.

| *References*

- ¹ Scott, J.C. 2017. *Against the Grain*. Yale University Press.
- ² Leff, J. 2009. Pastoralists at war: Violence and security in the Kenya-Sudan-Uganda border region. *International Journal of Conflict and Violence* 3: 188-203.
- ³ Audu, S.D. 2014. Freshwater scarcity: A threat to peaceful co-existence between farmers and pastoralists in northern Nigeria. *International Journal of Development and Sustainability* 3 (1): 242-251.
- ⁴ Dong, S., Liu, S. and Wen, L. 2016. Vulnerability and resilience of human-natural systems of pastoralism worldwide. In: Dong, S., Kassam, K.A., Tourrand, J. and Boone, R. (eds.) *Building Resilience of Human-Natural Systems of Pastoralism in the Developing World*. Springer, Cham, Switzerland.
- ⁵ López-i-Gelats, F., Fraser, E.D.G., Morton, J.F. and Rivera-Ferre, M.G. 2015. What drives the vulnerability of pastoralists to global environmental change: A meta-analysis. *Global Environmental Change* 39: 258-274.
- ⁶ Galvin, K.A. 2009. Transitions: Pastoralists living with change. *Annual Review of Anthropology* 38: 185-198.
- ⁷ McGahey, D., Davies, J., Hagelberg, N. and Ouedraogo, R. 2014. *Pastoralism and the Green Economy – a natural nexus?* IUCN and UNEP, Nairobi.
- ⁸ Davies, Jonathan, personal communication.
- ⁹ Hatfield, R. and Davies, J. 2006. *Global Review of the Economics of Pastoralism*. World Initiative on Sustainable Pastoralism, GEF, UNDP and IUCN, Nairobi.
- ¹⁰ Manzano-Baena, P. and Salguero-Herrera, C. 2018. *Mobile Pastoralism in the Mediterranean: Arguments and evidence for policy reform and to combat climate change*. Mediterranean Consortium for Nature and Culture, Gland, Switzerland. http://medconsortium.org/wp-content/uploads/2017/12/MobilePastoralismMotherDocument_December2017_ForWeb.pdf.
- ¹¹ Coughenour, M.B. 2008. Causes and consequences of herbivore movement in landscape ecosystems. In: Galvin, K.A., Reid, R.S., Benke Jr, R.H. and Hobbs, N.T. (eds.) *Fragmentation in Semi-Arid and Arid Landscapes*. Springer, Dordrecht, Netherlands. http://dx.doi.org/10.1007/978-1-4020-4906-4_3.
- ¹² McGahey, D., Davies, J., Hagelberg, N. and Ouedraogo, R. 2014. op cit.
- ¹³ Manzano-Baena, P. and Salguero-Herrera, C. 2018. op cit.
- ¹⁴ Vidal-Gonzalez, P. 2013. Sacred rituals and popular religiousness amongst transhumant shepherds of Teruel region, Spain. *Pastoralism: Research, Policy and Practice* 3: 24.
- ¹⁵ Ben Hounet, Y., Brisebarre, A.-M. and Guinand, S. 2016. The cultural heritage of pastoralism – local knowledge, state identity and the global perspective: The example of local breeds in Morocco. *Scientific and Technical Review of the Office International des Epizooties* (Paris) 35 (2): 365-370.
- ¹⁶ Labadi, S. 2005. A review of the Global Strategy for a balanced, representative and credible World Heritage List 1994–2004. *Conservation and Management of Archaeological Sites* 7 (2): 89-102, DOI: 10.1179/135050305793137477.
- ¹⁷ Rössler, M. 2010. Agropastoralism and sustainable development: The recognition of agropastoralism in the framework of international conventions. In: Lerin, F. (ed.) *Pastoralisme méditerranéen : patrimoine culturel et paysager et développement durable*. Options Méditerranéennes: Série A. Séminaires Méditerranéens no. 93. CIHEAM / AVECC / UNESCO. Montpellier, pp 9-15.
- ¹⁸ <https://www.worldheritageoutlook.iucn.org/> (accessed 11/5/2018).

- ¹⁹ <https://en.unesco.org/news/lake-turkana-national-park-site-kenya-inscribed-list-world-heritage-danger>, (accessed 4/7/2018).
- ²⁰ <https://www.iucn.org/fr/node/28725> (accessed 27/7/2018).
- ²¹ IUCN. 2017. World Heritage Nomination – IUCN Technical Evaluation Qinghai Hoh Xil (China) – ID No 1540, May 2017.
- ²² China's official nomination to UNESCO, p.180. <https://whc.unesco.org/en/list/1540/documents/> (accessed 27/7/2018).
- ²³ IUCN. 2017. World Heritage Nomination, op cit.
- ²⁴ China's official nomination to UNESCO, op cit., p.139.
- ²⁵ China's official nomination to UNESCO, ibid., p.81.
- ²⁶ Article 26 of the Regulations of the People's Republic of China on Nature Reserves, 'In nature reserves, such activities as felling, grazing, hunting, fishing, gathering medicinal herbs, reclaiming, burning, mining, stone quarrying and sand dredging etc., shall be prohibited unless it is otherwise provided by relevant laws and regulations'. 1994.
- ²⁷ China's official nomination to UNESCO, op cit.
- ²⁸ International Campaign for Tibet: Nomads in 'no man's land: China's nomination for UNESCO World heritage risks imperilling Tibetans and wildlife, 30 June 2017, <https://www.savetibet.org/nomads-in-no-mans-land-chinas-nomination-for-unesco-world-heritage-risks-imperilling-tibetans-and-wildlife-2/> (accessed 27/7/2018).
- ²⁹ ibid.
- ³⁰ Studley, J. 2018. Indigenous sacred natural sites and spiritual governance: The legal case for juristic personhood. Routledge, London.
- ³¹ <https://www.worldheritageoutlook.iucn.org/explore-sites/wdpaid/555624859>.
- ³² <http://rukor.org/kokoshilihoh-xil/>.
- ³³ BBC News. 2017. UNESCO heritage listing sparks Tibetan resettlement fears, 10 July 2017. <https://www.bbc.co.uk/news/world-asia-china-40552772>.
- ³⁴ Dömpke, S. 2017. Emptying Tibetan lands for safari tourism. Rukor. <http://rukor.org/emptying-tibetan-lands-for-safari-tourism/>.
- ³⁵ Tibet.cn. 2018. Latest travel ban announced in Qinghai. http://eng.tibet.cn/eng/travel/news/201806/t20180606_5916279.html.
- ³⁶ Liechti, K. and Biber, J.P. 2016. Pastoralism in Europe: Characteristics and challenges of highland-lowland transhumance. *Revue Scientifique Et Technique-Office International Des Epizooties* **35** (2):561-575.
- ³⁷ whc.unesco.org/en/list/1153/ (accessed 2/5/2018).
- ³⁸ ibid.
- ³⁹ O'Rourke, E. 2006. Biodiversity and land use change on the Causse Me' jan, France, *Biodiversity and Conservation* **15**: 2611-2626. DOI 10.1007/s10531-005-5402-0.
- ⁴⁰ whc.unesco.org/en/decisions/1976 (accessed 2/5/2018).
- ⁴¹ Plan de gestion Causses & Cévennes 2015/2021. whc.unesco.org/document/138496 (accessed 2/5/2018).
- ⁴² whc.unesco.org/en/decisions/4310 (accessed 2/5/2018).
- ⁴³ whc.unesco.org/en/list/1153/ (accessed 2/5/2018).
- ⁴⁴ Crosnier, C. 2006. Biodiversity and relevance of local practices in the Cévennes Biosphere Reserve. *International Social Science Journal* **58** (187): 151-160.
- ⁴⁵ Liechti, K. and Biber, J.-P. 2016. op cit.

- ⁴⁶ Fonderflick, J., Lepar, J., Caplat, P., Debussche, M. and Marty, P. 2010. Managing agricultural change for biodiversity conservation in a Mediterranean upland. *Biological Conservation* **143**: 737-746.
- ⁴⁷ Manzano-Baena, P. and Salguero-Herrera, C. 2018. op cit.
- ⁴⁸ whc.unesco.org/en/list/1153/ (accessed 2/5/2018).
- ⁴⁹ O'Rourke, E. 2006. op cit.
- ⁵⁰ Fonderflick, J., Lepar, J., Caplat, P., Debussche, M. and Marty, P. 2010. op cit.
- ⁵¹ Liechti, K. and Biber, J.-P. 2016. op cit.
- ⁵² Manzano-Baena, P. and Salguero-Herrera, C. 2018. op cit.
- ⁵³ Crosnier, C. 2006. op cit.
- ⁵⁴ Plan de gestion Causses & Cévennes 2015/2021. whc.unesco.org/document/138496 (accessed 2/5/2018)
- ⁵⁵ Crosnier, C. 2006. op cit.
- ⁵⁶ Moulin, C.-H. 2014. Multiple services provided at territory scale from Mountain and Mediterranean livestock systems. *Options Méditerranéennes* **109**: 559.
- ⁵⁷ ibid.
- ⁵⁸ www.nemausus.com/fete-de-la-transhumance-juin-2018-a-l-esperou/ (accessed 3/5/2018).
- ⁵⁹ www.facebook.com/FetedelaTranshumanceenCevennes/ (accessed 3/5/2018).
- ⁶⁰ Blanc, M. 2017. *Food, Nature and Society: Rural Life in Late Modernity*, Routledge, London.
- ⁶¹ O'Rourke, E. 2006. op cit.
- ⁶² Liechti, K. and Biber, J.-P. 2016. op cit.
- ⁶³ Rapport périodique - Deuxième cycle Section II- Les Causses et les Cévennes, paysage culturel de l'agro-pastoralisme méditerranéen, whc.unesco.org/document/164152 (accessed 2/5/2018).
- ⁶⁴ whc.unesco.org/en/events/1408/ (accessed 2/5/2018).
- ⁶⁵ UNEP-WCMC. 2011. *Pyénées – Mont Perdu. Spain & France*. UNEP-WCMC World Heritage Information Sheets. www.unep-wcmc.org/resources-and-data/world-heritage-information-sheets (accessed 1/5/2018).
- ⁶⁶ http://whc.unesco.org/en/list/773/.
- ⁶⁷ UNEP-WCMC. 2011. op cit.
- ⁶⁸ ibid.
- ⁶⁹ Gómez, D., Lorda, M., Garmendia, J. and García, M.B. 2017. Spatial distribution and environmental analysis of rare flora of the Pyrenees. *Pirineos: Revista de Ecología de Montaña*, 172.
- ⁷⁰ http://whc.unesco.org/en/list/773/.
- ⁷¹ UNEP-WCMC. 2011. op cit.
- ⁷² http://whc.unesco.org/en/list/773/.
- ⁷³ ibid.
- ⁷⁴ Oteros-Rozas, E., Martín-López, B., González, J.A., Plieninger, T., López, C.A. and Montes, C. 2013. Socio-cultural valuation of ecosystem services in a transhumance socio-ecological network. *Regional Environmental Change* DOI 10.1007/s10113-013-0571-y.
- ⁷⁵ Escudero, M.N.I. 2014. About the conservation of cultural landscapes: Sustainability or unviability? A comparative study on the emergent landscape management in heritage sites in mountain regions: the Andes and the Pyrenees. Thesis.

- ⁷⁶ <http://whc.unesco.org/en/list/773/>.
- ⁷⁷ Oteros-Rozas, E., Ontillera-Sánchez, R., Sanosa, P. Gómez-Baggethun, B. Reyes-García, V. and González, J.A. 2013. Traditional ecological knowledge among transhumant pastoralists in Mediterranean Spain. *Ecology and Society* **18** (3): 33. <http://dx.doi.org/10.5751/ES-05597-180333>.
- ⁷⁸ Escudero, M.N.I. 2014. op cit.
- ⁷⁹ *ibid.*
- ⁸⁰ UNEP-WCMC. 2011. op cit.
- ⁸¹ Escudero, M.N.I. 2014. op cit.
- ⁸² *ibid.*
- ⁸³ <http://whc.unesco.org/en/list/773/>.
- ⁸⁴ UNESCO. 2014. State of conservation of World Heritage properties inscribed on the World Heritage List. WHC-14/38.COM/7B, p. 90. <http://whc.unesco.org/archive/2014/whc14-38com-7B-en.pdf> (accessed 10/6/2018).
- ⁸⁵ Escudero, M.N.I. 2014. op cit.
- ⁸⁶ www.worldheritageoutlook.iucn.org/explore-sites/wdpaid/145590 (accessed 14/6/2018).
- ⁸⁷ UNESCO. 2014. op cit.
- ⁸⁸ www.worldheritageoutlook.iucn.org/explore-sites/wdpaid/145590 (accessed 14/6/2018).
- ⁸⁹ UNESCO. 2014. op cit.
- ⁹⁰ whc.unesco.org/en/list/1513 (accessed 3/5/2018).
- ⁹¹ Tambe, S. and Rawat, G.S. 2009. Ecology, economics, and equity of the pastoral systems in the Khangchendzonga National Park, Sikkim Himalaya, India. *Ambio* **38** (2): 95-100.
- ⁹² whc.unesco.org/en/list/1513 (accessed 3/5/2018).
- ⁹³ World Heritage Nomination – IUCN Technical Evaluation Khangchendzonga National Park (India) – ID 1513, whc.unesco.org/document/152841 (accessed 3/5/2018).
- ⁹⁴ Tambe, S. and Rawat, G.S. 2009. op cit.
- ⁹⁵ *ibid.*
- ⁹⁶ Tambe *ibid.*
- ⁹⁷ Bhasin, V. 2011. Pastoralists of Himalayas. *Journal of Human Ecology* **33** (3): 147-177.
- ⁹⁸ Bhagwat, S., Diwan, M. and Venkataramani, V. 2011. Study of ecological, socio-economic and livelihood dimensions of grazing exclusion in protected forest of west Sikkim. Institute for Financial Management and Research – Centre for Development Finance (IFMR-CDF).
- ⁹⁹ Tambe, S. and Rawat, G.S. 2009. op cit.
- ¹⁰⁰ Nomination for inscription on the World Heritage List, Khangchendzonga National Park, 2016. whc.unesco.org/uploads/nominations/1513.pdf (accessed 3/5/2018).
- ¹⁰¹ Tambe, S. and Rawat, G.S. 2009. op cit.
- ¹⁰² Nomination for inscription on the World Heritage List, Khangchendzonga National Park, 2016. op cit.
- ¹⁰³ www.worldheritageoutlook.iucn.org/explore-sites/wdpaid/555622043 (accessed 3/5/2018) and <https://www.devex.com/news/in-india-not-all-are-pleased-by-a-national-park-s-world-heritage-status-91139/amp> (accessed 27/7/2018).
- ¹⁰⁴ Tambe, S. and Rawat, G.S. 2009. op cit.
- ¹⁰⁵ Bhagwat, S., Diwan, M. and Venkataramani, V. 2011. op cit.

- ¹⁰⁶ Chettri, S. 2015. Politics of pastoralism and social exclusion: A case study of Sikkim. Dissertation for Master of Philosophy, Sikkim University, Gangtok.
- ¹⁰⁷ ICOMOS Khangchendzonga (India) No 1513 whc. unesco.org/document/152839 (accessed 3/5/2018).
- ¹⁰⁸ *ibid.*
- ¹⁰⁹ Lachungpa, U. 2009. Indigenous lifestyles and biodiversity conservation issues in North Sikkim. *Indian Journal of Traditional Knowledge* 8 (1): 51-55.
- ¹¹⁰ www.worldheritageoutlook.iucn.org/explore-sites/wdpaid/555622043 (accessed 3/5/2018).
- ¹¹¹ Lachungpa, U. 2009. *op cit.*
- ¹¹² World Heritage Nomination – IUCN Technical Evaluation Khangchendzonga National Park (India) 2016. *op cit.*
- ¹¹³ www.worldheritageoutlook.iucn.org/explore-sites/wdpaid/555622043 (accessed 3/5/2018).
- ¹¹⁴ World Heritage Nomination – IUCN Technical Evaluation Khangchendzonga National Park (India) 2016. *op cit.*
- ¹¹⁵ whc.unesco.org/en/list/1513 (accessed 3/5/2018).
- ¹¹⁶ <https://www.devex.com/news/in-india-not-all-are-pleased-by-a-national-park-s-world-heritage-status-91139/amp> (accessed 27/7/2018).
- ¹¹⁷ www.worldheritageoutlook.iucn.org/explore-sites/wdpaid/555622043 (accessed 3/5/2018).
- ¹¹⁸ whc.unesco.org/en/list/1513 (accessed 3/5/2018).
- ¹¹⁹ *ibid.*
- ¹²⁰ Tambe, S. and Rawat, G.S. 2009. *op cit.*
- ¹²¹ whc.unesco.org/en/list/801/ (accessed 4/5/2018).
- ¹²³ *ibid.*
- ¹²⁴ *ibid.*
- ¹²⁵ *ibid.*
- ¹²⁶ World Heritage Committee. 2016. Decision 40 COM 7B.80. Lake Turkana National Parks (Kenya) (N 801bis) <https://whc.unesco.org/en/soc/3455>(accessed 11/5/2018).
- ¹²⁷ www.worldheritageoutlook.iucn.org/explore-sites/wdpaid/145586 (accessed 4/5/2018).
- ¹²⁸ <https://en.unesco.org/news/lake-turkana-national-park-site-kenya-inscribed-list-world-heritage-danger>.
- ¹²⁹ UNESCO and IUCN. 2012. Reactive Monitoring Mission to Lake Turkana National Parks (Kenya). Paris, France and Gland, Switzerland: UNESCO World Heritage Centre and IUCN. <https://whc.unesco.org/document/117237> (accessed 10/5/2018).
- ¹³⁰ <https://www.internationalrivers.org/blogs/433-9> (accessed 4/5/2018).
- ¹³¹ UNEP-WCMC. 2011. Lake Turkana National Parks, Kenya. UNEP-WCMC World Heritage Information Sheets. www.unep-wcmc.org/resources-and-data/world-heritage-information-sheets (accessed 1/5/2018).
- ¹³² Cabeza, M., Fernandez-Llamazares, A., Burgas, D., Fraixedas, S. and Lopez-Baucells, A. 2016. Breaking the Cradle of Humankind. *Biosphere* 18: 58-69.
- ¹³³ Dioli, M. 2018. Nomad aesthetic: Cattle modifications among the northern Turkana of north west Kenya, *Pastoralism: Research, Policy and Practice* 8: 6. DOI 10.1186/s13570-017-0110-4.
- ¹³⁴ Ogutu, J.O., Piepho, H-P., Said, M.Y., Ojwang, G.O., Njino, L.W., et al. 2016. Extreme wildlife declines and concurrent increase in livestock numbers in Kenya: What are the causes? *PLoS ONE* 11(9): e0163249. doi:10.1371/journal.pone.0163249.
- ¹³⁵ *ibid.*

¹³⁶ *ibid.*

¹³⁷ Bollig, M. 2016. Adaptive cycles in the savannah: Pastoral specialization and diversification in northern Kenya, *Journal of Eastern African Studies*, **10** (1): 21-44, DOI: 10.1080/17531055.2016.1141568.

¹³⁸ Ogutu, J.O., Piepho, H-P., Said, M.Y., Ojwang, G.O., Njino, L.W., et al. 2016. *op cit.*

¹³⁹ *ibid.*

¹⁴⁰ Watete, P.W., Makau, W-K., Njoka, J.Y., AderoMacOpiyo, L. and Mureithi, S.W. 2016. Are there options outside livestock economy? Diversification among households of northern Kenya. *Pastoralism: Research, Policy and Practice* 6:3 DOI 10.1186/s13570-016-0050-4.

¹⁴¹ von Hohnel, L. 1894. *A Narrative of Count Samuel Teleki's Exploring and Hunting Expedition in East Equatorial Africa in 1887 and 1888*. Longmans, London and New York.

¹⁴² Stewart, D.R.M. 1963. Wildlife census: Lake Rudolf. *East African Wildlife Journal* **1**: 121.

¹⁴² Gownaris, N.J., Pikitch, E.K., Aller, J.Y., Kaufman, L.K., Kolding, J., et al. 2016. Fisheries and water level fluctuations in the world's largest desert lake. *Ecohydrology* **10** (1): <https://doi.org/10.1002/eco.1769>.

¹⁴³ Cabeza, M., Burgas, D., Rocha, R., Fernández-Llamazares, Á., Fraixedas, S., et al. 2016. Winds of Hope for Sibiloi National Park. *Swara* **4**: 33-37.

¹⁴⁴ www.worldheritageoutlook.iucn.org/explore-sites/wdpaid/145586 (accessed 4/5/2018).

¹⁴⁵ UNESCO and IUCN. 2012. Reactive Monitoring Mission to Lake Turkana National Parks (Kenya). Paris, France and Gland, Switzerland: UNESCO World Heritage Centre and IUCN. <https://whc.unesco.org/document/117237> (accessed 10/5/2018).

¹⁴⁶ www.worldheritageoutlook.iucn.org/explore-sites/wdpaid/145586 (accessed 4/5/2018).

¹⁴⁷ UNESCO and IUCN. 2015. Reactive Monitoring Mission to Lake Turkana National Parks (Kenya). Paris, France and Gland, Switzerland: UNESCO World Heritage Centre and IUCN. <https://whc.unesco.org/document/136991> (accessed 10/5/2018).

¹⁴⁸ Maghanjo Mwamidi, D., Renom, J.G., Fernández-Llamazares, Á., Burgas, D., et al. 2018. Contemporary pastoral commons in East Africa as OECMs: A case study from the Daasanach community. *PARKS* 24 Special Issue: 79-88.

¹⁴⁹ Ogutu, J.O., Piepho, H-P., Said, M.Y., Ojwang, G.O., Njino, L.W., et al. 2016. *op cit.*

¹⁵⁰ www.worldheritageoutlook.iucn.org/explore-sites/wdpaid/145586 (accessed 4/5/2018).

¹⁵¹ UNESCO and IUCN. 2012. *op cit.*

¹⁵² UNESCO and IUCN. 2015. *op cit.*

¹⁵³ www.worldheritageoutlook.iucn.org/explore-sites/wdpaid/145586 (accessed 4/5/2018).

¹⁵⁴ UNEP-WCMC. 2011. *op cit.*

¹⁵⁵ www.worldheritageoutlook.iucn.org/explore-sites/wdpaid/145586 (accessed 4/5/2018).

¹⁵⁶ UNEP-WCMC. 2011. *op cit.*

¹⁵⁷ UNESCO and IUCN. 2012. *op cit.*

¹⁵⁸ Fernández-Llamazares, Á. and Cabeza, M. 2018. Rediscovering the potential of indigenous storytelling for conservation practice. *Conservation Letters* **11** (3): 1-12.

¹⁵⁹ <https://sibiloi.wordpress.com/ethnographic-research/> (accessed 10/5/2018).

¹⁶⁰ Ogutu, J.O., Piepho, H-P., Said, M.Y., Ojwang, G.O., Njino, L.W., et al. 2016. *op cit.*

¹⁶¹ <http://whc.unesco.org/en/list/774> (accessed 26/3/2018).

- ¹⁶² <https://www.protectedplanet.net/laponian-area-world-heritage-site> (accessed 26/3/2018).
- ¹⁶³ Svets, K. and Sande, A. 2016. Solving landscape-related conflicts through transnational learning? The case of transboundary Nordic World Heritage sites, *Landscape Research* **41** (5): 524-537, DOI: 10.1080/01426397.2016.1151485.
- ¹⁶⁴ Reimerson, E. 2016. Sámi space for agency in the management of the Laponia World Heritage site, *Local Environment*, **21** (7): 808-826, DOI: 10.1080/13549839.2015.1032230.
- ¹⁶⁵ Green, C. 2014. The Laponian World Heritage Area: Conflict and Collaboration in Swedish Sápmi. In: Disko, S. and Tugendhat, H. (eds.) *World Heritage Sites and Indigenous Peoples' Rights*, IWGIA, Forest Peoples Programme, Gundjehmi Aboriginal Corporation.
- ¹⁶⁶ Reimerson, E. 2016. op cit.
- ¹⁶⁷ Svets, K. and Sande, A. 2016. op cit.
- ¹⁶⁸ Porsanger, J. 2012. Indigenous Sámi religion: General considerations about relationships. In Mallarach, J.-M., Papayannis, T. and Väisänen, R. (eds.) *The Diversity of Sacred Lands in Europe: Proceedings of the Third Workshop of the Delos Initiative – Inari/Aanaar 2010*. Gland, Switzerland: IUCN and Vantaa, Finland: Metsähallitus Natural Heritage Services.
- ¹⁶⁹ Svets, K. and Sande, A. 2016. op cit.
- ¹⁷⁰ Green, C. 2014. op cit.
- ¹⁷¹ Reimerson, E. 2016. op cit.
- ¹⁷² <http://whc.unesco.org/en/list/774> (accessed 26/3/2018).
- ¹⁷³ Reimerson, E. 2016. op cit.
- ¹⁷⁴ *ibid.*
- ¹⁷⁵ Tjuottjudusplána. 2012. *The Management Plan of the Laponian World Heritage site*. https://laponia.nu/wp-content/uploads/2014/08/Laponia-forvaltningsplan-eng-web-150327_2.pdf (accessed 26/3/2018).
- ¹⁷⁶ Reimerson, E. 2016. op cit.
- ¹⁷⁷ *ibid.*
- ¹⁷⁸ *ibid.*
- ¹⁷⁹ *ibid.*
- ¹⁸⁰ Green, C. 2014. op cit.
- ¹⁸¹ IUCN/WCMC. 1996. World Heritage Nomination – IUCN Summary, The Laponian Area (Sweden).
- ¹⁸² <https://www.worldheritageoutlook.iucn.org/explore-sites/wdpaid/124388> (accessed 26/3/2018).
- ¹⁸³ <http://eunis.eea.europa.eu/sites/SE940002> (accessed 26/3/2018).
- ¹⁸⁴ Eriksson, O., Niva, M. and Caruso, A. 2007. Use and abuse of reindeer range. *Acta Phytogeographica Suecica* **87**. Svenska Vaxtgeografiska Sällskapet, Uppsala.
- ¹⁸⁵ Wielgolaski, F.E. 2002. Nordic mountain birch-forests. In: Kankaanpää, S., Müller-Wille, L., Susiluoto, P. and Sutinen, M.L. (eds.) *Northern Timberline Forests: Environmental and Socio-economic Issues and Concerns. The Finnish Forest Research Institute Research Papers* 862, Kolari Research Station, pp 76-90.
- ¹⁸⁶ UNEP-WCMC. 2011. Socotra Archipelago, Yemen. UNEP-WCMC World Heritage Information Sheets. www.unep-wcmc.org/resources-and-data/world-heritage-information-sheets (accessed 1/5/2018).
- ¹⁸⁷ whc.unesco.org/en/list/1263 (accessed 1/5/2018).
- ¹⁸⁸ UNEP-WCMC. 2011. op cit.
- ¹⁸⁹ *ibid.*

- ¹⁹⁰ Scholte, P., Al-Okaishi, A. and Saed Suleyman, A. 2011. When conservation precedes development: A case study of the opening up of the Socotra archipelago, Yemen. *Oryx* **45** (3): 401-410.
- ¹⁹¹ UNEP-WCMC. 2011. Socotra Archipelago, Yemen. op cit.
- ¹⁹² Cheung, C. and DeVantier, L. 2008. Socotra – a natural history of the islands and their people. In: Van Damme, K. (ed.): *Odyssey Books and Guides*. Airphoto International Ltd., Hong Kong.
- ¹⁹³ Scholte, P., Al-Okaishi, A. and Saed Suleyman, A. 2011. op cit.
- ¹⁹⁴ Morris, M. 2018. The Traditional Way of Life in *Information and Advice for Visitors and Tourists*, Friends of Socotra, www.friendsofsoqotra.org/pdfs/FOS%20Leaflets%20for%20Visitors%20English%20-%20March%202018.pdf (accessed 1/5/2018).
- ¹⁹⁵ Scholte, P., Al-Okaishi, A. and Saed Suleyman, A. 2011. op cit.
- ¹⁹⁶ OCHA. 2017. *Humanitarian Bulletin Yemen*, 26.
- ¹⁹⁷ *ibid*.
- ¹⁹⁸ www.aljazeera.com/indepth/inpictures/2015/02/precarious-living-yemeni-island-socotra-150213145010826.html (accessed 1/5/2018).
- ¹⁹⁹ www.britishcouncil.org/arts/culture-development/cultural-protection-fund/projects/Intergrating-Socotra-heritage (accessed 1/5/2018).
- ²⁰⁰ Morris, M. 2018. op cit.
- ²⁰¹ Kingdon, J. 1989. *Island Africa: The Evolution of Africa's Rare Plants and Animals*. Princeton University Press, Princeton, New Jersey, pp. 38-42.
- ²⁰² Scholte, P. and de Geest, P. 2010. The climate of Socotra Island (Yemen): A first-time assessment of the timing of the monsoon wind reversal and its influence on precipitation patterns and vegetation. *Journal of Arid Environments* **74**: 1507-1515.
- ²⁰³ Peutz N. 2011. Bedouin 'abjection': World heritage, worldliness, and worthiness at the margins of Arabia. *American Ethnologist* **38** (2), 338-360. doi:10.1111/j.1548-1425.2011.01310.x.
- ²⁰⁴ UNEP-WCMC. 2011. Socotra Archipelago, Yemen. op cit.
- ²⁰⁵ Scholte, P., Al-Okaishi, A. and Saed Suleyman, A. 2011. op cit.
- ²⁰⁶ *ibid*.
- ²⁰⁷ www.worldheritageoutlook.iucn.org/explore-sites/wdpaid/903138 (accessed 1/5/2018).
- ²⁰⁸ whc.unesco.org/en/soc/3461 (accessed 1/5/2018).
- ²⁰⁹ Scholte, P., Miller, T., Raqueb Shamsan, A., Saed Suleiman, A., Taleb, N., et al. 2008. *Goats: Part of the Problem or the Solution to Biodiversity Conservation on Socotra?* Socotra Conservation and Development Programme. Hadibo, Socotra, Yemen.
- ²¹⁰ Scholte, P., Al-Okaishi, A. and Saed Suleyman, A. 2011. op cit.
- ²¹¹ Scholte, P., Miller, T., Raqueb Shamsan, A., Saed Suleiman, A., Taleb, N., et al. 2008. op cit.
- ²¹² whc.unesco.org/en/soc/3461 (accessed 1/5/2018).
- ²¹³ <https://www.protectedplanet.net/swiss-tectonic-arena-sardona-world-heritage-site> (accessed 26/3/2018).
- ²¹⁴ Swiss Federal Office for the Environment. 2006. *Nomination of the Glarus overthrust as a UNESCO World Heritage site*. Federal Office for the Environment, Bern, Switzerland.
- ²¹⁵ *ibid*.
- ²¹⁶ Seidl, I., Böni, R., Lauber, S. and Herzog, F. 2015. Developing, Implementing and Communicating Inter- and Transdisciplinary Research: AlpFUTUR as an Example *GAIA* **24** (3): 188-195.

- ²¹⁷ Swiss Federal Office for the Environment. 2006. op cit.
- ²¹⁸ ibid.
- ²¹⁹ Seidl, I., Böni, R., Lauber, S. and Herzog, F. 2015. op cit.
- ²²⁰ Liechti, K. and Biber, J.P. 2016. op cit.
- ²²¹ Swiss Federal Office for the Environment. 2006. op cit.
- ²²² ibid.
- ²²³ Vittoz, P. and Engler, R. 2007. Seed dispersal distances: A typology based on dispersal modes and plant traits. *Botanica Helvetica* **117**: 109-124.
- ²²⁴ UNEP-WCMC. 2011. *Swiss Tectonic Arena Sardona, Switzerland. UNEP-WCMC World Heritage Information Sheets*. <https://www.unep-wcmc.org/resources-and-data/world-heritage-information-sheets> (accessed 27/3/2018).
- ²²⁵ Swiss Federal Office for the Environment. 2006. *Nomination of the Glarus overthrust as a UNESCO World Heritage site*. Federal Office for the Environment, Bern, Switzerland
- ²²⁶ Liechti, K. and Biber, J.P. 2016. op cit.
- ²²⁷ <https://www.worldheritageoutlook.iucn.org/explore-sites/wdpaid/903140> (accessed 27/3/2018).
- ²²⁸ UNEP-WCMC. 2011. *Swiss Tectonic Arena Sardona, Switzerland*. op cit.
- ²²⁹ Swiss Federal Office for the Environment. 2006. *Nomination of the Glarus overthrust as a UNESCO World Heritage site*. Federal Office for the Environment, Bern, Switzerland.
- ²³⁰ Liechti, K. and Biber, J.P. 2016. op cit.
- ²³¹ IUCN. 2008. World Heritage Nomination – IUCN Technical Evaluation: Swiss Tectonic Arena Sardona, Switzerland – ID No. 1179. IUCN, Gland, Switzerland.
- ²³² UNEP-WCMC. 2011. *Swiss Tectonic Arena Sardona, Switzerland*. op cit.
- ²³³ www.nasa.gov/multimedia/imagegallery/image_feature_1070.html (accessed 2/5/2018).
- ²³⁴ whc.unesco.org/en/list/769/ (accessed 2/5/2018).
- ²³⁵ ibid.
- ²³⁶ www.nhpfund.org/nominations/uvs-nuur.html (accessed 2/5/2018).
- ²³⁷ IUCN. 2003. IUCN Technical Evaluation, *Uvs Nurr Basin (Mongolia / Russian Federation)* ID No. 769 Rev. Gland (Switzerland): IUCN. <http://whc.unesco.org/en/list/769/documents/> (accessed 2/5/2018).
- ²³⁸ Hilbig, W. 2003. The distribution of the vegetation in the Uvs-nuur basin and its surrounding mountain ranges, *Feddes Repertorium* **114** (7-8): 540-558. DOI: 10.1002/fedr.200311014.
- ²³⁹ IUCN. 2003. *IUCN Technical Evaluation, Uvs Nurr Basin (Mongolia / Russian Federation)* op cit.
- ²⁴⁰ whc.unesco.org/en/list/769/ (accessed 2/5/2018).
- ²⁴¹ ibid.
- ²⁴² World Heritage nomination document, 2003. whc.unesco.org/uploads/nominations/769rev.pdf (accessed 2/5/2018).
- ²⁴³ Hilbig, W. 2003. op cit.
- ²⁴⁴ www.worldheritageoutlook.iucn.org/explore-sites/wdpaid/900880 (accessed 2/5/2018).
- ²⁴⁵ ibid.
- ²⁴⁶ Mongush, M. 2006. Modern Tuvan Identity. *Inner Asia* **8** (2): 275-296. DOI: 10.1163/146481706793646765.
- ²⁴⁷ UNEP-WCMC. 2011. *Uvs Nuur Basin, Mongolia & Russian Federation*. op cit.
- ²⁴⁸ ibid.

- ²⁴⁹ Ulambayar, T., Fernández-Giménez, M., Baival, B. and Batjav, B. 2016. Social outcomes of community-based rangeland management in Mongolian steppe ecosystems. *Conservation Letters* 10 (3): 317-327 DOI: 10.1111/conl.12267.
- ²⁵⁰ www.worldheritageoutlook.iucn.org/explore-sites/wdpaid/900880 (accessed 2/5/2018).
- ²⁵¹ UNEP-WCMC. 2011. *Uvs Nuur Basin, Mongolia & Russian Federation*. op cit.
- ²⁵² www.worldheritageoutlook.iucn.org/explore-sites/wdpaid/900880 (accessed 2/5/2018).
- ²⁵³ IUCN 2013. World Heritage Outlook Consultation form. World Heritage Site: Uvs Nuur Basin. Gland, Switzerland: IUCN.
- ²⁵⁴ Tilman Jaeger, personal communication, October 2018.
- ²⁵⁵ whc.unesco.org/en/list/769/ (accessed 2/5/2018).
- ²⁵⁶ UNEP-WCMC. 2011. *Uvs Nuur Basin, Mongolia & Russian Federation*. op cit.
- ²⁵⁷ World Heritage nomination document, 2003. op cit.
- ²⁵⁸ Mongush, M. 2006. op cit.
- ²⁵⁹ factsanddetails.com/russia/Minorities/sub9_3e/entry-5125.html (accessed 2/5/2018).
- ²⁶⁰ whc.unesco.org/en/list/769/ (accessed 2/5/2018).
- ²⁶¹ Butorin, A. 2005. Elaboration of a Joint Mongolian-Russian Federation Site Management Plan for the "Uvs Nuur Basin" World Heritage Site, UNESCO Activity-Financing Contract No.: 876884.5. www.nhpfund.org/research-projects/uvs-nuur-project-report.html (accessed 2/5/2018).
- ²⁶² <https://whc.unesco.org/en/criteria/> (accessed 11/5/2018).
- ²⁶³ Randall, S. 2015. Where have all the nomads gone? Fifty years of statistical and demographic invisibilities of African mobile pastoralists. *Pastoralism: Research, Policy and Practice* 5: 22.
- ²⁶⁴ Markarkis, J. 2004. *Pastoralism on the Margin*. Minority Rights Group International, London.
- ²⁶⁵ Pandey, A., Pradhan, N., Chaudhari, S. and Ghate, R. 2017. Withering of traditional institutions? An institutional analysis of the decline of migratory pastoralism in the rangelands of the Kailash Sacred Landscape, western Himalayas. *Environmental Sociology* 3 (1): 87-100. DOI: 10.1080/23251042.2016.1272179.
- ²⁶⁶ Dong, S., Wen, L. Liu, S., Zhang, X. Lassoie, J.P. et al. 2011. Vulnerability of worldwide pastoralism to global changes and interdisciplinary strategies for sustainable pastoralism. *Ecology and Society* 16 (2): 10. [online] URL: <http://www.ecologyandsociety.org/vol16/iss2/art10/>.
- ²⁶⁷ Brumann, C. and Berline, D. 2016. Introduction; UNESCO World Heritage – Grounded? In: Brumann, C. and Berline, D. (eds.) *World Heritage on the Ground: Ethnographic perspectives*, Berghahn Books, New York · Oxford (p. 10).



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