# 3. "It Does Matter Who Leans on the Stick": Hungarian Herders' Perspectives on Biodiversity, Ecosystem Services and their Drivers

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**MOTTO:** **Nature as source of knowledge**
**(the story of the village teacher and the old herder)**

*The old shepherd is lying on his front on his suba [sheepskin greatcoat], smoking his pipe quietly. I haven't seen him for ages. Last summer I visited him a lot. I had the idea of teaching him to read, but he just shook his head.*

*"I don't want to be a priest," he said. "My two books are enough for me."*

*"Which two books?"*

*"My day-book and my night-book."*

*"What are they?"*

*"My day-book is the field, my night-book is the starry sky."*

*Then he taught me to read from his two books. He taught me about "blood grass", which opens up locks; about "Mary's tears", which tremble eternally among the blades of grass; the "saga herb", whose roots everyone should wear around their neck … and countless other secrets of the earth, and also of the sky, where every star has a name. Then the old herder talked about the crack in the sky – when it opens up, people can catch a glimpse into Heaven.*

G. Gárdonyi, Fires and shadows (a novel in the book '*My Village*'). Légrády, Budapest, 1898.

## Summary

This chapter is based on a film made with traditional herders (Indigenous and Local Knowledge (ILK) holders) in Hungary for the IPBES Regional Assessment for Europe and Central Asia (Molnár *et al*. 2016b[1]). The goal of the film was to provide an overview of herders' traditional ecological knowledge (TEK), which is a type of ILK. The herders interviewed are traditional herders possessing rich TEK mostly inherited from the family and previous generations, and tested and adapted during their personal life. In this chapter we summarize herders' understandings, knowledge and arguments related to the origin of their knowledge, indicators of knowledge validation, trends of biodiversity, ecosystem services and drivers behind these changes, effects of invasive alien species, cooperation and conflicts with conservation management, herders' own innovations for reducing some of the conflicts, the role of ancient breeds in animal husbandry and nature conservation, effects of agricultural regulations, and effects of drivers like subsidies and the global market on herders' quality of life. A section is dedicated to planning and traditional scenario building. We put special emphasis on possibilities of knowledge co-production by herders and conservationists/scientists, and the role policies and different value systems play in the herders' well-being, resilient continuation of their livelihoods and sustainable use of biodiversity. All text *in italics* is a quotation from the herders in the film, the follow-up ILK dialogue workshops or from our own previous studies. Dashed lines (/) separate quotations of different herders.

## Key messages

- Many traditional herders are knowledgeable about local biodiversity and ecosystem services, though they feel that "*a lot of people don't consider it real knowledge*." (Molnár 2012a, 2012b, 2013, 2014)
- ILK in the European, Central Asian region is a rich source of local understandings and management practices that can help the sustainable management of biodiversity and ecosystem services: "*I try to fit in with both sides, so that it's good for me and for the conservation ranger.*" "*Every area still has its own herder, who knows the area, and knows what can graze where and when*." (cf. Oteros-Rozas *et al*. 2013, Meuret and Provenza 2014, Haraszthy 2014, Molnár 2014, Babai *et al*. 2015, Hartel *et al*. 2015, Varga *et al*. 2016a, b, Varga and Molnár 2014)
- Traditional peoples are not a source of conflict, but in many cases they provide opportunities to learn about a potentially more sustainable use of natural resources (Berkes *et al*. 2000). They may help us pinpoint incentives and policies that are harmful to biodiversity and ecosystem services, and prevent misinterpretation of the local effects of policies and other drivers (Babai *et al*. 2015, Batáry *et al*. 2015, Molnár *et al*. 2016a,b, Varga *et al*. 2016b).
- Local traditional knowledge is dynamic and adaptive: "*I adopted what I needed from the older people*." The added value of traditional knowledge is that it is learnt through living in close relation to the environment, dependent on ecosystem services (Gugič 2009, Berkes 2012, Babai *et al*. 2014, Molnár 2012b).
- Herders deserve respect for their knowledge and the management of local ecosystem services: "*If people respected us a bit more, that would mean a lot*." (cf. Henle *et al*. 2008, Molnár 2012b, Kunkovács 2015)
- The European, Central Asian region has high biological and cultural diversity. Local people are diverse, thus policies and regulations have to respect these diversities: "*The kind of herding*

1 The short, 17-minute summary version is available here: www.youtube.com/watch?v=2Dq_U-yCBfI; and the longer 38-minute version with more ecological details here: www.youtube.com/watch?v=dj5iLAuWoJg.

*I do now will be killed off sooner or later, regardless of the subsidy structure.*" (cf. Nori and Gemini 2011, Hernández-Morcillo *et al*. 2014, Sutcliffe *et al*. 2015, Babai *et al*. 2015, Hartel *et al*. 2015, Molnár and Berkes 2016, Molnár *et al*. 2016a,b)

- Herders argue that human-nature relations of the wider society should be changed: "*People should be encouraged to love nature, to see where they live.*" / "*Young people should be taught to love nature.*"
- Co-production of knowledge by ILK holders and scientists produces new knowledge that neither of them would otherwise have: "*In fact, for them to know something, or to write a book or make a film, they need us very much!*" "*Conservation rangers wouldn't talk to us 20 years ago. Now they stop and we can talk about pasturing.*" (cf. Tengö *et al*. 2014, Molnár *et al*. 2016a,b)

## 3.1. Introduction

### 3.1.1. Concept of the chapter

This chapter is not intended to be a conventional scientific paper. It provides a sort of structured message of Hungarian traditional herders for the regional and global assessments, and for policy makers, conservation managers, scientists and other stakeholders. The first and last authors have been studying traditional herders' ecological knowledge since 2008. They have published several papers in English and Hungarian and a bilingual book on this topic. The second, third and fourth authors are considered three of the most knowledgeable middle-aged Hungarian herders. The remaining two authors are students who participated in the research and film-making.

### 3.1.2. Study area

The most economic 'modern' use of species-rich grasslands and wood-pastures in protected areas in Hungary is extensive grazing that produces high-quality meat. Hungarian grasslands still provide livelihoods for hundreds of herding and thousands of farming families. Traditional herders manage grasslands by extensive, rotational grazing, clearing, deliberate trampling in certain seasons, burning and manuring to increase forage quality and quantity (Molnár 2014, Molnár *et al*. 2015; Varga and Molnár 2014). The three herders co-authoring this chapter utilize saline steppes, sand grasslands and wet *Molinia* meadows. These grasslands survived intensification because the area cannot be profitably used for intensive arable farming, and were designated as protected areas between the 1970s and the1990s. Herders usually have been born into multigenerational herder families, even though it is increasingly common that the livestock is fenced or is accompanied by someone who is not a herder by 'training'. Grasslands are divided into pasture parcels with approximately 90–150 hectares available for a flock of sheep and 500-800 hectares for a cattle herd. Fixed fencing and hedgerows are rare, electric fencing is spreading. As a rule, a flock and a herd consists of 500-800 sheep and 250-300 heads of cattle, respectively. Herding dogs are still crucial in directing the herds. Grazing follows a recurring yearly cycle due to the seasonally variable, but annually partially repeated grazing conditions. Grazing season lasts from March/April to November/December (Molnár 2012b, Varga and Molnár 2014, Varga *et al*. 2016b), influenced by many factors, primarily weather and the hydrological condition of the pasture (Molnár 2014).

## 3.2. Methodology

Participatory observations of herding were carried out between 2008 and 2015 with 42 traditional herders. Parallel deep and semi-structured interviews were made with 134 herders and 43 conservation managers (for methodological details see Molnár 2014, Varga and Molnár 2014). Questions for the film were developed to serve the needs of the European and Central Asian Assessment but were culturally adapted to the herders' world view. The text of the chapter is based as much as possible on original quotations. Interviews for the film were made in July and October 2015 at Hajdúsámson (L. Sáfián, born 1969), Kunpeszér (J. Máté, born 1980) and Kunmadaras (S. Barta, born 1982), in Hungary. All text in italics is a quotation from the film, the follow-up ILK dialogue workshops or from the authors' previous studies. Dashed lines (/) separate quotations of different herders. The first version of the film was watched together with the herders on 29 March 2016, and was modified according to their comments. Informed consent was obtained at the beginning of filming and after the finishing of the film. The film is available online (see footnote 1). The messages of the chapter were reviewed and commented on during four follow-up workshops held in March, April and May 2016 in Hódmezővásárhely, Kunadacs, Poroszló, and Hajdúböszörmény.

## 3.3. Traditional ecological knowledge of Hungarian herders

### 3.3.1. Origin of herders' knowledge

Herders' knowledge is a culturally transmitted, dynamic knowledge, primarily inherited from older generations but also adapted to the modern socio-ecological environment (photos pp. 47 & 48). As herders put it: *I was born into it. I learnt everything I know about herding from my father, and I adopted what I needed from the older people. / Not from books, but from my father and grandfather. / I learnt it from my father. I didn't study this, I inherited it, I was born into it.*

The second most important source of information for traditional ecological knowledge is personal observation; that is, personal experience. Herders spend a tremendous amount of time out in the pasture, a great deal of information gets fixed consciously and unconsciously in their memory: *I was there with the herd, to fatten them, that's why we can explain so much. / I only know what I lived through, I got wet and was cold many times. Several herders explicitly said that a good herder must learn directly from the animals: We were talking with them like I do with you now. / Sheep so much don't like [this plant] that I don't even care to call it by a name. / I know only what they eat.*

Ábel Molnár

Traditional herders learn their ecological knowledge in the family, from elders, and by personal experience from the livestock and nature. They argue that "*it does matter who leans on the stick*" – in this case on a shepherd hook, László Sáfián, shepherd (Varga *et al.* 2016a, Molnár 2012, Molnár *et al.* 2016b).

Comparison of herders' vocabulary with scientific nomenclature showed much less overlap than expected. For example, for local plant names the overlap was less than 10%, for habitat names the overlap was what science took from herders (Molnár 2012a, 2012b). The herders' knowledge system seems to develop quite independently from Western Science.

### 3.3.2. Indicators of knowledge validation by herders

Herders keep validate each others' knowledge. Nothing is accepted if not legitimate. *Just one sentence, or from the way he moves, from his nature, if I talk to him, and I know if he's a herder, or just faking it. /* [A real herder] *lives with his herd about 90% of the time. His livestock gives him away. You can tell from them* [the livestock] *if the person looking after them is a "pastor" or just a nobody. / The most important thing is for his family to have been herders, at least one generation back.*

The ways in which herders typically learn reflect this need for legitimacy (Varga *et al*. 2016a). When we asked what makes a good herder, the first answer was: *to love the animals. Sheep have to be as loved as a child. / One who doesn't love animals shall not stand beside them, these animals expect from us* [fodder, care etc.]. */ You have to love the livestock, and spend time and energy with them. An average man at home has to love his family at most, but we have to love this too. We can't take time off, there are no Sundays. / I can't just go home after an eight-hour shift. It's more than that. You wake up at night thinking, what are the sheep doing?*

Ábel Molnár

Traditional herders use ancient practices to graze their livestock. However, old practices are constantly adapted to new socio-ecological environments (Molnár 2012, Molnár *et al*. 2016a,b).

### 3.3.3. Grass as an ecosystem service

Grass is the key ecosystem service for herders. *We live 100% on grass. / The way I see it, if there's no livestock, then I don't exist either. No money, no family, I'd have to find another way to survive. I don't want to drive a tractor or mow meadows. / I see myself as a herder, so it's very important for a calf to reach the right weight as soon as possible, without fodder, only eating grass and drinking its mother's milk.*

*That's a source of pride to me, that's why I see myself as a herder.* As grass is the primary forage, grasses, sedges and their relatives are well known by herders (more than 29 folk taxa, Molnár 2012b).

Herders are observant people and they show a kind of elementary affection towards wildlife: *we couldn't bring over the trough for two years! By the time we got there* [in spring], *a hoopoe had already nested underneath*.... Once a herder saved a nice plant never seen before from grazing (*Asclepias syriaca*): *I took water and watered it, goat doesn't eat it, when you come, I show it* [and asked its name]. The relation of herders to pasture plants is, however, typically utilitarian: *I know them as long as they are good for me, I am into it* [=learning/knowing them] *because I am interested*.

### 3.3.4. Biodiversity trends and their drivers

Herders have a deep understanding of biodiversity and its trends (Molnár 2014, Varga and Molnár 2014). They distinguish at least 160 wild plant folk taxa, and about 80 folk habitat types (Figure 3.1 below) and they have a detailed understanding of landscape history, and processes of ecosystem degradation and regeneration (Molnár 2014). *There are fewer birds now than before. I think that's because there was more livestock in the past.* [Steppe birds] *put their nests where they can see all around, where things are safe. There are more beetles, more cowpats for birds to feed from* [on pastures]. */ The partridge has completely disappeared. / Swallows have also almost totally disappeared. And the birds that used to pick the flies off the livestock. / There are plenty of wild boars, thanks to the reeds, where they like to hide. They completely dig up the pasture. That's not good for us.*

The most general view is that there is not enough grazing livestock, and thus the landscape changes: *it was loaded in the past;* [now] *there is nothing to keep it clean. / The entire* [area] *is wild, became wild. / The grassland is dirty* [full of litter]. The main term is 'to have become wild', meaning that it is no longer under the orderly control of herders, leaf litter has accummulated, and biomass production has dropped (Molnár 2014, cf. Babai *et al*. 2014, Babai and Molnár 2014).


Zsolt Molnár

**Figure 3.1.** Some of the key folk habitat names used by Hungarian herders herding on saline steppes. Herders can assign a specific name to every part of their pastures (for details see Molnár 2012a,b, 2013).

### 3.3.5. How invasive alien species affect ecosystem services

Hungary's natural heritage is heavily impacted by the spread of invasive species (Haraszthy 2014). Grasslands are being encroached by e.g. *Amorpha fruticosa, Solidago* spp. and *Asclepias syriaca*. Invasive species have expected and unexpected effects on herding. While *Asclepias* is degrading pastures, some invasive species provide new ecosystem services. According to herders *old-field grass* [ragweed, *Ambrosia artemisiifolia*] *is good for grazing in summer. Sheep like to browse on old-field grass by the roadside or in stubble. It's no enemy of mine. You can fatten sheep on it.* On floodplains, cattle feed on *Amorpha* which turned out to be an effective way of meadow restoration (Schindler *et al*. 2016).

Invasive species often spread on underused or abandoned marginal areas that were utilized as reserve pastures during early spring, summer drought or winter in the past. European Union and national agricultural policies focus on conventional pasture areas (dry and wet grasslands). Marginal areas are neglected, and invasive species are encroaching. However, for the effective operation of extensive grazing systems these areas are often very important and deserve more attention (Varga *et al*. 2016b).

### 3.3.6. Conflicts of hay meadow management

Conservation regulations have an increasing impact on traditional land-use practices in Hungary. Some practices are subsidised, some are banned (Molnár *et al*. 2016a, Babai *et al*. 2015). As local conservation management is rarely discussed with locals there are many unexpected and unnecessary side effects. Hay meadow management regulations are important for the protection of ground-nesting birds and insects but experiences show that regulations should be adapted more to local ecology and local traditions. *You can't start before 15 June. If it's a hot year, the grass is useless by then, because it's all dried out. / We only get second-class hay, no matter how we try.* All herders agree that late mowing has an adverse effect on traditional farming.

Burning is a difficult issue too. Herders argue that with burning they could control native spreading species: *Bushes encroach and the wetlands are taken over by sedge. The simplest way to stop these plants is with fire: that kills the sedge and the bush too. But that's illegal. Willow bushes [Salix cinerea] are protected by the National Park. They take up so much land, not just the meadows, but the pastures too, and they'll never give it back. Because we aren't even allowed to kill them.* There seems to be an urgent need for landscape- and culture-specific agricultural regulation and subsidy systems. Inappropriate regulations and disrespect for local traditions result in maladaptive solutions (cf. Babai *et al*. 2015, Molnár *et al*. 2016a).

### 3.3.7. Forest grazing

Forests were always part of the extensive grazing systems in Hungary (Hartel *et al*. 2015, Varga *et al*. 2015, 2016b). However, during the last 150 years grazing livestock has been increasingly banished from forests (Varga and Molnár 2014). Conscious suppression of traditional land-use practices is among the most important drivers of these changes. *Since I've lived here it's not allowed to graze in the forest. I've never done it legally, only in secret. It would make things easier. The grass starts growing there in early spring, that would mean a whole month less relying on fodder.* A more multifunctional use of forests and agroforestry systems, e.g. wood-pastures with recognized high nature and cultural value, would be beneficial also for herders (Vityi and Varga 2015).

### 3.3.8. Herders' solutions for reducing certain conflicts

Herders are not passive. They often develop tradition-based solutions that can serve as a compromise. Nature conservationists should acknowledge these and motivate further developments. For example: *I try to fit in with both sides, so that it's good for me and for the conservation*

*ranger. I did what I heard at home from my father. They grazed on the hay meadow in early spring. It's good for me, because the grass I cut* [in late June] *is not too old, but the grass is still there for their* [the rangers'] *wildlife until June. / My father and I started cutting down and clearing out the tall vegetation from the marsh. This made a good habitat for birds. In summer the water went away, and by September there was fresh grass for the livestock to graze on*. Knowledge co-production could be a useful tool to improve management. Herders and conservationists/scientists have started co-production of new knowledge that neither of them would otherwise have (Berkes 2012).

### 3.3.9. The role of ancient breeds in animal husbandry and nature conservation

Traditional breeds can find their place in modern pastures. *These are the breeds that are best suited for Hungary's pastures. If we had a proper lamb market, then with Hungarian racka sheep I could get the same results as I do now, with these more sensitive breeds, with half the work and half the trouble. / This is important because they* [ancient breeds] *graze on several types of plants that other breeds don't like to eat. Even on lower quality fodder you can produce better quality with them* [photo below]. *They're not* [so] *choosy. What's more, there are fewer problems. And it makes a herder proud to watch over Hungarian grey cattle more than with Hungarian Simmenthal.*

Grassland intensification is not permitted in protected areas. On these pastures bio meat production based on ancient breeds seems to be a good solution. Furthermore, the pasture grazed by ancient cattle and sheep breeds that are herded by traditional herders in traditional costumes has been a high quality ecotourism product since the early 20th century.

Ábel Molnár

Traditional old breeds not only hold valuable genes for future cross-breeding, they are the best suited animals to manage 'poor' saline pastures while providing high quality bio meat for the market (e.g. the grey cattle meat in baby foods) (Sándor Barta, cattle herder).

### 3.3.10. Livestock diversity

We asked herders why they keep diverse flocks: *We're trying to cross-breed meat-producing sheep, so that our pastures can support them. That's why they're so spectacularly cross-bred. So they are productive in two types of weather, in dry weather, and in rainy years too.* This is a good example for the role genetic diversity may play during adaptation to climate variability.

### 3.3.11. Why is the meat sold abroad? Global drivers and the need for marketing at home

Hungarian herders are too dependent on global markets. *Lamb meat should be advertised so that people know what we make here in Hungary, that they can buy it fresh, not frozen. Look, all the cooking programmes* [on TV] *have wine suggestions, which means that wine gets properly advertised. But lamb doesn't! Lamb stew has gone out of fashion in Hungary, so people have forgotten how to make it. And if stew is badly made, it gets a bad name.* Better marketing locally, nationally and regionally could highly improve herders' livelihoods. See, for example, the success story of the ancient breed of pig, the Hungarian Mangalitza (see e.g.: www.mangalicatenyesztok.hu/index-english.html).

### 3.3.12. A new driver: the EU subsidies and their controversial effects

Agricultural payments are a vital source of income for traditional herders though there are adverse side effects too. *Subsidies are very good because they help smallholders to develop, for example, by paying for proper winter fodder. The downside is that a lot of people are only keeping animals in order to qualify for the subsidies. That's bad for the herder community, because the large subsidies mean herders aren't needed.* [Because] *the livestock doesn't need to be productive, all that matters is the headcount.*

As electric fencing replaces herding, traditional knowledge of herders becomes less valued. Centuries old adaptive knowledge is being lost that could otherwise help develop old-new grassland management practices. Based on our own and on herders' experiences we suggest that in landscapes where traditional grassland management is still operational, regulators should learn local management practices first and ensure that if functional practices survived, they are adapted, instead of forcefully imposing requirements on farmers which are alien to the local landscape and society (Babai *et al*. 2015, Molnár *et al*. 2016a).

### 3.3.13. "Scenario building" by "sedentary nomads" – herders live in unstable socio-ecological environments

Traditional herders keep adapt to the changing socio-ecological environment. Herders continually have to make plans about the place and intensity of grazing (Kis *et al*., 2016). It has to be good for the animals so they fatten more rapidly, but some parts should be left for the rest of the year, others should not grow too tall because it would grow too old. Meanwhile, reserve pastures and places for cutting hay should also be reserved. Besides these shorter-term plans herders also have longer-term goals, visions, even scenarios, and they develop possible pathways to reach these desired goals (Molnár 2014, Molnár *et al*. 2016a).

As can be seen below, Hungarian herders have kept many nomadic elements in their ways of adaptation, as part of their world view. *What I know for sure is that the sheep do well today, but ten years from now I don't know what will happen. I'd like to do the same thing, in the same place. But there's no certainty. All I can plan with is my own expert knowledge. Even though I have my own flock, it's not enough to plan 2–3 years ahead. The problem is the pasture* [tenure] *and the lamb market. My father's way of thinking was: there are 100 collectives, and he won't live 100 years* [so he can easily move to another place]. *So he never planned long-term. And that's what we inherited. I know for sure that I look after my sheep well today, but tomorrow, who knows? / Things change. Everyone is moving into meat* [from producing milk]. *But change can come any time, and then… It's not easy. When you have one thing, the market needs the other, and then you have to change. / My parents said that in the 1970s, shearing was a celebration, and wool made a profit. Then things gradually got worse, so now we're happy if we can pay the shearer from the wool. In the old days, you could buy all the winter fodder from it.*

Planning processes must reflect on many unexpected drivers. European Union regulations are often based on Western European understandings and world-views that are sometimes very different from East-Central European ones (particularly, for example, in post-soviet EU member

states). Not only communism but the previous centuries have left their historical legacy that should be respected. Planning would be much easier if regulations were more respectful of local knowledge and culture.

## 3.4. Reading from more than one book: a future supported by multiple knowledge systems

### 3.4.1. Meeting of two knowledge and value systems

Traditional knowledge of herders and science-based knowledge of conservation rangers often meet as semi-natural pastures are mostly designated as protected areas. Different world views, different interests may result in conflicts (Molnár *et al*. 2016a). *Conservation rangers wouldn't talk to us 20 years ago. They criticised us without asking us anything. Now they stop and we can talk about pasturing. We agree on about 90% of things. The difference between them and me is that for the rangers, it's all about the plants* [protected plant species], *but for me it's all about the animals* [livestock]. */ Things are different here in the Kiskunság National Park. We have one ranger who wants to make things better, who represents our interests. / The situation is a bit better today. They* [the rangers] *still don't ask us about things, but if we have an idea, they give us more support. But we don't communicate enough for us to know what they are thinking, and they don't know what we think or want.*

The conclusion is that better communication could solve several of the conflicts (photo below).

Anna Varga

Meeting of knowledge systems in the field and production of new knowledge on grassland management. European Union policies and regulations are mostly based on Western European scientific experiences, world views and value systems: this may be one of the reasons why they are often inefficient or inappropriate to support biodiversity conservation in the East-Central European context. There is an urgent need for landscape- and culture-specific agricultural regulation and subsidy systems (from left to right: Csaba Vadász, conservation ranger; Zsolt Molnár, botanist, ethnoecologist; János Máté, traditional herder).

### 3.4.2. The future of herders and their knowledge: the role of policies and other drivers

As traditional grazing is a cheap and easily manageable way of conservation management and as there are incentives from EU, traditional grazing is expected to survive and to adapt to upcoming socio-economic environments. National and EU policies are powerful drivers. They can help support conservation management significantly, but they also have the power to destroy local traditional livelihoods and local culture. *I think, at most, herders will be kept in the national parks, as an attraction. The kind of herding I do now will be killed off sooner or later, regardless of the subsidy structure. I can't compete with a farmer who's got hundreds of hectares. My sheep mean everything to me, it doesn't matter how big my house is. As long as I can provide for my family, I'm perfectly satisfied. / Nowadays pastures are being fenced off by the big companies and small entrepreneurs too. That's changing the nature of herding. They don't need us any more, because the cattle is kept in place by the electric fences*.

In contrast, other herders argue: *I think it* [herding] *will be more respected. There are fewer herders now, and those who deal with the livestock* [livestock owners] *will realise it mustn't be allowed to disappear. / Both the rangers and the researchers will appreciate us more than they do now. / Now things are getting a bit better, and the right connections are being made between the national park, pasture management and animal husbandry.*

National parks and other forms of nature conservation may motivate and support, or alternatively, prohibit or suppress traditional use. Parks are in a position to develop new ways of conservation management based on local and traditional knowledge, for example, by co-producing knowledge with herders. However, we do not believe that conservation-oriented extensive grazing can be built only and exclusively on traditional herder wisdom. It also needs to be adapted to the current socio-ecological environment. In order to do so you need new mechanisms to generate and transfer knowledge and experiences and an efficient cooperation between various knowledge systems (science, traditional knowledge, conservation practice) (Molnár *et al*. 2016a).

One of our suggestions is that a new profession is needed: that of the *conservation herder* (Molnár *et al*. 2016a). The conservation herder would be an individual knowledgeable about herding and pasture management, trained to some degree in conservation and ecology, able to design management experiments, and develop novel but tradition-based management practices. As such, he/she could facilitate adaptation of extensive herding in the changing socio-economic environment.

### 3.4.3. Herders' services: who would miss herders?

Quality meat production and nature conservation management definitely need herders. Grass-fed cattle is regarded as more healthy compared to grain-fed. Herding in protected areas can provide high quality meat. *People have got used to artificial food. People don't realise that if herders go, tasty meat will go too*. Health, productivity and well-being of the animals also depend on the herder. For example: *The yield of a flock depends on the herder. 100%! If the summer grazing is not done properly, they won't breed well, and there won't be any* [enough] *lambs*.

In high nature-value areas herders could function as 'ecological doctors' (*sensu* Meuret and Provenza 2014). They manage and restore grasslands and wood-pastures in many parts of Central Europe (Vityi and Varga 2014). *If there were no herders here, the area wouldn't be grazed properly. Nature would suffer. The livestock would only eat what's in front of them. Nobody would force them into the marsh, to clean the area up* [from encroaching tall vegetation]. *You need herders for that. So the livestock doesn't eat where it wants, because that's not proper grazing – they would only eat the good grass* [like children prefer sweets]. */ Every area still has its own herder, who knows the area, and knows what can graze where and when. Without herders, it wouldn't be pasture any more, just rough land. / The herders have to be asked their opinion: the starting point should be what the livestock eat. Because I can tell them what they eat in spring, in summer or now, when the frosts are coming. I know what kind of grass the cattle prefer, so I can decide if we should stay out, because they'll eat it, or if we should go in* [to the winter stable], *because they won't.*

### 3.4.4. What should be changed to improve the lives of herders?

We asked this very general question to seek general answers (i.e. not specifically related to herding). The insights we received were unexpected and surprising: *People should be encouraged to love nature, to see where they live. Not on a computer. / At herders' festivals, they can see herders dressed in fancy clothes, but they never meet them in real life. So they don't have any real idea about us. / If people respected us a bit more, that would mean a lot. Young people should be taught to love nature. Young people today don't like it. They even look down on us and on what we do. / I think honour is the most important thing for herders. In my grandfather's day, a herder had pride and appreciation. It's a lot worse these days. Also – in the 21st century – herders should be paid what they are worth, not just a minimal salary, but a higher category than that. I don't mean earning 500,000 forints* [about 1500 euros/month], *but enough to raise the family comfortably. Then I could be proud to be a herdsman – financially too.*

There is a vicious cycle between appropriate earnings and effective herding: if herders are not paid appropriately, they will not work properly; if they do not work properly, they will not be paid appropriately. Respect, honour and proper salaries are vital to change the trend. As shown above, herders do have valuable functions in the modern world – especially in nature protected areas (Varga and Molnár 2014, Babai *et al*. 2015, Molnár *et al*. 2016a). Herders could be paid for the services they provide. Nowadays *more livestock is being kept, which is good for the grasslands. That's very positive. After the end of communism, a lot of livestock was "killed off" in Hungary. Now things are getting a bit better, and the right connections are being made between the national park, pasture management and animal husbandry.*

### 3.4.5. Why aren't the bookshelves full of books about herders' knowledge?

There are only very few books on the ecological knowledge of traditional herders living in Europe and Central Asia. We asked herders, what do they think, why? *Herders don't get enough recognition. It's getting better, but it's still not enough. People never thought about herders as knowledgeable people. / I don't think people really spent much time on such things, so it got a bit lost, but now some people want to revive things. / A lot of people don't consider it real knowledge. Until people change their opinion about this, there's no point writing a book about it.* The first books on the topic were published only some years ago (Molnár 2012b, Meuret and Provenza 2014). They emphasize the 'art and science' of herding and the deep understanding of local ecology by herders. Having more books on traditional herding would help build recognition of this knowledge and skill, assist in networking and lobbying at the European level, cross language barriers and hopefully in protecting this knowledge from further loss.

### 3.4.6. The basics of cooperation between researchers and herders

There is a general understanding in Hungary that we need a more efficient cooperation with local people, and effective co-production of new knowledge for better, more efficient and sustainable land use and conservation management. Herders argue that first *we need to recognise each other's knowledge. Then researchers have to try living together with a herder, to understand why we do the things we do, and to realise that it's really a science. And herders have to recognise the researchers' knowledge. / Things need to be discussed. There are lots of researchers, but the fact is that not everybody comes and talks to us. The herders need to meet more people and talk to them more. If researchers treated us better, things would work out fine. / The main thing is to have a kind of friendship, so it's not just official. A researcher should get to know me and my family, and then he can ask his questions. Researchers should treat herders like humans. I don't think I'm less of a person than someone who went to university. In fact, for them to know something, or to write a book or make a film, they need us very much.*

A recent example of cooperation and co-production of new knowledge is a paper published in *Ecosystem Health and Sustainability* co-authored by herders, conservationists and researchers (Molnár *et al*. 2016a). The four follow-up ILK dialogue workshops organized during this project also contributed to this process (photo below).

Ábel Molnár

Follow-up dialogue workshop at Hajdúböszörmény, Hungary. Herders, farmers, nature conservationists, a forest engineer and researchers were discussing common interests and conflicts of traditional grazing in protected areas and forests

## Conclusion

> *A lot of people say traditions need to be safeguarded. It's not traditions that need safeguarding, it's livestock. Traditions need to be loved and respected, but what needs to be safeguarded is the livestock.*
>
> Sándor Barta, cattle herder

Traditional extensive grazing is supported by nature conservation management, and agri-environmental and Natura 2000 (a network of protected habitats across the EU) regulations and payments. However, most economic and political drivers act against traditional management: "*the Park favors traditional herding but with these regulations the steppe lifestyle will be killed off*". As herding is a special way of management, a special way of life and livelihood, policies should better be adapted to regional ecological and cultural differences inside the European Union, and show more respect to well-adapted and "renewable" traditions. The universalism of science needs to be tempered with local and traditional knowledge to produce contextually tailored local solutions. Scientists and policy makers can help those people who still use and want to use local and traditional knowledge for their livelihoods. EU policy could effectively help maintain local knowledge-based livelihoods.

Let's not forget that although herders may not understand the key terms (e.g. biodiversity and ecosystem services) used in international arenas like the Intergovernmental Platform on Biodiversity & Ecosystem Services, they still know a lot about these issues. They have argued that *if we don't cooperate, then herding will die out and be lost forever.* In our understanding traditional herding is not backward, nor outdated, but provides an important link to sustainability.

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