Rewilding Law Group:

Natural Processes

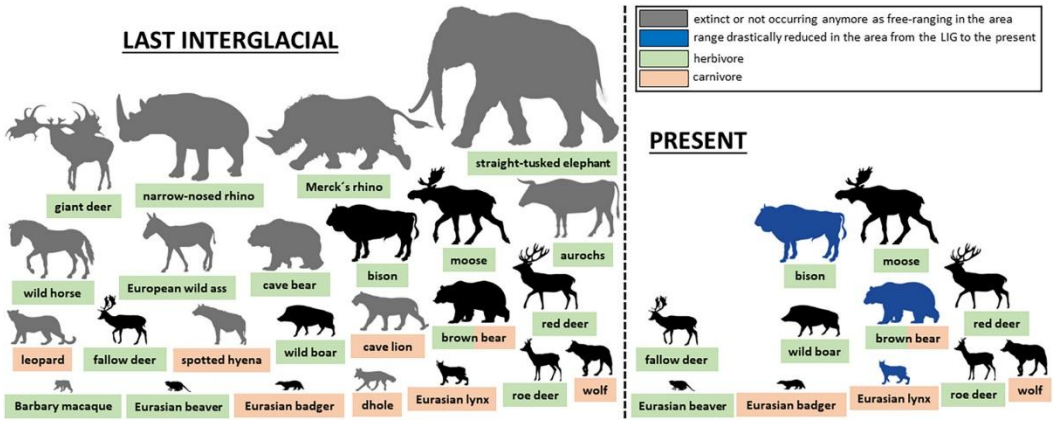
Illustration: Jeroen Helmer, ARK Rewilding

Thanks to everyone who joined us on 29 June 2026 to explore how natural processes can be used to help nature restore itself to rich, self-regulating ecosystems, and particular thanks to our speaker, Leo Linnartz of ARK Rewilding Nederland. Below is a recap of what we discussed, with some useful links. Leo's presentation slides are available here and the video recording here.

Relationship Building	
Connecting and knowledge-sharing	This call was introduced by Catriona Campbell, a Rewilding Lawyer on the Rewilding Law team at the Lifescape Project, who introduced herself and her work at Lifescape. As usual, the call began with time to connect in small breakout groups so that members could meet, exchange and **build our community of rewilding lawyers and practitioners**. If you would like an introduction to anyone you met, let us know. You'll find more information on rewilding law at Lifescape's Rewilding Law Hub, which we created in partnership with Rewilding Europe and Rewilding Britain.
Background – Natural Processes in Rewilding	
Setting the scene – natural processes as the engine of rewilding	The topic of this call was the role of natural processes in rewilding. For roughly 150 years, nature conservation has focused on protecting individual species and slowing their decline. Rewilding takes a different approach: rather than managing for particular species, it aims to restore as many natural processes as possible so that ecosystems become rich and *self-regulating* again, with as little human interference as possible. Those processes – from reintroducing free-roaming herbivores, welcoming predation, cyclical processes, erosion and sedimentation, tidal action and peat formation – are the

	levers practitioners can "pull" to help nature restore itself. They also raise the practical and legal questions that recur throughout our group's work: what counts as "natural", when (if ever) intervention is appropriate, and how the law should treat processes such as natural grazing, flooding, and the death and decomposition of animals in the landscape?
Speaker – Leo Linnartz	
About Leo Linnartz, ecologist and rewilding expert at ARK Rewilding Nederland	Leo Linnartz is a Dutch ecologist and an expert in the theory and practice of rewilding at ARK Rewilding Nederland, a Netherlands-based NGO that has been working on nature restoration for over 35 years. He has spent some 27 years working on large and small rewilding projects across the Netherlands and, as ARK's knowledge-sharing programme lead, brings together practical field experience and ecological theory to make it usable for others. He first drew his inspiration for rewilding and nature restoration from southern Africa, where new reserves reintroduce large herbivores and predators and leave management largely to the animals, the wind and the water. Alongside co-authoring Rewilding Europe's guide Rewilding Horses in Europe: Background and Guidelines (with Renée Meissner and Rhys Lemoine), Leo has drawn his field experience together in a new book, *Natural Processes in the Netherlands and Beyond* – a practical guide for anyone who wants to understand the levers that help nature restore itself to rich, self-regulating ecosystems.
ARK Rewilding Nederland and restoring ecosystems by restoring natural processes	ARK Rewilding Nederland is an NGO with around 41 employees and an office in Nijmegen, with over 35 years of experience and seven regional programmes showcasing rewilding across the Netherlands. The idea behind everything ARK does is the same: to restore the ecosystem by restoring as many natural processes as possible – while keeping people in the picture, as observers rather than as predators or managers.
A hierarchy of interacting processes – abiotic and biotic	Natural processes are numerous, but they form a kind of hierarchy. Climate, topography and hydrology operate at the largest scale and set the conditions for everything else – without rain nothing grows; too much rain brings floods. From these flow the soil, the vegetation, the herbivores and the predators, all interconnected and interacting with one another. As a rule the lower (abiotic) processes act on a large scale and the upper (biotic) ones more locally, and influence is not only "bottom-up". The beaver is a vivid counter-example. By felling trees and building dams it changes the hydrology, and over time even the topography, of a stream valley: the floodplain backs up, sediment settles behind the dam, and leaves and wood become stored under water where there is little oxygen. The result is carbon storage and a cooling effect from the water and the trees that live on it. As Leo put it, the beaver helps compensate for some of what we get wrong – we simply don't have enough beavers to make up for everything.
Abiotic processes at a large scale – the Border Meuse	One of ARK's first projects, on the Border Meuse, shows abiotic processes working at scale. The river had very little room, hemmed in by a concrete flood wall protecting a village built in the wrong place. The floods of 1993 and 1995 – when the Rhine flooded too and a dykes nearly broke – brought home the urgency: people could be evacuated, but the animals could not. A national obligation to supply gravel for the building industry was combined with delivering flood defence and a rewilded river. As gravel was extracted, the river bed

	widened – the old steep wall was pushed back 100 metres in places and more than a kilometre in others – creating space to store floodwater. As the gravel banks and floodplain were restored, people returned in their thousands on warm days, and erosion and sedimentation could resume. The dynamic gravel beds and waterways support pioneer plants and birds such as the little ringed plover, and riparian woodland is periodically "reset" where the river changes course and erodes part of it away – which is exactly as it should be.
Grazing as a biotic process – herbivores and succession	Where there are no herbivores, bare ground in this dynamic landscape is colonised by pioneers; willows take over and grow into a dense, dark, closed woodland with little light and almost no undergrowth. Starting from the same point but with herbivores present, the riparian woodland develops very differently: willows still dominate the canopy, but there is openness between them, with shrubs, flowers, grassy patches and dead wood, and far more diversity. Herbivores delay succession towards closed woodland, and outside the woodland they maintain open shrubbery and flower-rich grasslands.
Restarting the forest cycle – fire, wind, insects, fungi and age	River erosion is only one of the disturbances that restart the cycle. Fire, wind and storms can do the same, as can insects and disease – ash dieback and other tree diseases can wipe out almost all individuals of a single dominant species – and, at a smaller scale, fungi. Old age matters too: where trees established at the same time, they age together, and fungi then take out tree after tree, opening the canopy. As a woodland opens and sunlight reaches the floor, grasses grow, leaf litter and productivity increase, and herbivores move in and suppress the recovery of the woodland. The cycle therefore turns continuously: abiotic processes tend to restart it, while biotic processes (grazing and browsing) slow it down, and with enough large herbivores the balance can shift back towards open conditions.
How large herbivores shape the landscape	Large herbivores slow down woody encroachment in many ways at once: they debark, rub, browse and break vegetation. In response, trees and bushes appear to adapt to grazing – more thorny shrubs, and trees such as apple developing many browsed-down side branches that protect the stem, with a broad crown of flowers (and later fruit) above the browse line. Once a shrub is large enough, trees can grow up through it. The result is a mosaic landscape that is exceptionally rich in flowers, and therefore in insects and birds.
Mosaic landscapes and the deep-time baseline	These half-open, flower-rich mosaics are not a novelty. Drawing on recent palaeoecological work (Czyżewski et al., 2026), Leo explained that mosaic landscapes have characterised Europe for around 23 million years, persisting through both glacials and interglacials and into the Holocene, and that today's biodiversity co-evolved with them. During glacial periods much of this biodiversity overwintered in Spain, Italy and southern France and moved north again as the climate warmed, ice age after ice age, without difficulty – until humans arrived and the largest animals disappeared. European wildlife once looked very different (Davoli et al., 2024): the straight-tusked elephant – a European species around one-and-a-half times the size of an African savannah elephant – alongside two species of rhinoceros, giant deer, aurochs, three species of bison (with different climate and habitat preferences) and hippopotamus, whose bones have been found in the Thames in London. Our failure to picture this is what is meant by "nature amnesia", or shifting baseline syndrome.

	 *Image: Example of species found in fossil sites of the LIG in Central Europe and which of these species currently occur in the same area / Davoli et al.* The losses are also more recent than we tend to assume. The Lascaux cave paintings are around 30,000 years old, but an Assyrian relief from roughly 800 BC depicts noblemen hunting elephants from horse-drawn chariots – written history, not pre-history. The horse chestnut tells a similar story (Tighe, 2026): historically distributed across Europe in each interglacial, it is now effectively stuck in the Balkans because it appears to have depended on elephants for dispersal. Tellingly, nuts kept at 36–37°C for about a day and a half — the gut passage time of an elephant — germinate readily afterwards, just as they would on emerging in a pile of nutrient-rich elephant dung.
Bison or bovine? Reintroducing herbivores in natural social herds	A common question is whether, now that bison are present, the "cattle" can be removed. Data from the Slikken van de Heen suggest not: bovines strongly prefer the open areas, while bison use is almost complementary, so the two species together (i.e. *Bos taurus* and *Bison bonasus*) produce a far more even distribution of grazing across the landscape (and bison's woodland use is probably underestimated, because GPS signal is weaker under tree cover). Equally important is reintroducing herbivores as natural social herds – not just castrated males, cows or young animals. With full social herds, stallions and bulls compete, so only the strongest males breed and inbreeding is avoided automatically. Social herds also use the area in a more varied way, have a bigger impact on the landscape and – contrary to common belief – are safer for visitors.
Biodiversity benefits – competition, wallows, seed dispersal and dung	Biodiversity benefits directly from this behaviour. Bulls create bull pits as they display, and these become prime habitat for digging bees, wasps and the pioneer plants that depend on bare ground. Wallows do similar work – dry wallows made by bison and horses, wet ones by wild boar and water buffalo. Although bull pits and wallows together make up less than 1% of the surface, they are regularly spaced and connected by animal trails and short, trampled grasslands, forming a small-scale mosaic that other species can move through. Wandering herbivores also spread seeds – plants such as agrimony have hooked seeds that catch on the coats of horses, cattle and bison (but not on smaller animals like mice!). And their dung, provided the animals are not given veterinary "medicine" that poisons the life in and around it, is full of life: a single dropping can hold a remarkable number of dung beetles, and horse dung supports many rare fungi. One striking example is the red-backed shrike, a dung-beetle specialist: of the territories recorded in the Maashorst

	rewilding area, 21 were in the grazed area (most of them in the 170-hectare bison enclosure within a 3,500-hectare site) against only around 2 outside it, which may also be attributable to the absence of human activity in the bison enclosure as well as the availability of dung beetles.
Food, body size and predation – what regulates herbivore populations	Drawing on a framework from savanna ecology (Hopcraft, Olff & Sinclair, 2010), Leo explained that the factors regulating herbivore populations are different, depending on the animals' body size. For large herbivores like horses and bovines, the population size is regulated principally by the *quantity* of forage, which is scarcest in winter, so without other regulation they experience a die-off at winter's end. Medium-sized herbivores – deer, geese, hare and rabbit – are limited less by how much food there is, and more by its *quality*. Here the large grazers help: by cropping rough grass into short, grazed swards, they improve the feeding grounds for these smaller herbivores. Predation is the third factor that influences herbivore populations. Wolf, bear and lynx matter most for the smaller and medium-sized herbivores, keeping their numbers in check and so leaving space for the largest species. Predators also produce carcasses – and a dead animal supports an enormous number of insects and other organisms. The bigger the carcass, the more complete the associated biodiversity.
Discussion	
What is "natural", and is there a balance?	**Question:** When we see natural processes – an animal dying, bark beetles killing trees – we have learned to read them as sad or as damage. How do you explain what is "natural", and where the balance lies, when discussing this with the public? **Answer:** There is no balance as such. Instead, the conflicting interests of different animals and processes hold one another in check, leaving gaps for others to exploit. Suppress wolves, for example, and golden jackals increase enormously: a wolf needs a territory of around 200 km² while a jackal needs perhaps 10, so removing one wolf pack can yield around twenty jackal packs. The same logic applies to claims that jays or magpies "eat all the young birds": the number of birds breeding in a town depends far more on the availability of grassland, bushes and good food than on predation – and many town birds end up in a cat's mouth in any case. In nature, choosing the wrong place to nest simply means the nest is found and eaten. The discomfort we feel around death in nature – the idea that it is "not allowed" – says a lot about us, and a lot about nature.
Public attitudes to carcasses in the landscape	**Question:** A major barrier to leaving carcasses is public attitude, and the bigger the carcass the more confronting people may find it. What is the attitude in the Netherlands, and is there public access to sites where carcasses are left to lie? **Answer:** Most people are comfortable with carcasses – surveys suggest around 80–90% – and it is the process of dying, rather than death itself, that people find hard. Leo showed some additional slides with images of marine carcasses (a pilot whale and a seal) on the beach. He described how the insect communities on marine and terrestrial carcasses were completely different from those found on fallow deer carcasses in the dunes only a short distance away. Even the seaward (salty) and landward (fresh) sides of the same animal carried different biodiversity, such that a carcass on the seashore could host roughly triple the biodiversity of another carcass 100 metres inland. On busy Dutch beaches, carcasses are moved to quieter, agreed locations where most people pass by without noticing them; they are often sign-posted with information which will actually prompt people to visit them out of interest.

Dead animals as a nutrient source	**Comment:** At a recent webinar on deer, a participant insisted that a deer carcass could not be left in the landscape because it would constitute "pollution". There is a useful comparison here with dead wood: we have learned to value deadwood, and it is time to recognise that dead animals are just as valuable. **Response:** Exactly so. Dead animals are full of minerals – calcium, potassium, magnesium – that nature needs. Sandy soils in particular are being heavily depleted, as acid rain and nitrogen dissolve and flush these minerals away, leaving soils progressively poorer. Returning carcasses to the landscape is an important part of restoring that circle of life.
Why is this not yet mainstream?	**Question:** The science behind this is convincing – so why is it not mainstream, both in society and in legislation? **Answer:** That is the "million-dollar question", and ARK has been making the case with concrete examples for 35 years. Part of the answer is that good work in one place is undone elsewhere: nitrogen deposition and pesticide drift continue to deplete nature, and the level of poison in the soil tracks closely with declines in insect populations. Demineralisation tells the same story – in the woodlands of a Flevoland polder, reclaimed from calcium-rich marine sediment only some 50–60 years ago, song thrushes feeding on house snails are declining in step with the falling limestone content of the soil, a warning of how scarce calcium could eventually become.
Changing cultural attitudes to death and decay	**Comment:** In south-west England, persuading deer stalkers to shoot and leave carcasses on the ground is extremely difficult – they are conditioned to see it as bad practice and as waste, even where the price per kilo makes recovery uneconomic. The Embercombe Rewilding Training teaches participants about the "necrobiome" – seeing how roadkill can benefit scavengers and carrion beetles – which takes people on a journey from disgust, through fascination, to acceptance. Because the course runs over a prolonged period, it can also help participants carrying loss or grief connect it back to the cycle of life. When it comes to attitudes towards leaving carcasses in the landscape, it is as much about undoing cultural programming around death as it is about biodiversity messaging. **Response:** This resonated strongly. In the same way that deadwood has come to be valued, we need to reframe the death of animals in a similar way, and a good deal of the work is cultural rather than ecological.
Hygiene, disease and the missing scavengers	**Question:** Coming from a medical and health background, the concern is less that a carcass is "diseased" and more about hygiene – the bacteria involved in decomposition, particularly near a water source. How is that managed? **Answer:** It is true that dead birds or mammals lying in water can generate bacteria and disease, so water is not the best place for them. But the wider point is that the landscape used to be full of large carcass-eaters – for example, the golden jackal is primarily a scavenger, which meant carrion was dealt with quickly. Nature needs its big scavengers back; restoring them is part of the answer. The group noted the example of vultures stripping a cow carcass within minutes, and the "chicken-and-egg" difficulty of restoring social scavengers like vultures, which need both food in the landscape and the presence of other vultures.
Evidence for the red-backed shrike comeback	**Question:** The red-backed shrike figures are striking – is the research published? **Answer:** The distribution map has been published as part of a report on the species, plants and insects of the Maashorst, but the underlying analysis of shrike pellets – which

	were found to be full of dung-beetle wing-cases rather than, say, grasshopper remains – is not yet published. (The full picture is also more nuanced: the bison area is largely inaccessible to people, and red-backed shrikes favour quiet, undisturbed spots, so as the population grows their distribution should become less tied to inaccessibility.) A participant noted a forthcoming paper setting out the ecological benefits of bison, based on an international literature review, which aims to pin down which of these often-anecdotal observations are scientifically established. See ARK's Nature news on this topic here.
Resources for further reading	**Leo Linnartz – book and guides** Linnartz, L. (2025). *Natural Processes in the Netherlands and Beyond*. Nijmegen: ARK Rewilding Nederland. English edition available here. Linnartz, L., Meissner, R., & Lemoine, R. (2023). *Rewilding Horses in Europe: Background and Guidelines*. Nijmegen: Rewilding Europe. Available here. Linnartz, L., Slagt, J., Dötig, L., Bengtsson, V., Bengtsson, O., Joye, T., Mannaert, A., Andersson, J., Aczél-Fridrich, Z., & Creemers, A. (2023). *Process Oriented Nature Conservation: a wilder, cheaper and more robust nature management*. PONC Project. Available here. **Academic studies referenced in the presentation** Czyżewski, S., Søndergaard, S. A., Molnár, Á. P., … & Svenning, J.-C. (2026). Revisiting Europe's temperate forests: palaeoecological evidence for an herbivory-driven woodland–grassland mosaic biome. *Biological Conservation*, 316, 111749. Available here. Davoli, M., Monsarrat, S., Pedersen, R. Ø., Scussolini, P., Karger, D. N., Normand, S., & Svenning, J.-C. (2024). Megafauna diversity and functional declines in Europe from the Last Interglacial to the present. *Global Ecology and Biogeography*, 33(1), 34–47. Available here. Tighe, A. J. (2026). The potential effect of megafaunal extinctions on modern conservation of horse chestnut *Aesculus hippocastanum*. *Plants, People, Planet* (advance online publication). Available here. Hopcraft, J. G. C., Olff, H., & Sinclair, A. R. E. (2010). Herbivores, resources and risks: alternating regulation along primary environmental gradients in savannas. *Trends in Ecology & Evolution*, 25(2), 119–128. Available here. **Large herbivores, carcasses and the circle of life** Rewilding Europe's Circle of Life page – here. Large herbivore project, Ķemeru Nacionālā parka Fonds, Latvia – part of Rewilding Europe's Wilder Parks. See a recent video of life on the project in the Dunduri meadows here. ARK Rewilding Nederland – *Zeekadavers* (sea carcasses) project. Available here. British Ecological Society – study on removing culled deer carcasses in Scotland and nutrient loss discussed here.
Contact	For questions, or to join the Rewilding Law Group, please contact Edwina Dunn.