

ECOS 40(6): The golden rules of rewilding – examining the case of Oostvaardersplassen

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This article adds to the “golden rules” of rewilding (the 3 Cs), that of Cores, Carnivores, and Corridors, a fourth C – Compassion – which would ensure that any (re)introduction must be in the interests of the individual animals involved. Using the history of the Oostvaardeplassen project as a case study, the scientific and ethical

constraints and opportunities for rewilding are discussed. All four Cs are absent from Oostvaardeplassen, which can, therefore, be considered an example of how rewilding should not be undertaken. So what are the alternative ways forward?

Conflict on the polders

In a small nature reserve in the Netherlands, protestors have been brandishing “Stop Rewilding” signs. Some were even dispersed by the police and military (Omroep Flevoland 2018a). The protestors want to see an end to the “rewilding” experiment, which has brought megafauna back to the Netherlands in the form of large deer, wild horses, and aurochs-like cattle (Vera 2009).

It is not unusual to greet the return of large wild animals with antagonism. What is unusual is that these protestors are not against the animals’ reintroductions, but instead are demanding that they be better cared for (Barkham 2018). The controversy is centered on Oostvaardersplassen (OVP), a 56-square-kilometer fenced-off reserve, into which megafauna have been introduced to recreate Pleistocene-like conditions (Vera 2009; Lorimer and Driessen 2014). The paleo-ecological data used for creating OVP supported by the ‘founding father’ of the area, Frans Vera (2009), suggested that historically many areas in what is now The Netherlands were open savannahs characterized by wild grazers.

Once introduced to the area, the deer, horses, and cattle prospered at first, until their numbers exceeded their habitat’s carrying capacity and animals started to starve (Shoreman-Quimet and Kopnina 2016; Barkham 2018). The reactions to on-going mass starvation events have been mixed (NOS 2018; NRC 2018). Those that see OVP as a *wild* issue advocate allowing animals to starve (Breeveld 2010). Those that see it as a *wildlife management* issue advocate culling (Staatsbosbeheer n.d.) and some have also promoted selling meat from the culls to fund conservation and sustainable farming (Den Hollander 2018). Those that see this as about *animal welfare* protest that both options are cruel and that the animals deserve to be fed and cared for (Barkham 2018).

Rewilding is increasingly galvanizing the imagination of the conservation community. 2021-2030 has been designated the Decade of Ecosystem Restoration (The United Nations General Assembly 2019) and aims to promote rewilding at the forefront of post-2020 biodiversity goals (Perino et al. 2019). The concept of “wilderness recovery” (Noss 1985) was developed in the *Earth First!* journal during the 1980s (see review in Noss 2019). Nature recovery, protection, restoration and later rewilding, however, have been labelled as Cartesian, un-philosophical and unscientific, and from the time of

its 18th Century re-emergence some critics have even associated it with post-colonial romanticism and conservative politics (for discussion and rebuttals see e.g. Doak et al 2015; Kopnina et al. 2018). While the definitions and conceptualization of rewilding have varied over the years, its most common strategy is the conservation of complete, self-sustaining ecosystems, primarily involving the protection and, where necessary, reintroduction, of keystone species in large, connected reserve networks (Brown 2011). Interpretations of the terms “keystone species” and “large” and “connected” have all affected the evolution of the rewilding concept. As the concept was formulated to address continental or global biodiversity loss (Soulé and Noss 1998), “large” referred to vast remote areas that could be protected as wilderness (Dudley 2008). Originally rewilding also envisioned megafauna as keystone species, with their large home ranges, large migration routes, and large predators. Connections between the conservation areas through less stringently protected area categories (Dudley 2008) would meet animals’ need to range. The 3 Cs triptych “*Cores, Corridors, and Carnivores*” (Soulé and Noss 1998) entails re-establishing natural ecosystem processes.

A complementary view is provided by Perino et al (2019); the authors devise a framework based on 1. Dispersal, 2. Trophic complexity, 3. Stochastic disturbances, which means random, natural processes, as opposed to, for example, those caused by human activities to prevent forest fires. The authors identify “*trophic complexity, stochastic disturbances, and dispersal as three critical components of natural ecosystem dynamics...[as] the core of rewilding*” (Perino et al. 2019:1). Perino and co-authors apply these frameworks to four examples of rewilding; a natural flood regime near Leipzig, the Swiss National Park, an area of Brazil, and the location surrounding the Chernobyl disaster. The researchers then measure these rewilding examples against their model, using diagrammes in which a triangle stretches towards where the greatest rewilding component, such as trophic complexity, is being realized. They also measure each rewilding example against non-material (e.g. inspiration, education), regulatory and material benefit variables.

An alternative and criticized approach to rewilding (Nogués-Bravo et al. 2016) focused on replacing species lost in the Late Pleistocene megafauna collapse with extant analogs (Donlan et al. 2005). For example, Donlan et al. (2005) called for African cheetahs and elephants to be released in North America to replace extinct species. Some of the premises associated with this type of “Pleistocene rewilding” were influential in the creation of OVP.

Here we discuss why the OVP experiment can be seen as a failure using the “golden rules” of the rewilding framework, including the four Cs – cores, carnivores, corridors, and compassion, to analyze this case and to suggest ways forward.

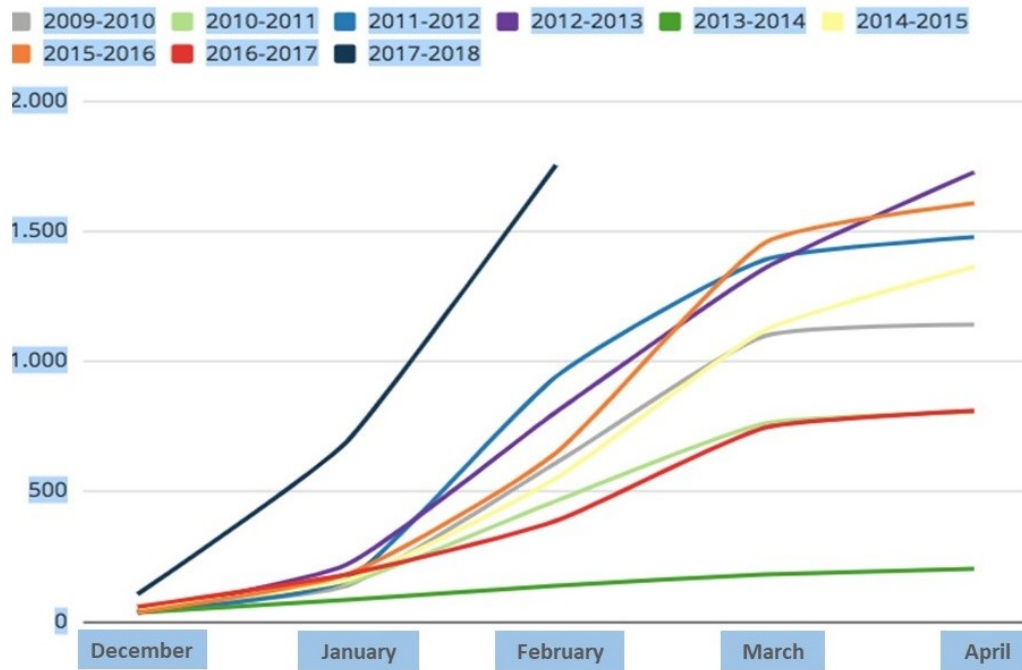
The Oostvaardersplassen

In 2008 red deer (*Cervus elaphus*), Konik horses (*Equus ferus*) and “Heck” cattle (*Bos taurus*) were introduced to OVP. Horses and cattle were selected from breeding programs that resembled their pre-domestic ancestors. Konik horses were chosen because they were considered to most resemble the tarpan and were brought in from Poland. The cattle were sourced from the Heck breed, named after the Nazi zoologist who bred them to resemble extinct aurochs.

Other introduced, reintroduced, or spontaneously settled species (native and not) included kingfishers (*Alcedo atthis*), the common spoonbill (*Platalea leucorodia*), Eurasian bittern (*Botaurus stellaris*), marsh harrier (*Circus aeruginosus*), bearded tit (*Panurus biarmicus*), foxes (*Vulpes vulpes*) and hares (*Lepus europaeus*). Additional species that had almost or entirely disappeared from the Netherlands now occur there, including the greylag goose (*Anser anser*), great cormorant (*Phalacrocorax carbo*), great white egret (*Ardea alba*), white-tailed eagle (*Haliaeetus albicilla*), and sanderling (*Calidris alba*) (Vera 2009; Lorimer and Driessen 2014).

It was originally proposed to create a passage from OVP to allow the megafauna and other wildlife to disperse. However, the ‘Oostvaarderswold corridor’ was halted in 2012 (ANP 2012). Since this time no additional wildlife area has been created even though, according to the European Union’s laws, other lands should have been converted into protected areas to compensate for this loss. At present the future of these compensatory plans remain unclear.

The introduced megafauna initially flourished in the reserve, but soon the lack of *corridors* to enable emigration, and the lack of *carnivores* to regulate population levels, resulted in vegetation loss and mass starvation. According to the official reports of Staatsbosbeheer (n.d.), a leading national public body and the landowner and manager of Dutch nature reserves, in the winter of 2011-2012 about 941 animals died naturally (although it is not clear whether starvation was considered natural) or were shot. Over 90% of animals were shot in 2014 to prevent starvation. In December 2017 nearly 5,300 red deer, Heck cattle and Konik horses were shot, 700 more than in 2016. The Staatsbosbeheer reported that 2,684 red deer, 75 cattle and 467 horses died in the five months from December 2016 to April 2017. In March 2018, the total number of dead animals recorded in the previous year was registered at 1,755 (Griekspoor 2018).



Mortality of large grazers – Oostvaardersplassen

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On 20th July 2018, following activist protests and an inquiry from the European Union, the deputy of the Province of Flevoland and director of Staatsbosbeheer, signed the Van Geel Covenant to shape the further development of OVP (Staatsbosbeheer 2018). This Covenant sets out plans for the development of a recreational area, with associated facilities, aiming to increase visitor accessibility and recreation opportunities. One of the measures enacted was to immediately reduce grazing pressure through the significant culling of approximately 3,000 animals, from which point annual culls would take place to contain megafauna populations at a level that would avoid starvation. From 10 December 2018 to 1 April 2019 a total of 1,745 red deer were shot, of which 1,235 were sold for human consumption. In September 2019 a planned cull of 490 red deer will commence (Staatsbosbeheer n.d.).

Measuring OVP against Peroni et al.'s rewilding framework

Perino et al. write that a “structured and participatory approach to rewilding is important to ensure that all stakeholders have a clear understanding of the goals, management options, desirable outcomes, and associated risks” (Ibid:5). The authors also assess the ecological viability of different management approaches alongside stakeholder perceptions, constraints (such as infrastructure hindering dispersal), the need for monitoring followed by adaptive management and adjustments, all of which should be coordinated through a communication strategy. Measured against these good practice guidelines OVP is an unqualified failure.

OVP fails Peroni et al.'s rewilding framework test in every respect. There is no trophic cascade (except perhaps for small animals), definitely no dispersal, and no stochastic disturbance. Moreover, the initial reliance on paleo-ecological data used for creating OVP as a supposedly historically open savannah has also been disputed; open areas were the result of medieval grazing and are thus cultural landscapes (Mitchell 2005; Whitehouse and Smith 2010; Hambler and Canney 2013; Merckx 2016; Sevink et al. 2018). Trees and not 'open landscapes with herbivores' might have predominated in prehistoric times, with open landscapes created far more recently through intense livestock grazing (Kirby 2005).

Local people, particularly protestors concerned with animal welfare, were also ignored (and are still being ignored by the new approach). In our analysis Peroni et al.'s framework for assessing a rewilding project's success, coupled with their sensible proposal concerning how to implement a rewilding project, demonstrate that OVP is a good example of how not to do anything.

Cores, Corridors, Carnivores... and Compassion

So, how do we reconcile rewilding with our ethical obligations towards animals? There are important ecological and ethical lessons that can be learned from the OVP experiment. The 3 Cs (Cores, Carnivores, and Corridors) were used concerning rewilding by Noss and Cooperrider (1994) and Soulé and Noss (1998). The cores refer to large, strictly protected ecologically intact areas, carnivores refer to natural predators, and corridors connect passages for fauna movements. We propose a fourth requirement: Compassion. This fourth C would ensure that any active (re)introduction must be in the interests of the individual animals involved.

Having compassion as a core guiding principle for rewilding would ensure that individual sentient beings are treated as *subjects*, rather than as mere *objects*. What Mary Midgley termed the *Golden Rule* – 'treat others as you would wish them to treat you' (Midgley 1983: 91) – calls on us to remove unnecessary human-caused suffering. Death and pain, whether by predation, starvation, or disease, are integral to life, but intentionally leading a sentient being into conditions of harm must be treated with moral concern. The idea that a fenced-in reserve could become ecologically self-regulating through the introduction of megafauna was nothing short of wishful thinking. Widespread starvation was inevitable without intensive ongoing culling. The bald facts are that the introduction of megafauna in OVP was approved without the possibility of natural regulation (non-intervention) or of "letting nature take its course"

(Shoreman-Ouimet and Kopnina 2016), and lacked any legal framework protecting (wild) animals or their habitats (Kopnina 2016a, 2016b).

The imperative to consider nature's legal rights were discussed in a recent *Science* article (Chapron et al. 2019). Mass starvation within a short period brought about by humans who forcibly bred and relocated animals into a fenced arena is not "natural" and is not ethical. It is also not competent. Perino et al.'s framework for assessing rewilding's efficacy emphasizes that initiatives need to be planned, stakeholders involved, and constraints such as "infrastructure hindering dispersal" (Perino 2019: 5) considered before any rewilding takes place; had OVP been included within the authors' 4 case studies we believe the Dutch experiment would fail in all of Perino et al.'s criteria for successful rewilding (Perino et al. 2019).

If corridors were to increase OVP's area, it is possible that predatory regulation of large herbivores might have been partially efficacious. Fenced-in herbivores, however, in the absence of large predators, could only have ever had their numbers limited by three possible means, starvation, removals (live or dead), and immunocontraception (Cohn and Kirkpatrick 2015). The assumption held by some of OVP's proponents that the starvation of fenced-in animals was somehow "natural" requires challenge. It cannot be termed "natural" because the choice of interventionist over non-interventionist strategies was predetermined within the protected area's spatially limiting design. The notion that OVP somehow represents a "natural process" has rightly been ridiculed by the Dutch media (Lubach 2016) and by protest groups such as Stichting Cynthia en Annemieke. Other mixed reactions followed, some celebrating cheap venison steak and exciting "wild recipes", or admiring the donation of surplus meat to food banks, or seeing the protests as an absurd over-reaction by 'animal fanatics' (Omroep Flevoland 2018b; NU 2019; various websites on Facebook and Twitter). From an informed conservation or non-anthropocentric point of view, however, OVP is no longer rewilding but has become an economic initiative whereby "exotic" animals are shot for "organic novelty" meat. As the popular Dutch newspaper NRC has reported in its editorial comment:

After twenty years of muddling through a man-made wilderness in the middle of a crowded part of Western Europe, it is time to abandon all too powerful ideas about what is possible, given the limitations of the area. Although animal suffering is also felt by humans, and our compassion should rather apply to factory-kept animals in the bio-industry, the annual large death toll in the polder among red deer, cattle, and horses is an abomination. Precisely because of the artificial nature of this so-called natural

process. This densely populated country needs places where people can enjoy nature. But that there should be a Dutch Serengeti between Lelystad and Almere is an illusion.

As a signatory of the Convention on Biological Diversity (CBD), the Netherlands committed itself to seek space for protected areas. At this hurdle, the Netherlands sacrificed its commitment to the international treaty in favour of economic growth and human recreation. Revision of this decision is necessary on both scientific and ethical grounds.

OVP fails the first 3 Cs by introducing megafauna into an area from which they cannot migrate, and where there are no large carnivores. It also fails the fourth C by violating the basic principle of respect for nonhuman subjectivity, interests, agency, and autonomy. The current political and economic climate in the Netherlands will not allow for the area's expansion, as required if the four Cs are to co-exist, owing to OVP's proximity to infrastructure, industry, and farming dominated landscapes. For rewilding to have legitimacy, the basic ecological and ethical requirements for rewilding need to be met.



Heck cattle at Oostvaardersplassen

Photo: Steve Carver

Rewilding for whom?

Here we have tried to distill what OVP signifies for the rewilding principle and movement. At its outset animals were used (albeit perhaps misguidedly) to recreate an earlier habitat, an aspiration which has migrated to utilizing them for consumer

products and to sustain a wilderness theme park. In other words, the prioritization of habitat has been replaced by an emphasis on two human benefits, food and recreation, with an underlying business basis. At no point were the introduced animals and their off-spring prioritized in OVP's rewilding experiment. This indictment, however, is not unique to OVP.

The first principle of Rewilding Britain concerns 'people, communities and livelihoods' and the role for animals is to be sustainably harvested through hunting and fishing. The Rewilding Europe website emphasizes human recreation and seeks business justifications for rewilding areas. The weft and web of this fundamentally anthropocentric outlook supports ecological processes that are "useful" for human welfare, as exemplified by the "new conservation" (e.g. Kareiva et al. 2011). In other words, rewilding efforts that were seen as economically profitable in providing a range of ecosystem services, including soil recovery from intensive agriculture, and improved water quality, were supported (Navarro and Pereira 2012; Pettorelli et al. 2018). This thinking assumes sufficient knowledge of ecological complexity to determine all aspects of advantage and profitability. Moreover, as noted by Foreman (1998), the original rewilding movement opposes the aim of profitability as a 'resourcist' approach to nature, which reduces natural elements to mere 'resources' or 'services' to be managed.

The critics of managerial and instrumental approaches to conservation have pointed out that the so-called "new conservationists" (e.g. Kareiva et al. 2011), who emphasize human welfare as the primary aim of conservation, ignore the intrinsic value of nature (Doak et al. 2015; Cafaro et al. 2017; Kopnina et al. 2018; Creasy 2019). If protected or created ecosystems were found to be less valuable than, e.g. agricultural monocultures, where their instrumental utility is the primary determinant of value, the justification for ecosystem protection weakens significantly (Creasy 2019). Accepting the intrinsic value of nature underpins not only pragmatic awareness of the unknown complexity of ecological systems upon which all life, humanity included, relies, but also the ethic of preserving the diversity of life.

Personal reflections

We have stressed in this article that OVP fails not only all efficacy tests – ranging from the 3 Cs triptych to Peroni et al.'s framework – but also the moral/ethical "test" encapsulated in consideration of the fourth C. It must, however, be recognised that conservation "science" is hardly ever objective and is intertwined with ethical and

ideological (and at times, economic and political) motives (Cafaro et al. 2017; Washington et al. 2017; Piccolo et al. 2018; Chapron et al. 2019).

We, as a group, have different backgrounds. One of us is a conservationist who studied science rather than a scientist who studied matters relating to conservation. Another one is a non-academic, an owner and protector of (relatively) wildland. A third trained in social science, with a specific background in anthropology. Our objectivity could certainly be brought into question. Does such a slant affect truth? For sure! And which truth are we listening to here with OVP (or elephants in Africa, wolves in the Rockies or dingoes in Australia)? It is that something morally wrong and ecologically impractical was or is being perpetuated. By what set of rules should necessary objectivity be applied? But what about the objectivity of conservation policy-makers, practitioners and indeed academics, not to mention policy-makers, involved in developing any land areas for wildlife and economic activities? Perhaps some scientists lose claim on objectivity when they disconnect from the grounded and moral aspects of science and can too easily lose touch with other types of thinking that also reveal underlying truths.

Theme park rewilding – the limitations

If humans constantly need to intervene, or if the strength of some ecological processes (such as starvation) exceed what would naturally occur in most wild ecosystems, this is no longer rewilding but experimentation, and as such is something which requires ethical evaluation. The discourse of “natural processes” is not only relevant when distinguishing between non-interventionist and interventionist (human management) strategies, applicable in the case of OVP, but also for opening wider questions about human agency and responsibility.

We agree with Noss (2019) that rewilding must address the threat of biological diversity loss, and that consequently there is a need to retain the original meaning of rewilding – the restoration of wildness. Without cores, carnivores, and corridors, and compassion for the individuals involved, the reintroduction of animals cannot be ethically justified (Wallach et al. 2018). Projects such as OVP carry the risk that the public will oppose any kind of rewilding if it becomes associated with callousness. Thus, based on these golden rules, OVP was never a suitable rewilding area for megafauna, particularly after the development of the ecological corridor (Oostvaarderswold) was halted. The funding intended for rewilding has been used, instead, to set up a free-range farm which aims to combine recreation with food production. OVP represents what happens when the 4 Cs are replaced by a profit-driven Pleistocene fantasy theme

park. While other rewilding projects may differ from OVP in significant respects their overseers should always ask themselves, for whom are we rewilding; nonhuman not human animals must hold centre stage if rewilding is to succeed practically and ethically.

From an ecocentric, and we dare say a simple humane point of view, the protestors are right. The time has come to end this cruel experiment. The authorities have acknowledged that OVP was never an appropriate rewilding site. But in prioritizing recreation and meat production within the revised management strategy, they have ignored a critical expectation that OVP was to be a wildlife sanctuary. Had meat production been an OVP objective from the outset, and if money for nature conservation had not been deployed on this project, there would be less debate. But the ethical and financial commitment to the sanctuary concept is important, at least to a segment of the Dutch public who can justifiably hold the authorities to the original commitment.

As authors we have differing experiences and views on the ethics and efficacy of culling (Leadbeater 2011), but we know that many protected area management systems utilise culling as a tool to supplement self-regulation within ecosystems. When culling becomes the primary regulatory mechanism, however, this tells us that the underlying purpose has fundamentally shifted from ecosystem sustainability to that of sustaining the viewing and harvesting of species that probably had no place in that system in the first place. Knowledge advancement concerning how animals perceive and interrelate means that their experience of human interventions must be considered within protected area management planning; the mechanistic view of animal social systems is as outdated as it is barbaric. One thing is certain: when animals' inability to migrate for food is addressed by their social fabric undergoing significant and regular disruption through culling, the area cannot be termed a sanctuary. From a compassionate conservation perspective, we can also argue that the scientific phrase 'social fabric disruption' does not really do justice to the pain and distress associated with death and bereavement felt by animals when they or their kin are shot.

If OVP is to regain its sanctuary status the project should, as an interim strategy, prioritize the provision of food until translocations and minimally-invasive reproduction suppressants can stabilize large herbivore numbers to limits that necessitate less ecological and social intervention. In the long term, the area should be left to the cormorants and egrets, to the common spoonbills and white-tailed eagles, to foxes and weasels – being populated by small animals, in contrast to megafauna – will

allow OVP to thrive as an ecologically self-regulating nature reserve, true to the spirit of that originally intended.

References

ANP 2012. RvS zet streep door aanleg Oostvaarderswold. [The Council of State has today drawn a line through the construction of nature reserve Oostvaarderswold] Nu.nl <https://www.nu.nl/binnenland/2757667/rvs-zet-streep-aanleg-oostvaarderswold.html>

Barkham, P. 2018. Dutch rewilding experiment sparks backlash as thousands of animals starve. *The Guardian*.
<https://www.theguardian.com/environment/2018/apr/27/dutch-rewilding-experiment-backfires-as-thousands-of-animals-starve>

Breeveld, H. 2010. Natuur gaat over leven en dood in Oostvaardersplassen. [Nature is about life and death in Oostvaardersplassen]. *Trouw*.
<https://www.trouw.nl/nieuws/natuur-gaat-over-leven-en-dood-in-oostvaardersplassen~b062edb5/?referer=https%3A%2F%2Fwww.google.com%2F>

Brown, C., McMorran, R. and Price, M.F. 2011. Rewilding—a new paradigm for nature conservation in Scotland?. *Scottish Geographical Journal*, 127(4):288-314.

Cafaro, P., Butler, T., Crist, E., Cryer, P., Dinerstein, E., Kopnina, H., Noss, R., Piccolo, J., Taylor, B., Vynne, C., Washington, H. 2017. 'If We Want a Whole Earth, Nature Needs Half'. A reply to 'Half-Earth or Whole Earth? Radical ideas for conservation, and their implications'. *Oryx—The International Journal of Conservation*, 53(1): 400.

Chapron, G., Epstein, Y. and López-Bao, J.V., 2019. A rights revolution for nature. *Science*, 363(6434):1392-1393.

Cohn, P., and Kirkpatrick, J., F. 2015. 'History of the Science of Wildlife Fertility Control: Reflections of a 25-Year International Conference Series,' *Applied Ecology and Environmental Sciences*, 3 (1):22-29.

Creasy, C. 2019. Contending with New Conservationism. In *Conservation – Integrating social and ecological justice*. Ed. By Kopnina, H., and Washington, H. Dordrecht: Springer. https://link.springer.com/chapter/10.1007/978-3-030-13905-6_3 Pp. 33-34.

Den Hollander, E. 2019. Meer dan 24.000 kilo hertenvlees uit Oostvaardersplassen verkocht [More than 24,000 kilos of venison from Oostvaardersplassen were sold] *AD*. <https://www.ad.nl/koken-en-eten/meer-dan-24-000-kilo-hertenvlees-uit-oostvaardersplassen-verkocht~a4daf880/>

Doak, D. F., V. J. Bakker, B. E. Goldstein, and Hale, B. 2015. What Is the Future of Conservation? In *Protecting the Wild: Parks and Wilderness, The Foundation for Conservation*. Edited by G. Wuerthner, E. Crist and T. Butler. Washington, London: The Island Press. Pp. 27-35.

Donlan, J., Greene, H.W., Berger, J., Bock, C.E., Bock, J.H., Burney, D.A., et al. 2005. Rewilding North America. *Nature* 436: 913-914.

Dudley, N. (Editor) 2008. *Guidelines for Applying Protected Area Management Categories*. Gland, Switzerland: IUCN. Pp14-15 &36.

Foreman, D. 1998. Putting the Earth First. In J. S. Dryzek and D. Schlosberg(Eds.). *Debating the Earth. The Environmental Politics Reader* (pp. 358–364). Oxford, UK: Oxford University Press.

Griekspoor, J. 2018. Recordaantal dode dieren in Oostvaardersplassen <https://www.omroepflevoland.nl/nieuws/157637/recordaantal-dode-dieren-in-oostvaardersplassen>

Hambler, C. & Canney, S.M. 2013. *Conservation*, 2nd Edition, Cambridge: Cambridge University Press.

Kareiva, P., Lalasz, R. and Marvier, M. 2011. Conservation in the Anthropocene: Beyond Solitude and Fragility. *Breakthrough Journal*. Fall, P. 29-27.

Kirby, K.J., Buckland, P.C., Bullock, J.M., Hodder, K.H. 2005. 'Large herbivores in the wildwood and modern naturalistic grazing systems,' *English Nature Research Reports*, Number 648.

Kopnina, H. 2016a. Wild Animals and Justice: The Case of the Dead Elephant in the Room. *Journal of International Wildlife Law & Policy*, 19(3): 219-235.

Kopnina, H. 2016b. Half the earth for people (or more)? Addressing ethical questions in conservation. *Biological Conservation*, 203, pp.176-185.

Kopnina, H., Washington, H., Gray, J., Taylor, B. 2018. 'The 'future of conservation' debate: Defending ecocentrism and the Nature Needs Half movement'. *Biological Conservation*, 217 (2018): 140-148.

Leadbeater, S.R.B. 2011. 'Deer management and biodiversity in England: the efficacy and ethics of culling,' *ECOS 32(1) 2011*: <https://www.banc.org.uk/wp-content/uploads/2015/05/ECOS-32-1-59-Deer-management-and-biodiversity.pdf>

Lorimer, J. and Driessen, C. 2014. Wild experiments at the Oostvaardersplassen: Rethinking environmentalism in the Anthropocene. *Transactions of the Institute of British Geographers*, 39(2):169-181.

Lubach, A. 2016. De Oostvaardersplassen – Zondag met Lubach. <https://www.youtube.com/watch?v=9VuLM4LLJOg>

Merckx, T. 2016. 'Rewilding: an enrichment to Flemish nature conservation' *Natuur focus* 15(1): 28-33.

Midgley, M. 1983. *Animals and Why They Matter*, The University of Georgia Press

Mitchell, F.J.G. 2005. How open were European primeval forests? Hypothesis testing using palaeoecological data, *Journal of Ecology* 93: 168–177.

Navarro, L.M. and Pereira, H.M. 2012. Rewilding Abandoned Landscapes in Europe. *Ecosystems* 15: 900–912.

Nogués-Bravo, D., Simberloff, D., Rahbek, C., and Saunders, N.J. 2016. Rewilding is the new Pandora's box in conservation. *Current Biology*, 26: R83–R101.

NOS. 2018. Onrust om bijvoeractie in Oostvaardersplassen, vijf arrestaties. [Unrest about additional action in Oostvaardersplassen, five arrests] <https://nos.nl/artikel/2225331-onrust-om-bijvoeractie-in-oostvaardersplassen-vijf-arrestaties.html>

Noss, R.F., and Cooperrider, A. 1994. *Saving Nature's Legacy: Protecting and Restoring Biodiversity*. Washington, D.C.: Island Press.

Noss, R.F. 1985. Wilderness recovery and ecological restoration: an example for Florida. *Earth First!* 5(8):18-19.

Noss, R. 2019. The Spectrum of Wildness and Rewilding: Justice for All. Kopnina, H. and Washington, H. (eds) *Conservation: Integrating Social and Ecological Justice*. Springer.

NRC. 2018. Het sterven van de grote grazers is niet natuurlijk. [The death of the big grazers is not natural]. <https://www.nrc.nl/nieuws/2018/04/20/oostvaardersplassen-het-sterven-van-de-grote-grazers-is-niet-natuurlijk-a1600268>

NU. 2019. 2000 kilo hertenvlees uit oostvaardersplassen naar voedselbanken [2000 kilo deer meat to Food Banks]. <https://www.nu.nl/dieren/5697875/2000-kilo-hertenvlees-uit-oostvaardersplassen-naar-voedselbanken.html>

Omroep Flevoland. 2018a. Leger helpt politie handhaven in Oostvaardersplassen. [Army helps police to keep order in Oostvaardersplassen. April 24. <https://www.omroepflevoland.nl/nieuws/159374/leger-helpt-politie-handhaven-in-oostvaardersplassen>

Omroep Flevoland. 2018b. Gemengde reacties op afschot dieren Oostvaardersplassen [Mixed reaction shooting animals in Oostvaardeplassen] <https://www.omroepflevoland.nl/nieuws/163904/gemengde-reacties-op-afschot-dieren-oostvaardersplassen>

Perino, A., Pereira, H.M., Navarro, L.M., Fernández, N., Bullock, J.M., Ceaşu, S., Cortés-Avizanda,

A., van Klink, R., Kuemmerle, T., Lomba, A. and Pe'er, G., et al 2019. Rewilding complex ecosystems. *Science*, 364(6438), p.eaav5570.

Pettorelli, N., Barlow, J., Stephens, P.A., Durant, S.M., Connor, B., Schulte to Bühne, H., Sandom, C.J., Wentworth, J. and du Toit, J.T., 2018. Making rewilding fit for policy. *Journal of Applied Ecology*, 55(3), pp.1114-1125.

Piccolo, J., Washington, H., Kopnina, H., Taylor, B. 2018. Back to the future: Why conservation biologists should re-embrace their ecocentric roots. *Conservation Biology*, 32(4):959-961.

Sevink, J., van Geel, B., Jansen, B., Wallinga, J. 2018. Early Holocene forest fires, drift sands, and Usselo-type paleosols in the Laarder Wasmeren area near Hilversum, the Netherlands: Implications for the history of sand landscapes and the potential role of Mesolithic land use. *Catena*. <https://doi.org/10.1016/j.catena.2018.02.016>

Shoreman-Ouimet, E. and Kopnina, H. 2016. *Culture and Conservation: Beyond Anthropocentrism*. Routledge Earthscan, New York.

Soulè, M. and Noss, R. 1998. "Rewilding and Biodiversity as Complementary Goals for Continental Conservation," *Wild Earth*, 8, 1-11.

Staatsbosbeheer n.d.

<https://www.staatsbosbeheer.nl/Natuurgebieden/oostvaardersplassen>

Staatsbosbeheer 2013. <https://www.staatsbosbeheer.nl/Over-Staatsbosbeheer/Nieuws/2018/04/rapport-commissie-van-geel-oostvaardersplassen>

The United Nations General Assembly 2019 <https://www.unenvironment.org/news-and-stories/press-release/new-un-decade-ecosystem-restoration-offers-unparalleled-opportunity>

Vera, F.W.M. 2009. Large-scale Nature Development – the Oostvaardersplassen, June 2009. *British Wildlife*. Available at <http://www.lhnet.org/large-scale-nature-development-the-oostvaardersplassen/>

Wallach, A.D., Bekoff, M., Batavia, C., Nelson, M.P. and Ramp, D., 2018. Summoning compassion to address the challenges of conservation. *Conservation biology*, 32(6):1255-1265.

Washington, H., Taylor, B., Kopnina, H. Cryer, P. and Piccolo, J. 2017. Why ecocentrism is *the* key pathway to sustainability. *Ecological Citizen*, 1(1): 32-41.

Whitehouse N.J. and Smith D. 2010. How fragmented was the British Holocene wildwood? Perspectives on the "Vera" grazing debate from the fossil beetle record, *Quaternary Science Reviews*, 29 (2010) 539–553.

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