

24. Domesticating rewilding: combining rewilding and agriculture offers environmental and human benefits

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Abstract

Despite, or because of, the debates surrounding it, rewilding remains a polarising concept, especially with respect to its (perceived) connotations of removal of human activity, particularly productive agriculture, from land. It is possible to reconcile rewilding and farming, however, thus helping to overcome concerns surrounding rewilding, and to produce win-win outcomes in terms of environmental and human benefits. By ‘domesticating’ rewilding (i.e. adapting it to be more compatible with human needs), ecological restoration can be combined with food production. The most straightforward way of achieving this is ‘agricultural rewilding’, a form of rewilding which aims to restore ecosystem functions using low-intensity human interventions involving the introduction, management, and harvest of livestock. For example, rewilding advocates the introduction of large herbivores for the ecological benefits they deliver within ecosystems. A purist view of rewilding would require that these herbivores be wild, or at least surrogates for wild species: they would provide ecological benefits but play no role in productive agriculture. In agricultural rewilding, however, these herbivores could be domestic species (typically hardy, native breeds), which would act as analogues for their wild counterparts: they would have the same ecological benefits *and* could contribute to food production. Combining rewilding and agriculture in this way helps to address some of the key concerns related to rewilding, such as that it excludes people and their livelihoods from the land, or that it can reduce food self-sufficiency, therefore outsourcing food production (and its related environmental impacts) to other areas. In addition, agricultural rewilding delivers environmental benefits associated with rewilding while also producing high-quality, high-welfare, high-value food in the form of meat that is environmentally, ethically, and financially sustainable.

Keywords: agroecology, conservation, livestock farming, regenerative agriculture

Rewilding as a conservation method and relationship with agriculture

Conservation (i.e. land use which *avoids* resource use by humans) and farming (i.e. land use which *involves* resource use by humans) are often considered diametrically opposed, resulting in the ‘land sparing’ model in which agriculture is intensified in one area to spare land for conservation in another. This land sparing approach is particularly evident in relation to the original concept of rewilding, which advocates sparing large cores of wild land for species whose conservation requires significant amounts of space to insulate them from the risk of extinction (Soulé and Noss, 1998). Many proponents, and indeed opponents, of rewilding still adhere to this view, with proponents claiming that rewilding must be ‘landscape scale’ and opponents fearing that rewilding entails the removal of active human engagement from large areas of countryside. These views are not unfounded since the factors they identify are among the key principles of rewilding, an ecological restoration approach which emphasises decreasing human intervention and increasing other-than-human autonomy. Thomas (2021) lists six factors which can be considered key tenets of rewilding: (1) operating at large scale; (2) increasing biodiversity; (3) restoring ecosystem functioning; (4) decreasing human intervention; (5) increasing other-than-human autonomy; and (6) self-identifying as rewilding. It should be noted, however, that a conservation project

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need not demonstrate all these factors to be considered rewilding; it need possess only two or more to exhibit 'family resemblance' (Wittgenstein, 1968) to rewilding. Family resemblance refers to the notion that members of a group may share different combinations of a common group of traits: thus, while all members of the group may differ, they are broadly similar by virtue of the way their traits overlap (Wittgenstein, 1968). Family resemblance is therefore a very useful concept with which to approach rewilding since the term has been subject to considerable stretching in its transition from the USA to other parts of the world, largely due to its plasticity (Collier and Mahon, 1993; Jørgensen, 2015). As a result, rewilding can now be considered an umbrella term, referring to a range of activities which exist along a spectrum from 'rewilding max' to 'rewilding lite' (Carver *et al.*, 2021; Gordon *et al.*, 2021; Martin *et al.*, 2021).

In practice then, rewilding means many different things to different people, often related to its geographical context. In the USA, rewilding tends to adhere to its original sense of 'cores, corridors and carnivores' ('three Cs rewilding', i.e. large reserves of land (cores) are linked together (corridors) to allow large predators (carnivores) to move freely within the landscape and exert a regulatory role on ecosystems (Soulé and Noss, 1998)). In Europe, by contrast, there is less emphasis on large carnivores and greater emphasis on large herbivores; the role of large herbivores as 'disturbance factors' and 'ecosystem engineers' within a landscape provides a regulatory function in ecosystems as vital as that of carnivores, albeit via grazing and browsing rather than predation (Hodder *et al.*, 2009; Jones *et al.*, 1994). Thus, the North American and European approaches use different orders of animals to achieve similar effects: (re)introducing large carnivores or herbivores restores trophic interactions to ecosystems. Within these broadly conceptually similar approaches of 'trophic rewilding' (Pettorelli *et al.*, 2018) practical differences exist however, particularly in relation to levels of human intervention involved. For example, 'active rewilding' often entails quite significant human intervention, which may be used as a catalyst at the start of a rewilding project or may be ongoing (Sandom *et al.*, 2018). On the other hand, 'passive rewilding' entails little or no human management of land, allowing natural processes to occur autonomously (Sandom *et al.*, 2018), and can include 'land abandonment' in which human influence is withdrawn from land which was previously managed (Navarro and Pereira, 2012). Focussing more closely on approaches to rewilding in Europe, an extremely broad range of projects exist; several initiatives all self-identify as rewilding and yet exhibit very different practices, from species reintroduction (e.g. 'Hop of Hope' grasshopper reintroduction in England) to restoration of severely degraded ecosystems (e.g. 'Rewilding Chernobyl Exclusion Zone' in Ukraine) to wholesale landscape-creation (e.g. 'Marker Wadden' in the Netherlands) (Rewilding Europe, 2022). These projects demonstrate the plasticity of the term 'rewilding' and extent to which it has become an umbrella term for a multitude of different activities. While some see this proliferation of projects under the heading of rewilding as a dilution of the term's radical potential (Carver and Convery, 2021), others see it as harnessing its inspirational properties (Deary and Warren, 2018).

Tailoring rewilding to local contexts becomes important since, while the 'three Cs' approach may be feasible in the USA, where large areas of (relative) wilderness which are (relatively) free from human influence or artefacts remain, it is less practical in Europe, where there is a long history of dense human habitation and extensive modification of landscape (Linnell *et al.*, 2015). Indeed, rewilding in Europe has experienced considerable controversy due to concerns over human exclusion from landscapes (Brown *et al.*, 2011; Wynne-Jones *et al.*, 2018) and lack of human intervention, which publics have sometimes interpreted as an abnegation of responsibility (e.g. Lorimer and Driessen, 2014). Because of such controversy, and other constraining factors, rewilding in Europe is being considerably adapted, leading to it being described as 'tamed' (Martin *et al.*, 2021) or 'domesticated' (Thomas, 2021). The forms of rewilding which are emerging are more compatible with other types of land use and therefore more socially acceptable, leading to co-existence and tolerance rather than generating controversy. Indeed, the compromises made by rewilding allow for 'land sharing' with farming (rather than relying on land

sparing for conservation), leading to the identification of 'agricultural rewilding', a form of rewilding which aims to restore ecosystem functions using low-intensity human interventions involving the introduction, management, and harvest of livestock (Mondière *et al.*, 2021). Agricultural rewilding offers the potential for win-win scenarios in which biodiversity is increased and ecosystems are restored along with active human intervention in landscapes and the provision of livelihoods which are financially and environmentally sustainable.

Negotiating rewilding and livestock farming

As agriculture occupies nearly 40% of the world's ice-free land (Foley *et al.*, 2011), the biodiversity status of agricultural land is crucial. While rewilding max generally occurs in landscapes where agriculture is absent, marginal or has been abandoned (Navarro and Pereira, 2012), agricultural rewilding can be found on productive, non-marginal land, on individual farms and/or within wider agricultural landscapes. Agricultural rewilding can enhance biodiversity within these areas to a greater extent than would be possible in conventional agriculture. Nonetheless, in negotiating its position within farming landscapes, agricultural rewilding compromises on some of the key tenets of rewilding. This compromise should not be interpreted as a weakness but rather as a strength in that rewilding can exhibit flexibility, expanding its applicability while still achieving its central purpose. While some advocates of rewilding see it as 'in danger of becoming all things to all people' and seek to 'keep it distinctive and close to its ecological roots' (Carver and Convery, 2021), agricultural rewilding is a pragmatic approach which has the potential to make rewilding compatible with other land use, thus reconciling rewilding and agriculture. Indeed, if agricultural rewilding is perceived as less threatening than rewilding max it has the potential to succeed within productive agricultural landscapes where forms of rewilding further along the spectrum may fail. In such cases agricultural rewilding can proceed and provide ecological benefits in human-dominated landscapes whereas, by rigidly adhering to its key tenets, rewilding max may not be able to proceed at all and would therefore produce no environmental benefits. The ways that agricultural rewilding achieves a compromise between rewilding and agriculture are discussed below.

Negotiating landscape scale and composition

It is argued that rewilding must occur at the landscape scale with large, core areas of land spared for conservation. Where this is unfeasible due to human and/or physical landscapes, rather than abandoning aspirations of rewilding, agricultural rewilding can exist at more human-compatible scales, aligned to farms or other areas of landownership (which has been observed to be socially acceptable based on mutual respect for land-ownership rights (Mikołajczak *et al.*, 2021)). In this way, relatively large-scale rewilding can still occur and provide ecological benefits while remaining compatible with existing land-ownership models. Agricultural rewilding can contribute greatly here since, in addition to the size of the area, land composition and heterogeneity are crucial in ensuring restoration of ecosystem functions, both of which can be achieved through pastoral agriculture (Sabatier *et al.*, 2014). For example, Rewilding Britain (2021) list eleven British rewilding projects with areas of 121–4,402 ha which have an agricultural output (i.e. they can be described as cases of 'agricultural rewilding') and which have been engaged in rewilding for at least five years. In these projects human intervention via agriculture is able to maintain heterogeneity at farm (as opposed to landscape) scale.

Negotiating biodiversity and ecosystem functioning

Rewilding emphasises restoring ecosystem functioning via 'natural processes', ideally using other-than-human agency. While rewilding max would insist that any species involved in an ecosystem be wild, agricultural rewilding permits the inclusion of domestic species. For example, certain agricultural systems (e.g. agroecological livestock systems) depend much more on ecosystem services supplied

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by biological processes than on human inputs, decreasing human inputs and improving ecological integrity to restore ecosystem functions (Therond *et al.*, 2017). When agricultural rewilding combines these principles of agroecology with rewilding, introducing domestic species to serve as ecosystem engineers and as analogues for their wild counterparts, it can have even greater ecological benefits and convert farmland into a biodiverse ecosystem. To function well within the ecosystem, and to provide biodiversity benefits, such species need to be hardy and/or traditional breeds and be well adapted to local conditions (e.g. English Longhorn cattle in Great Britain or Maraichine cattle in French marshland) and be kept at low stocking rates (Herrero-Jáuregui and Oesterheld, 2018). Appropriate stocking rates have been demonstrated at existing (agricultural) rewilding projects: for example, ecosystem restoration in the south block of the Knepp Wildland is performed using several species with an overall stocking rate of 0.23 livestock units/ha/year (unpublished data). Thus, in addition to their role as ecosystem engineers, the domestic species involved in agricultural rewilding have the added benefit of fulfilling a role in productive agriculture which the wild species in rewilding max do not. Moreover, agricultural rewilding can have biodiversity benefits over those of rewilding max since it can create and maintain habitats which may be lost in rewilding max and whose loss would pose a threat to habitat specialists (Navarro and Pereira, 2012).

Negotiating degree of human intervention and other-than-human autonomy

Unlike rewilding max, which ultimately seeks to remove all human intervention from a landscape, agricultural rewilding retains elements of human intervention both by necessity and design. Such interventions can enhance rewilding via habitat restoration, extensive grazing / grazing control or reduction, tree planting, species reintroduction, deer control, and controlled flooding of land, all of which can be conducted as part of agricultural rewilding (indeed these activities are present in rewilding projects listed by Rewilding Britain (2021) which we class as agricultural rewilding). Perhaps most relevant to the continuation of agriculture is the extensive livestock grazing, although deer control and species reintroduction (depending on the species concerned) can also play a role. In this way, agricultural rewilding allows for meat production at a modest level not least because, in order to maintain stocking rates and therefore the functioning of restored ecosystems, species populations must be regulated, with human harvesting of livestock mimicking predation (Gordon *et al.*, 2021). This management and slaughter of species impinges on their autonomy and killing of animals in either conservation or farming contexts is not without controversy. It is, however, arguably more morally defensible to kill animals for food as part of agricultural rewilding than if animals would otherwise be culled but not enter the human food chain, as may occur in rewilding max. Moreover, while some people oppose killing any animal for human consumption, others are particularly concerned by intensive agriculture and the conditions within which animals live and die. Extensive farming as part of agricultural rewilding therefore offers an advantage in that animals can be kept in naturalistic conditions and according to high welfare standards.

Concluding remarks

Agricultural rewilding, which permits continued human intervention in the landscape, offers a win-win scenario. Domestic livestock can be present in the landscape, restoring biodiversity and regenerating ecosystem function, active human intervention in the landscape can continue in the management of these species and, while the autonomy of other-than-human species is somewhat curtailed by their management and ultimate slaughter, their lives, as part of an extensive farming system, will have been lived to high welfare and environmental standards, and their deaths can provide high-quality meat and contribute to food self-sufficiency, thus to some extent decreasing the outsourcing of food production to areas where environmental standards are lower, and avoiding associated environmental impacts. Thus, agricultural rewilding can address two concerns about current animal production by: (1) reversing its impact on

biodiversity; and (2) offering better animal-welfare conditions. While agricultural rewilding produces meat in an environmentally sensitive and sustainable way its primary aim is ecosystem restoration with livestock production as a secondary goal. As a result, its agricultural output is low and this is an obstacle to its expansion in the current context of the need to feed nine billion people by 2050. Further work regarding meat production from agricultural rewilding would therefore be highly illuminating as would research concerning food production from other means and/or changes to consumption habits, all of which will help to address questions of supply and demand for the global population while remaining within planetary boundaries.

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