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Rewilding the European Landscape
An Unconventional Approach to Land Management

Traditional land use in Europe has been on the decline since the end of World War II. Driven by social, physical, and economic factors, agricultural land abandonment has resulted in a decline of 17% of rural populations since 1961 (Navarro and Pereira 2012). Younger generations are moving into cities with the hope of finding competitive careers, while ageing populations stay in place with limited access to transportation infrastructure and economic opportunity. Over time, this migration has created a feedback loop, where the decline of commercial and public services in rural areas indirectly incentivizes relocation to more densely populated regions. In some cases farmers are too poor to leave their ancestral plots, but lack viable work options in the neighboring communities. As families separate in search of better economic opportunities, the cohesive fabric of farming communities unravels. This provides conglomerate farming companies with real-estate, spurring the development of large scale intensive agricultural operations. The farms with poorer soils, mountainous terrain, or restricted access for mechanization are not suitable for acquisition—increasingly, the land is left fallow and unmanaged. Though locavore movements in Europe are gaining traction, the markets tend to be restricted and slow-growing. Regulatory measures, including the designation of “Less Favored Areas” by the European Common Agricultural Policy, provide subsidies to farmers to discourage abandonment; however, the payouts, while costing governments a fortune, do not provide much relief on an individual basis. The problem is complex and subject to regional considerations—economic factors, environmental conditions, and cultural norms vary across locales and countries—there exists no single solution to this increasing trend.

Extensive agriculture, characterized by a mosaic of use patterns, has long been viewed as ecologically beneficial in Europe. Certain species thrive at the edge of habitats; the mix of pasture for livestock, semi-forested orchards, vineyards, and meadows was thought to be the best use of land for humans and wildlife alike. Characteristics of traditional agriculture: polyculture, use of common lands, crop rotation, composting, and the scarcity of external resources provided a framework for coevolution and habitation in the landscape. In some areas, biodiversity has long been prized for contributing to the



Source: Staffan Widstrand/Rewilding Europe

www.rewildingeurope.com



quality of agricultural products. Traditional land-use has low nutrient input, resulting in low fertilizer, pesticide, and herbicide levels in the soil and water systems. Unfortunately, this type of agriculture also has relatively low output—generally only providing enough for the family or small-scale markets. Spain and

Portugal, with their relatively arid climates, have

the largest land areas of traditional farming. Though some farms will continue to be supported by funds from tourism and cultural preservation, a movement toward intensification of the most productive agricultural lands, with the addition of imports from other countries, is expected to be the model of food production for Europe in the years to come. The three accepted strategies of land management: extensive agriculture, intensive agriculture, and afforestation aren't applicable to regions where infrastructure and production are limited. Across Europe, two extremes are emerging across the landscape: the return of wild vegetation and animals on abandoned property, and the wide-ranging conversion of the most fertile regions to mechanized agriculture.

The outcome of agricultural land abandonment, both in an ecological and anthropogenic context, depends on an array of historic and current circumstances. Soil quality is determined by what types of crops or livestock occupied the land before vacating. Erosion issues arise when fields are left fallow and without the introduction of native species (and subsequent culling of invasives), landscapes can become havens for pests and weeds. Where soil amendments have enriched the organic content of the substrate, unique or sensitive species have thrived. Climate conditions have changed over time, as well as the abundance of animal and plant species that once kept biotic systems in balance. When lands succumb to the processes of nature, historic and cultural artifacts disappear. Over time, familial and ethnic sites of importance lose geographic context. For those who remain, the reintroduction of native flora may taint the taste of milk or meat from the livestock still grazing on adjacent lands. Similarly, crops may struggle against emergent successional forests on neighboring properties, due to shade and competition.

Deforestation (a pattern previously interrupted only by the collapse of the Roman Empire and the Black Death) has been supplanted by afforestation strategies, often in the hands of global companies. Tree plantations provide little economic benefit for an individual owner but large swaths of land, owned by multinationals, can turn a profit at harvest. Areas which are deemed unsuitable for plantations are actively managed to keep succession at bay; landscapes which appear unmanaged or wild are generally viewed as undesirable in countries which have historically valued dominance over nature. Regeneration can take a long time in drier climates, and is dependent on the quality of the native seed bank. In wet climates it can take just 15 years, but in the early successional stages land is vulnerable to invasive species. Terrains in drier regions that have been allowed begin the process of succession are often overtaken by sagebrush and scrub—perfect tinder for wildfires. Goats, sheep and cattle roamed these pastures at one time, keeping the dry undergrowth to a minimum. With livestock declining by 25% since 1990, invasive and native shrub species have re-emerged, making fires a major risk to biodiversity

and human welfare (Navarro and Pereira 2012). Confronted with continued population decline, governments are seeking an unprecedented method of land management, one which relies minimally on external resources while promising financial and ecosystem services.

Recognizing the challenges associated with large scale land abandonment across the European Union, a novel and adaptive land management strategy called “rewilding” is gaining momentum, a proposal which assumes ecosystems cannot be restored without the re-introduction of the animals that originally inhabited them. Sara Reardon describes this new paradigm for conservation as being based on the the following two premises: “first, that many supposedly wild areas are actually a mere shadow of what they were before our ancestors arrived on the scene. Second, that we cannot restore these ruined ecosystems to their former glory without restoring the animals that shaped them—especially the big animals at the top of the food chain” (1). The economic precedent for this movement comes from the success of the United States’ establishment of National Parks, where taxpayer and tourist revenue support the management of flora and fauna while creating jobs in education, recreation, scientific, and service industries. Subsidies designed to keep rural farms operational have been insufficient and expensive for governments. Rewilding (also known as “process protection” and “landscape recovery” strategies) hope to return cultivated lands to their wild states with minimal human and economic interventions. A Dutch foundation, appropriately named “Rewilding Europe” has been particularly instrumental in convincing government and land holders to set aside large tracts of lands for ecosystem corridors across the continent. Different regions will have varying degrees of protection—some will be strictly non-consumptive while others will issue permits for hunting and fishing. A key part of their mission is the re-introduction of herbivores, whose presence will maintain a mosaic landscape, which promotes greater biodiversity than homogenous forests. These animals will also keep the scrub species at bay; thereby reducing the threat of wildfires. In addition to herbivores, a variety of carnivores, birds, and aquatic species are also being considered. The release of predator species is hotly contested, due

to fears of negative human-animal interactions, endangerment of livestock, and a historic/instinctive distrust of wolves and big cats. However, without these predators, overpopulation, disease, and overgrazing are bound to create massive problems for land managers. Educational campaigns are emerging in countries where the poaching of wolves, lynx, and bears has long been accepted as a preventative measure.

The table below lists the mammals nominated for reintroduction in Rewilding Europe's latest report :

1. European bison (<i>Bison bonasus</i>)	10. Golden jackal (<i>Canis aureus</i>)
2. Alpine ibex (<i>Capra ibex</i>)	11. Grey wolf (<i>Canis lupus</i>)
3. Iberian ibex (<i>Capra pyrenaica</i>)	12. Eurasian lynx (<i>Lynx lynx</i>)
4. Southern chamois (<i>Rupicapra pyrenaica</i>)	13. Iberian lynx (<i>Lynx pardinus</i>)
5. Northern chamois (<i>Rupicapra rupicapra</i>)	14. Wolverine (<i>Gulo gulo</i>)
6. Eurasian elk (<i>Alces alces</i>)	15. Grey seal (<i>Halichoerus grypus</i>)
7. Roe deer (<i>Capreolus capreolus</i>)	16. Harbour seal (<i>Phoca vitulina</i>)
8. Red deer (<i>Cervus elaphus</i>)	17. Brown bear (<i>Ursus arctos</i>)
9. Wild boar (<i>Sus scrofa</i>)	18. Eurasian beaver (<i>Castor fiber</i>)

Source: Dienet et al 2012

To understand the importance of establishing predators alongside herbivores, one can look at an often cited precedent which began as an experiment in the early 1980's. A Dutch man named Frans Vera decided to release back bred Heck cattle on his property, in the hope that they would rewild themselves and restore ecological balance on his acreage. Heck cattle are the hardiest and mostly closely related to the ancient Auroch, a wild cow that roamed the European landscape until 1627. All of the cattle we see today descended from these long-horned beasts. They were enormous, known for their violent tempers and their ability to survive in the harshest of landscapes. Over hunting and pressure from the proliferation of domesticated cattle on their grazing lands eventually drove them to extinction, an event which has been lamented ever since. In the 1920s the Nazis began a propaganda effort to select and breed a type of Auroch from existing hardy cattle. They were never able to re-create the extinct species, but the look-alikes were released on a preserve where the Nazi elite vacationed.

Recent efforts are more precise but still unsuccessful; scientists are gathering genetic material from old bones and Auroch teeth, then using the data to compare the genes to modern cattle. This DNA is used to determine which breeds carry the greatest number of traits from the Aurochs, therefore selecting which cattle should be bred to exhibit phenotypes. Until a new generation has matured and reproduced (without the complications of inbreeding) Aurochs are unlikely to establish themselves in their former home.

Frans Vera understood his cattle were not equivalent to the Aurochs, but they might serve the same function as keystone substitute species (those that have a great impact on an ecosystem despite relatively small numbers) in the restoration of his 13,837 acre property. He also released a herd of ponies with similar hardy back-bred traits, called the Konick. He opened his land as a reserve and invited tourists to witness the animals in their natural environments. With the idea that the fence

surrounding the reserve would restrain their numbers, the animals were allowed to starve and die when the winter weather depleted their food supply. As their carcasses decayed on the soil, rare carrion birds descended onto the reserve and made it their home. A novel ecosystem was born, manipulated by human influence, but generating its own complex



Source: Mark Hamblin/Wild Wonders of Europe www.rewildingeurope.com

processes without active management. Not surprisingly, tourists were very alarmed to see starving cattle and ponies (a cherished companion to many Europeans) when they came to visit Vera's reserve. The smell of death was overwhelming and visitors were disturbed to witness scavengers devouring the captive "wild" animals. Charges of animal abuse were brought on Vera, who believed the welfare of cattle and ponies were secondary to the roles they were meant to play in the ecology of the landscape.

An agreement was reached that when animals appeared to be starving or succumbing to disease they would be shot—only the carcasses out of view of the visiting public would be left to rot. Vera's experiment was highly revealing for future tourism in the rewilding movement: this is how people would react when undomesticated animals were allowed to suffer.

Biopolitical discourse generally revolves around the treatment of animals in the following modes: conservation, welfare, biosecurity, and agriculture (Lorimer 2013). People ascribe different uses to different species, depending on their historical use and a real or imagined relationship with them. The rewilding movement wants to create a mode of its own, which seeks to unite conservation and welfare, while appreciating the risks inherent with the proximity of wild creatures to domesticated animals and urban areas. Disease transmission is a particularly worrisome to farmers, whose livestock are often very susceptible to illness because they aren't bred for hardiness or genetic diversity. Property owners are concerned about attacks on pets and children, as well as the the very expensive prospect of replacing landscape vegetation after a herd of roaming herbivores decide to graze on their lawns and flowers. It is unlikely the parks established for rewilding will be fenced, and in colder months animals are likely to venture far from their summer ranges in search of food. If predators are kept out of reserves, culling the herd will likely prove expensive and wasteful, especially if carcasses are not left to decay in place out of concern for public opinion. Animals slated for reintroduction can not be considered fully wild or domesticated; in the early stages, rewilding demands at least some intervention to ensure these novel ecosystems can sustain themselves in the long term. Convincing the public this is a worthwhile investment requires the partnership of governments, non-profits, educational institutions, and conservation advocates.

The Rewilding Europe foundation has an ambitious vision, even in the short-term. They plan to rewild 2,471,053 acres across ten chosen regions, representing ecosystems from the alpine to the sea (rewildingeurope.com 2014). They are not alone in their efforts; the World Wildlife Federation is a major

contributor, while local governments and NGOs have signed on in nearly every country of interest. Partners include (but are not limited to) the Wildlife Recovery Programme, the Taurus programme (a group particularly interested in Aurochs), the European Rewilding Network and the Fundación Naturaleza y Hombre in Spain. Public relations are paramount in the foundation—strategies in youth education, internet presence, publications, and social media have been pivotal in its campaign. Equally important is communication with landholders, who provide the missing acreage links for corridors across political boundaries.

Five regions are included with the short-term vision of Rewilding Europe. They include: the Velebit Mountains in Croatia, the area known as Western Iberia across Portugal and Spain, the Danube Delta and Southern Carpathians in Romania, and the Eastern Carpathians of Slovakia and Poland. In the Velebit mountains, the eastern slopes were the frontline for Croatian and Serbian troops during the Balkan conflict. Remaining villages in the region are dwindling and the presence of buried land mines makes the region prohibitive to development. Economic prospects are few in Western Iberia, where the land is prone to dense scrub and forest fires. Interestingly, this region is home to a UNESCO world heritage site, where paleolithic drawings provide visitors with narratives of ancient times. European rabbits, which were once abundant, are in precipitous decline. Their natural predator, the Iberian lynx, is soon to follow. The regional hub of Tulcea in the Danube Delta of Romania is known for good standards of accommodation and an extant tourism economy. The delta has long swaths of undisturbed coastlines, with one of the largest reed beds in the world. The neighboring primeval Letea Forest is designated as a UNESCO Biosphere reserve and already enjoys stringent protection standards. Though economically depressed at the moment, the Danube Iron gate and Romanian health resorts have been famous attractions in the Southern Carpathians. This region would benefit ecologically from the reintroduction of the European beaver and the Griffon vulture. Comprehensive GIS mapping is underway while funding is secured—the hope is to designate hunting-free zones to increase overall

populations of wildlife. Political and local support is still sought in the Eastern Carpathians, where vast areas of protected lands already exist. With media distribution and stakeholder meetings, Rewilding Europe hopes to convince locals to get on board and secure lands to provide vital linking habitat.

Ecotourism has been touted as the new economic model for these regions; however, a lack of roads and basic infrastructure (such as decent accommodations) make this a remote possibility in some places. Without viable alternatives, nature tourism, which is shown to be three times more popular than conventional tourism, may be the most feasible option. With up-front government and entrepreneur investment, building

accommodations and roads could be the impetus for targeted redevelopment in economically depressed regions. Having wilderness within commuting distance of urban centers has been shown to increase population, property values and amenity growth. Whereas westerners tend to view conservation as being something separate from humans, Europeans



Source: Staffan Widstrand/Rewilding Europe www.rewildingeurope.com 

view the land as an entity they have co-evolved with—an inextricable part of their cultural fabric.

Rewilding is not a one size fits all approach, instead, planners look at the preservation of each region according to its unique qualities. Parks can be established for multiple recreational uses or preserved as museums, homages to agricultural and architectural antiquity. Similarly, abandoned industrial landscapes can be decontaminated, but the structures left to deteriorate naturally. Sensitive wilderness areas can be protected and left alone entirely or strategically managed to ensure endangered or threatened species have habitat to rebuild their numbers. Rare plant species have emerged in abandoned agricultural plots where they have never been seen before; years of soil amendments made

the land hospitable to vegetation that would otherwise be relegated to specific habitat patches. Altered soils make rewilding difficult in some respects; reconstructing the flora and fauna in a world transformed by climate change, industrial pollutants, and a lack of keystone species can be nearly impossible. It is necessary to look at these landscapes not as static entities, or to lament what they used to be. Instead, these ecosystems will have their own unpredictable but meaningful biotic qualities and adaptations.

Rewilding has benefits beyond those for wildlife or human enjoyment. Reforestation and selective harvesting produces timber yields, while controlling erosion and increasing infiltration and evapotranspiration. With water quality and scarcity being a major concern in climate change predictions, protecting and redeveloping riparian corridors, wetlands, and permeable surfaces will be advantageous for generations to come. Upland reforestation can reduce flooding in low-lying cities and villages. Successional forests sequester carbon and reduce the heat-island effect more so than fast-growing timber species. Grasslands have been shown to have higher albedo (reflectivity) than forests and urban areas, another powerful agent against global warming.

Landscapes are protected when they are deemed aesthetically or emotionally beneficial, worthy of conservation, or they meet a perceived standard of what naturalness. The rewilding movement is shifting perceived baselines about the definition of wilderness. It presents itself as a positive view of conservation, one that is looking at solutions while being comfortable with the potential risks. Perhaps this refreshing perspective in the deluge of dismal predictions about the environmental future of our planet is what society needs to start making changes. Rewilding is an inherently interdisciplinary approach—one that has the potential to yield valuable information about the ecological, political, and social impacts of environmental restoration a changing world.

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