A thesis submitted to the Department of Environmental Sciences and Policy of Central European University in part fulfilment of the Degree of Master of Science

"Europe's New Wild" A study of the management and planning of European rewilding projects.

Maximiliaan BEELDENS

July, 2016

Budapest

# Notes on copyright and the ownership of intellectual property rights:

(1) Copyright in text of this thesis rests with the Author. Copies (by any process) either in full, or of extracts, may be made only in accordance with instructions given by the Author and lodged in the Central European University Library. Details may be obtained from the Librarian. This page must form part of any such copies made. Further copies (by any process) of copies made in accordance with such instructions may not be made without the permission (in writing) of the Author.

(2) The ownership of any intellectual property rights which may be described in this thesis is vested in the Central European University, subject to any prior agreement to the contrary, and may not be made available for use by third parties without the written permission of the University, which will prescribe the terms and conditions of any such agreement.

(3) For bibliographic and reference purposes this thesis should be referred to as:

Beeldens, M. 2016. "Europe's New Wild" A study of the management and planning of European rewilding projects. Master of Science thesis, Central European University, Budapest.

Further information on the conditions under which disclosures and exploitation may take place is available from the Head of the Department of Environmental Sciences and Policy, Central European University.

# Author's declaration

No portion of the work referred to in this thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.



Maximiliaan BEELDENS

## **CENTRAL EUROPEAN UNIVERSITY**

ABSTRACT OF THESIS submitted by: Maximiliaan BEELDENS for the degree of Master of Science and entitled: "Europe's New Wild" A study of the management and planning of European rewilding projects. Month and Year of submission: July, 2016.

Rewilding is often described in academic literature as a promising new conservation strategy, especially in European landscapes. In recent years, many rewilding projects have started to put these new ideas into practise. This study looks at how these European rewilding projects attempt to plan and manage their endeavours, paying special attention to how they try to overcome obstacles and their relationships with local stakeholders. To obtain data, this study has made use of a combination of an internet mediated questionnaire and semi-structured interviews. As European rewilding projects are still in their infancy, so is their management. Though operational, most initiatives are still designing their formal management plans. Adaptive management is widely used in tackling a wide array of rewilding obstacles and partnerships play a big role in this, on all levels or rewilding management. Rewilding in Europe is very promising and is already showing some of its potential, but it is still early days and much more effort is needed to achieve the ambitious goal of fully-functioning ecosystems with nature-based economies. Management, policies and research all need to improve and work collaborate for rewilding to succeed in Europe.

**Keywords:** rewilding, biodiversity conservation, adaptive management, systematic conservation planning, wilderness, wild, reintroduction.

# Acknowledgements

I would like to thank my supervisor, professor Brandon Anthony, for his help, critical comments, suggestions and encouragement, which pushed me to make the most out of my research.

Many thanks also go to my friends, who have made this year an unforgettable one and who have given my so many new experiences and insights.

To my parents, I am immensely grateful for making it possible for me to pursue my studies and for instilling in me a never ending interest and passion for the natural world.

Lastly, I want to express my gratitude to Mit, for her great support, patience, but most of all her love.

# **Table of Contents**

1. Introduction 1		
1.1.	Rewilding: What's in a Name?	1
1.2.	Rewilding as the new Wilderness Idea ?	3
1.2.1.	Wilderness in the law	6
1.3.	Rewilding in a European Context	7
1.3.1.	A European Interpretation	7
1.3.2.	Europe as the Land of Possibilities ?	8
1.3.3.	Obstacles to Rewilding	12
1.3.4.	Bringing it into Practise	14
1.4.	Rewilding Ourselves	17
1.4.1.	Rewilded Minds	17
1.4.2.	Human Responsibilities	18
2. Co	nceptual Framework	19
2.1.	Systematic Conservation Planning	20
2.2.	Stakeholder Participation	24
3. Re	search Question, Aims and Objectives	26
4. Me	ethods	27
4.1.	Qualitative Questionnaire	27
4.2.	Internet Mediated Research	28
4.3.	Limitations	28
4.4.	Research Ethics	28
4.5.	Analysis	29
5. Re	sults	30
5.1.	Rewilding Sites and their Specifics	31
5.2.	Defining Rewilding in Practise	32
5.3.	Management of Rewilding Areas	33
5.3.1.	Management Planning	34
5.3.2.	Adaptive Management	35
5.3.3.	Rewilding Objectives	37
5.4.	Obstacles along the Way	41
5.4.1.	Problems and Solutions	42
5.4.2.	Policies for Rewilding	45
5.4.3.	Public Opinion and Stakeholder Involvement	47
6. Co	nclusions, Recommendations and Further Research	49
7. Bibliography		
Appendix : Survey Questions		61

## **List of Figures**

**Figure 1**: Abandoned farmhouses are a common sight in the Eastern Rhodopes Rewilding Area, Bulgaria.

Figure 2: Likelihood of land abandonment in EU member states.

Figure 3: Rewilding initiatives part of the European Rewilding Network.

Figure 4: The different steps of Systematic Conservation Planning.

Figure 5: The adaptive management cycle.

Figure 6: The respondent rewilding projects of the internet mediated research questionnaire.

**Figure 7**: Recently reintroduced Garrano horses, a breed closely related to the Eurasian wild horse (Equus ferus ferus), Rewilding Western Iberia.

Figure 8: Vision for Rewilding Eastern Carpathians.

Figure 9: Egyptian vulture painted on apartment building in Madzharovo, Bulgaria.

# List of Abbreviations

- CAP Common Agricultural Policy
- EU European Union
- IMR Internet Mediated Research
- NGO Non-Governmental Organisation
- SCP Systematic Conservation Planning

# "Europe's New Wild"

# A study of the management and planning of European rewilding projects

1. Introduction

## 1.1. Rewilding: What's in a Name ?

Rewilding is a relatively recent term in the study of conservation biology. It has its origins in the late 1980's and started to get a foothold since 1990, when it was first used by American conservationist and dedicated activist Dave Foreman (Soulé and Noss 1998; Sandom et al. 2013; Johns 2016). The first detailed and refined definition of the term rewilding was given by biologists Michael Soulé and Reed Noss (1998). It was conceptualised as a new method in conservation that could complement existing conservation biology, that relied heavily on the designation of protected areas or biodiversity reserves to literally 'conserve' or protect areas of land valuable for biodiversity (Soulé and Noss 1998). Biodiversity conservation through area protection proved insufficient in maintaining healthy and autonomously functioning ecosystems as even the largest protected areas such as the Yellowstone Ecosystem could not prevent degeneration of important species and ecological processes without intensive management by humans (Soulé and Noss 1998; Sandom et al. 2013). Research indeed indicates that the current focus on reserves is not enough to halt the decline in biodiversity (Butchart 2010), suggesting that additional methods are needed to make conservation more effective. Rewilding was put forward early on as a much needed addition to the toolbox of conservation, for the current protection of biodiversity was not deemed sufficient and other, additional methods are needed (Soulé and Noss 1998). It was introduced to improve biodiversity by restoring or re-establishing ecological processes and ecosystems on a large scale with a strong focus on what are called 'keystone species'. This would not only increase the size of ecosystems, but also make them, as well as the existing protected areas, more robust in the face of human threats (Noss and Cooperrider 1994; Soulé and Noss 1998). Although it was initially introduced as complementary to other conservation methods, as protecting the wildernesses that are left is seen as the cornerstone of conservation (Wuerthner et al. 2014), some authors praise the broad focus and ambition of rewilding, which make it stand out (Fraser 2009).

In its first incarnation as defined by activists and scientist such as Foreman, Soulé and Noss, rewilding was a mainly North American idea, focussed on three C's: cores, corridors and

CEU eTD Collection

carnivores (Soulé and Noss 1998; Sandom et al. 2013; Jorgensen 2015). The cores represent the need for large reserves in which biodiversity has the space to thrive, a scientifically proven need for effective conservation (Cooperrider and Noss 1994), which need to be well connected to ensure genetic health within communities, hence the corridors (Soulé and Noss 1998). The carnivores stand for the importance of keystone species in the overall health of ecosystems. Large carnivores play a vital role through trophic cascades and can be important for the overall image of the project (Soulé and Noss 1998). The third C has received some modification in more recent publications. Sandom et al. (2013) rather call it 'species reintroduction to restore ecosystem functioning', a formulation that is more general and more directed towards the overall goal of reinstating working ecosystems. The focus is no longer only on carnivores, but has become broader and also includes other 'keystone species' that have disproportionately significant effects on the ecosystem (Fraser 2009). Together, these three principles form the baseline of the scientific argument in favour of rewilding (Soulé and Noss 1998; Sandom et al. 2013). The way in which Foreman used the term rewilding implied the necessity of a very large scale as he wanted to create a large system of North American wilderness in protected areas which would be able to support all native species in sustainable numbers (Johns 2016). By combining existing protected areas with restored landscapes and by reconnecting habitats, rewilding could prove to become a solution to one of the most pressing problems in conservation; habitat fragmentation (Fraser 2009; Bekoff 2013). The initial definition of rewilding as discussed by Soulé and Noss has over time been expanded by other naturalists and come to include also ecological processes that go beyond the scope of the three C's, such as natural fire cycles and inundations (Fraser 2009). Some have taken the rewilding idea a step further to what is called 'Pleistocene rewilding', in which even extinct species and ecosystems would be resurrected (Donlan et al. 2006; Richmond et al. 2010). There are those who try to realise such grand projects, but Pleistocene rewilding's greatest merit is that is highlights the ambitious and optimistic nature of rewilding that allows people to think big and dream again in the field of conservation (Monbiot 2013).

Within the science of conservation biology, there already was a branch occupied with the restoration of ecosystems, but authors describing rewilding do mark some differences. Whereas restoration implies a return to something that was in the past, it is the rebuilding of an ecosystem that has been lost and thus has a fixed goal of restoring that ecosystem (Jorgensen 2014). Rewilding, on the other hand has no such goal. It is not a predefined point in the past that is to be the end result of rewilding (Rewilding Europe 2016a). Rewilding

Europe (2016) wants the idea of rewilding to be future-minded. Jorgenson (2014) states however that their reintroduction goals do have an air of nostalgia for a distant past. These reintroductions do serve a greater purpose as motors behind fully functioning ecosystems (Sandom et al. 2013) that ultimately have no or little need for human interference. This idea or rather ideal of 'non-human autonomy' is what unites all scientific definitions of rewilding to date (Prior and Ward 2016), demonstrating that rewilding is not a hollow concept merely because it has many different definitions. Nonetheless, there are doubts over the outcome of rewilding as a conservation strategy, especially because of its uncertain outcomes (Nogués-Bravo et al. 2016). Around the same time as the first use of the concept of rewilding, there had been some debate, especially in the field of environmental philosophy, on whether it would be altogether possible for humans to recreate or even improve nature or wilderness (Rolston 1991). This consideration is justified, as biologists also urge to remain realistic about the degree to which we would be able to recreate nature (Bekoff 2014). Rewilding, however does not wish to remake a historical reality, but rather wants to provide possibilities for new ecosystems (Bekoff 2014). And it seems that nowadays restoration ecology is becoming an increasingly important element in the toolbox of environmental policymakers and scientists (Suding 2011), providing opportunities for rewilding to become part of official policy.

## 1.2. Rewilding as the new Wilderness Idea ?

The term re-wilding contains an obvious reference to the idea of the wild or wilderness, a term that has had its own fair share of debate and controversy within the spheres of environmental philosophy and conservation (Callicott 1994, 2000). The wilderness idea has been extensively debated in the field of environmental philosophy over the years and has received both criticism and praise. There are voices who call for the term wilderness to be cast aside as an outmoded way to interact with nature, while others still see great value in its use as both a philosophical idea and a practical concept for conservation (Cronon 1995). By explicitly attempting to make nature and ecosystems 'wilder' (Rewilding Europe 2015), rewilding does appear to show a positive inclination towards the wilderness idea, albeit in a more modern and anthropogenic incarnation. There is thus a danger that rewilding will receive similar criticisms as wilderness due to its close etymological and ideological links. Though similar in sounds and origin, I argue that the term rewilding can challenge wilderness as a new way of framing nature conservation, as it does away with many of the connotations that make wilderness such a contested term. Apart from challenging the wilderness idea, it

gives its basic premises new legitimacy by overcoming some of its main difficulties. To explore the possibilities of rewilding as a rejuvenated form of the wilderness idea, I discuss some of the most prevalent critiques and praises on the wilderness idea, before investigating how rewilding fits into this tradition.

Wilderness has in the past often been praised by environmentalists as a cure for the negative aspects of human society. Wilderness in its most commonly used definition is an area of nature that is untouched or virtually unaltered by human interference (Callicott 1994, 2000). According to Cronon (1995), Wilderness is seen by some as 'an antidote to our human selves', somewhere humans can escape to if we feel at odds with civilization. But Cronon wonders whether that is the true nature of wilderness. Wilderness, in his eyes, is essentially part of nature, but it is also a human creation as it the result of people's perception of certain areas of land (Cronon 1995), a perception that is not necessarily close to the truth. The idea of wilderness with a positive connotation originated mainly in the United States. Most authors hence focus on the US or North America, but this does seem limited, as the current usage of the terms wild and wilderness is not limited to North America any longer in common use. The terms are increasingly applied in Europe, where they were, according to authors such as Cronon (1995), not traditionally used. An important and widespread critique of mainly the North American version of wilderness is that it is interpreted as misanthropic, because the traditional wilderness idea sees humans only as visitors whose, mostly detrimental, impacts are undesirable (Callicott 2000). Some also call it ethnocentric (Callicott 2000), as to create an 'uninhabited wilderness', indigenous people have in several cases been forced to move out of their ancestral lands to make way for wilderness reserves (Cronon 2005). It seems possible at first that rewilding might have a similar goal of undisturbed landscapes, with no human habitation or activity, but those who bring rewilding into practice see it differently. Rewilding often has the explicit goal of benefiting people, as well as biodiversity, with a focus on benefitting local communities (Rewilding Europe 2015). Although people would be taking a step back as far as management and intrusion goes, there would be plenty of room for people to interact with nature in rewilding areas. In fact, that is an important objective of the movement (Bekoff 2014; Rewilding Europe 2015; Prior and Ward 2016). Large wilderness reserves, such as the first national parks in the United States, have the reputation of being instruments of top-down conservation with little or no regard to local or aboriginal peoples, hence the accusations of ethnocentrism (Guha 1989; Callicott 1994 and 2000; Fraser 2009). The idea of a pristine landscape without any human alterations that is connected to wilderness

is also not applicable to rewilding, as the whole concept of rewilding revolves around areas that had been altered or impoverished by humans, but are now given the opportunity to become 'wilder' (Rewilding Europe 2015; Johns 2016). It is no use to ponder over the wilderness that once was, we should instead be working on the wild that can be (Bekoff 2014).

Guha (1989), when discussing the downsides of the wilderness idea, was cautious of exporting a concept such as wilderness to other continents as the 'American model' might not be desirable or feasible in Europe or Asia. The result might become 'politically suspect' and hence not sustainable as a conservation project on the long term (Guha 1989). It has, however, been shown that the globalisation of that other North American concept, rewilding, has not been problematic in the sense that its meaning and use has been adapted to the local contexts of each continent (Johns 2016) and the rewilding areas would not be suspect, but rather inclusive and locally imbedded. The establishment of rewilding areas would ideally be done in close cooperation and agreement with local people and businesses to ensure mutual benefits (Rewilding Europe 2016a). Rewilding could be able to lend new legitimacy to the wilderness idea thanks to its inclusionary and often bottom-up model of wilderness restoration and conservation.

To be a viable conservation strategy, wilderness areas have to coincide with biodiverse areas, or should at least be representative for native biodiversity (Johns 2016). The founder of the concept of rewilding has stated that large swathes of land, designated as wilderness and free from human disturbance are 'essential to the comprehensive maintenance of biodiversity' (Foreman *et al.* 1992). However, what is seen as wilderness are often merely areas of land that were deemed unproductive an thus left to their own devices, as humans have no interest in them (Johns 2016). Hence Foreman's emphasis on wilderness that contains healthy populations of native fauna and flora with special attention for large predators (Foreman et al. 1992). The link between the wilderness idea and the conception of rewilding is clearly there, but rewilding strays of the traditional path by not expecting wilderness to be pristine and free of human influence, a feature that is likely not to exist in anyway (Sandom et al. 2013). Instead new wild landscapes, aided by humans, have become the focal point and ultimate goal of what can be seen as a more realistic, yet also highly ambitious wilderness movement. Rewilding, as the new incarnation of wilderness, or at least wilder nature, can thus overcome many of the problems and criticisms that the traditional wilderness idea has encountered in the past. Rewilding provides a more optimistic and future-oriented approach that has its roots

in the wilderness movement, but combines this with ambitious restoration goals (Sandom *et al.* 2013; Donlan *et al.* 2006).

### 1.2.1. Wilderness in the law

In the Unites States, wilderness has been given a clear legal definition, that includes some important elements of what a wilderness areas is or should be. The 1964 'Wilderness Act' does not only define wilderness, it also designates areas as wilderness and interestingly, also states the purpose of these wildernesses (Johns 2016). The Wilderness Act defines wilderness as follows:

"A wilderness, in contrast with those areas where man and his works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value."

Important aspects in this definition are that wilderness is supposed to be 'untrammeled', or unaffected by human and that there is to be no permanent human presence in these areas. It does state, however, that these areas should offer the possibility of (primitive) recreation, opening possibilities for ecotourism, which is seen as a primary purpose of wilderness areas. It also states that there might be a need for management to preserve its current state, which might seem somewhat contradictory, as human activity is to affect these areas in as limited a way as possible. Size is also an important and clearly defined requirement of wilderness areas. Johns (2016) notes that the quality of these areas are not represented in the definition as it does not mention the need for these areas to be ecologically self-sustaining, nor the presence of high biodiversity or species of conservation interest. There, thus are some notable differences between what is legally defined as wilderness by US law and the wild lands that

should be the result of rewilding, according to its first conception (Soulé and Noss 1998; Sandom *et al.* 2013). It is clear that the US legal definition is guided by the original wilderness idea, which has had its share of criticism, as shown earlier.

There is currently no legal definition of what rewilding is or should be, even though the idea of wilderness and making space for wild lands is being promoted by the European Parliament as an important element of conservation (Johns 2016). Considering the experimental nature of rewilding initiatives, which might mean changing goals, definitions and methods, it might be unfavourable for the development of rewilding as a conservation tool to set a permanent definition of what rewilding is and entails (Pellis and De Jong 2016). This would allow individual initiatives to define rewilding in their own contexts with the possibility to consider their own objectives and strategies. In a European context, this would be especially relevant, for local differences in the level of human presence and disturbance might significantly alter the possibilities for rewilding in any given area. In the results chapter, the way in which rewilding initiatives is defined by law, as it will be interesting to see how they differ. For rewilding to have a lasting influence, the resulting landscapes should be able to enjoy legal protection.

## 1.3. Rewilding in a European Context

Although rewilding as a concept has its roots in North-America, it has not remained a regional idea and has been eagerly adopted on other continents as well (Johns 2016). It has caught on particularly well in Europe, where it has become an important theme in conservation (Johns 2016). Rewilding is seen as a new, positive and optimistic wind in a conservation landscape that has been criticised as dominated by old institutions and high politics with an often gloomy message (Jepson 2016). Rewilding thus gets quite a lot of media coverage and has some very fervent supporters in Europe (Monbiot 2013).

## 1.3.1. A European Interpretation

In making the crossing to Europe, the concept has been adapted to fit its new surroundings and became more suitable for implementation in a continent with a different history and mind-set. The difference between the North American and European approaches to wilderness and rewilding boils down to the role humans can have in a wild environment and the

availability of land. The traditional idea of wilderness without human intervention is part of the American culture (Nash 1967). European wilderness and by extension the European interpretation of rewilding leaves room for humans to interact with the wild and to leave their mark (Pellis and De Jong 2016). This is also reflected in the European practice of rewilding that often shows the close connection between nature and culture in the continent (Prior and Ward 2016). Effectively, the dualism between nature and culture that is often witnessed in North American wilderness discourse is not present in Europe (Linnell *et al.* 2015). It has been suggested that in Europeans much more readily accept humans as part of their environment and of the nature that surrounds them (Hall 2014). In practise this means that rewilding does not need to have an end point in which there are no humans whatsoever. European rewilding allows for people to be part of the end result or rewilding (Pellis and De Jong 2016), whatever that may be. Hereby, European rewilding refutes one of the main critiques, namely that it would exclude humans through land-sparing practises (Jorgenson 2014; Pellis and De Jong 2016).

Johns (2016) has noted that in Europe, more so than in North America, rewilding is often used as almost synonymous with ecosystem restoration. European ecosystems have been heavily modified by human interactions with them and to be able to ensure that they can fully function again, an effort is often needed in the form of reintroductions or reforestation projects (Pellis and De Jong 2016). This differs from the famous example of Yellowstone national park in the US, where the large wild land was present, and rewilding took the shape of bringing back the wolf (Fraser 2009; Monbiot 2013). In Europe, the landscape often needs to go through a transformation from a cultural, and in many cases agricultural landscape to one where nature is the prime actor. Another important characteristic of European rewilding is the emphasis that is given to the role of large grazers in an ecosystem. Highly influential in this context is the work of Dutch biologist Frans Vera, who studied 'grazing ecologies' and the relation between natural grazing and forest structures. After studying pollen and vegetation deposits in peat, Vera concluded that European lowland forests must have been quite open, for he found evidence of many oak and hazel trees, which need openings in the canopy to generate (Vera 2000). He attributed these openings in lowland forests to the presence of large grazers in the form of ungulates such as wild horses, deer and aurochs (Vera 2000 and 2009; Pellis and De Jong 2016). This so called 'wood-pasture hypothesis' became the basis of some of the first practical rewilding projects in Europe, notably in Vera's homeland, the Netherlands, where a 'new wilderness' was created north of Amsterdam; the Oostvaardersplassen (Vera 2009). Not

large carnivores were reintroduced here, but large ungulates, notably Konik-horses and Heckcattle, as proxies for extinct wild horses and aurochs (Vera 2009; Pellis and De Jong 2016). Vera was not the only one to come up with a theory on European lowland forests however, and other research on pollen may debunk his hypothesis (Birks 2005; Mitchell 2005). The high-forest hypothesis downplays the importance of large herbivores in lowland forest regeneration and states that open spaces in dense old-growth forests were created by abiotic factors such as wind (Birks 2005; Mitchell 2005). Europe is highly diverse in landscapes and ecosystems, though, so the practise and focus of rewilding will inevitable differ across the continent (Pellis and De Jong 2016).

Although rewilding may not have fixed outcomes, this goes to show that there is room for debate and experimentation in the science and management of European rewilding, which takes European conservation out of its rut and makes it all the more exciting (Jepson 2016).

#### 1.3.2. Europe as the Land of Possibilities ?

Not only is there a distinct European rewilding movement, the continent is also proving to be a source of opportunities to experiment with practical rewilding. That being said, Europe's specific contexts also bring along a set of interesting challenges that need to be dealt with. The most important opportunity for rewilding in Europe is the occurrence of large scale land abandonment all over the European countryside, as seen on map 1 (Navarro and Pereira 2015a). It is estimated that between 10 and 30 million hectares of land will be abandoned by the year 2030 (Verburg and Overmars 2009). This tendency is especially felt in remote rural regions where agricultural productivity is low and the population is ageing. People increasingly leave these areas, a process that is reinforced by natural succession that makes abandonment spiral (Navarro and Pereira 2015a). Especially the mountainous areas of Europe are experiencing a depopulation and farmland abandonment, as illustrated in image 1, causing forest expansion (Conti and Fagarazzi 2005). This is seen by many as a societal problem (Conti and Fagarazzi 2005; Navarro and Pereira 2015a). However, this offers some important possibilities for rewilding those areas as this would mean a more biodiversity-friendly and cheaper form of land management (Schnitler 2014; Navarro and Pereira 2015a). Current EU policies do not encourage rewilding as viable solution to land abandonment, however (Navarro and Pereira 2015a). The EU's common agricultural policy favours these lands to remain productive and awards subsidies to prevent abandonment (Jepson 2016). So although

CEU eTD Collection

it is true that land abandonment is a significant possibility for rewilding in Europe, there is a need for policy adjustments if rewilding is to be implemented on a large scale throughout Europe (Jepson 2016). The possibilities of rewilding in Europe do not limit themselves to abandoned and marginal agricultural lands, however. There is great margin for improvement in productive and fertile lands as well. Rewilding need not mean that land is given up entirely, it can also imply improvements to agricultural practices to make them more sustainable and wildlife-friendly (Merckx 2015). The use of Agro-Environmental Schemes prove that agricultural productivity and biodiversity can go hand-in-hand (Merckx 2015).



*Figure 1: Abandoned farmhouses are a common sight in the Eastern Rhodopes Rewilding Area, Bulgaria. Image source: Maximiliaan Beeldens.* 

A second possibility for rewilding in Europe is the remarkable comeback of large carnivores, one of the three cornerstones of the rewilding ideas, throughout the continent (Enserinck and Vogel 2009; Boitani and Linnell 2015). This goes to show that species such as grey wolves and brown bears do not necessarily need large wilderness areas to return and they can indeed adapt to human presence (Boitani and Linnell 2015). Research has shown that large carnivores and remnant European wilderness areas largely coincide and that these populations are suitable to recolonise nearby abandoned lands (Ceauşu *et al.* 2015). This suggests that the natural conditions for rewilding in Europe are present, but that is requires good management and policies to become a truly successful strategy. In those places where lost species have not started to return naturally, EU legislation might provide alternative opportunities as the

Habitats Directive asks EU member states to study the possibility of reintroducing locally extinct species (Council Directive 92/43/EEC). Their presence remains precarious to some, however, so the main objective must be to design a model for coexistence with these creatures (Enserinck and Vogel 2009).



CEU eTD Collection

Footnote:

Data for Guadeloupe (FR), Martinique (FR), Guyane (FR), Réunion (FR) and Açores not available

Figure 2: Likelihood of land abandonment in EU member states. Measured in a composite index (0-1) of the risk of land abandonment based on five drivers: weak land markets, low farm income, low farm investment, age of farm holder and remoteness and low population density. (Source: Eurostat 2013).

## 1.3.3. Obstacles to Rewilding

Despite these opportunities for rewilding, there are a host of challenges and obstacles to overcome if the rewilding process is to fulfil its potential in Europe. Not every rewilding project may encounter the same problems, but there are some issues that most initiatives will have to deal with at some point.

The first major obstacle that is particular to European rewilding has to do with current policies and laws that are not always favourable to this new type of land management. Although the European Union (EU) has set a goal of restoring 15% of all ecosystems within its territory as part of its 2020 biodiversity strategy, EU and conservation institutions seem reluctant to change their land management policies (Monbiot 2013; Jepson 2016). The main problem lies with the EU's Common Agricultural Programme (CAP) and the farming subsidies it generates. About one tenth of all agricultural subsidies from the CAP goes towards sustaining farming in so called 'less favoured areas', which happen to be those areas most prone to land abandonment (Merckx and Pereira 2015). Interestingly, the reasoning behind these subsidies is that traditional, extensive farming methods would be beneficial for farmland biodiversity (Merckx and Pereira 2015). Rewilding initiatives could benefit from current CAP subsidies by engaging in agro-environmental schemes, but the requirements for these are often contradictory to the low-management ideals of rewilding (Jepson 2016).

The current EU biodiversity policies can also halt the development of rewilding, especially in the naturally rich areas that make up the Natura 2000 network, as member states are obliged to upkeep the 'compositional character' of these sites (Jepson 2016). Rewilding could be complementary to the current EU biodiversity policies, but some changes would need to be made to accommodate for rewilding in the existing policy framework (Merckx and Pereira 2015; Jepson 2016). Proponents of rewilding plead for a policy reform, as they argue the current attempts to counteract land abandonment are expensive and often inefficient at reaching both their socio-economic and environmental goals (Merckx and Pereira 2015). Current agro-environmental schemes can be valuable in some cases, but it would need to be assessed where low-management would be better suited for the purpose of improving biodiversity (Merckx and Pereira 2015) and in these cases, rewilding would be a more cost-efficient way of improving biodiversity. Jepson (2016) would even like to see a legal obligation for EU member states to establish experimental rewilding sites. Regardless of the

possible solutions, there is a consensus among rewilding scholars that rewilding needs to be included as a possible land management tool in EU policies (Navarro and Pereira 2015b). However, the conservation community might need some convincing too, as they are considered too conservative (Jepson 2016), as some think that passive management might increase the risk of problems such as invasive species, wildfires and increased predation (Sandom et al. 2013). In cooperation with academic experts on the topic of rewilding and the University of Oxford, Rewilding Europe has recently published a policy brief in which it clearly states what it would like to see changed to accommodate for rewilding in Europe. First and foremost, it would like to see the EU recognise rewilding as a viable conservation method (Jepson and Schepers 2016). The popularity of the concept in Europe and the fact that so many initiatives are being set up across the continent should urge the EU to take rewilding into account. According to the brief, the EU should see rewilding as a complementary strategy to its existing biodiversity policies as it could even help achieve a more efficient implementation of the Birds and Habitats Directives (Jepson and Schepers 2016). It could indeed fill in the need for wilderness areas in the Natura 2000 network. Jepson and Schepers (2016) suggest that the EU starts actively supporting and funding existing and new rewilding initiatives as part of its biodiversity strategy. Such changes should create a more productive climate for rewilding in Europe, which would, according to the authors of the policy brief, also benefit European biodiversity on the whole.

The second main obstacle rewilding in Europe could face is human-wildlife conflict, or more generally a conflict of interests between cultural and natural values. The success the rewilding idea in Europe is based upon the premise that humans and large carnivores can coexist, but the recovery or reintroduction of such animals across the continent has sparked controversy (Rewilding Britain 2016e). Especially the return or expansion of wolves seems to be difficult to accept to people who might come into direct contact with them or those who stand to lose livestock or pets to wolves (Smith 2014). In countries like Scotland, the farming community is a small minority in its opposition to carnivore reintroduction, yet proves to be especially vocal and influential (Monbiot 2013). The return of large carnivores this needs to be carefully planned and managed to reduce conflict, because avoiding conflict by concentrating on areas where conflict is less likely to occur is not the most effective conservation strategy (Rondinini and Boitani 2007). Although it are the carnivores that get most of the media attention, herbivores also create tension as their rising numbers might lead to increased crop damage,

disease transfers to domestic animals and possibly lead to increased road accidents (Boitani and Linnell 2015).

It is not only direct human-wildlife conflict that might pose an issue, but also and misconceptions about animals that lead to negative attitudes towards rewilding (Boitani and Linnell 2015). Scavengers such as vultures are often still thought of as harmful, causing people to oppose their conservation (Cortés-Avizanda *et al.* 2016). Rewilding initiatives need to thus spend a lot of attention and effort towards creating ways for people to coexist with wild animals (Beckoff 2014; Enserinck and Vogel 2014; Boitani and Linnell 2015). And in order for this to be achieved, socio-cultural, as well as natural and financial aspects need to be taken; into account, as well known remedies such as compensation might not resolve underlying reasons for the conflict (Dickman 2010). If not, rewilding schemes will lack the local support needed to be successful on the long term.

#### 1.3.4. Bringing it into Practise

Several projects have not waited for government policies to initiate rewilding in Europe and have started to realise their own initiatives. The biggest and most ambitious of these projects is Rewilding Europe, an organisation founded in 2010 with the grand aim of rewilding more than one million hectares in ten rewilding sites across Europe by the year 2022 (Rewilding Europe 2013a). They have also designed their own 'working definition' of what rewilding comprises and how it sees this in a European context:

"Rewilding ensures natural processes and wild species to play a much more prominent role in the land- and seascapes, meaning that after initial support, nature is allowed to take more care of itself. Rewilding helps landscapes become wilder, whilst also providing opportunities for modern society to reconnect with such wilder places for the benefit of all life." (Rewilding Europe 2014)

When looking at all the elements present in this definition, it becomes clear that several important aspects and core ideas of rewilding, that have been discussed in the above chapters, feature in this definition. It can thus be seen as exemplary for the European rewilding movement. It testifies of an increasingly more positive appreciation of wild landscapes in Europe as there is a need to reconnect to such places, while at the same time implying the importance of rewilding for biodiversity conservation. The basis, the restoration of ecological processes and keystone species, is obviously present. But what is significant, is that human

intervention and support is also included in the definition, which is seen by scholars (Hall 2014) as characteristic for the European approach to rewilding and wilderness. Rewilding Europe aims to bring its aim of rewilding one million hectares into practise by establishing 10 pilot sites across Europe, of which 9 are currently operationalised (Rewilding Europe 2013a). Within these sites, Rewilding Europe works together with existing local organisations in order to achieve their aim. Every individual pilot are has a ten-year vision of what it hopes to achieve or which natural processes and species it would like to see restored (Rewilding Europe 2016b). Rewilding Europe sees itself as an experimental organisation (Pellis and De Jong 2016). As a result of its novelty, it would have to learn from its own mistakes, so it will be interesting to see whether their projects use adaptive management principles.

The human aspect of rewilding is also embodied in the 'entrepreneurial' nature of organisations such as Rewilding Europe (Pellis and De Jong 2016), as they are in favour of human economic activities in or near rewilding sites as long as these do not become damaging or contradictory to their objectives (Pellis and De Jong 2016). They support initiatives that wish to develop businesses that are based on the values of rewilding in order to support local jobs and income by marketing wild nature and the experiences that go with it (Rewilding Europe 2016c). This to create economic and societal incentives to rewild, which represents the human benefit in their working definition. Having a profitable or at least sustaining business based on restored landscapes can also lend legitimacy to the project among local inhabitants. Rewilding can thus make nature pay for itself in different ways, by means of a low-maintenance management strategy and lending economic value to nature.

As a way of sharing best practises and knowledge among the many rewilding projects across the continent, Rewilding Europe has set up the European Rewilding Network, which consists of all sites seen on map 2 (Rewilding Europe 2013b). This online network wants to increase the visibility of rewilding projects and improve projects as well as the movement as a whole by conducting trainings and seminars on key topics such as species reintroductions, education and communication, habitat restoration, community involvement and ecotourism (Rewilding Europe 2013b).



**CEU eTD Collection** 

*Figure 3: Rewilding initiatives part of the European Rewilding Network, nine of which are Rewilding Europe pilot areas. Situation in April 2016. Source: Jepson and Schepers 2016.* 

Another organisation that groups several rewilding projects together is Rewilding Britain, which, as the name suggests, is working in the United Kingdom. It is even more ambitious in its aims than Rewilding Europe as it wants to rewild one million hectares in Britain alone, both in terrestrial and aquatic environments (Rewilding Britain 2016a). They define rewilding along the same lines as Rewilding Europe, but also stress the ecosystem services that could be provided by rewilded land (Rewilding Britain 2016b). Unlike Rewilding Europe, they do not

have projects running at the moment, but they do support ten established areas across Britain in a similar set up as the European Rewilding Network (Rewilding Britain 2016d). Although its ambitions might be high, it remains a voluntary collection of highly localised initiatives.

## 1.4. Rewilding Ourselves

Since its conception in the early 1990's, the term rewilding has been used in several different ways. Its definition has not only remained closely linked to the wilderness idea but has come to include ecosystem restoration and is even used in more urban contexts, far removed from the wild cores that Foreman described (Jorgensen 2015; Johns 2016). Interestingly, it is not only used to describe strictly biophysical phenomena, but also the reconnection of humans with nature (Monbiot 2013; Beckoff 2014). This human element has been part of rewilding from the very beginning as Soulé and Noss (1998) saw the reintroduction of large carnivores as a chance for humans to regain some humility when entering wild landscapes. But, it has been elaborated more recently by rewilding activists as one argument in their very broad arsenal of reasons to support rewilding. Although still experimental, the science to support rewilding is there, the argument goes (Bekoff 2014), what is needed now, is to rewild ourselves.

## 1.4.1. Rewilded Minds

In its relatively short existence, the term rewilding has widened greatly in scope (Monbiot 2013). It has evolved from being applied only to the context of nature conservation and the restoration of ecosystems to also include important psychological and social aspects. Rewilding could provide an antidote to what George Monbiot (2013) coined 'ecological boredom', a state of disconnection from nature that is symptomatic to modern societies, which makes life less interesting and causes irresponsible behaviour towards the environment (Bekoff 2014). According to some authors, rewilding proposes to reintroduce nature back into the lives of people by reconnecting them to natural processes, as well as reintroducing nature in the landscape, thus creating a link between our daily lives and the wild (Monbiot 2013; Bekoff 2014). This reconnection with nature or the wild as implied in the usage of rewilding by authors like Monbiot (2013) and Bekoff (2014) is reminiscent of Arne Naess' 'deep ecology' (1985). In this theory, there is an all-important balance in the world's ecosystems of which humans are an essential part (Naess 1985) and thus, humans need to be aware of their position within this system. This can be achieved by 'rewilding our hearts' (Bekoff 2014).

which stands for increased humility and compassion in our contacts and interactions with nature. Rewilding in this sense is not only a conservation strategy, but a mind-set that enables humans to see nature and especially other animals in a different light (Bekoff 2014). In both deep ecology and rewilding, nature is given existential value that needs to be respected and promoted and which requires humans to change their attitudes and actions accordingly (Naess 1985; Bekoff 2014).

Although rewilding ourselves is a personal pursuit centred around changing individual behaviour (rewilding begins at home and within (Bekoff 2014)), it is portrayed as a social movement that is needed to move society towards more sustainable behaviour, which is needed if conservation efforts are to be effective in gaining broad support (Bekoff 2014). This very broad approach of rewilding by Bekoff makes it an umbrella term, one that includes almost all conservation methods and is presented as a panacea for all sorts of societal and environmental problems. This might draw away attention from what rewilding's founders had intender the term to signify, although an open definition could gain support for the term from different corners.

## 1.4.2. Human Responsibilities

Rewilding has since its inception also been seen as a question of ethics (Soulé and Noss 1998). Humans have inflicted so much damage to nature that it is now our responsibility to give back, goes the argument, expressed by biologists and religious figures alike (Fraser 2009, McKibben 2010; Bekoff 2014). Others such as Erle Ellis go further by arguing that as we are now living in the Anthropocene, creating a liveable environment is our responsibility so humans must take over a large part of nature's work (Ellis 2012). Rewilding could be a scientific way to fulfil this responsibility, as it could compensate for some of the losses by restoring functioning ecosystems. This idea is being promoted by respected scientists such as E.O. Wilson, who has ambitiously stated that 50% of the earth's surface should be set aside for conservation and rewilding (Wilson 2016; Lynn 2015). Again, large carnivores are central in this argument. Humans have willingly extirpated animals such as wolves and bears from large parts of their natural ranges, and it would thus be no more than just for humans to aid their return (Soulé and Noss 1998). For people to fulfil this responsibility there would thus be a need for benevolent action to reintroduce these animals and restore their habitats, albeit until they could survive without human management (Soulé and Noss 1998). This might be evident within the scientific community, where the urgency of biodiversity loss is well understood,

but among the public, reintroducing predators remains highly controversial (Fraser 2009; Diemer *et al.* 2003). This highlights that if rewilding is to be a successful conservation strategy, it needs to include education and compensation schemes to reduce the negative aspects and attitudes associated with living near wild nature.

Apart from fulfilling a responsibility towards the environment, there is also a social element to rewilding. Establishing rewilding areas can lead to a host of new possibilities for people in or around these areas, especially when it comes to income and employment (Fraser 2009). Ecotourism is the most obvious path to take (Enserink and Vogel 2009), as many people could be interested to enjoy the rewilded nature and as described above, it is an important objective of rewilding to reconnect people with the natural world (Bekoff 2014). Management and monitoring of the areas also creates opportunities for scientists, fieldworkers and rangers (Fraser 2009).

Ecosystem services are another way rewilding could benefit society in several ways (Cerqueira *et al.* 2015). Tourism and job creation were mentioned, but one of the great socioenvironmental issues of our time is climate change and also in this instance, rewilding can provide possibilities (Fraser 2009). Large scale forest regeneration on abandoned lands could increase the carbon sequestration capabilities of a given area and improve air quality (Navarro and Pereira 2015). Restoring processes like hydrological cycles have the possibility to mitigate flooding, providing yet another vital service to both society and the environment (Monbiot 2013; Rewilding Britain 2016c). Human health would also benefit from rewilding the countryside, or our cities for that matter (Bekoff 2014), as spending time in nature has been proven to benefit our wellbeing in numerous ways and could be seen as preventive healthcare (Maller *et al.* 2006).

So by taking up responsibility for the environment, proponents of rewilding argue that humans would benefit just as well. Fraser (2009) even goes so far as to call it a '*Marshall Plan for the planet*'.

#### 2. Conceptual Framework

Rewilding may have an ideal of a very low or even non-existent level of human management for its areas, but as even the most 'wild' and large protected areas are in need of well thought through management plans (Sandom *et al.* 2013), it seems unlikely that rewilded areas will be completely self-regulating. This is especially true in the first stages of rewilding an area, when there would be a need for intensive human intervention to reintroduce species, for example

(Rewilding Europe 2014). Indeed, it seems that even the most fervent advocates of rewilding see a need for at least some degree of management of rewilding areas on the long term and experience tells us that even the wildest and largest of areas must be managed to avoid degeneration of their ecosystems (Soulé and Noss 1998; Sandom *et al.* 2013; Johns 2016). The idea of bringing back what was once lost and then leaving the ecosystem to fend for itself seems rather utopian, but the long term goal of rewilding Europe 2014; Johns 2016). For the foreseeable future, management and conservation planning will remain part of rewilding. There is thus a need for an evolutionary and systematic approach to suit the specific and somewhat experimental method that is rewilding.

## 2.1. Systematic Conservation Planning

Systematic conservation planning (SCP) is a model for biodiversity conservation that sets out a clear set of steps that should lead to the achievement of pre-defined conservation goals and objectives (Margules and Pressey 2000). The focus of SCP is mainly on protected areas and reserves which, in ideal situations, would safeguard important elements of biodiversity and ecological processes from human pressures. This could be achieved if two important objectives were reached: representativeness of local biodiversity and persistence thereof, meaning that once a reserve is created, it does not deteriorate but remains healthy on the long term (Margules and Pressey 2000). If applied to rewilding, persistence would mean the selfsufficiency of the ecosystem. Margules and Pressey (2000) set out the six steps that make up SCP, which are seen as the standard blueprint for SCP. These six steps do not follow each other in a linear fashion. Constant review and feedback is an important part of SCP that makes it more adaptable in case obstacles should arise during the process. Figure 1 shows these feedback loops schematically. Especially in the early stages, feedback loops make it possible to adapt the planning process in order to streamline it (Sarkar and Illoldi-Rangel 2010). The six steps are the following:

- 1. Compile data on the biodiversity of the planning region
- 2. Identify conservation goals for the planning region
- 3. Review existing conservation areas
- 4. Select additional conservation areas
- 5. Implement conservation actions
- 6. Maintain the required values of conservation areas



Figure 4: The different steps of Systematic Conservation Planning. Arrow show the links and influences between steps and double arrows indicate possibilities for feedback, which is possible between most steps. Source: Sarkar and Illoldi-Rangel 2010.

The system allows for the detection of possible conflicting values between conservation goals and socio-economic goals, and for compromises to be made (Rondinini and Pressey 2007. This could prove especially valuable in Europe, where biodiversity often coincides with high human population densities (Araujo 2003), urging a need for stakeholder involvement and trade-offs to be made (Anthony and Szabo 2011). Rewilding areas may have issues with being entirely representative of the biodiversity in the area, as it are often not the most productive and intact areas that become rewilding areas (Navarro and Pereira 2015; Johns 2016). However, this may not be a problem, as rewilding seeks to achieve fully functioning and representative ecosystems. It may need somewhat of a different approach though. Systematic conservation planning could prove a highly interesting path for developing European rewilding areas and will thus be used here as a theoretical framework to discuss rewilding efforts. Developed and applied mostly in Australia and Southern Africa (Margules and Pressey 2000; Rondinini and Pressey 2007), systematic conservation planning can be a highly valuable addition to European conservation management, if sufficiently adapted to the specific contexts present in Europe (Rondinini and Pressey 2007; Rondinini and Boitani 2007). Rewilding as a form of conservation does not feature in the existing body of literature on SCP, thus leaving no precedents. However, habitat restoration, similar in its goals, though not identical to rewilding (Sandom et al. 2013), is mentioned as a possible beneficiary from the use of systematic conservation planning (Margules and Pressey 2000), which provides rewilding initiatives with a basis to work from. The reintroduction or reestablishment of large carnivores is one of the main goals as well as one of the main sources of contention of European rewilding (Seddon et al. 2014), and would subsequently be in need of thorough planning and management. This topic fits very well within the idea of systematic conservation planning as exemplified by Rondinini and Boitani (2007), who use the framework to study the potential for wolf (Canis lupus) and brown bear (Ursus arctos masiciani) conservation in the Italian Apennines, an area that coincides with an established rewilding area.

Step six of SCP, the maintaining of required values of conservation areas, essentially requires monitoring and evaluation, and good management (Margules and Pressey 2000). To cope with changes in societal and environmental conditions, this management needs to be as flexible as possible, especially so in the case of rewilding areas, which often do not have a fixed goal comparable to that of other conservation projects, but do need to achieve certain objectives.

The experimental nature of European rewilding areas would hence call for adaptive management, that would allow for learning and adjustments along the way. Adaptive management emerged in the late 1970's as a new approach to management, based upon environmental modelling and simulations to foresee future effects of human interventions (Holling 1978; Lescuyer 2002). Its most important advantage for environmental management is that it holds changes in the environment or specific conservation context into account and which allows for methods to change accordingly (Lescuyer 2002). The use of adaptive management is most suitable for conservation projects that are thought to respond to management interventions, but where the result of these management actions is uncertain (Williams and Brown 2012). Adaptive management integrates scientific knowledge and

planning with management practises, which is vital for natural resource management (Williams and Brown 2012).

Adaptive management is a learning process, designed for management to cope with changes in both the physical and societal environment in which a conservation project takes place (National Research Council 2004). Its intention is to improve the ability of projects to respond to changed situations and new information when trying to reach pre-set goals and objectives (National Research Council 2004). What makes adaptive management such an attractive method for rewilding projects is that there are both active and passive management options and the possibility to evolve from one to the other. Rewilding theorists have identified the need for both initial active intervention and subsequent evolution towards passive management practises (Rewilding Europe 2014; Merckx and Pereira 2015). Active methods of adaptive management seem most suitable for coping with initial uncertainty of rewilding projects, as available information is constantly reviewed and a broad range of actions and ecosystem models are compared and used to seek the best suited mode of action (National Research Council 2004). Later on, when the a thorough base of knowledge on the area is established and there is a consensus on the goals and methods to be adopted, there can be a change to a more passive form of adaptive management in which a single, tried and tested, mode of action is chosen (National Research Council 2004). In both cases, monitoring of the results of management actions is essential, as this forms the basis of future learning and adaptation, which are the key to success of rewilding projects. The process of adaptive management is similar to that of SCP and is often used as part of broader conservation planning and management. The cycle of adaptive management can be better understood when shown schematically, as in figure 2.



Figure 5: The adaptive management cycle. The feedback loop makes sure new information and experience is integrated in future management, thanks to constant monitoring, even when passive management methods are chosen. Source: CEDA 2015.

#### 2.2. Stakeholder Participation

Bringing together all interested parties or stakeholders in a conservation project such as NGO's, governments, local businesses and citizens to share goals, actions, concerns, knowledge and resources is the core of the participatory approach. Several rewilding advocates or scholars have highlighted the importance of local stakeholder participation for the success of rewilding efforts in the long run (Bauer *et al.* 2009; Bekoff 2014; Rewilding Europe 2014; Pellis and De Jong 2016). This is the case with many uses of natural resources and methods of conservation, where public participation is positively encouraged by policymakers (Warner 1997; Szabo *et al.* 2008; Young *et al.* 2013). Issues such as nature conservation are often complex, which is why people see a need for transparent decision making processes (Reed 2008). Public bodies are also interested in outsourcing or cooperating on conservation projects with private partners as this might reduce public

expenses and benefit other stakeholders (Young et al. 2013). There are several arguments commonly named supporting stakeholder participation. Firstly, it works favourable for the democratic processes and governance within conservation (Young et al. 2013; Hurlbert and Gupta 2015). Experience suggests that better decisions are being made thanks to participatory approaches because of the wider information base available to decision makers (Reed 2008). A second argument is that stakeholder involvement can bring in local knowledge, which can benefit the management of a conservation area (Young *et al.* 2013). When setting up rewilding sites and prioritized actions and locations, it is important to take into account social values of sites where conservation actions or, more specifically, rewilding is to take place (Whitehead et al. 2014). This information on social valuation might be used to predict areas and topics where conflict between stakeholders is likely to occur or reversely, where rewilding efforts are most likely to succeed due to shared interests (Whitehead et al. 2014). In this way, the rewilding management would be able to direct its strategies and management plans towards community participation that minimises conflict and ensures that conservation and social values coincide. Linnell et al. (2015) warn that due to important cultural values, full scale rewilding might not be possible or desirable in some areas of Europe, but with proper planning, the idea of low-intervention management might be more readily accepted and integrated in cultural contexts. Social values are being taken into account in many cases, especially where conservation interests and human populations concur as there is a question of maintaining both social welfare and reaching conservation objectives in a culturally 'appropriate' way (Stephanson and Mascia 2009). This ties in with a third commonly heard argument in favour of participatory approaches, namely that is can increase trust between parties with the goal of reducing conflict or at least trying to depolarise differences in viewpoints by gaining a better understanding of the conflict (Young et al. 2013). Within the context of rewilding, this could be particularly helpful when it comes to conservation conflicts (Redpath et al. 2013), particularly the reintroduction or improvement of populations of large carnivores, which is one of the most salient issues of conservation and rewilding (Wilson 2004; Chapron et al. 2014; Smith 2014). Although the general public often shows a positive attitude towards the comeback of large carnivores (Ericsson and Heberlein 2003; Smith 2014), those who live in proximity to them or who stand to lose income often think differently (Ericsson and Heberlein 2003). Specific planning to overcome or prevent human-wildlife conflict has been the focus of several studies (White and Ward 2010; Treves et al. 2009; Messmer 2000). Human-wildlife conflict could reduce the legitimacy of a rewilding project among local people (Young et al. 2013), so here too can participatory planning help reduce

CEU eTD Collection

friction (Treves *et al.* 2009). Several different methods for conflict mitigation could be used in co-decision with stakeholders such as relocation, compensation for losses and lethal control (Treves *et al.* 2009; Smith 2014).

## 3. Research Question, Aims and Objectives

Rewilding has proven to be a popular and hotly debated topic in academic literature recently, with publications exploring its definitions (Jorgensen 2015; Johns 2016; Prior and Ward 2016), its governance and policy possibilities (Navarro and Pereira 2015; Pellis and De Jong 2016), and its implications for ecosystems and biodiversity (Boitani and Linnel 2015; Rey Benayas and Bullock 2015). However, almost no mention is being made of the actual planning and management structures of European rewilding projects, even when it comes to potential problems. They are however an important part of any conservation project (Margules and Pressey 2000; Boitani and Rondinini 2007). The aims of my study below will thus be concentrated on the issues of planning, management and the community-related aspects thereof. Although much has already been said about definitions of rewilding (Jorgensen 2015), local differences are still worthy of investigation. As the meaning individual projects give to the term might define their objectives and methods.

The overall aims of this research are the following:

- 1. To establish whether European rewilding areas have specific rewilding objectives they want to meet.
- 2. To explore whether these areas have formal systematic conservation plans and what these entail.
- 3. To establish whether these areas use adaptive management to reach these objectives and what actions they undertake in order to achieve them.
- 4. To identify what obstacles European rewilding areas encounter and how they attempt to overcome these.

In order to achieve these aims, I will be conducting a survey of a wide range of European rewilding areas with questions focussed on the above mentioned aims. In addition to this, I seek to conduct several semi-structured in situ interviews with staff of selected rewilding initiatives, which will provide more nuanced information on the practical workings of the rewilding initiative. The research is focussed around the following question: *How are European rewilding areas planned and managed with special regards to local involvement and obstacles*?

## 4. Methods

As there has been little research on the management of rewilding so far, this research has an exploratory function which leads to relatively broad aims. But in order for a broad scope to be sufficiently focussed, a methodology with mixed methods has been utilised here. In order to obtain an overview of European rewilding sites, an online questionnaire was devised, which is the most practical method to obtain the needed information from a large population over an extensive geographical area. To supplement this questionnaire, several interviews were taken with specific rewilding projects. These interviews provided the research with more in depth knowledge and practical examples that would have been difficult to retrieve using a more general survey. The questionnaire is a good tool for obtaining information on which management tools are being used by rewilding initiatives, while interviews can shine some light on how they are implemented.

## 4.1. Qualitative Questionnaire

In order to assess how European rewilding areas are planning and managing to achieve their goal of rewilding, I utilised a qualitative questionnaire or survey, based on the guidelines set out by De Vaus (2002) and Jansen (2010) which was sent out to all self-defined European rewilding areas. These organise themselves within two networks; the European Rewilding Network and Rewilding Britain. This questionnaire was designed to gather data on three categories of information in accordance with the above stipulated aims: local definitions of rewilding and specifics on the initiatives, management and planning of the area, including stakeholder participation, and obstacles that have arisen during the process of rewilding. The questionnaire thus consisted of three sections, comprising three types of questions; multiple choice, short open ended questions and those that require a longer open ended answer. By using a qualitative survey, I looked for diversity of the characteristics or categories of information in the answers given by rewilding areas, rather than look for numerical frequencies as is the case in quantitative survey methods (Jansen 2010). The reason for this is that the response rates are likely to be rather low, with a high diversity in answers.

## 4.2. Internet Mediated Research

The questionnaire was sent to the rewilding initiatives using an online survey programme named '*surveygizmo*', in what is called internet mediated research (IMR) (Hewson 2003). IMR was used here because using the internet is the easiest and most time and cost efficient method of conducting survey research over a large geographical area, as was the case in this Europe-wide research. Being automated, the survey is easily replicated and distributed to the target audience who, in their turn, need only to enter information and submit it (Hewson 2003).

## 4.3. Limitations

The length of the questionnaire did not exceed 20 questions, of which 7 were open ended questions that required a longer answer. The questionnaire was purposely held relatively short as not to deter response, although length is not proven to be an important factor in response rates (De Vaus 2002). Even though, response rates are difficult to foresee and are in a large part in the hands of the respondents, rather than the researcher. This is the greatest limitation of this survey method and must be anticipated (De Vaus 2002). Hence, the questionnaire was complemented with semi-structured interviews with rewilding areas which went into more depth. Sending reminders or follow-up e-mails can also improve response rates and has proven to be effective in this and previous research to counter forgetfulness (Hewson 2003). When interpreting the received data, one needs to keep in mind that the population studied is by no means complete, but is a random sample of case studies (De Vaus 2002). Hence, generalisations need to be considered with care. Another limitation is the limited timeframe, which causes the survey to consist of what Jansen (2010) calls a one-shot, one-method sample that involves a single empirical research cycle (research question $\rightarrow$  data collection  $\rightarrow$  analysis  $\rightarrow$  report), instead of using a follow-up cycle to test the theoretic assumptions made after the first cycle. Because of this, the conclusion or hypothesis cannot be tested again with a new sample (Jansen 2010).

#### 4.4. Research Ethics

Even when conducting an IMR by using a survey, it is necessary to uphold some ethical considerations. Gathering data needs to be done while following an ethics protocol. The first issue is that of informed consent (Hewson 2003). Participants are informed of the nature of the research and of the reason why they are asked for their participation. The second issue is

confidentiality, which is ensured by using data only in aggregate form as not to disclose details on individual projects or participants (Hewson 2003). Thirdly, participants are given the possibility to receive a summary of the results of the study. This is to ensure they are aware of what has happened with the information they have given. In addition, the results of this study might interest and benefit the participants and other rewilding initiatives. The participants were also provided with my contact details and information about affiliation, for when additional questions should arise.

## 4.5. Analysis

Qualitative surveys can be analysed in several different ways, depending on the nature of the data and the information one seeks to acquire (De Vaus 2002). Jansen (2010) suggests two main types of qualitative survey, based on how they are to be analysed. The first is a pre-structured or deductive survey in which the sought after information is categorised in advance (Jansen 2010). The data are analysed to establish whether the predefined categories are present in the population that is being scrutinized with the survey (Jansen 2010). The second type of qualitative survey, the one that is used here, is an open or inductive survey. In the case of an open survey, one looks for categories or information or characteristics by interpreting the gathered raw data and not beforehand (Jansen 2010), in this case the submitted answers to the questionnaire and additional interviews. The open or inductive method is more suited to this research due to the diversity of the rewilding initiatives that form the subject of the study. Predefined characteristics are difficult to set in this case as characteristics may vary greatly and are not easily predictable.

As it is highly unlikely to have a response rate of 100%, there is a need to have a qualitative sample that represents the total population of rewilding areas other than by having a large sample (Jansen 2010). In this case, a diversity sample is used that is representative of rewilding initiatives across Europe. This sample is made up of rewilding initiatives from all over the continent and from both the European Rewilding Network and Rewilding Britain. The sample was not purposely selected but results from the fact that the total population of European rewilding initiatives is in itself highly diverse and well spread, in combination with a stroke of luck. With any survey, there is always the question of saturation; will the response rate be high enough to adequately answer the research question? In the case of qualitative research, this is determined empirically, rather than by reaching a numerical threshold.

## 5. Results

As previously reported, the survey was sent out to all members of the European Rewilding Network and Rewilding Britain, the two largest organisations that group individual rewilding initiatives. Out of these 50+ areas that were contacted, the response rate was 13%. Limited response rates are always a danger when conducting IMR (Hewson 2003). However, the initiatives that have responded form a well spread sample that is made up of rewilding initiatives from both Rewilding Britain and the European Rewilding Network and that are located in all corners of Europe. Hence, the sample can be regarded as relatively representative of the European rewilding movement. The resulting analysis subsequently does represent most aspects of European rewilding management.



*Figure 6: The respondent rewilding projects of the internet mediated research questionnaire. Source: Maximiliaan Beeldens/Google Maps.* 

## 5.1. Rewilding Sites and their Specifics

Having its roots in the wilderness movement, the creators of the term rewilding were ambitious and had the intention of creating large areas of rewilded land, big enough to support self-regulating ecosystems with populations of large animals that need space to thrive (Soulé and Noss 1998; Sandom et al. 2013). This is represented in the 'cores' idea; one of the three pillars of rewilding, as conceptualised by Soulé and Noss (1998). The US Wilderness Act suggests that a wild area needs to be larger than 5000 hectares in order to be formally recognised as wilderness. When it comes to the size criterion, all rewilding areas that have responded are indeed larger than 5000 hectares, with sizes ranging from 30.000 to 2.6 million hectares, indicating that the idea of creating sizeable core areas is being brought into practise. Yet, these areas are not always constituted of continuous swathes of uninhabited land. Most European rewilding sites are often disconnected and contain settlements of various sizes, roads and in some cases structures such as hydroelectric dams. Of those European rewilding areas that responded, none have suggested that they answer to the American wilderness ideal of an unaltered landscape without human presence, nor that they aim to do so. To the contrary, although rewilding sees opportunities in land abandonment, it seems that most initiatives actively aim to include local communities, rather than replace them with wilderness. The goal seems not to realize vast landscapes, emptied of human activity, but large areas where humans can live alongside wild nature.

As rewilding is relatively new as a concept, the projects that want to bring the concept to life are recent as well. Rewilding Europe as an organisation was only founded in 2010, yet it already has 9 pilot projects up and running, with the most recent addition being made in June 2016. Likewise the European Rewilding Network was set up in 2014 and combines more than 40 projects. However, conservation and restoration efforts in these areas did not start as late as this. Although the concept or at least the term rewilding was adopted by the areas between 2010 and 2016, most rewilding projects are based on conservation projects that have already been running for a considerable time, so rewilding in Europe usually does not start from scratch. To become one of the Rewilding Europe sites for example, existing conservation areas and projects needed to apply and the most suitable sites were selected (I-3). Rewilding Europe did not actively seek out the best areas for their rewilding Britain and the European Rewilding Network, were also established much earlier and only recently adopted the title of rewilding area. In many cases, existing protected areas such as national parks and Natura 2000

zones have adopted rewilding in addition to their other designations. All of the respondents in this research indicated that rewilding takes place in an area of which a substantial part (or all of it) is already formally protected.

It is hard to characterise European rewilding sites with other words than highly diverse. There is no unified method of designation of new rewilding sites. In many cases the area adopts the label itself, while larger organisations like Rewilding Europe choose areas from a list of applicants. However diverse these areas may be, what the respondents have in common is a large size of land to work with and the fact that none of them is devoid of human presence and activity, albeit to varying degree. There is also no unity in the type of ownership of rewilding areas. While only one of the respondents is entirely in private hands, most areas are a mix between state and private ownership, while in the United Kingdom, charitable trusts also play an important role.

## 5.2. Defining Rewilding in Practise

As Jorgenson (2015) has stated, even in theory, a consensus has not been reached on how rewilding should be defined. Thus, it is no wonder that practitioners of rewilding seem to hold a wide variety of opinions on what it should mean in reality. Although Rewilding Europe has come forward with a working definition, which has been shown above, the individual projects that are part of this wider initiative all give their own meaning to the word and have their own priorities.

In line with what Johns (2016) remarked, it seems that most respondents see ecosystem restoration as an important element of what rewilding means or make little distinction between the two, when asked how they define rewilding in their specific context. However, contrary to restoration in the strictest sense of the word, many rewilding projects have the aim to generate 'wilder' places, where natural processes can again occur, instead of having a predefined, specific outcome in mind. In combination with this restoration, reintroducing lost species is seen by many respondents as a vital element of this restoration and rewilding. This is of course one of the core aspects of what rewilding means in many academic and popular definitions of the term (Soulé and Noss 1998; Monbiot 2013; Sandom *et al.* 2013). Importantly, rewilding is seen first and foremost as a conservation strategy by some respondents, that can be an addition to their pre-existing conservation strategies (I-3).

More than half of all respondents stated that rewilding should not only be good for nature and biodiversity, but should also be to the benefit of people, especially local communities. This notion is central to the European interpretation of rewilding, which is much more ready to accept that humans play an important role in the rewilding process and must share in the results (Hall 2014). The most obvious way in which rewilding can benefit local inhabitants and visitors is ecotourism, which is an important part of the descriptions respondents have given of their projects. Some members of the European Rewilding Network are ecotourism operators. This is a reversal of the order, while other initiatives see ecotourism as a consequence of wilder landscapes, some want to rewild their surroundings as it will also benefit their tourism business. It is not only the opportunity business opportunities of ecotourism that are important to what rewilding means to the respondents. The idea of reconnecting humans with wild nature also features in some of the definitions of rewilding. Whether the focus of rewilding lies on conservation or the social aspects of bringing back nature also differs between areas. Some do not mention a human dimension to rewilding, while others see it as central to the meaning of the concept.

Rewilding as a term is gaining popularity and has been given countless meanings and definitions, which has been criticized by some (Jorgensen 2014). But I would argue that rewilding might not benefit from a narrow definition. It's strength lies in the fact that it is a holistic term, bringing together several existing conservation methods and goals under a bigger ideal of restoring entire ecosystems.

## 5.3. Management of Rewilding Areas

The type of management structures of rewilding projects differs significantly, which is related to the land ownership structures, which range from private to public ownership and in some cases charitable trust foundations. Often, management is also provided by local environmental NGO's, such as WWF in the Southern Carpathians rewilding area or the Bulgarian Society for the Protection of Birds in the Eastern Rhodopes rewilding area. Management can also be shared, however, which is the case for all 9 projects part of Rewilding Europe (Rewilding Europe 2016d). Here, local organisations are assisted in their management tasks by the head office in the Netherlands. This provides individual projects with more guidance and might enable the sharing of experience.

## 5.3.1. Management Planning

Perhaps due to the novelty rewilding, surprisingly few respondents actually have formal management plans in place. Those that do, all lie within existing national parks, which goes a long way in explaining why they have management plans that predate the adoption of the rewilding idea. None of these national park management plans make any mention of rewilding, however, suggesting that the concept has not yet been integrated in the management of these areas. The existence of these formal management plans and the adoption of the rewilding idea in these areas seems unrelated at present. Management plans mostly have predefined time spans, however and existing plans probably predate the establishment of these parks as rewilding sites. We may thus see rewilding be explicitly featured once these formal management plans are updated.

Three other respondents indicated that they were in the progress of making formal management plans, with specific rewilding aims this time. These projects are part of Rewilding Europe's nine pilot areas and are being guided by the organisation's main office and directory in establishing these plans (I-3). In consultation with the individual sites, Rewilding Europe sets out goals and objectives for each of its pilot areas and a management plan to reach these (I-3). This appears to be a slow or recent process, however, as some of these projects have not obtained formal planning after five years of being operational. Rewilding Europe does state that it is a learning organisation (2015) and that the process of rewilding is still rather unknown territory. However, this would suggest a need for planning to make the entire process more comprehensible.

Although reintroduction and conservation of keystone species and habitats is high on the agenda of rewilding, specific planning in the shape if Systematic Conservation Planning to achieve this, is only used by one respondent and is being developed by one other. Again, the explanation for this may be found in the fact that where there is planning in place, this is due to pre-existing conservation structures. In the Bulgarian Eastern Rhodopes rewilding area, which is the only respondent that currently uses SCP, the Bulgarian Society for the Protection Birds has been working on conservation programmes for years. It uses SCP in conservation projects for species such as endangered Egyptian vultures and has only recently started integrating these plans and objectives with broader rewilding goals for the area, in line with the planning and objectives it is developing with Rewilding Europe of which is it part (I-3).

The only other respondent that is in the process of developing SCP, the Southern Carpathians rewilding area in Romania, is doing so in the context of designing a formal management plan in close cooperation with Rewilding Europe, as mentioned before. So in this instance, SCP is being developed for the first time in the area and will include rewilding as an important element from its outset. The presence of Natura 2000 sites in these two areas can also be an explanation for why SCP is being used there, as European commission requires its member states to take management actions to protect these sites (European Commission 2016a). It is safe to say that formal planning of rewilding sites is still in its infancy, but the ongoing planning efforts of Rewilding Europe and its sites are important in establishing a precedent for other projects to learn from. Once finished, these plans will be the first formal management plans to fully integrate large scale rewilding. Projects outside of the Rewilding Europe pilot areas might benefit from these management plans through information exchanging networks such as the European Rewilding Network. Herein lies a great opportunity for the European rewilding movement to formalise and become more organised. A blueprint for rewilding planning that can be adapted to regional and local needs and specificities that can be implemented by rewilding projects across the continent might make the rewilding movement a more plausible conservation method to be adopted by national or EU policymakers complementary to current conservation methods. It will also be interesting to see how SCP will be integrated in these rewilding plans, as this poses an opportunity for established and tested methods of conservation to be combined with the new, broader and more holistic scope of rewilding. Adaptability is key to the success of management plans for rewilding, however, as areas, contexts and objectives differ widely.

## 5.3.2. Adaptive Management

Although formal conservation planning is yet to be widely adopted by rewilding projects, the questionnaire and interviews show that adaptive management, which is often an important part of SCP, is already an important tool, used by most respondents in this research in one way or other. All but one respondent uses (or is in the progress of implementing) adaptive management. This result is unsurprising as adaptive management is highly suitable for an experimental and new conservation method such as rewilding. The principles of adaptive management are adopted in several different ways by different projects, depending on the specific objectives. Some examples will illustrate how adaptive management is currently being implemented by rewilding projects.

CEU eTD Collection

With regards to both reintroductions of animal species and projects such as reforestation, adaptive management is implemented by the use of zonation (I-2; I-3). As stated earlier, many rewilding areas in Europe are significant in size. But rewilding and conservation efforts are often more concentrated in smaller pilot areas or zones within the larger rewilding area. By focussing on smaller pilot areas, rewilding managers want to try out any interventions on a more realistic and comprehensible scale. When an intervention does not go to plan, it can easily be contained and adjusted because of the size of these pilots. Conversely, when experiences in these pilot areas are positive, they can be applied on a larger scale and eventually throughout the entire rewilding area. This approach is used by the Eastern Rhodopes rewilding area, for example, where horses are being brought back to the wild. Horses are introduced in a pilot area, where their impact and behaviour is closely monitored. In the event of problems, they can be translocated to other zones. The goal is to eventually have wild horses roam over the entire rewilding area (I-3). Species reintroductions are good examples for why rewilding needs well executed adaptive management. Williams and Brown (2012) see the need for adaptive management in case of drastic management interventions of which the outcomes are unsure, which is the case for species reintroductions in several respondent rewilding areas. Zonation would also be used in the future to experiment with passive management or hands-off management in parts of rewilding areas, before this is tried on a larger scale. In the Eastern Rhodopes, there are plans to implement hands-off management in Natura 2000 areas, which would combine the practises of rewilding with EU conservation schemes (I-3).

The principles of adaptive learning and subsequent management have also lead some areas in the direction of rewilding. Previous projects for vulture conservation in Bulgaria have illustrated that rewilded ecosystems might be more beneficial than traditional conservation methods such as supplementary feeding thanks to the presence of wild prey species (I-3), leading local conservationists to adopt the ideas of rewilding. This showcases that the learning cycle of adaptive management lay at the beginning or rewilding and is currently being used throughout the process.

The idea of pilot areas is being implemented on different levels. Firstly, as shown above, existing rewilding projects use small pilot areas to test out management interventions, which might later be brought to the entire are. Similarly, Rewilding Europe sees its 9 current rewilding areas as pilots for rewilding across Europe (Rewilding Europe 2016d). These areas

should showcase the possibilities of rewilding and inspire the concept to increase in scale and be implemented all over the continent (Rewilding Europe 2016d).

It is important, however, that the information and experiences that were learnt during the process of adaptive management, especially during the phase of monitoring and additional research, are effectively implemented later on. A paper by Schindler et al. (2011) has shown that scientific recommendations after research have in the past not been implemented to a sufficient degree in the protected area that is now the Eastern Rhodopes rewilding area, a respondent in this research. Although predating the establishment of the rewilding area, this paper highlights that conducting research and monitoring needs to lead to changes and improvements in the management of an area. The causes for a lack of implementation and adaptation often lie with a lack of political will to improve conservation efforts or incompetent local authorities (Schindler et al. 2011). This highlights the importance of cooperation with the authorities responsible for conservation for the success of rewilding projects in general and adaptive management practices in particular. Another lesson that was learnt during the early stages of rewilding, is that projects not only need a sound scientific background and support from responsible authorities, but also need local people to back their projects (I-3; I-4). Thanks to their adaptability, social and cultural obstacles can also be dealt with, about which more in a later chapter.

## 5.3.3. Rewilding Objectives

Perhaps surprisingly, not all initiatives that have responded, have actual rewilding objectives, even though they effectively see themselves as a rewilding project in some way or other. This may be caused by the fact that many rewilding areas were not established as such, but took on the rewilding aspect in a later stage. The adoption of concrete rewilding objectives may come in a later stage, as is the case with formal planning. Within the European Rewilding Network, there are also several projects that are centred mainly around ecotourism and see conservation as a secondary activity, yet they label themselves as rewilding initiatives by joining the network. When it comes to sharing knowledge, their experience with ecotourism might benefit other rewilding areas, which is why their presence within the network could be seen as a worthwhile addition. It remains an interesting observation, however, that there are self-proclaimed rewilding areas without rewilding objectives. Both of these projects are located in Scotland, United Kingdom, where rewilding is highly controversial, which may

explain the slow progress (Jones 2015). This will be discussed in more detail in the chapter on obstacles to rewilding.

All other respondents do have explicit rewilding objectives, which are wide ranging in nature. Among the responding rewilding areas, habitat restoration is the most prevalent objective. At first, this result seems to corresponds again to what Johns (2016) has said on European rewilding, namely that it is seen as almost identical to habitat or ecosystem restoration. It is important to remember, however, that all these projects are still in their initial phases, during which restoration and active management interventions are a significant element of the rewilding process. Only after these initial restoration works can other rewilding objectives such as hands-off management or reintroductions of keystone species be pursued, as there needs to be a certain standard of habitat quality for rewilding to be successful. I believe that restoration features frequently in the definitions and objectives of respondents in this research, mainly because of the fact that it is still early days for European rewilding an a lot of the early preparatory work still needs to be done. In addition, most European habitats are profoundly changed by human activities (Goudie 2000), meaning that drastic interventions such as reforestation or river and wetland restorations are often needed. Definitions and objectives of European rewilding projects will possibly lean more towards other aspects of rewilding than restoration as projects progress over time. Passive management will most likely feature more as an objective as projects and ecosystem restorations progress.

After the improvement or restoration of habitats, the objectives that are the most prevalent among respondents are those concerned with species reintroductions and improvements of present populations. On the short term, this often means bringing back large herbivores to regions where they disappeared or have dwindled in numbers. To realise these goals many smaller targets are being set by rewilding areas, which range from finding suitable locations to release these animals, to selecting them in zoos and most importantly, obtaining permission from authorities to actually reintroduce them. These herbivore reintroductions and population improvements, in turn serve the long-term goal of rewilding by shaping their environment through grazing and by providing food for carnivores and scavengers (Rewilding Europe 2016d; I-3). Several respondents have already made progress in these herbivore reintroductions, which is an important step in terms of reaching short to mid-term objectives. Respondents in Romania have started to reintroduce European bison to the Southern Carpathians, which has been their main rewilding objective. The Portuguese Western Iberian

rewilding site has brought back horses ( as seen in image 2) as well as ancient cattle breeds to replicate the ecological role of the extinct aurochs. In the Bulgarian Eastern Rhodopes, horses have also been brought back, as well as a first pair of European bison and efforts are being made to improve the local deer populations. These examples show that although the planning process is still under way in these areas, this does not inhibit them from realising their first rewilding objectives. Formal management plans are no prerequisite to rewilding efforts or even successes, but might be able to streamline the process and improve its status as a legitimate conservation method.



Figure 7: Recently reintroduced Garrano horses, a breed closely related to the Eurasian wild horse (Equus ferus ferus). These animals are allowed to roam freely within a pilot zone of the Western Iberia rewilding area. Image source: Maximiliaan Beeldens.

It is telling that when asked about specific rewilding objectives, almost half of the respondents indicated that setting up opportunities for wildlife tourism or wildlife related businesses is one of them. Tourism and other businesses are seen as an integral part of what is means to rewild an area. The rewilded land needs to provide local people with new opportunities for income, as these regions have often become less interesting for agriculture, which is one of the main drivers behind their abandonment (Monbiot 2013; Navarro and Pereira 2015a). Rewilding Europe has indeed been characterised as an entrepreneurial organisation (Pellis and De Jong 2016) because of their focus on establishing nature-based economies in their rewilding areas. Rewilding arguably needs these business opportunities to ensure local legitimacy (I-4), as European rewilding sites invariably contain people living and working in the area who need to

see the benefits of rewilding projects. Although the tourism industry is still in an early phase of development in the Eastern Rhodopes, local authorities have enthusiastically embraced the opportunities it brings to the area (I-3). This proves that providing alternative livelihoods for communities can be a very effective method of gathering official support for rewilding projects. The objective of creating nature-based economies ties in well with another important objective, namely to invest in local partnerships with interested stakeholders and local communities, which will be looked at in more detail later.

As mentioned, land abandonment is seen by proponents of rewilding as a great opportunity. However, when traditional land uses and farming methods disappear on a relatively short timescale, this can also have negative effects on local biodiversity (I-3). This is why several rewilding projects have the reintroduction of large grazers as one of their first objectives (I-3). The influence of Frans Vera's theories (2000) on rewilding shines through here. This is the case in Bulgaria, Portugal and the Netherlands, to name but a few examples. However, the reverse is true in Scotland, where overgrazing by deer is halting forest regeneration. On the short term, the main rewilding objective for Scottish rewilding projects such as 'Trees for Life' is reforestation, by using fences to keep out deer or domestic sheep (Trees for Life 2016). On the long term, however, natural predators such as lynx and wolves would be reintroduced to counter the problem of overgrazing (Monbiot 2013; Trees for Life 2016). This exemplifies how short term and long term rewilding objectives are used and which might not be reached using the same methods. The long term goal of recreating self-regulating ecosystems is not one that can be reached over night, hence the importance of setting short term objectives in rewilding areas. Rewilding Europe also has medium term objectives. Each of their 9 pilot areas has a 10-year vision towards which their short term objectives are directed. These 10-year visions (see image 3) include all or most of the rewilding objectives described above and if completed, should go a long way towards meeting the goal of setting up the conditions necessary for re-establishing self-functioning ecosystems that in their turn support local economies.



Figure 8: Vision for Rewilding Eastern Carpathians. For each of its pilot rewilding areas, Rewilding Europe has made artistic representations of their vision for the area. This image shows what the organisation would like to see in the future in the Eastern Carpathians rewilding area, spanning the borders of Poland, Slovakia and the Ukraine. Image source: Jeroen Helmer/Rewilding Europe.

## 5.4. Obstacles along the Way

Obstacles to rewilding in Europe come in many forms and sizes, which require rewilding managers to respond in several different ways. These obstacles, and their possible solutions, will be discussed here and are divided into three categories; problems related to the rewilding process in the field, issues related to the policies that affect rewilding and issues concerning public opinion. Not all projects face these problems, however, but some are universal an require a broad, collective approach, while others are localised issues that need local solutions.

Literature on rewilding seems to have accurately predicted most obstacles that do occur when rewilding is brought into practise. Several examples will illustrate this. But what is most interesting, are the actions taken by rewilding projects when confronted by these problems.

#### 5.4.1. Problems and Solutions

The possible problem for rewilding that is most often discussed in both academic literature and popular media is that of human-wildlife conflict, as seen in the literature review. But despite the saliency of human-wildlife conflict, only the Eastern Rhodopes area currently identifies this as a possible, albeit minor (I-3; I-4), problem. The reason for this might lie with the fact there is a relatively large variety of large mammals living in the area at this point. The prime suspect of human-wildlife conflict is the wolf and indeed, it has caused some casualties among livestock in the Rhodopes, albeit very rarely as people in the region have adapted their farming methods to their presence (I-4). People here are generally more accepting of wolves, but there have been instances of livestock-holders using poisoned bait to rid themselves of wolves, which also affect scavengers such as the critically endangered Egyptian vulture (I-4). The response of the rewilding management has not really focussed on wolves, perhaps surprisingly, as conflict is uncommon and poisoning of these animals even more so. Instead, local rewilding management has tries to raise awareness of the plight of local vulture, which are likely to suffer from poisoning intended for wolves. This campaign has proved rather successful, for people have started to value vultures because of the wildlife tourism and subsequent income they can provide (I-3), as illustrated in image 4. That being said, one of the rewilding objectives that has been set by Rewilding Europe and the Eastern Rhodopes does include the organisation of a compensation scheme for losses of livestock to wolves. However, local experts regard this as unlikely and even undesirable considering the likelihood of abuse (I-4). Similar apprehension towards compensation schemes is felt in Western Iberia, even though the situation is very different there with wolves yet to return to that rewilding area (I-1). Compensation may still be considered, however, as it expected that communities in Western Europe will not accept wolves as readily as people in many parts of Eastern Europe, where wolves have never disappeared (I-3). In the United Kingdom, the prospect of retuning wolves has proven to be especially controversial (Rewilding Britain 2016e).



Figure 9: The municipality of Madzharovo in Bulgaria has embraced wildlife tourism as a new form of income for the community as well as the authorities. The presence of endangered Egytian vultures has the potential of bringing birdwatchers to the area and is thus highly valued to a degree that they have been painted on local apartment buildings. Image source: Vladislava Ilieva/The Return of the Neophron.

Apart from conflict caused by predation, reintroduced herbivores have been at the root of human-wildlife conflict as well by grazing or trampling crops. As mentioned in the chapter on adaptive management, several rewilding projects are addressing this issue by using pilot areas in which herbivores are released. By closely monitoring their behaviour, they hope to find the most ideal circumstances in which to fully reintroduce species such as horses and deer, while minimising human-wildlife conflict (I-3; I-4). In some cases, translocation has been used to limit conflict (I-3), but this type of measure is not sustainable on the long term. Another solution used by some respondents is fencing (I-2), although this can only be a temporary measure, as the ultimate goal is to have these animals roam freely. Just as with carnivores, there is a need to find an acceptable level of coexistence with large herbivores. With both animal groups, the problems seem to arise when people are not accustomed to live alongside these creatures. Limiting conflict will require time and patience from rewilding initiators, as short term solutions such as compensation, translocation or fencing contradict what rewilding stand for, namely a reconnection with wild nature and species (Monbiot 2013; Beckoff 2014), which will require adaptation and acceptance.

There are also instances in which humans instigate conflict which damage rewilding efforts. In these cases, rewilding can be compromised by often illegal actions of members of the community. Two examples of this have been experienced by respondents. The Western Iberia rewilding area has had to cope with illegal burning of abandoned farmland by livestock holders who wish to use it for extensive grazing (I-1). These fires interrupt the process of succession, but also endanger the protected areas in the region (I-1). In the Eastern Rhodopes, it is poaching that impedes the progress of rewilding, although the issue has somewhat improved in recent years (I-3). Poaching is especially problematic as it has almost wiped out the local red deer population and limits the scope of fallow deer reintroductions (I-4). One of the main drivers behind the issues of burning and poaching in these areas is poverty, as people struggle to make a living in these relatively remote areas (I-4). This illustrates Dickman's (2010) argument that in social issues often lie at the basis of human-wildlife conflict. It is a difficult issue to address and these difficult living conditions are part of the reason why such areas are eligible for rewilding in the first place. The rewilding projects try to overcome this problem by providing alternative livelihoods based on a sustainable nature-based economy. Ecotourism would of course play an important role in this, but there would also be opportunities for small scale agriculture in some rewilding areas. Rewilding Western Iberia for example, allows for the production of organic produce such as olive oil and honey (I-1). Although it might be difficult to provide alternative income for the entire community (I-4), a new economy would be to the benefit of struggling areas. The hope is that if more people derive income from nature, there will be a higher valuation thereof and there would be less need to supplement income with activities such as poaching or illegal burning. Apart from economic solutions, rewilding initiatives also attach importance to local partnerships to reduce conflict and obstacles. The reasons for these partnerships are often pragmatic (Pellis and De Jong 2016), as an example from the Eastern Rhodopes highlights. Here, the rewilding management works together with a local hunting society with a dual purpose (I-3). Firstly, it is in both parties' interest to limit poaching and there is willingness to work together on this issue to monitor and prevent illegal hunting. Secondly, reintroduction efforts of fallow deer and European bison are initiated at the local game reserve which is located within the rewilding area, as poaching here is very rare and the reserve is well monitored (I-3; I-4). So, although the partnership with hunters is unlikely, local rewilding efforts do benefit from it. These examples prove that in many instances tackling obstacles to rewilding happens on a case-to-case basis. Again, the reason for this is to be found in the fact that in most cases, planning is still in a developmental phase. Perhaps it will benefit the quality and effectiveness

**CEU eTD Collection** 

of problem-planning if rewilding projects have already experienced the obstacles that face them, rather than planning in the face of uncertainty. Each problem also needs tailored solutions, as the example of cooperation with local hunters illustrates, which cannot be planned for beforehand. Information exchange on the topic of problem solving through rewilding networks offers great opportunities for future rewilding projects as it is likely that many obstacles experiences in pilot projects will be present in other areas as well.

## 5.4.2. Policies for Rewilding

European policies have a dual effect on rewilding initiatives. They are seen as obstructive to progress on the one hand, but at the same time rewilding projects eagerly make use of the existing EU biodiversity subsidies. This has already been discussed in the literature review, but here I describe how rewilding projects experience the effects of policies in the field and what their responses are to them.

One of the greatest obstacles to rewilding in Europe from a policy perspective, is the Common Agricultural Policy, which has great effects on land use due to agricultural subsidies. This policy affects the entire European Union and thus a large proportion of the European rewilding movement, but not every individual project experiences direct negative effects. One project that does see the CAP as one of the major obstacles to the rewilding process is the Eastern Rhodopes rewilding area. The area is quite remote and land abandonment is a common occurrence but in recent years, subsidies from the CAP have caused people to come back to the area as livestock holding has become a profitable occupation (I-3; I-4). Unfortunately, there are examples where people hold livestock without actually producing food, as subsidies alone are more than enough to make a living (I-4). Such examples prove that CAP subsidies often miss their goal. This return of livestock and people has proven to be difficult to tally with rewilding ideals as it causes increased grazing and disturbance (I-3; I-4). Individual rewilding projects can hardly change the EU's CAP, but they do try to use other EU policies to their benefit, which compensates somewhat for the possible negative effects of CAP. The most important tool in this respect are LIFE-projects, which are the financial instrument of the EU's nature policies (European Commission 2016b). LIFE projects are aimed at protecting or restoring threatened habitats and species or to tackle wider biodiversity issues (European Commission 2016b). So, there is significant scope for rewilding projects to gain much needed EU funding. Among the respondents, there are LIFE projects running in the Southern Carpathians rewilding area for bison reintroductions, in the Eastern Rhodopes to

improve vulture habitats and in the Kemeri National Park in Latvia for river restoration. Important habitats within rewilding areas can also be included in the Natura 2000 network of protected sites, which provides additional protection. In the Eastern Rhodopes, the rewilding management is trying to negotiate with the Commission to allow passive management in some zones of the Natura 2000 protected area in the region, which would combine rewilding principles with EU biodiversity policy (I-3). By making use of the Natura 2000 network and LIFE projects, rewilding is, integrating itself into European biodiversity policy practise. To become an official part of the EU biodiversity policy, the European rewilding movement will need to exhibit how it can benefit and complement existing policies. And using the existing tools to its benefit seems to be a good start.

British rewilding projects might have somewhat different prospects for the future than those in other parts of Europe. Considering both the positive and negative effects EU policies and subsidies have on rewilding, it will be very interesting to see how British rewilding projects are affected by the referendum that resulted in the United Kingdom leaving the EU in the foreseeable future. On the one hand, people have already started seeing the possibilities of this political move for rewilding efforts across Britain. The disappearance of EU agricultural subsidies might cause farmland abandonment to rise (Barkham 2016), especially in upland areas, where farming or livestock holding is often unprofitable and heavily reliant on money coming from the EU (Monbiot 2013). However, as the UK will no longer receive support for its agriculture from the EU, it will also lose environmental subsidies for conservation efforts such as LIFE projects under the Habitats directive, which are often an important source of funding. The Scottish respondents in this research have also indicated that an impending land reform by the Scottish government might also change ownership and management structures of land in Scotland. The general hope is that this will benefit rewilding in this region, but that remains to be seen. In general, Scotland is seen as a region with great potential for rewilding, considering its low population density and large areas of land suitable for reforestation and reintroductions (Brown et al. 2011). But, respondents in Scotland have indicated that public opinion on rewilding is still a thorny issue, which they will need to overcome.

What all rewilding projects have in common is the need for policies of which they are an integral part. Today, rewilding could fit into the European biodiversity strategy, but only as an afterthought. To fulfil its potential, rewilding would need to be seen as a complementary and necessary part of biodiversity policies. Projects now complain about weak or inconsistent

policies and a lack of systematic funding, which is the result of rewilding not yet being a recognised conservation tool by governments or the EU.

## 5.4.3. Public Opinion and Stakeholder Involvement

Assessing public opinion is difficult as stances towards rewilding differ widely across Europe, within countries and also within local communities. Some projects have more difficulties with negative opinions than others, but most projects recognise the need to address their legitimacy among local communities if they wish to make progress.

Among the respondents, the problem of negative public opinion seems to be the most pressing in Scotland. Both Scottish rewilding areas in this research, namely Coigach Assynt and Mar Lodge Estate, indicated cultural and societal opposition to rewilding as the most important or even only hindrance to their efforts at this stage. Long term goals of rewilding in Scotland, notably carnivore reintroductions are not even considered by the Scottish respondents, because of the controversy of the topic which is especially high in this region due to the prevalence of sheep farming and public fears of security (The Wolves and Humans Foundation 2016; Rewilding Britain 2016e). Public opposition to rewilding appears to go much further than objections to large carnivores, however. Rewilding projects in Scotland experience that among local communities, there is a low level of acceptance of changes in land use in general. Respondents acknowledged a great difficulty of convincing local communities of the benefits rewilding could bring to them and the natural environment. But to be able to make any progress, they identify exactly this as the solution to public objections. The projects seek to address the problem by setting up clear communication strategies and local cooperation with land owners to ensure better relationships with local stakeholders. The main goal is to convince communities of the possibilities of rewilding. This promises to be a long process, however, as Rewilding Britain identifies the British public as more reluctant to land changes than any other in Europe (Rewilding Britain 2016e).

Similar objections to rewilding are to be found in Latvia, where one rewilding project in the Kemeri National Park has identified public opinion as its main obstacle. The Kemeri National Park's main rewilding objectives are to restore wetlands and river systems, but local communities and municipalities are reluctant to hand traditionally productive land back to natural processes such as inundations. In contrast to Scotland, the extent of public opposition is limited to the idea of possibly losing agricultural land. These communities live in close proximity to wolves without this being seen as an obstacle, as Eastern and Northern European communities are more used to their presence (I-3). As in Scotland, education and

CEU eTD Collection

communication is considered essential in overcoming negative public opinion. In Latvia, the Kemeri National Park rewilding area aims to address the issue of negative public opinion towards rewilding by organising meetings with relevant stakeholders and especially members of the community. Through these meetings, the management hopes to spread the message of rewilding and reduce hostility towards the idea.

In general, the need to educate people on the possible benefits of rewilding is recognised by widely (I-4). Several rewilding projects have already started educational initiatives with a variety of target audiences. As shown, the Scottish and Latvian respondents try to address local communities first and foremost as a result of their specific societal context which has proven to be more sceptical. In other areas, notably in the Southern Carpathians, Eastern Rhodopes and Western Iberia rewilding areas, an important target audience are university students (I-2;I-3). This is beneficial to rewilding in several ways, as students help the purpose of rewilding by performing research and monitoring and provide technical assistance, but more importantly, they help spread the word within the academic world. The third, as according to some (I-4; I-1), most important target group of educational projects are schoolchildren.

Partnerships between rewilding initiatives and a range of other stakeholders have been mentioned before in several different contexts and they can be vital in changing public opinion on rewilding for the better by including the public in the process. The hope is that stakeholder who are involved in the rewilding process will view it is a more positive light. Of course, stakeholders can benefit from rewilding in several ways, which were described earlier, such as through business opportunities. But in some cases, stakeholders are also invited to participate in the rewilding projects themselves. Among the respondents there were two notable examples. The Coigach Assynt rewilding area in Scotland is run by a trust that brings together local landowners on whose land the rewilding project is situated and other partners. Together, they participate in the decision making process of the rewilding area. So far, it has proven difficult to maintain a shared vision with all partners. But in order to go forward in the rewilding process, the project needs to establish that it can secure benefits for the community and all partners involved. Perhaps this participatory approach is more difficult and slower than other rewilding approaches as compromises need to be made. But ideally, once decisions are made, there will be fewer contestations from the community.

The Swedish Lapland rewilding area, which is the largest European rewilding project in terms of size, also takes a partly participatory approach to rewilding. The project is the most recent

addition to the pilot projects of Rewilding Europe and has thus only recently started the planning process, which is being run in association with the Rewilding Europe headquarters. In this process, however, it is the goal to include the knowledge and needs of the local Sami communities that inhabit the vast rewilding area, which comprises about 2,9 million hectares. Due to the young age of the project, it is too early to assess the cooperation with these Sami communities, but the outcome of this partnership will be interesting as it may become an important precedent of participatory approaches in rewilding planning and management.

#### 6. Conclusions, Recommendations and Further Research

The European rewilding movement is a fascinating one. Its most important characteristic may be its great diversity, especially when it comes to defining the concept in practise. Despite there being no single definition of rewilding in Europe, there are some important recurring elements in the various meanings projects give to rewilding.

As expected, habitat restoration came up most frequently as an important part of what rewilding means. But to say that European rewilding projects make no distinction between the two is an exaggeration. Rather, it illustrates the importance of the first stages of the rewilding process, in which intensive restorations of European landscapes are necessary. Apart from ecological meanings within rewilding definitions such as restoration and reintroductions, European rewilding projects also attach importance to the human elements of rewilding. These take the form of reconnecting people to nature, but mainly to integrate wildlife-based businesses into a sustainable local economy from which both the rewilding areas is thus part of the definition and not seen as an obstacle, but as most rewilding efforts take place in abandoned landscapes, it is implied that local communities are limited in size. All in all, European rewilding is seen by practitioners as an ambitious and positive movement, in which both ecosystems and people take the central stage.

This diversity in definitions and meanings translates into a similar diversity of objectives for rewilding. The stage of rewilding projects determines to a great extent how it is defined and managed, as with the succession of stages, different objectives will become more important and hence, different management tools and techniques will come to the forefront. In these first stages, adaptive management is of great importance to many rewilding projects as they induce changes in landscapes of which the outcomes are still unknown. Adaptability is a desirable

asset of any management strategy in such cases. What has also become apparent is that formal conservation planning seems to be in its infancy in most rewilding projects. Rewilding Europe and its pilot sites are in the process of devising conservation plans that take into account the objectives of rewilding and pay attention to contextual characteristics. The result of their efforts will be an interesting precedent for other rewilding areas and could set the tone for the entire European rewilding movement.

One of the most salient issues of rewilding, the reintroductions of missing species is an interesting example of how European rewilding areas implement adaptive management structures. Pilot areas and zones within larger rewilding areas play an important part in this. What is tried, tested and learnt on a smaller, more controllable scale, can later be implemented on the scale of entire rewilding areas. This highlights that European rewilding projects take a cautious approach to reach their goals, whereas public opinion may see rewilding as a reckless endeavour, especially when it comes to carnivore reintroductions, which are more contentious. There is a clear need for well though through conservation planning. It is important to also learn lessons from areas that already manage with large carnivores. For this, the European Rewilding Network shows great potential. In the same way as rewilding areas use adaptive management on a small scale within their areas, so too could it be implemented on a continental scale if this network is used in a systematic way. A lot of academic work has also been done on adaptive management, planning and specifically reintroductions. Rewilding initiatives should make full use of these resources. Rewilding projects should work with academic institutions right from the start. Currently, some rewilding projects work with university students in the form of internships within the scope of monitoring or field work, but both rewilding projects and scientific understanding of rewilding would benefit from more permanent collaboration. Most academic literature on rewilding that currently exists, is on the possibilities, obstacles and future of rewilding and little research has been published on its practise, while this would benefit rewilding in the field the most. There is a need and also great possibilities for research in several fields ranging from ecology to social sciences, which are particularly important in studying conflicts and opinions. This scientific knowledge can subsequently be used to inform decision making on planning and management and policies.

On all levels of rewilding projects, partnerships and collaborations are central to their management strategies. On the highest level, partnerships between umbrella organisations such as Rewilding Europe and funding partners, EU institutions and researchers strive provide resources for individual projects. These umbrella organisations then provide assistance to

these projects in the field. Individual projects in their turn try to increase local support for rewilding by partnering with local stakeholders and communities to decrease conflict and build a shared vision. This last element cannot be underestimated in a process where support and participation of the local community is vital for success. To be more effective, however, these partnerships and collaborations should be expanded. Especially when it comes to policy, the rewilding movement needs a unified voice that is able to lobby governments and other conservation organisations in order to make rewilding into an official biodiversity policy tool. Again, the European Rewilding Network shows potential in this regards, as it bundles many individual projects in a single organisation.

These partnerships and their overarching presence illustrate one of the most compelling traits of the rewilding movement in Europe; its holistic approach, which ranges from the ecological to the social elements of the puzzle. This holism might also go far in explaining the recent success or at least popularity of the term rewilding as it brings the promise of conservation, a sustainable economy and a stable community, integrated into a single ideal. This new wind, or rather 'new wild' is still in its early stages, but shows promise as a conservation strategy, both in its aspirations and its early projects. In order to fulfil its potential, though, European rewilding projects must live up to these possibilities of cooperation, information exchange and local involvement.

# 7. Bibliography and References

Alexander, M. 2013. *Management planning for nature conservation: a theoretical basis & practical guide*. Dordrecht : Springer.

Allen, C. R. and Garmestani, A.S. 2015. *Adaptive Management of Social-Ecological Systems*. Dordrecht : Springer.

Anthony, B.P. and Szabo, A. 2011. Protected areas: conservation cornerstones or paradoxes? Insights from human-wildlife conflicts in Africa and Southeastern Europe. In: The Importance of Biological Interactions in the Study of Biodiversity, Dr. Jordi Lopez-Pujol (Ed.), ISBN: 978-953-307-751-2, InTech, Available from: <u>http://www.intechopen.com/books/the-importance-of-biological-interactions-in-the-study-ofbiodiversity/protected-areas-conservation-cornerstones-or-paradoxes</u>.

Araujo, M. B. 2003. The coincidence of people and biodiversity in Europe. *Global Ecology and Biogeography* 12: 5–12.

Barkham, P. 2016. Rewilding could be the way to save Britain's farms. *The Guardian* (London) July 11.

Bauer, N., Wallner, A. and Hunziker, M. 2009. The change of European landscapes: Humannature relationships, public attitudes towards rewilding, and the implications for landscape management in Switzerland. *Journal of Environmental Management* 90: 2910–2920.

Bekoff, M. 2014. *Rewilding our hearts*. Novato: New World Library. Birks, H.J. 2005. Mind the gap: how open were primeval forests? *Trends in Ecological Evolution* 20(4):154-156.

Boitani, L. and Linnell J.D.C. 2015. Bringing large mammals back: large carnivores in Europe. In *Rewilding European landscape*. ed. H. M. Pereira, L. M. Navarro, 67-84. Heidelberg, Springer Open.

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

Butchart, S.H., Walpole, M., Collen, B., et al. 2010. Global biodiversity: indicators of recent declines. *Science* 328: 1164–1168.

Callicott, J.B. 1994. A critique and an alternative to the wilderness idea. In *Environmental Ethics*. Ed. A. Light and H. Rolston, 172-186. Oxford: Blackwell Publishing.

Callicott, J.B. 2000. Contemporary Criticisms of the receives Wilderness idea. USDA Forest Service Proceedings (15)1: 24-31.

Ceauşu, S., Carver, S., Verburg, P.H., Kuechly, H.U., Hölker, F., Brotons, L. and Pereira H.P. 2015. European wilderness in a time of farmland abandonment. In *Rewilding European landscapes* ed H. M. Pereira, L. M. Navarro, 25-46. Heidelberg: Springer Open.

CEDA (Central Dredging Association). 2015. Integrating adaptive environmental management into dredging projects. Position paper. URL : <u>http://www.dredging.org/media/ceda/org/documents/resources/cedaonline/2015-01-ceda\_positionpaper-</u> integrating\_adaptive\_environmental\_management\_into\_dredging\_projects.pdf.

Cerqueira, Y., Navarro, L.M., Maes. J., Marta-Pedroso, C., Pradinho Honrado, J. and Pereira, H.M. 2015. Ecosystem services: the opportunities of rewilding in Europe. In *Rewilding European landscapes* ed H. M. Pereira, L. M. Navarro, 47-64. Heidelberg: Springer Open.

Chapron, G., Kaczensky, P., Linnell, J.D.C. *et al.* 2014. Recovery of large carnivores in Europe's modern human-dominated landscapes. *Science* 346: 1517-1519.

Conti, G. and Fagarazzi, L. 2005. Forest expansion in mountain ecosystems: "environmentalist's dream" or societal nightmare? Driving forces, topics and impacts of one of the main 20<sup>th</sup> century's environmental, territorial and landscape transformations in Italy. *Planum* 6: 1-20.

Cortés-Avizanda, A., Donazar, J.A., Pereira, H.A. 2015. Top Scavengers in a Wilder Europe. In *Rewilding European landscapes* ed H. M. Pereira, L. M. Navarro, 85-106. Heidelberg: Springer Open.

Cronon, W. 1995. The trouble with Wilderness; or, getting back to the wrong nature. In *Uncommon Ground: Rethinking the Human Place in Nature*. Ed William Cronon, 69-90. New York: W. W. Norton & Co.

De Vaus, D. A. 2002. Surveys in social research. London : Routledge.

Dickman, A.J. 2010. Complexities of conflict: the importance of considering social factors for effectively resolving human–wild life conflict. *Animal Conservation* 13: 458-466.

Diemer, M., Held, M. and Hofmeister, S. 2003. Urban Wilderness in Central Europe, Rewilding at the Urban Fringe. *International Journal of Wilderness* (9)3: 7-11. Donlan, C., Berger, J., Bock, C.E. 2006. Pleistocene Rewilding: and optimistic agenda for twenty-first century conservation. *American Naturalist* 168: 660-681. Ellis, E. 2012. The Planet of No Return. Human Resilience on an Artificial Earth. URL: <u>http://thebreakthrough.org/index.php/journal/past-issues/issue-2/the-planet-of-no-return</u>

Enserink, M., and Vogel, G. 2006. The carnivore comeback. Science, 314,746–749.

Ericsson, G. and Heberlein T.A. 2003. Attitudes of hunters, locals, and the general public in Sweden now that the wolves are back. *Current Biology* 111(2): 149-159.

European Commission. 1992. Council Directive 92/43/EEC. Natural Habitats. URL: http://eur-lex.europa.eu/legal-content/BG/TXT/?uri=uriserv:128076

European Commission. 2016a. Management of Natura 2000 sites. URL: http://ec.europa.eu/environment/nature/natura2000/management/index\_en.htm

European Commission. 2016b. LIFE Programme. URL: <u>http://ec.europa.eu/environment/life/</u>

Eurostat. 2013. Agri-environmental indicator - risk of land abandonment. URL: <u>http://ec.europa.eu/eurostat/statistics-explained/index.php?title=Agri-</u> <u>environmental\_indicator\_risk\_of\_land\_abandonment&oldid=263522</u>

Foreman, D., Davis, J., Johns, D., Noss, R. and Soulé, M. 1992. The Wildlands Project mission statement. *Wild Earth* 1: 3-5.

Fraser C. 2009. Rewilding the world. New York: Henry Holt/Metropolitan.

Goudie, A. 2000. *The human impact on the natural environment*. Cambridge, Massachusetts: MIT Press.

Hall, M. 2014. Extracting Culture or Injecting Nature? Rewilding in transatlantic perspective. In *Old world and new world perspectives on environmental philosophy*. Ed Kuelarz J. and Drenthen, M., 17-35. New York: Springer.

Hewson, C. 2003. Conducting research on the internet. The Psychologist 16(6): 290-293.

Holling, C. S. 1978. Adaptive environmental assessment and management. Chichester: Wiley.

Jansen, H. 2010. The logic of qualitative research and its position in the field of social research methods. *Forum: Qualitative Social Research* 11(2): 1-14.

Jepson, P. 2016. A rewilding agenda for Europe: creating a network of experimental reserves. *Ecography* 39: 117-124.

Jepson, P. and Scherpers, F. 2016. Making space for rewilding: creating an enabling policy environment. Rewilding Europe Policy Brief. University of Oxford.

Johns D, Rewilding, Reference Module in Earth Systems and Environmental Sciences, Elsevier, 2016. 08-Feb-2016 doi: 10.1016/B978-0-12-409548-9.09202-2.

Jorgensen, D. 2015. Rethinking Rewilding. *Geoforum* 65: 482-488. Laiolo, P., Rolando, A. and Valsani, V. 2004. Responses of birds to the natural reestablishment of wilderness in montane beechwoods of North-Western Italy. *Acta Oecologica* 25: 129–136.

Lescuyver, G. 2002. Tropenbos' experience with adaptive management in Cameroon. In: Oglethorpe, J. A. E & International Union for Conservation of Nature and Natural Resources & Sustainable Use Initiative (Organisation) & Tropenbos Foundation & Internationaal Agrarisch Centrum. *Adaptive management : from theory to practice*. Cambridge: IUCN, World Conservation Union.

Linnell, J.D.C., Kaczensky, P., Wotschikowsky, U., Lescureux, N. and Boitani, L. 2015. Framing the relationship between people and nature in the context of European conservation. *Conservation Biology* 29(4): 978–985.

Lynn, W. 2015. Setting aside half the Earth for 'rewilding': the ethical dimension. The Conversation. URL: <u>https://theconversation.com/setting-aside-half-the-earth-for-rewilding-the-ethical-dimension-46121</u>

Maller, C., Townsend, M., Pryor, A., Brown, P., and St Leger, L. 2006. Healthy nature healthy people: 'contact with nature' as an upstream health promotion intervention for populations. *Health Promotion International* 21(1): 45-54.

Margules, C.R. and Pressey, R.L. 2000. Systematic Conservation Planning. *Nature* 405: 243-253.

McKibben, B. 2010. *Earth: making a life on a tough new planet*. New York: Times Books Henry Holt.

Merckx, T. 2015. Rewilding: Pitfalls and Opportunities for Moths and Butterflies. In *Rewilding European landscapes*, ed H. M. Pereira, L. M. Navarro, 107-125. Heidelberg: Springer Open.

Merckx, T. and Pereira, H.M. 2015. Reshaping agri-environmental subsidies: from marginal farming to large-scale rewilding. *Basic and Applied Ecology* 16(2): 95-103.

Messmer, T.A. 2000. The emergence of human–wildlife conflict management: turning challenges into opportunities. *International Biodeterioration & Biodegradation* 45(4): 97-102.

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

Monbiot, G. 2013. *Feral: Searching for Enchantment on the Frontiers of Rewilding*. London: Allen Lane.

Naess, A. 1985. Ecosophy T: Deep versus Shallow Ecology. In *Environmental ethics, readings in theory and application*. 7<sup>th</sup> ed., ed Pojman, P.J. et al., 222-230. Boston: Cengage Learning.

Nash, R. 1967. Wilderness and the American mind. Connecticut: Yale University Press.

National Research Council. 2004. *Adaptive Management for Water Resources Project Planning*. Washington DC: National Academies Press.

Navarro, L.M. and Pereira H.M. 2015a. Rewilding abandoned landscapes in Europe. In *Rewilding European landscapes*, ed H. M. Pereira, L. M. Navarro, 3-23. Heidelberg: Springer Open.

Navarro, L.M. and Pereira H.M. 2015b. Towards a European Policy for Rewilding. In *Rewilding European landscapes*, ed H. M. Pereira, L. M. Navarro, 205-221. Heidelberg: Springer Open.

Nogués-Bravo, D., Simberloff, D., Rahbek, C. and Sanders, N.J. 2016. Rewilding is the new Pandora's box in conservation. *Current Biology* 26(3): 87-91.

Noss, R. and Cooperrider, A. 1994. Saving nature's legacy. Washington, DC: Island Press.

Pellis, A. and De Jong, R. 2016. Rewilding Europe as a new agent of change? Exploring the governance of an experimental discourse and practice in European nature conservation. Report commissioned by Netherlands Environmental Assessment Agency. Wageningen University.

Pereira, H.M and Navarro, L.M. (eds.). 2015. *Rewilding European Landscapes*. Heidelberg: Springer Open.

Prior, J. and Ward, K. 2016. Rethinking Rewilding: a response to Jorgensen. *Geoforum* 69: 132-135.

Reed, M.S. 2008. Stakeholder participation for environmental management: A literature review. *Biological Conservation* 141: 2417 – 2431.

Rewilding Britain. 2016a. About. URL: http://www.rewildingbritain.org.uk/about/

Rewilding Britain. 2016b. Rewilding. It's all about bringing nature back to life and restoring living systems. URL: <u>http://www.rewildingbritain.org.uk/rewilding/</u>

Rewilding Britain. 2016c. Benefits. URL: http://www.rewildingbritain.org.uk/rewilding/benefits. Rewilding Britain. 2016d. Rewilding Projects. URL: http://www.rewildingbritain.org.uk/rewilding/rewilding-projects/

Rewilding Britain. 2016e. Challenges. URL: <u>http://www.rewildingbritain.org.uk/rewilding/challenges</u>

Rewilding Europe. 2013. Executive Summary. URL: <u>https://rewildingeurope.com/wp-content/uploads/2013/12/Rewilding-Europe-executive-summary.pdf</u>

Rewilding Europe. 2014. Rewilding Europe Annual Review 2014.

Rewilding Europe. 2015. Rewilding Europe presents working definition of 'rewilding'. URL: <u>https://www.rewildingeurope.com/news/rewilding-europe-presents-working-definition-ofrewilding/</u>

Rewilding Europe. 2016a. What is Rewilding ? URL: https://www.rewildingeurope.com/about/what-is-rewilding/

Rewilding Europe. 2016b. Areas. URL: https://www.rewildingeurope.com/areas/

Rewilding Europe. 2016c. Making it Real. URL: https://www.rewildingeurope.com/about/key-elements/

Rewilding Europe. 2016d. Annual Review 2015. Rewilding Europe: Nijmegen.

Redpath, S., Young, J., Evely, A., Adams? W.M., Sutherland, W.J., Whitehouse, A., Amar, A., Lambert, R.A., Linnell, J.D.C., Watt, A., and Gutiérrez, R.J. 2012. Understanding and managing conservation conflicts. *Trends in Ecology & Evolution* 28(2): 100-109.

Rey Benayas, J.M. and Bullock J.M. 2015. Vegetation Restoration and Other Actions to Enhance Wildlife in European Agricultural Landscapes. In *Rewilding European landscapes*, ed H. M. Pereira, L. M. Navarro, 127-142. Heidelberg: Springer Open.

Richmond, O.M.W., McEntee, J.P., Hijmans, R.J., Brashares, J.S. 2010. Is the Climate Right for Pleistocene Rewilding? Using Species Distribution Models to Extrapolate Climatic Suitability for Mammals across Continent. *PLoS ONE* 5(9): e12899. URL: <u>http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0012899#abstract</u>

Rolston, H. 1991. The wilderness idea reaffirmed. *The Environmental Professional* (13): 445-452.

Rondinini, C. and Boitani, L. 2007. Systematic Conservation Planning and the Cost of Tackling Conservation Conflicts with Large Carnivores in Italy. *Conservation Biology* 21 (6):1455-1462.

Rondinini, C. and Pressey, R. L. 2007. Special Section: Systematic Conservation Planning in the European Landscape: Conflicts, Environmental Changes, and the Challenge of Countdown 2010. *Conservation Biology* 21 (6):1404-1405.

Sandom C, Donlan CJ, Svenning J.C, and Hansen D. 2013. Rewilding. In *Key topics in conservation biology* volume 2. Ed McDonald, D.W. and Willis K., 430–451. Hoboken, N.J.: Wiley.

Sarkar, S. and Illoldi-Rangel, P. 2010. Systematic Conservation Planning: an Updated Protocol. *Natureza & Conservaçao, Brazilian Journal of Nature Conservation* 8(1): 19-26. Schinlder, S., Curado, N., Nikolov, S.C., Kret, E., Carcamo, G.C., Poirazidis, K., Wrbka, T. and Kati, V. 2011. From research to implementation: Nature conservation in the Eastern Rhodopes mountains (Greece and Bulgaria), European Green Belt. *Journal for Nature Conservation* 19(4):193–201.

Schnitzler, A. 2014. Towards a new European wilderness: Embracing unmanaged forest growth and the decolonisation of nature. *Landscape and Urban Planning* 126: 74–80. Seddon P.J. et al. 2014. Reversing defaunation: Restoring species in a changing world. *Science* 345: 406-412.

Smith, T. 2014. Rewilding in the real world: managing conflict between humans and large carnivores. URL: <u>https://iesinternships.wordpress.com/2014/06/16/rewilding-in-the-real-world-managing-conflict-between-humans-and-large-carnivores</u>

Soulé , M. and Noss R. 1998. Rewilding and biodiversity: complementary goals for conservation. *Wild Earth* 8(3): 19–28.

Stephanson, S.L., and Mascia, M.B. 2009. *Putting people on the map: An approach to integrating social data in conservation planning*. SSWG Working Paper 1. Society for Conservation Biology. Social Science Working Group: Washington, D.C.

Suding, K.N. 2011. Toward an Era of Restoration in Ecology: Successes, Failures, and Opportunities Ahead. *Annual Review of Ecology, Evolution, and Systematics* 42: 465-487. Szabo, E.A., Lawrence, A., Iusan, C. and Canney, S. 2008. Participatory protected area management – A case study from Rodna Mountains national park, Romania. *International Journal of Biodiversity Science and Management* 4: 187-199.

Trees for Life. 2016. Missing species and rewilding. Rewilding. URL: <a href="http://treesforlife.org.uk/forest/missing-species-rewilding/rewilding/">http://treesforlife.org.uk/forest/missing-species-rewilding/</a>

Treves, A., Wallace, R.B. and White, S. 2009. Participatory Planning of Interventions to Mitigate Human–Wildlife Conflicts. *Conservation Biology* 23(6): 1577–1587.

Vera, F. 2000. Grazing ecology and forest history. Wallingford: CAB International.

Vera, F. 2009. Large-scale nature development – the Oostvaardersplassen. *British Wildlife*, 28-36.

Verburg, P. H., & Overmars, K. P. 2009. Combining top-down and bottom-up dynamics in land use modelling: Exploring the future of abandoned farmlands in Europe with the DynaCLUE model. *Landscape Ecology*, 24,1167–1181.

Warner, G. 1997. Participatory management, popular knowledge and community empowerment: the case of sea urchin harvesting in the Vieux-Fort area of St. Lucia. *Human Ecology* 25(1): 29-46.

White, P.C.L. and Ward, A.I. 2010. Interdisciplinary approaches for the management of existing and emerging human–wildlife conflicts. *Wildlife Research* 37(8) 623-629.

Whitehead, A., Kujala, H., Ives, C.D., Gordon, A., Lentini, P.E., Wintle, B.A., Nicholson, E. and Raymond, C.M. 2014. Integrating biological and social values when prioritizing places for biodiversity conservation. *Conservation Biology* 28(4): 992-1003.

Wild Europe Initiative. 2016. A wind of change in Western Europe. URL: <a href="http://www.wildeurope.org/index.php/restoration/national-strategies/a-wind-of-change-in-western-europe">http://www.wildeurope.org/index.php/restoration/national-strategies/a-wind-of-change-in-western-europe</a>

Williams, B. K., and Brown, E.D. 2012. *Adaptive Management: The U.S. Department of the Interior Applications Guide*. Washington D.C.: Adaptive Management Working Group U.S. Department of the Interior.

Wilson, E.O. 2016. *Half-earth: our planet's fight for life*. New York : Liveright Publishing Corporation.

Wilson, C. J. 2004, Could we live with reintroduced large carnivores in the UK?. *Mammal Review* 34: 211–232.

Wuerthner, G., Crist, E., and Butler, T. (eds.) 2014. *Keeping the Wild. Against the Domestication of Earth*. Washington: Island Press.

Young, J.C., Jordan, A., Searle, K.R., Butler, A., Chapman, D.S., Simmons, P. and Watt, A.D. 2013. Does stakeholder involvement really benefit biodiversity conservation? *Biological Conservation* 158: 358-370.

# Personal Communications

Interview Code	Function of Interviewee	Date
I-1	Communications Officer at Rewilding Western Iberia and Associação Transumância e Natureza (ATN)	June 29th – July 2nd 2015
I-2	Rewilding Officer at Rewilding Western Iberia	June 29th - July 2nd 2015
I-3	Team Leader of Rewilding Eastern Rhodopes, Bulgaria. Conservation Director of the Bulgarian Society for the Protection of Birds	July 5 <sup>th</sup> 2016
I-4	Part-time employee of the Bulgarian Society for the Protection of Birds and wildlife guide in the Rewilding Eastern Rhodopes area	July 6th 2016

## Appendix: Survey Questions

- I. Basic Info
  - Name of the Rewilding Area (RA)
  - Country in which RA is located
  - What is the size of the RA (in ha)?
  - When was the area established ?
  - How much of the area is formally protected ?
  - How is land ownership arranged ? (Privately Owned, Publicly Owned, Other)
  - When did the area adopt the idea of Rewilding ?
  - How do you define the concept of Rewilding in your context ?

# II. Management

- Does the area have a formal management plan ? YES/NO
- If YES, could you provide this in text or as a link ?
- Do you use Systematic Conservation Planning YES/NO/IN PROGRESS
- Do you use Adaptive Management ? YES/NO/IN PROGRESS
- Do you have specific rewilding objectives ? YES/NO
- If yes, what are these rewilding objectives ?
- Which actions are undertaken to reach these objectives?
- Do these rewilding objectives apply to the entire protected area ?

# III. Obstacles

- Have you encountered any problems or obstacles in trying to reach these objectives ? Which ?(Legislative, cultural, societal, human-wildlife conflict, other,...)

- How do you attempt to overcome these obstacles ?
- How (if at all) are local stakeholders being involved in your rewilding initiative?
- Is stakeholder participation part of your management plan?
- If so, how are stakeholders involved in the management of your area ?
- How, if at all, do local communities participate in your rewilding area?
- Is the general opinion of local people on your rewilding area positive or negative?
- What, according to you, is the reason for this opinion?