Social Norms for Conservation

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Preface

This report is about my thoughts on why we need to come up with a different and better way of doing conservation. Despite the best efforts of conservationists and preservationists in the past century, we find ourselves in the middle of a biodiversity extinction event of an unprecedented scale and rate. Multiple lines of evidence suggest that this extinction event is caused, in large part, by our consumerist tendencies and our abuse of common pool resources. However, few conservation efforts have tried to deal with these issues that are undeniably more social than legal or political. Thus, I believe that it is imperative that we begin to take the power of social forces into consideration when planning our conservation efforts.

My thoughts have been shaped by conversations I have had with experts in many different fields as well as by the literature that has been produced by these and other experts. Thus, this report will start with a brief literature review of some of the important ideas that I have come across in different fields such as history, conservation biology, and psychology.

The literature review will begin with a brief history of conservation, particularly as it pertains to the United States. In this section, while taking a look at how the field of conservation has evolved, I will point out what I perceive to be the shortcomings of different conservation approaches that have been used in the past and those that are being currently used as well. This will, hopefully, motivate the need for a new way of thinking about how to achieve our desired conservation goals; one that takes into consideration the behaviors of people and the societies that they are a part of.

I will then introduce social norms (section 1.2) as a possible tool that we could use in doing conservation since social norms appear to determine a large part of our social behavior. In this section, I will introduce the different schools of thought on social norms and their predictions for how norms originate, evolve, and change. I will also point out where each of these schools of thought fall short and why we need to do more research on social norms to truly understand them. I will also take a brief look at norm interventions and how they have been used in different situations to change inefficient or harmful social norms.

In the next three chapters, I will introduce my ideas on how I plan to contribute to the knowledge of social norms and how I think they can be used in doing conservation more effectively.

Chapter 2 will deal with my ideas on determining which social norms we as

conservationists need to focus on in order to affect the most significant amount of change. Using the results from this research, I hope to address a concern that many social scientists have voiced, which is, that changing social norms might not make much of a difference to conservation outcomes. Given that different norms often behave very differently and have different properties, these results will also help me in deciding which norms to focus on in researching the questions I will bring up in the final two chapters.

In chapters 3 and 4, I will discuss how I hope to contribute to the understanding of social norms, particularly conservation related social norms. Chapter 3 will outline some of the field experiments and surveys I hope to undertake in the next few years, and in chapter 4, I will provide very basic details about some of the models of social norms that I would like to investigate mathematically.

This report is probably best read linearly, but anyone familiar with social norms can skip ahead to section 1.2.2 after section 1.1. Even for readers familiar with the history of conservation, I would encourage skimming section 1.1 because my motivation for trying to use the considerable power of social norms derives in large part from the matter presented in that section. While chapters 2, 3, and 4 inform each other, they are fairly independent and can be read in any order although I would still recommend reading chapter 2 before the other two.

Acknowledgements

It is of course always impossible to credit everyone whose guidance and conversations have shaped one's ideas. However, I would at least like to thank those who I know have definitely influenced the way I think about the issues presented in this report. I sincerely apologize to those who have either helped mold my ideas unbeknownst to me or to those who I might forget to mention here.

I believe I would have been quite lost without the support of Professor Debbie Prentice. Despite her busy schedule as Dean of the Faculty at Princeton, she agreed to serve on my committee without hesitation. She also finds time to respond to all my requests for help, regardless of how little sense they might make because of the hurry and excitement in which I send them to her after coming across or coming up with new ideas.

Many thanks are due also to my advisor, Professor Simon Levin, who seems to entertain whatever ideas I bring to him with enthusiasm. He has been very supportive of me exploring different topics even though I have not followed through on most of them. His encouragement has been crucial for my decision to focus on investigating social norms and their application to different kinds of coordination and prosocial behaviors for my doctoral work.

I fear I have failed to make good use of the knowledge and intellectual fertility of my other two committee members, Professors Corina Tarnita and David Wilcove. However, this is something I intend to rectify since the conversations I have had with them have been very thought provoking and helpful as well.

I cannot thank Professor Henry Horn enough for the long discussions on not only the ideas presented here, but also on various other projects and issues that I have considered investigating at different times. A special thanks also to Professor Rob Pringle who introduced me to some of the literature on Rights Based Approaches to Conservation. The philosophy and methods adopted by conservationists championing this approach have had a profound influence on how I think about conservation.

I also have to mention Matthieu Barbier, a postdoc in the Levin lab, whose contribution in getting me to explore alternative modeling approaches. We have both been displeased, to differing degrees, by the emphasis on game theory and on thinking of people characterized as *Homo economicus* when building models to explain social behavior. Without Matthieu, I probably would not have known as much about other possible approaches as I do now. His anthropological views have also helped me to think about things from a very different perspective.

Relatedly, I am also grateful to the Levin lab and the EEB department in general for the informative and stimulating discussions I have had with different members of these groups.

Finally, I cannot pass up this opportunity to thank a great friend and mentor, Jane Masterson. It was only because of my fortuitous acquaintance with her that I seriously considered pursuing an advanced degree in ecology. I had been exploring a number of different fields prior to meeting her without ever really thinking about anything related to ecology as a viable career option. Needless to say, I draw a lot of inspiration from her and her thoughts influence mine immensely.

Contents

Chapter 1

Literature Review

Over the past two years, my ideas have evolved rapidly in response to the literature I have come across and because of the conversations I have had with experts in disparate fields. In this chapter, I will present and discuss some of the literature that has influenced me most.

My thoughts have been heavily influenced by reading about different approaches to conservation that have been undertaken and by what I consider to be their drawbacks. These perceived drawbacks might at times have something to do with the underlying philosophies or with the methods used, but the biggest shortcoming is that they have largely been unable to achieve their desired outcomes on a large scale. I believe that this is because these approaches do not take societies and social forces into consideration even though the issues that conservationists have to deal with seem to be a direct result of the behavior of societies. In order to address this, we need to understand how societies work; why they behave how they behave and why individuals in societies make the decisions that they do.

This chapter will provide a brief introduction to some of the major schools of thought in conservation, the methods they have used, and the shortcomings of these methods. It will also introduce social norms, which are probably the most significant of the social forces that drive the behavior of individuals within societies; and thus, of societies themselves. Through this chapter, I hope to motivate the questions that I am going to begin addressing during my time here at Princeton.

1.1 A Brief History of Conservation

The history of conservation in the US is long, complicated, and involves a number of different actors advocating for different ideals, goals, and approaches. However, for a fairly straightforward and deceptively linear timeline, see figure 1.1. I will follow this timeline in this section merely to simplify matters. However, it is important to note that the picture is not as simple and clear cut

as the figure makes it out to be. For example, as early as the late nineteenth and early twentieth centuries, Gifford Pinchot, Theodore Roosevelt, and many others were already advocating strongly for the 'nature for people' approach to conservation [2–4]. The recent debate between proponents of 'nature for itself' against those who propose more utilitarian and economic standards was already playing out between seminal figures like Pinchot and John Muir [5].

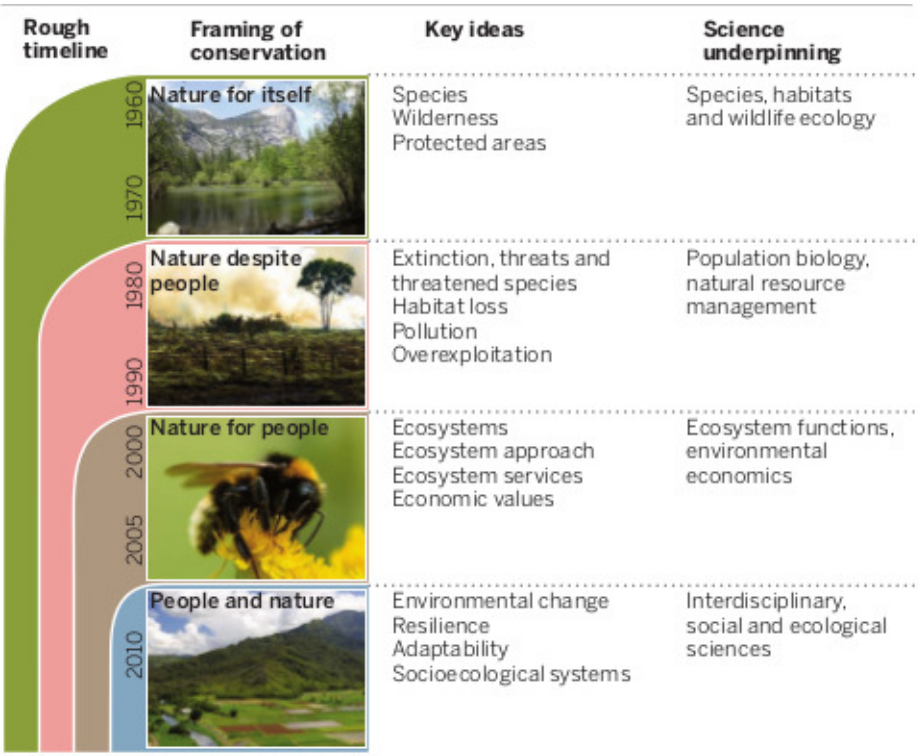

Figure 1.1: A very simplified timeline of conservation in the US [1]

1.1.1 Nature for itself

The basis for a lot of the efforts before the 1970s was the misguided 'Nature for itself' philosophy. According to this philosophy, 'wilderness' is nature untouched by the hands of men. The intrinsic value of life is a central tenet of this line of thought. The 'nature for itself' ideology was promoted by early preservationists such as John Muir and Henry David Thoreau [6,7]. Approaches emerging out of this way of thinking include the designation of national parks and the protection of endangered species. These approaches are still evident today, especially in areas of the world that are most vulnerable to large losses in biodiversity and forest cover. In fact, E.O. Wilson, in his most recent book *Half-Earth: Our*

Planet's Fight for Life, suggests that in order to stave off the cataclysmic mass extinction event facing us today, we need to set aside about half of our planet's surface as a permanent nature preserve [8].

Notwithstanding the legal, political, and logistical difficulties involved in designing and creating nature preserves that are subject to different levels of human use, there is ample evidence to prove that this underlying view of wilderness as untramelled nature itself is grossly incorrect. In the United States, Native Americans had been managing and molding land for their uses for centuries [9–11]. Management techniques mostly included the use of fire. Besides playing an important role in agriculture, these fires served predominantly two additional purposes: ensuring fresh grass for their large herds of horses to graze on, and to promote the growth of herbs, berries, and other forage which would lure game animals in [9,12]. A number of the grasslands, prairies, and open pine forests that early explorers were so attracted to and felt so strongly inclined to preserve can, to some extent, be attributed to the Indian fires.

In addition to painting a false picture of nature and humans' place in it, the nature for itself approach in many cases ends up adversely affecting the people who most heavily depend on it for their livelihoods. A number of journalists, environmental policy scholars, and environmental historians have criticized conservation efforts for displacing populations of native people and people who are forced into homesteading because of socio-economic reasons [13–15]. This often leads to feelings of resentment against conservation organizations and government bodies amongst the local people. Sometimes, the extreme discontent engendered amongst locals causes them to take strong anti-conservation retaliatory actions such as burning down large swathes of designated national parks (personal communication with Benjamin H. Johnson, an environmental historian). The recent standoff in Malheur is also evidence of disenchanted ranchers and other affected people reacting to exclusionary federal government policies [16]. The checkered history of national parks throughout the world often includes severe human rights violations that are very rarely brought up when discussing the history of conservation.

Due to the negative effects it has on local people's attitudes towards conservation and because the underlying ideology only serves to further the incorrect notion of human societies and nature being wholly seperate entities, the methods resulting from the nature for itself line of thought cannot provide sustainable conservation options. Unless we understand that all of life on earth is closely linked and that we are all simply components of a large, complex adaptive system, there will be little realization of the need for conservation. There will be limited public support for conservation, particularly when our methods are turning large sections of society against conservation. While arguments concerning the intrinsic value of life are important and useful, they alone cannot suffice. Despite this being the most prevalent conservation philosophy for well over the past hundred years, we are still facing a mass extinction event of an unprecedented scale [17–19]. That is not to say that national parks and nature preserves have not been at all successful or that we should completely abandon them. There is plenty of evidence to show that without them, we would proba-

bly be facing even greater biodiversity losses [20–23]. However, it is imperative that we come up with better, more inclusive ways of doing conservation. There needs to be a greater recognition of how our natural systems affect us and how we affect them.

Conservationists realized all of this and these very concerns led to the next three phases in the history of conservation. Beginning in the late 1970s, there was a shift in thinking from the 'nature for itself' or 'nature without people' approach to a 'nature despite people' approach. This marked the recognition and consideration of the often deleterious effects that human activities have on nature.

1.1.2 Nature despite people

The period extending from the 1970s to the turn of the century witnessed a shift from thinking about nature as completely removed from the human enterprise to thinking about nature as being severely harmed by the human enterprise. Probably the most influential work of this period was Rachel Carson's *Silent Spring* published in 1962. Carson's work awakened the United States and the world at large to the environmental impact that our actions could have (in this case, the use of pesticides, especially DDT) [24]. *Silent Spring* had a number of long lasting impacts. It ensured that 'No one since would be able to sell pollution as the necessary underside of progress so easily or uncritically' [25]. The ecofeminism movement can be traced back to it as well, as can, at least partially, the formation of the Environmental Defense Fund and the Environmental Protection Agency [25].

A number of other scholars researched and wrote about related issues as well. E.O. Wilson identified the 'four mindless horsemen of the environmental apocalypse' (over-exploitation, habitat destruction, introductions of non-native species, and the spread of diseases carried by non-native species) as being responsible for most of the species losses that we were and still are facing [26]. In *The Condor's Shadow*, David Wilcove drew attention to a number of different ways in which mankind endangers nature and how conservationists the world over attempt to protect nature from human activities [27]. Other scholars attempted to quantify the deleterious effects of the four mindless horsemen on species diversity and the environment [28–35].

The methods that arose out of this phase of conservation history focused on assuaging the past effects of human influence and on figuring out more biodiversity and environmentally friendly ways of conducting our activities. The land sharing (making agricultural land more biodiverse by having various different crops and micro-habitats) versus land sparing (large areas of homogenous agricultural land inter-mixed with areas of protected preserves) argument was one of the major artifacts of this period [36–38]. Other proposed solutions included using biocontrols instead of chemical pesticides and insecticides [39] and regulation of harvesting levels. One of the important outcomes from this phase was the growing advocacy for community based instead of top-down, governmentally or otherwise enforced management [40].

While this period in the history of conservation marked a significant move in the direction of a healthier perspective on the relationship between people and nature, the nature despite people perspective is completely unidirectional. It fails to acknowledge the fact that we humans depend heavily on nature for our sustenance and well being. Viewing humans and civilization as the enemy and only concentrating on the negative influences that we have historically had on other species paints a depressing picture that often turns people off. Many scholars felt the need for a view that recognized the other side of the equation: how nature affects humans and how we depend on nature. This, along with the fact that a lot of the methods proposed by the 'nature despite people' way of thinking were mired in economic, political, and scientific obstacles, set the stage for the next phase in the history of conservation.

1.1.3 Nature for People

Gretchen Daily and Paul Ehrlich spearheaded this new and fairly recent phase in the history of conservation and found support amongst pillars in the fields of ecology and conservation such as Daniel Janzen [41–45]. They advocated for the protection of natural ecosystems because these ecosystems provide valuable services to humans. These services include [41]:

- purification of air and water
- mitigation of floods and droughts
- detoxification and decomposition of waste
- generation and renewal of soil and fertility
- pollination of crops and natural vegetation
- control of the vast majority of potential agricultural pests
- dispersal of seeds and translocation of nutrients
- maintenance of biodiversity, from which humanity has derived key elements of its agricultural, medicinal, and industrial enterprise
- protection from the sun's harmful ultraviolet rays
- partial stabilization of climate
- moderation of temperature extremes and the force of winds and waves
- support of diverse human cultures
- providing of aesthetic beauty and intellectual stimulation that lift the human spirit.

Very broadly, ecosystem services can be separated into four categories [47]:

- Provisioning services: This refers to the provision of goods such as food, raw materials, and water.
- Regulating services: These services result in benefits from the regulation of ecosystem processes. Benefits include carbon sequestration, climate regulation, waste and water treatment, and pest and disease control.
- Cultural services: These are the nonmaterial, often non-consumptive benefits that people enjoy from nature. Examples of such benefits are recreational experiences, cultural, spiritual, or historical experiences, and science and education.
- Supporting services: These services are necessary for the production of the other ecosystem services. These include nutrient recycling, primary production, and soil formation.

Early estimates placed the value of these services at around $33 trillion/yr [46]. The Millennium Ecosystem Assessment in 2005 provided much of the impetus required for the adoption of this philosophy in the conservation world. A major shift in goals was the emphasis on the protection of valuable ecosystems instead of individual species and habitats important for biodiversity. However, the maintenance and promotion of biodiversity was also seen as a key goal of the ecosystem services argument since it was assumed that the continued provision of services depended on the complexity, redundancy, and stability afforded by biodiversity. Paul Ehrlich likens biodiversity to rivets on an airliner's wing [48]. Since airliners are built to be much stronger than they need to be, popping a rivet here or a rivet there might not make much of a difference to the structural integrity of the wing. However, beyond a certain point, the wing is compromised and the airliner can no longer fly. Similarly, species extinctions could lead to a situation where we can no longer procure from nature the services that we have come to take for granted.

Recent work however, has shown that there are at least some services where species richness might not be all that important and thus, that ecosystem services alone might not be able to provide satisfactory grounds for conserving biodiversity [49,50]. Critics have seized on this apparent shortcoming and added it to the already long list of criticisms that have been leveled against the conservation through ecosystem services school of thought. The past few years have witnessed a heated and at times vitriolic debate between the proponents of 'new conservation' (the ecosystem services argument) and advocates of conservation for the sake of protecting nature for itself.

During his time serving as the chief scientist at The Nature Conservancy (TNC), Peter Kareiva, along with his long time colleague and collaborator Michelle Marvier, pushed strongly for the adoption of the conservation for ecosystem services ethic. At the same time, he also derided other efforts based on older ideologies [51, 52]. Some of the criticisms raised by Kareiva were the same ones that I have brought up in the two previous sections. These include: (i) conservation does not take human welfare into account, (ii) conservation rests

on the myth of wilderness as pristine, untouched nature, (iii) conservationists wrongly assume that nature is fragile and that it cannot recover from the damage inflicted by human activities, and (iv) past conservation efforts have failed to protect biodiversity [51–53].

Needless to say, this ended up ruffling quite a few feathers and prompted a number of conservationists to speak out against him and TNC. They accused them of selling out to corporate interests [54], of trying to repackage a centuries old approach that was already a big part of conservation efforts [53, 55], and of promoting an overly anthropocentric view that could not possibly solve all of the problems that conservationists had been trying to address because it completely marginalized all other concerns [53]. The trouble stemmed from Kareiva claiming that 'nature for people' was the only ideology that we should be using to guide our conservation efforts; that all other schools of thought were useless and were no longer required. To some, this seemed more like a business strategy aimed at trying to attract new investors by disavowing the older, less economically favorable approaches to conservation [Rob Pringle, personal communication]. In practice however, there is no reason why ecosystem services cannot simply be used as another tool in our growing conservation toolbox.

Personally, while I agree with the critcism that 'nature for people' is too anthropocentric and therefore, cannot possibly address all of conservation's concerns, I believe that it does have an important role to play in conservation. Putting conservation in terms of ensuring the continued survival and well being of the human race appeals strongly to rationality and policy. Before ecosystem services considerations became so mainstream, conservation was dominated by emotional, cultural, philosophical, and aesthetic appeals; none of which are easily amenable to legal or political instruments. When put in terms of how much money we stand to lose or gain from the protection of important ecosystems however, we can begin employing innstitutions that are already in place to protect and regulate public goods.

However, the ecosystem services argument does seem to be a very short term approach to conservation. If some technological innovations happen to provide the same services at a lower cost that an ecosystem was providing earlier or if the services are no longer required, there would be no reason to continue preserving the ecosystem under the 'nature for people' ethic. Moreover, the services that an ecosystem provides often become apparent only after the degradation of the ecosystem. Also, there are studies that suggest that the valuation or monetization of nature might lead to the weakening of intrinsic motivations for conservation that existed prior to the realization of these utilitarian values [56]. At best then, an argument from the 'nature for people' perspective could be used to protect an ecosystem that is at risk of immediate destruction or degradation and where the services provided are obvious and quantifiable.

'Nature for people', like 'nature despite people', adopts a completely unidirectional perspective on the relationship between nature and people. Both approaches fail to recognize that people are just one of the many components of nature, although 'nature for people' probably comes a bit closer. A view propounding nature as subservient to human needs and desires seems to be just

as unhealthy as a view depicting humans as the enemies of nature; and just as incorrect as a view portraying humans and nature as wholly separate entities. We are products of a long evolutionary process and are only here on this planet now because this process, through the interactions between its numerous components both extinct and extant, happened to produce conditions that can support us. Similarly, our interactions with the rest of nature creates conditions that favor or hurt other species. Any conservation methods based on ideologies that ignore this bidirectional relationship is doomed to fail.

In recent years, there has been a growing acknowledgement of this bidirectional relationship, giving rise to the last of the phases in the history of conservation, the 'humans and nature' phase.

1.2 Social Norms

1.2.1 Theories of Social Norms

1.2.2 Norm Interventions in Other Arenas

Chapter 2

Are Norms Useful in Conservation?

Chapter 3

Field Studies and Experiments

Chapter 4

Models

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