# The stirrings of an ecological conscience: A defense of the moral status of the ecosystem

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## Introduction

Scientists theorise that we have entered the sixth mass extinction in the earth's history. The concentration of greenhouse gases in the atmosphere is the highest it has been in at least 800,000 years (IPCC, 2014, p. 4). Moreover, a widely accepted figure estimates that by 2050 about 200 million people will be climate refugees (Myers, 2002). Scientists predict flooding, droughts, infertile land, pandemics and a host of other scenarios that will likely occur by the year 2100 if we continue to emit greenhouse gases at our current pace (Wallace-Wells, 2019). The earth has recovered after each previous mass extinction, and it will survive an imminent sixth extinction event. Humans and many other organisms may not. With that, the fight against climate disaster is a fight for the survival of life on earth as we know it. The social importance of this debate should be alarmingly clear.

Climate degradation poses a transgressive threat: droughts, famines and floods pay no attention to the end of one polity and the beginning of another, nor do they care if you are a human, a rabbit or a tree. In light of this I feel it is sensible - if not critical - to make the transgressive impact of climate degradation a central consideration in any debate on climate *justice*. Put simply: climate disaster has the potential to affect *all* life on earth. Thus, if we attempt to outline any principles of climate justice, we must consider all living things.

Many justice theorists would disagree with me on this. The idea that any non-human entity can have rights is - at least in Western philosophy - quite new. By far most philosophers throughout history grant moral status exclusively to humans, either implicitly or explicitly. Peter Singer, as

an animal rights ethicist, represents an important shift in this narrative. He brought prominence to the idea that *some animals* also deserve moral consideration, because like humans they are capable of feeling pleasure and pain (1974). Some philosophers go a step further by arguing that *all living things* deserve moral consideration. They consider the moral status of animals alongside those of other organisms (like plants and fungi). Finally, some thinkers argue that holistic entities, *too*, might be deserving of moral status. In environmental ethics, the question usually becomes whether *ecosystems* as entities are worthy of moral consideration. It is this final strand of theory that has - in the context of the climate disaster that looms over us - caught my attention. *If* one concludes that the ecosystem is an entity worthy of moral status, this could have immense implications on how we think about climate justice.

This thesis is a critical exploration of the moral status of the ecosystem. The central question I pose is this: *to what extent, and if so why, do ecosystems (as holistic entities) deserve moral standing?* The thesis is structured as follows. In the first chapter, I start with a reconstruction of a fundamental text in holistic environmental ethics: Aldo Leopold's The Land Ethic (1949). I then introduce two different interpretations of Leopold and discuss the significance of their disagreement. In the second chapter, I defend the moral status of ecosystems with my own argument, which I call the ecological interdependence argument. Rather than presenting an entirely new idea, the ecological interdependence argument builds on the two existing texts introduced in chapter one, by attempting to resolve some of the issues they suffer from. In the final chapter, I discuss one of the most important critiques of holistic ethics: Regan's (1983) ecofascism charge.

## Chapter 1: Understandings of holistic morality

Holistic environmental ethics is grounded in the belief that an ecosystem (or 'biotic community') has a moral value that exists independently from or prior to the moral value of its constituent parts. Imagine that I share with you my plans to burn down a forest. How do you convince me that doing so would be wrong? Perhaps you note that I will endanger the lives of innocent animals that live in the forest. Or you remind me that the forest's trees are old and too beautiful to needlessly destroy. But maybe, instead, you remind me of the value of the whole forest - its beauty and its importance as a living, breathing, thing. If you lean in this direction, then your intuitions are those of a holistic environmental thinker.

Aldo Leopold - an American conservationist - laid the foundation of the field of holistic environmental ethics with his seminal essay The Land Ethic (1949). The essay was so influential that in this thesis I sometimes speak interchangeably about Leopold's land ethic and holistic environmental ethics at large.

The idea presented in The Land Ethic is that biotic communities can be rights-bearing entities. Leopold may have been a great writer, but he was not a philosopher. The land ethic is a short essay that introduces a powerful idea but does not delve deeply into it. It is for this reason that The Land Ethic has been interpreted and debated by philosophers trying to translate the essay into a full-fledged theory of environmental ethics. In this section, I introduce Leopold's land ethic and outline the key conflict that has arisen between different interpretations of the idea. In the section that follows, I critically assess the strength of these interpretations: not in how closely

they resemble Leopold (1949), but instead how well they fare as theories of holistic environmental ethics in their own right.

***The land ethic***

Leopold notices that conservation efforts are generally framed in economic terms. Nature needs to be protected because it provides valuable resources, or because it generates tourism. Land-use ethics, he reasons, are too heavily governed by this economic self-interest:

> ''A system of conservation based solely on economic interest is hopelessly lopsided. (...) It assumes falsely that the economic parts of the biotic community can function without the uneconomic parts.'' (1949, p. 214)

Following this observation, Leopold argues that an ecosystem has moral importance that is not based on its usefulness to humans. Leopold does not delve too deeply into the 'why' of this statement, but his interpreters offer us a number of possible justifications. Two such justifications come from Callicott (1989) and Dixon (2016) respectively:[1]

1) Biotic wholes have value because they are communities connected through community-sentiments;
2) Biotic wholes have value because they are entities with a capacity for health.

The first interpretation relies on Leopold's emphasis on the ecosystem as a biotic *community*. In this interpretation one passage is particularly important: ''We can be ethical only in relation to something we can see, feel, understand, *love* or otherwise have faith in.'' (Emphasis added,

[1] Academics have interpreted The Land Ethic in myriad ways. I have decided to focus on these two interpretations, because I believe the contrasts between the two approaches touch on the key difficulties that arise when one tries to justify moral consideration for the ecosystem.

Leopold, 1949, p. 214). In this interpretation of the land ethic, Leopold is thought to be drawing on Darwin's theory of sociobiology (Millstein, 2015). Darwin thought that sentiments of affection within a community (in any species) might be evolutionarily benefitial, since close-knit communities seem to function more efficiently than communities with weaker relationships between members (Millstein, 2015, p. 302). If that is true, then evolutionary theory suggests that such affectionate sentiments would slowly spread throughout a population. In this interpretation, they have since come to encompass all of the land. The moral status of the land thus lies in the community-sentiments that tie it together. This interpretation is famously supported by Callicott (1989).

The second interpretation of the land ethic focuses on the capacity of the land for health (taken to mean self-renewal). Leopold reasons that just like an organism, an ecosystem must - before it can do anything else - be healthy. Any ethic can be framed as a limitation on freedom of action that serves a greater good (Dixon, 2016). The land ethic, then, serves the good of *survival*: ecosystems, and the beings that live within it, can only survive if they are healthy. In this interpretation, the capacity for (and necessity of) health is thus considered as the feature that necessitates moral standing for the ecosystem.

These two interpretations are not just responses to the land ethic: they form two core positions in the field of holistic environmental ethics at large. One could engage with a number of discussions ongoing in the field, but I feel this one is particularly fundamental: it seems to me that how we *justify* the moral status of the land needs to come before anything else. In what

follows, I critically engage with the two positions, outline their limitations, and formulate the most important unresolved tensions that exist between them.

***The rights of the land: community-sentiments or health?***

This section is dedicated to the clashes between the community and health interpretations of the land ethic. I should stress though, in case it is still unclear, that these two interpretations both believe that the ecosystem *can* and *does* have rights. Their disagreement is instead about how they reach this conclusion, and so the debate that follows is *internal* to the field of holistic environmental ethics. In this section, I discuss the implications and limitations of both the community-sentiments and health arguments. Ultimately, I identify two key issues that remain unresolved in the debate.

A land ethic justified with the *community-sentiments* argument emphasises the existence of affectionate sentiments between members of the land community (towards each other, and towards the land as a whole). Admittedly, there is something intuitive about this idea, which may be why Callicott feels so strongly that it is the correct way to justify the land ethic. Feelings of love for, and kinship with the natural world are as old as time. Think of Hinduism, Peyotism (a Native American religion), or the ancient Greek god Pan (god of the wild). All of these ancient religions put great emphasis on the value of nature: it is revered, feared and yes, loved. And while Callicott's argument of community-sentiments is less spiritual and more scientific, it finds its roots in the same basic, ancient intuition: that humans are so deeply connected to nature that we *must* owe something to it.

Despite its intuitive force, the community-sentiments argument can be critiqued on several fronts. One, we might question whether it is true at all that affectionate sentiments are as widespread as Callicott (1989) would have it. Sure, there are examples of humans loving the land (think of the nature-worshipping religions) - but it is just as easy to name examples of humans disregarding and destroying the land, showing no affection for it at all. And that is just talking about humans. In a true *land* ethic, affectionate sentiments would need to be felt between *all* species, for each other and for the land as a whole. Surely, to feel affection requires at least some level of sentience. Can viruses, flies and fungi think anything about anyone, *let alone* feel affection? I highly doubt it. And if not all beings within the land feel these community-sentiments, then we cannot speak of a true land *community*, and the land's claim to moral status falls apart.

A second criticism is this. Even if one could somehow prove that every being that lives within the land *does* experience community-sentiments, from humans to fungi, the actual evolutionary benefit of those sentiments has been brought into question (Cronin, 1991; Goetz et al., 2010; Millstein, 2015). This critique is based on findings in the natural sciences which suggest that compassion is actually highly costly for organisms, and ''too costly for the self to align with the tenets of evolutionary theory'' (Goetz et al., 2010, p. 351). In other words: that community-sentiments exist *not because* of evolution, but *in spite* of it. The idea here is that any experience of community-sentiments (and potential altruistic behaviour that follows from those sentiments) directly contradicts the tenet that lies at the heart of evolutionary theory: survival of the fittest. The survival of the fittest concept proposes that the creatures who most successfully pursue their self-interest have the biggest chance of surviving (and thus procreating, and thus

passing on their genes in the evolutionary whirlpool). Feelings of compassion, in this interpretation, are thus costly for those who feel them, not beneficial.

The fact that doubt exists about the actual evolutionary benefit of community-sentiments, gives me enough reason to believe that the 'burden of proof', so to say, lies with anyone trying to further a theory based on it. Callicott offers no such proof: he assumes that community-sentiments have evolutionary benefits, builds his argument on this assumption, but never provides support for it. This is a critical problem in the text, for the following reason. Leopold specifically says that ''an ethic, ecologically, is a limitation on freedom of action in the struggle for existence'' (p. 202, 1949). In other words, Leopold thinks that an ethic of ecology should serve existence: of the land, and the things that live within it. So to justify the land ethic, you need to explain *how the land ethic serves existence*. This is assuming, of course, you accept Leopold's definition of an ecological ethic. But since Callicott is building directly on Leopold's text, it is reasonable to assume he does accept it. So if community-sentiments are not proven to be evolutionarily beneficial and thus not proven to be essential in the struggle for existence, how are they morally relevant (at least in direct relation to the land ethic)? And if they are not, how do they help us explain the moral relevance of the land?

This same criticism creates a relevant segue to the second interpretation. Dixon (2016) argues that it is not community-sentiments, but *capacity for health* that explains how the land ethic serves existence, and thus becomes morally relevant. In The Land Ethic, Leopold frequently analogises ecosystems with organisms. He even calls the land a ''collective organism'' (1949, p. 223). The common denominator that Dixon notices, is that *both* organisms and ecosystems have

a capacity for health. In line with the passage from the previous paragraph, capacity for health is the feature that grants moral status to the ecosystem. The logic here is as follows. An ecological ethic is a limitation on freedom of action in the struggle for existence; thus to justify the ethic (the limitation on freedom of action) you need to explain how it serves existence; health is a necessary condition for existence; the ethic thus needs to protect health; and thus any entity with capacity for health is worthy of moral consideration. The key assumption here is that a proper land ethic *protects* the health of the ecosystem. So, while Callicott's assumption that community-sentiments serve species' survival lacks clear evidence, Dixon's assumption that health is necessary for survival is indisputable.[2]

But clearly, Leopold is not the sole authority on what constitutes a proper ecological ethic. When judged by a different standard, the scale may suddenly tip in favour of the community-sentiments interpretation. It makes sense to judge the interpretations by their compatibility with the text they wish to interpret, but as stated before, we should view these theories not just as interpretations but also as holistic ethics theories in their own right. For this reason, I will discuss a final contrast between Callicott (1989) and Dixon (2016), one which exceeds the question of how well the authors interpret Leopold, and instead relates directly to how feasible their respective theories of holistic enviromental ethics are.

One passage from The Land Ethic is of central importance in this disagreement: ''A thing is right when it tends to preserve the *integrity, stability and beauty* of the biotic community. It is wrong when it tends otherwise.'' (Emphasis added, Leopold, 1949, pp. 224-225). This excerpt is often

[2] I am not making a bold statement here. While organisms can generally survive periods of being unhealthy, being healthy is essential to an organism's chances of survival.

described as the essence of Leopold's land ethic, but its precise meaning is heavily debated (Millstein, 2015, p. 302). Unsurprisingly, Callicott (1989) and Dixon (2016) are in disagreement about the meaning of the passage, too.

If we follow Callicott, then the passage can be taken to mean that a proper land ethic allows us to put the interests of the biotic community *before* the interests of its constituent members. Callicott reasons that our relationship of affection for the land weighs heavier than our relationship of affection for other individuals *within* the land. On this point he notes:

> ''The moral worth of individuals (including, take note, human individuals) is relative, to be assessed in accordance with the particular relation of each to the collective entity which Leopold called land.'' (1989, p. 28)

Clearly, this is a controversial statement. If accepted, it implies that we might tolerate the suffering of humans and other organisms, so long as it benefits the ecosystem. For example, a pandemic could be reframed as a good thing because it combats human overpopulation (which puts a strain on the environment).

In Dixon's interpretation, it is not always possible to put the interests of the biotic community before those of its individual members, because *both* have a health. Yes, the ecosystem has moral status since it has a capacity for health, but so do organisms - and there is no clear reason to prioritise one over the other:

> ''Leopold's ideas would preclude treating individual organisms arbitrarily, for reasons not having to do with their biotic community membership. (...) Some reasonable justification is necessary for such sacrifices [of individual lives].'' (Dixon, 2016, p. 209)

So while Dixon grants that sometimes the sacrifice of an individual life may be necessary (for example, to provide in your own sustenance), his health interpretation seems much less sure that the ecosystem always comes before the individual organism. While nuance may be appropriate in a matter of this complexity, Dixon offers no real insight into what should happen when the interests of the ecosystem and individual lives within it *do* conflict. His theory is a pluralist ethical theory, in this sense. And as Millstein (2015) puts it: ‘’Don’t pluralist ethical theories run into trouble when their different aspects conflict?’’ (p. 312). A pluralist theory that offers no guidance on how to navigate its plurality risks fragility.

Dixon might respond that wanting a one-size-fits-all solution to *any* clash between the interests of individuals and the ecosystem is an impossible demand. I disagree: later on in this thesis, I defend why a solid theory of holistic environmental ethics must put the ecosystem’s interests before the interests of its constituent parts. This does not mean that individual interests can never be heeded, it only means that when individual interests are fulfilled the cost for the ecosystem should not be disproportionally high. This problem, of how we ought to weigh the interests of individuals and the interests of the ecosystem, is a key criticism of holistic environmental ethics, popularly put forward by Regan (1983) who coined the term ‘’ecofascism’’. I will return to it in chapter three, but I mention it here to demonstrate that within holistic environmental ethics, there is no unified position when it comes to this matter.

In concluding this chapter, I will summarise what I have done so far. I began this chapter with an introduction of Aldo Leopold’s The Land Ethic. This essay is so influential that a discussion of differing interpretations of the essay touches on some of the core debates in the field of holistic

environmental ethics at large. Two positions within holistic environmental ethics, both trying to justify *why* the land deserves moral status, were discussed: the community-sentiments position and the health position. Callicott's approach places the moral importance of the ecosystem in the idea that it is a community, connected through affectionate sentiments. I noted that there is an intuitive strength to the community-sentiments approach, but that there is something of a challenge in justifying how such sentiments become morally relevant (considering the fact that their usefulness in protecting 'existence' has been brought into question). On this matter, Dixon's health approach offers stronger support (health, quite clearly, is a necessary prerequisite for long-lasting existence). But the health approach suffers from a problem of its own: when it comes to weighing the interests of ecosystems and individual beings, it remains undetermined about what ought to happen when interests clash. On this point, the community-sentiments approach takes a determined stance.

Clearly, a renewed theory of holistic ethics must resolve not just one but both of these issues:

1) It must be clear why the chosen feature or relationship of the ecosystem (community-sentiments, capacity for health, or something else) is morally relevant, and thus justifies the moral status of the ecosystem;
2) It must be clear how the theory balances the interests of the ecosystem and its constituent members, and that choice must be properly justified.

In the second chapter of this thesis, I lay the groundwork for a theory which does just that.

## Chapter 2: A new understanding of holistic morality

In this chapter I present an idea which I call the ecological interdependence argument. This argument is not a full-fledged theory. Instead, it is an initial move to an improved understanding of the land ethic, and of holistic environmental ethics by extension. I combine insights by holistic ethics scholars and insights of my own, and reformulate them into an argument that may offer a realistic new way of thinking about the ecosystem as an entity that is deserving of moral status. Importantly, I attempt to bring together the community-sentiments and health approaches. My aim is to show that the two approaches are not diametrically opposed, but instead ideas which *yes*, are different, but which are nonetheless derivatives of the same basic truth about ecosystems. This truth, put shortly, is that ecosystems are communities made up of interdependent members, and that this interdependence is characterised both by the importance of community relations[3] and by the importance of health.

Although the ecological interdependence argument is a philosophical argument, its validity depends on the empirical assumption that it rests on: that ecosystems are characterised by interdependence, and that this interdependence makes the ecosystem bear resemblance to *a living thing*. I will therefore begin with a short empirical exploration of ecological interdependence, and demonstrate how the concept lies at the intersection of the community and health approaches. I then move onto an exploration of what makes ecological interdependence morally relevant.

[3] I switch vocabulary here from 'community-sentiments' to 'community relations', which is a broader term that I take to include sentiments of compassion *as well as* more 'practical' relations between organisms and their environment, such as mutualism and parasitism.

***What is ecological interdependence?***

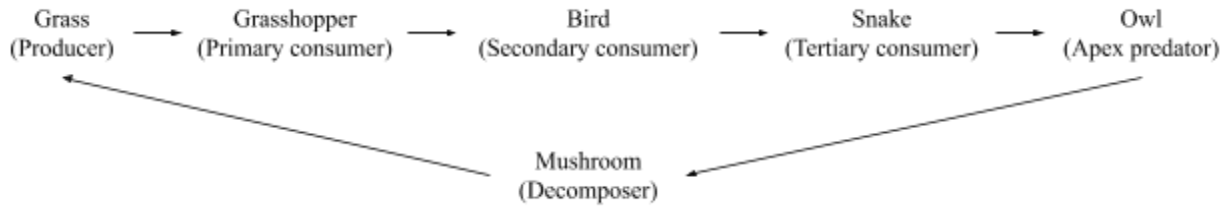
Interdependence is a well-established fact of biology. Mostly, interdependence exists in a web of consumption relations, popularly represented by the trophic levels model which divides species into producers, consumers and decomposers. Aside from consumption, there are many other ways in which species depend on each other: think for example of plants which need insects to pollinate, or animals that need the oxygen that plants put into the air. As Leopold puts it: ‘’the scientist (...) knows that the biotic mechanism is so complex that its workings may never be fully understood’’ (1949, p. 205). Ecosystems are highly complex systems, in which species interact with one another in a host of different ways. *Community relations* of some sort are thus evidently present in ecosystems: the ecological community may be loosely-knit and something of which the community members are largely unaware, but that does not make it any less real.

If species within the ecosystem interact, in a great many ways, then a logical follow-up question is: *why* do they do so? After all, assuming one accepts Darwin’s theory of evolution, changes *within species* happen for a reason: the bird’s beak slowly adapts to tough nutshells, the moth turns black to blend in with the city’s soot-covered trees. The same may be true for the whole: if community relations did not serve a purpose, why would they persist?

The purpose of interaction between species, I believe, is that it is a mechanism which ensures the continued health of the ecosystem, and by extension the health of the things within it. I will need to break this down. For starters, what constitutes a healthy ecosystem? I hardly dare pose this question because volumes can be (and have been) written about what a healthy ecosystem is (Calow, 1992; Wicklum & Davies, 1995; Lancaster, 2000). For the purpose of this essay,

however, I follow Leopold (1949) in taking a healthy ecosystem to mean one that is capable of self-renewal. A healthy ecosystem can also adapt to internal and external stress in a relatively swift manner (Constanza & Mageau, 1999).

Now that we understand what ecosystem health is, the question becomes how the health of the ecosystem is supported by the community relations within it. The answer is that the more biodiverse an ecosystem is (and by extension the more complex its community relations) the more resilient and thus healthy it is (Yachi & Loreau, 1999; Ives & Carpenter, 2007). In environmental science this is known as diversity-stability theory. The idea is that biologically diverse communities are more capable of responding to stressors, because there are more species which possess the traits needed for the ecosystem at large to adapt. Imagine a forest biome in which the following food chain exists:[4]




Now, let us say that the bird population in the forest is wiped out by a deadly bird-disease. A link is now missing in the food chain: the snakes can no longer feed themselves, which affects the owls, which affects the mushrooms, and so on. But of course, that is assuming these are the only species in the ecosystem. Imagine now that the same thing happens in a more biodiverse ecosystem. The birds disappear, but rather than migrating or dying out, the snakes can change

[4] This image is my own, the content is based on Encyclopædia Britannica (2020).

their diet to include mice. Because another species is present in the ecosystem, the food chain is protected, and with it the health of the biome.

This simplified example demonstrates that the resilience (and thus health) of an ecosystem is supported by its biodiversity (which translates to more complex community relations). I hope that at this point it is clear to the reader that what I am attempting to demonstrate is this: the reality of ecosystems shows that the concepts of community and health actually go hand in hand, and that their confluence can be understood as the concept of *ecological interdependence*.

It is in this interaction between health and community that the ecosystem begins to look a bit like a *living thing*. Just like an organism it has a complex structure (the community aspect), the purpose of which is to make sure that the *whole* is functional and capable of responding to external stress (the health aspect). Some ecologists have gone as far as to call the ecosystem a super-organism, notably Clements (1916) - and I already mentioned that Leopold calls the ecosystem a ‘’collective organism’’ (1949, p. 223). Theories of this kind note that both ecosystems and organisms are collectives made of living subunits which together constitute a functioning whole: an ecosystem is filled with plants, animals, and so on; an organism (say, a human) is filled with microbiota such as bacteria, fungi and viruses.

While this ‘ecosystem-as-organism’ theory *could* be incredibly useful in my attempt at justifying the moral status of the ecosystem[5], it is heavily disputed (Van Baalen & Huneman, 2014; Dixon, 2016). In our case, we do not need to go so far as to call the ecosystem an organism, or in other

[5] It might lead to a line of reasoning which proposes that if organisms are owed moral consideration, then ecosystems - as super-organisms - ought to receive it too.

words: a living thing. It is enough to demonstrate that the ecosystem *bears resemblance* to a living thing. So, to reiterate my point: ecological interdependence is the confluence of the ecosystem's complex structure and the functionality and health which that structure enables. These characteristics *resemble* those of a living thing. Ecological interdependence may not be the *only* way to demonstrate that the ecosystem resembles, or is, a living thing, but that is not a problem for the line of reasoning I develop in this thesis. I will return to this notion in the next section. For now simply keep it in mind.

So far, I have explained what ecological interdependence means on an empirical level. But the two challenges posed at the end of the last chapter remain. In the section that follows, I address the first: if ecological interdependence is to be the justification of the ecosystem as a morally considerable entity, then I must demonstrate what makes ecological interdependence morally relevant.

***Why is ecological interdependence morally relevant?***

I set out to answer this question to avoid falling into the is-ought trap (as laid out by Hume). Simply establishing that within ecosystems ecological interdependence exists (the 'is'), is insufficient in arguing why that fact should make ecosystems morally considerable (the 'ought').

To begin this section, I accept Leopold's assessment that ''an ethic, ecologically, is a limitation on freedom of action in the struggle for existence'' (1949, p. 202). This definition closely resembles those of other philosophers, classic and contemporary alike. For example, both Bentham (1789) and Mill (1861) feel that morality needs to serve the prevention of harm;

Frankena (1980) thinks that morality should involve avoiding and preventing harm to others; and Greene (2013) claims that morality should enable cooperation between individuals (all referenced in Gert & Gert, 2020). While Leopold's definition is certainly not the only way to understand what constitutes an ethic, I feel the definition is sufficiently grounded in broader philosophical literature to use it moving forward.

In making the jump from what *is* (ecosystems are ecologically interdependent entities that bear resemblance to a living thing) to what *ought* to be (ecosystems are entities that deserve moral consideration), I take an Aristotelian approach. This means I assume that within nature each entity has a particular goal. You will have to bear with me for a moment, as I expand on Aristotle's teleology, before applying the theory to the ecosystem. The idea that humans have a telos (a goal, a *raison d'être*) is not too difficult to imagine: many of us believe we know our own purpose in life, or we actively search for it, believing that it can be found. But it would be a misinterpretation of Aristotle to say that the possession of a telos is restricted to entities that are self-aware and capable of reflection in the way that humans are: ''Aristotle envisages a (...) role for teleology in natural explanation: nature exhibits teleology without design'' (Shields, 2020). This 'teleology without design' is a seed that grows into a tree: in other words, it is an entity reaching its full potential without actively trying to do so. Humans do it too, by the way: a person does not *think* about the fact that she wants to grow from a baby into a strong adult.

I assume that all living things possess the telos of reaching one's full potential. Do not read this as a profound statement, but instead as a rather empirical assessment: living things *tend towards* growth and development, and this development moves towards an optimal state: things grow

towards a maximum height, strength, intelligence and so on. It is only with ageing, illness or injury that an organism's tendency towards growth is disrupted, and even then the organism tries to recover (or in the case of ageing, tries to stave off its effects). As before, I am basing myself on scientific findings:

> ''Growth (...) is not perpetual. The limits for both total body size and organ size are probably established by genetic mechanism.'' (Wilt, 2018)

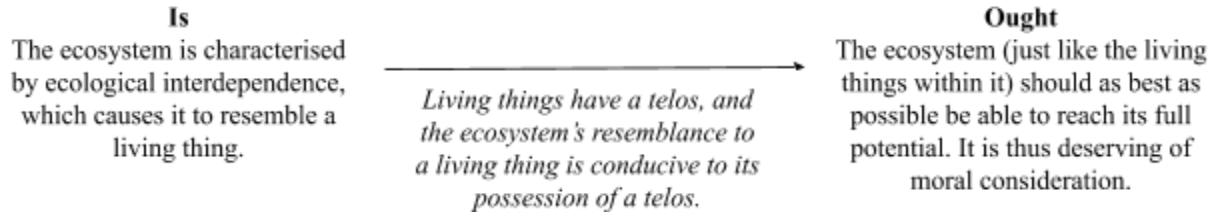
Now that I have laid out the basic idea of teleology, and how I see it reflected in the natural sciences, you may ask yourself: how does this notion relate to the ecosystem, and to ecological interdependence? As detailed in the previous section, the concept of ecological interdependence represents the confluence of the ecosystem's complex structure and the functionality and health which that structure enables. It is through these characteristics that the ecosystem begins to resemble a living thing. I argue that this resemblance is sufficient in demonstrating that the ecosystem, just like an organism, has a telos. In natural science, the telos of the ecosystem is often called the 'climax community': it is the highest stage of biotic succession that an ecosystem is capable of (Encyclopædia Britannica, 2019). In simple terms, it describes the most complex and stable state that an ecosystem can reach: its point of greatest synergy. The North American Sonoran Desert is often named as an example of a present day climax community (Egler, 1954): it is a highly complex and relatively stable system. The fact that ecosystems can reach a climax point does not mean that this climax is reached and then maintained eternally: just like in organisms, 'peak health' is a moment in time that eventually passes.

A critic may note that we cannot extend Aristotle's teleology approach to ecosystems, because where an organism grows toward one 'peak' and then deteriorates (for example, a human is said to be strongest from 25 until 35, after which natural ageing slowly starts impacting them), the same cannot be said for ecosystems, because their strength fluctuates constantly. I do not find this criticism convincing. For one, organism health does fluctuate within a single lifespan (organisms are constantly recovering from illness and injury). Moreover, I defend myself against this criticism by noting that as an ecosystem's strength fluctuates (this process is known as ecological succession), so too the very essence of the ecosystem is transformed. For example, a savanna climax community may destabilize due to drought, and then evolve into a desert climax community. While one ecosystem was born out of another, we must refer to them as separate entities, made up of mostly different constituent parts. Or in teleological terms: two different entities, each with their own *telos*.

Thus far, I have argued that ecosystems, similarly to organisms, possess a telos. It is ecological interdependence that makes the possession of this telos possible: ecological interdependence, as a system of relations between the constituent parts of the ecosystem and the whole, allows the ecosystem to grow, respond to stress, and *reach a maximum state*. Ecological interdependence need not be the *only* way one can reason that the ecosystem has a telos. To understand this the reader could think back to classical teleological thought. The human telos has also been argued to originate from different sources: some find man's telos in our potential for growth as organisms, but others find it in our potential for spiritual fulfillment.

In accordance with Aristotle, I argue that what *ought* to be revolves around potential. Entities

that possess a telos - from organism to ecosystem - should (as best as possible) be able to reach their full potential. This is where I begin to come full-circle: allow me to demonstrate the structure of my logic in this connection between *is* and *ought*.




The critical reader, who has kept in mind the approaches upon which I tried to improve with my ecological interdependence argument, might now ask themselves: if the ecological interdependence argument was put forward to show that the ecosystem resembles a living thing (and thus has a telos, and thus deserves moral consideration) - how does it add to Dixon's (2016) health approach? Dixon, too, draws a comparison between the organism and the ecosystem by arguing that both have a capacity for health. But as stated in the first chapter, the health approach fails to give us an answer to a core dilemma: how do we weigh the rights of the ecosystem with the rights of individual living things, when their interests clash? For now, suffice it to say that my argument is less compromising than Dixon's. I demonstrate that while both the ecosystem and its constituent members have rights, when a conflict of interests occurs the rights of the ecosystem must come before the rights of the constituent members. I will delve back into this in the final chapter of this thesis, when I present the ecofascism charge as the most important critique of the ecological interdependence argument.

There is a last point I wish to make before moving on, which has to do with humankind's role in all of this. I began this thesis by establishing that there is a problem: humans are severely

damaging the world's ecosystems. We are not the only species in history to have done so: think of harmful algal blooms, which are detrimental to aquatic biomes, or locust plagues which wreak havoc on forests and plains. That said, homo sapiens is without a doubt the most dangerous culprit: no other species has damaged ecosystems so widely, persistently and deeply. O'Neill (2001) sharply observes that ''if there was ever a species that qualified as an invasive pest, it is homo sapiens'' (p. 3279). In a similar vein, Leopold notes the following: ''Our bigger-and-better society is now like a hypochondriac, so obsessed with its own economic health as to have lost the ability to stay healthy.'' (1949, p. 9). The damage that humans cause to the rest of the natural world is precisely the reason why this discussion is relevant. While it is outside of the scope of this thesis, the notion that the ecoystem is an entity deserving of moral standing has great implications for us as humans. If the ecosystem has rights, then our behaviour clearly violates them. I come back to this in the final chapter.

In this chapter I have put forward my ecological interdependence argument, and shown that it is a confluence of Callicott's (1989) and Dixon's (2016) approaches. The argument resolves two issues. One, it shows why ecological interdependence makes the ecosystem worthy of moral status (which Callicott's community-sentiments approach did not do). Two, it offers a solution to the problem of weighing the rights of the ecosystem with the rights of its constituent members - a demanding solution, but a solution nonetheless. What follows is the final chapter of this thesis, in which I defend the ecological interdependence argument against a particular criticism and delve more deeply into the implications of my defense.

## Chapter 3: The ecofascism charge

Holistic environmental ethics theories have been criticised in a number of ways, but one criticism seems most persistent. Put simply, the criticism states that granting moral status to ecosystems has dangerous consequences for the rights of individuals. I choose to focus entirely on this criticism. One, because I think writers like Callicott (1989) have already given convincing repsonses to other criticisms. Two, because I feel that the ecofascism charge may be the most powerful problem that theories of holistic environmental ethics are faced with: if I can defend myself successfully against this attack, I believe one of the hardest battles has been fought.

So, at last we arrive back at the problem of how to balance the rights of the ecosystem with the rights of its individual members. I have already mentioned that when the ecological interdependence argument is followed, the rights of the ecosystem must come before the rights of its members. The reason for this becomes clear in the defense against Regan's (1983) ecofascism charge, originally directed at Leopold (1949) but equally relevant here. I will begin with a short explanation of Regan's critique and then outline my defense.

Regan, an animal rights ethicist, believes that certain animals have rights. The animal rights view is, when compared to traditional anthropocentric philosophy, already a reasonably extreme view: it puts humans on equal footing with gorillas, dogs, cows and the likes. But it is in tension with holistic ethics theories. In Regan's theory, wholes (like ecosystems) cannot have rights, because one could envisage situations in which individual organisms could be sacrificed for the benefit of

the whole. This is unacceptable to Regan: sacrificing the individual for the whole would be, in his eyes, a kind of *ecofascism*.

Regan is not blind to the problem of climate degradation, but he thinks the right solution to it is to respect the rights of individual creatures within the ecosystem:

> ''Were we to show proper respect for the rights of the individuals who make up the biotic community, would not the community be preserved?'' (1983, pp. 362-363).

The short answer to Regan's retorical question is *no*, it would not. I think Callicott says it perfectly: ''To attempt to safeguard the rights of each and every individual member of an ecosystem would be to attempt to stop practically all trophic processes beyond photosynthesis.'' (1989, p. 43). Nature, as Callicott notes, is *not* fair, and it does not respect the rights of individuals. Consumption, competition and death all play an important part in the overall health of the ecosystem, and, in the long-run, also of its individual members. To be fair, Regan probably does not mean that we need to keep every species alive for as long as possible: he is aware of these processes and the basic functioning of ecosystems. But by focusing entirely on the rights of individual entities to live and thrive, he disregards that no constituent part can succeed if the whole to which it belongs is not protected first. In other words, we do not protect ecosystem health by ensuring organism health: we protect organism health by ensuring ecosystem health. A flower cannot grow in a barren wasteland, a fish cannot swim in a toxic ocean.

An ethic for the preservation of nature therefore cannot start with the rights of individuals, and only then consider how the ecosystem comes into play. Doing so would mean one would need to label as unjust ‘’the trophic asymmetries laying at the heart of evolutionary and ecological processes’’ (Callicott, 1989, p. 43). I think an ethical principle lies at the root of this empirical defense. Think back Leopold, who says that an ecological ethic should serve the struggle for existence (1949, p. 202). I have argued already that an ethic should be developed in service of entities’ ability to reach their full potential. So on this point, empiricism and ethics converge. The ecosystem must come before its constituent parts: it is an empirical truth, and an ethic which is created in service of existence must ground itself in this truth, or it logically contradicts itself.

I concede that even if one agrees with every step of the argumentation I have presented, the conclusion feels dangerously extreme, and its potential consequences threatening. After all, we *know* that humans are harming the ecosystems in which they live. Does this mean that humans who harm the environment should be eradicated, in service of protecting the whole? Or even if we forbid active killing, should we let famines and pandemics run their course so that the human strain on the environment is lessened? Even if such a conclusion is accepted in ethical discourse, it could never stand in the ‘real’ world. When presented with the choice to kill a group of lumberjacks or to let them cut down a forest, I would say my goodbyes to the forest (and I suspect most people would do the same). So how do we rhyme the ethical conclusion with its real-life implications?

This contradiction does not point to a problem in the ethic, nor does it imply that there is something wrong with our unwillingness to kill a bunch of lumberjacks. Instead, it puts its finger

precisely on an open wound in modern society: the depravity of modern capitalism. The fact that we are faced with this contradiction (an either-or choice between human and environment) at all, demonstrates that human society became unsustainable a long time ago. *When*, precisely, could be extensively debated: maybe it was when we stopped being hunter-gatherers, or with the founding Dutch East India Company which traded across the seas, or during the Industrial Revolution. Whenever it was, proof of the unsustainable nature of human society is all around us: resource depletion, species extinction, pollution - all can be traced back to a prioritisation of economic interest above everything else. The solution to the contradiction that we face is thus not to pick one or the other (humankind or ecosystem) but to gradually dismantle the thing that forces us to make the choice at all: the capitalism that permeates modern human society.

Even a person who believes that *only humans* have rights should be concerned: climate degradation, as a result of global capitalism, has taken innumerable lives and will continue to kill. The current state of the world benefits no one in the long run. The solution to this problem (the either-or choice between human and ecosystem, as well as Regan's ecofascism charge) is thus to accept that while the world we live in is what we *know*, it is not a morally neutral world. Instead, it is fraught with injustices to humans, other organisms and ecosystems alike. Subsequently, if one is to restore justice for the world's ecosystems and their inhabitants, wide-ranging changes need to be made to the social, political and economic structures in human society that collectively support the exploitation of the natural world.

## Conclusion

In this thesis, I set out to show why the ecosystem is deserving of moral status. I presented the ecological interdependence argument, which resolves two limitations that plagued Callicott's (1989) community approach and Dixon's (2016) health approach. I demonstrated that the two approaches were actually describing different aspects of the ecological interdependence that characterises ecosystems. The ecological interdependence argument is clear on how the interests of the ecosystem should be weighed with the interests of its constituent members, and it offers a clear, teleological justification for *why* the ecosystem is a morally considerable entity.

I can now answer my research question - *to what extent, and if so why, do ecosystems (as holistic entities) deserve moral standing?* - by concluding that the ecosystem deserves moral standing, because its ecological interdependence functions as a mechanism which makes it resemble a living thing, to such an extent that we can identify the ecosystem's telos. The ecosystem's moral standing thus arises from the belief that it should, best as possible, be able to reach its full potential, its climax state.

Human behaviour clearly violates the ecosystem's right to fulfillment of its telos. If my conclusions are accepted, then the societal implications are substantial: to rectify the injustice done to the ecosystem, humankind must dismantle the capitalist structures that are currently nestled comfortably in the foundations of modern life. If we do nothing or too little and continue on our current path, disaster is imminent. Academically, my conclusion leaves me feeling uneasy. Is extinction to be warded off with pen and paper? If the injustice to the natural world is

as deep as I have argued, and time is running out, what happens now? Do we write more papers or take to the street? Perhaps the answer is *both*, or maybe it is too late for either to have an effect. We do what we can, I suppose. My recommendation for future research that explores the moral status of the ecosystem, particularly in the context of looming climate disaster, is thus that it should reflect critically not only on its contribution to the philosophical debate but on its contribution to conservation, policy-making and other fields concerned with climate protection.

In concluding this thesis, I believe to have presented a justification for the moral status of the ecosystem that is well-grounded in existing literature, logically consistent, and a relevant contribution to debate about the scope of moral considerability. But of course (as I suspect is often the case) there are a great many things I still wish to say and write. In writing this thesis I spent a lot of time thinking about how to balance empirical findings from the natural sciences and philosophical and logical reasoning. I am happy with the balance I struck - I think philosophy is deeply entrenched in reality, not detached from it. There is, of course, a limitation that comes with philosophising about the natural world. Philosophical thinking that is grounded partially in logic and partially in findings from the natural sciences, must accept that its effort must be an ongoing one. Leopold noticed this, too, and I choose to conclude this thesis with a note of uncertainty from his hand. Uncertainty about the fruitfulness of philosophical endeavors such as his and mine, and uncertainty about the future that we face: ‘’Whatever may be the equation for men and land, it is improbable that we as yet know all its terms.’’ (1949, p. 220).

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