

The title "Coral Reef Toolkit" is displayed in a large, white, sans-serif font, centered over a background of vibrant coral reef imagery. The background is a collage of various coral species, including large, rounded, pinkish-orange corals and smaller, more intricate structures in shades of blue, purple, and red.

The background of the page is a vibrant, close-up photograph of coral reef structures. The colors are primarily shades of purple, magenta, and blue, with some darker, almost black areas. The coral appears to be branching and has a textured, porous appearance. The lighting is dramatic, highlighting the edges and creating deep shadows.

***Evolution towards a Rights-based Framework  
for Coral Reef Protection***

***Earth Law Center and Howell Conservation Fund***

***October 2019***



***Authors:***

*Michelle Bender, Brett Howell, Elizabeth Goldstein,  
Sofia Garrick, Queena Chen, Mehrose Akhtar,  
Faisal Patil, Shana Shell*





## Foreword: A Framework for Coral Reefs

Coral reef ecosystems cover less than one percent of the ocean, yet 25 percent of all known marine species use reefs for food, shelter, and breeding. Additionally, these ecosystems are vital to the livelihoods of millions of people worldwide through food, jobs and coastal protection from extreme weather events.

It is 2019 and we have lost half of the world's coral reefs. Scientists now say the Great Barrier Reef will never be the same. We have two options. We can continue operating within our existing regulatory systems, win some battles, but lose more coral. Or we can adopt a new system that can save the other fifty percent. We can save half of the world's coral reefs if we embrace novelty, acknowledge our deep connection with the ocean, and adopt holistic, precautionary and future-based decision making.

Traditional approaches, both market-based and marine protected areas, have their limitations in providing real protection to coral reef ecosystems. Amongst these limitations are property rights constraints, competing interests and uses, and traditional cost-benefit analysis.

An emerging legal framework, Rights of Nature, is taking hold internationally to protect ecosystems by taking the ecosystem out of the realm of property, recognizing the ecosystem as a subject of rights, and ensuring its rights are not violated in decisions that affect its health. This approach has been applied towards rivers, mountains and national parks, but has yet to be tested in marine ecosystems. Additionally, a new insurance scheme was recently launched for the Mesoamerican Reef, and shows promise in restoring coral reefs after hurricane events. However, even this approach can be further evolved, as the purpose of insurance is to prevent human loss and for human benefit.

What if we insured the coral reef for itself, designated it as a legal entity, restored the reef proactively and managed human activity so that the reef's health and integrity are maintained? Such a framework is what we propose—a combination of the approaches, both traditional and novel, to ensure the lasting longevity of these incredibly vital ecosystems. Herein lies how such an approach would look like—the future of coral reef conservation.



# Table of Contents

- Background and Rationale** ..... 4
- I. Our Current Framework ..... 6
  - A. Law of the Sea Convention ..... 6
  - B. Paris Climate Agreement ..... 6
- II. Our Recommendation/Proposal ..... 7
  - A. Marine Protected Areas ..... 8
  - B. Market-based Approach ..... 10
  - C. Rights of Nature ..... 14
- III. Exploring Different Pathways for Reefs ..... 17
  - A. Recognizing the Rights of Reefs ..... 17
  - B. Recognizing Reefs as a Legal Entity ..... 18
  - C. Guardianship Model Pathway ..... 18
  - D. Incorporating Rights into Payment Model through  
Restoration Funds and Trust/Insurance ..... 19
- IV. Conclusion ..... 19

## Appendices:

- I. How could criteria for decision making look like under this framework? .... 20
- II. Frequently Asked Questions ..... 26



# Acronyms

<b>EBM</b>	Ecosystem Based Management
<b>EEZ</b>	Exclusive Economic Zone
<b>GLORES</b>	Global Ocean Refuge System
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>IUCN</b>	International Union for Conservation of Nature
<b>FKNMS</b>	Florida Keys National Marine Sanctuary
<b>MPA</b>	Marine Protected Area
<b>NEPA</b>	National Environmental Policy Act
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>OHI</b>	Ocean Health Index
<b>SLED</b>	Sustainable Livelihoods Enhancement and Diversification
<b>UDRME</b>	Universal Declaration of Rights of Mother Earth
<b>UNCLOS</b>	United Nations Convention on the Law of the Sea
<b>UNDP</b>	United Nations Development Programme
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change



## Background and Rationale

Coral reefs occupy less than one percent of the ocean but are home to more than 25 percent of all marine species,<sup>1</sup> approximately one million species, supporting more species per unit area than any other marine environment. In addition to providing habitat, food, shelter and breeding grounds for marine species, coral reefs also benefit human health and livelihoods. These ecosystems provide medicine, food, and jobs for 500 million people,<sup>2</sup> and act as a buffer and protection from weather events and erosion.<sup>3</sup> The benefits translate to an economic value of 100,000 to 600,000 USD per square kilometer per year<sup>4</sup> and approximately 375 billion USD overall.<sup>5</sup> The range demonstrates that experts disagree on the exact value depending on their customized methodology.


**Global climate change, acidification, and human activities (including pollution, overfishing and coastal development) threaten the existence of coral reefs.**

Ocean acidification occurs as a result of the ocean absorbing about half of the carbon dioxide emitted from human activities.<sup>6</sup> The introduction of CO<sub>2</sub> to seawater creates carbonic acid which increases the acidity of the water, resulting in acidification.<sup>7</sup> This interaction also decreases the concentration of carbonate ions in the ocean. Carbonate ions are essential for the structural integrity of marine life such as coral.<sup>8</sup> In water with increased acidity, larval development declines by up to 73 percent and leaves existing coral less resilient to disturbances.<sup>9</sup>

While the absorption of greenhouse gases by the ocean is beneficial to reducing the levels of CO<sub>2</sub> in our atmosphere, it also causes ocean warming.<sup>10</sup> Rising temperatures are a primary cause of coral bleaching events. Coral bleaching is essentially a stress response. When compared to humans, a rise in 2 degrees Celsius is a difference of having an average body temperature of 98.6°F to a fever of 102.2°F. Coral contain zooxanthellae algae within their tissues that will lose the ability to photosynthesize when the temperature is above their normal range. The coral senses this abnormality and responds by releasing the algae, much as the human body would attempt to release harmful bacteria during a fever. What remains is the coral's transparent, white skeleton. As coral release these components, however, they lose their most important food source. This leads to starvation. In the 1980s, the global proportion of coral being hit with a bleaching event was 8 percent. In 2016, this number was reported to be 31 percent.<sup>11</sup>

Coral reef ecosystems are rapidly degrading and 58 percent of all reefs are at "serious risk" of extinction due to human activity.<sup>12</sup> By 2030, it is estimated that more than 90% of the world's reefs will be threatened. By 2050, it is predicted that





nearly all reefs will be threatened with 75% facing high, very high, or critical threat levels.

The statistics show that, although multiple initiatives have been put forward internationally, we need to do more to prevent the extinction of coral reefs.

Experts worldwide are calling for a shift to holistic and alternative forms of management to maintain ocean health. The same call for change is mirrored for coral reef ecosystem protection, where scientists call upon new strategies that “take into account the need to protect, maintain and restore coastal ecosystems, system functions and land-sea connectivity”<sup>13</sup> and “more vigorous, innovative and adaptive management strategies”<sup>14</sup> in order to maintain and restore coral reef health. Additionally, it is increasingly imperative that we acknowledge “the role of human activity in shaping ecosystems” to improve coral reef resilience.<sup>15</sup>

## **Our Current Framework**

Governments around the world have implemented a variety of conservation initiatives to protect and conserve coral reef; including international agreements, marine protected areas, and local law.

### *A. Law of the Sea Convention*

The United Nations Convention on the Law of The Sea (UNCLOS III), also known as the Law of the Sea Convention or the Law of the Sea Treaty, is the primary international agreement that regulates the rights and responsibilities of nations regarding their use and treatment of the Oceans.

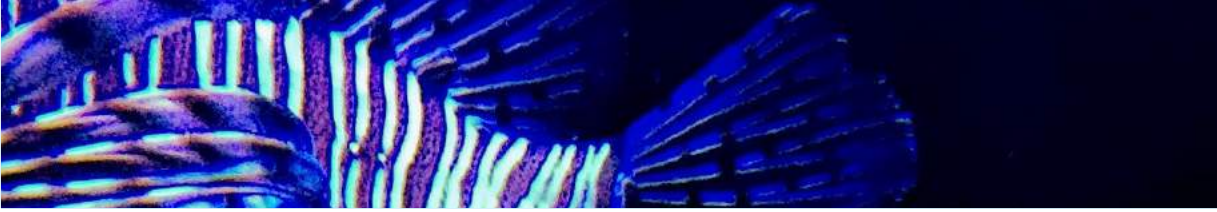
Most of the world’s coral reefs are situated within coastal states’ jurisdiction, entitling them to conserve or exploit most of the world’s reef as they each see fit. The Exclusive Economic Zone (EEZ) allows a coastal state the right to exploit, develop, manage, and conserve all resources of an area extending 200 nautical miles from its shore. Most offshore oil and gas exploration, for example, is overseen by countries within these exclusive zones.

### *B. Paris Climate Agreement (United Nations Framework Convention on Climate Change)*

The burning of fossil fuels and subsequent release of carbon dioxide into the atmosphere create two of the most serious threats to coral reefs: ocean acidification







and ocean warming.

Reducing fossil fuel emissions and stabilizing global rise in temperature at 1.5 degrees Celsius is considered “the only opportunity” to save coral reefs. To save corals, local efforts must be supplemented by global efforts. The Paris Climate Agreement notes that in taking action to address climate change we must ensure “the integrity of all ecosystems, including oceans, and the protection of biodiversity.”<sup>16</sup>

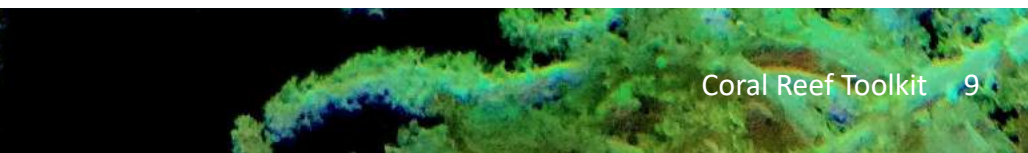
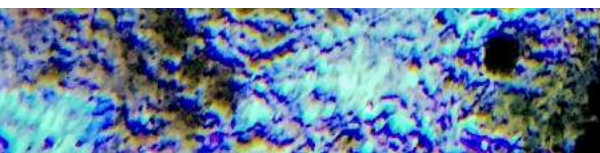
However, the Agreement largely focuses on economics and the economic system (which is mentioned 18 times throughout) rather than the proper functioning of natural systems. Most recently, the Intergovernmental Panel on Climate Change highlighted the urgency to act now, warning that we have 12 years to change our practices to keep the global temperature rise at 1.5 degrees Celsius.<sup>17</sup>

Current frameworks, including the United Nations Framework Convention on Climate Change (UNFCCC), aim to achieve “sustainable use” of the marine environment. The main concern with this goal is the dominance of anthropocentric language, and the representation of Nature as having mainly instrumental value. Nevertheless, the concept of sustainable development was created on human-centered values, focusing on the support of human needs and preventing the loss of biodiversity for human benefit. As is currently interpreted, this reinforces the idea that humans are above and separate from Nature.<sup>18</sup>

Indeed, the language of Sustainable Development Goal 14 to “conserve and sustainably use the oceans, seas and marine resources for sustainable development” equates the ocean’s value to human wants and needs, failing to mention conserving the ocean for use and enjoyment of the species that live there, as well as the web of life that depends on it. It is now imperative, to prevent the crisis now evident,<sup>19</sup> that we evolve our perceptions and values. We need to transition to language and law that represents the interconnectedness of ecological processes, that sees humans as inseparably embedded within nature, and listens to the sea.<sup>20</sup>

## Our Recommendation

We propose a combination of the management frameworks that are currently in use in some areas to protect coral reefs. These are namely: instituting marine protected areas, developing insurance for reefs, and transitioning to an Earth-centered legal framework. This will allow reef management to be more inclusive, proactive, and responsive<sup>21</sup> while providing a more effective system to protect coral reefs in the face





of climate change.

### *A. Marine Protected Areas*

The International Union for the Conservation of Nature (IUCN) defines a marine protected area (MPA) as “A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.” Even though definitions of MPAs are not globally uniform, they all share the same aims of protecting biodiversity, cultural heritage, and sustainable livelihoods.

By managing human activity in defined areas, MPAs offer an opportunity to address threats to coral reef health including overfishing, pollution, vessel traffic, and oil and mineral extraction.

Additionally, “no-take” marine protected areas, where human activity is prohibited, deliver several benefits including: increasing biomass (size) and biodiversity (number of species), increasing ecosystem capacity to withstand stress and change, protecting cultures that rely on subsistence fishing, boosting local economies through tourism and scientific advances, and helping commerce and leisure by increasing and perpetuating fish populations.<sup>22</sup> In fact, the net benefits (social, cultural, economic and ecological) far exceed the costs (start-up, operating, congestion and opportunity) by a magnitude of 3.17- 19.77.<sup>23</sup>

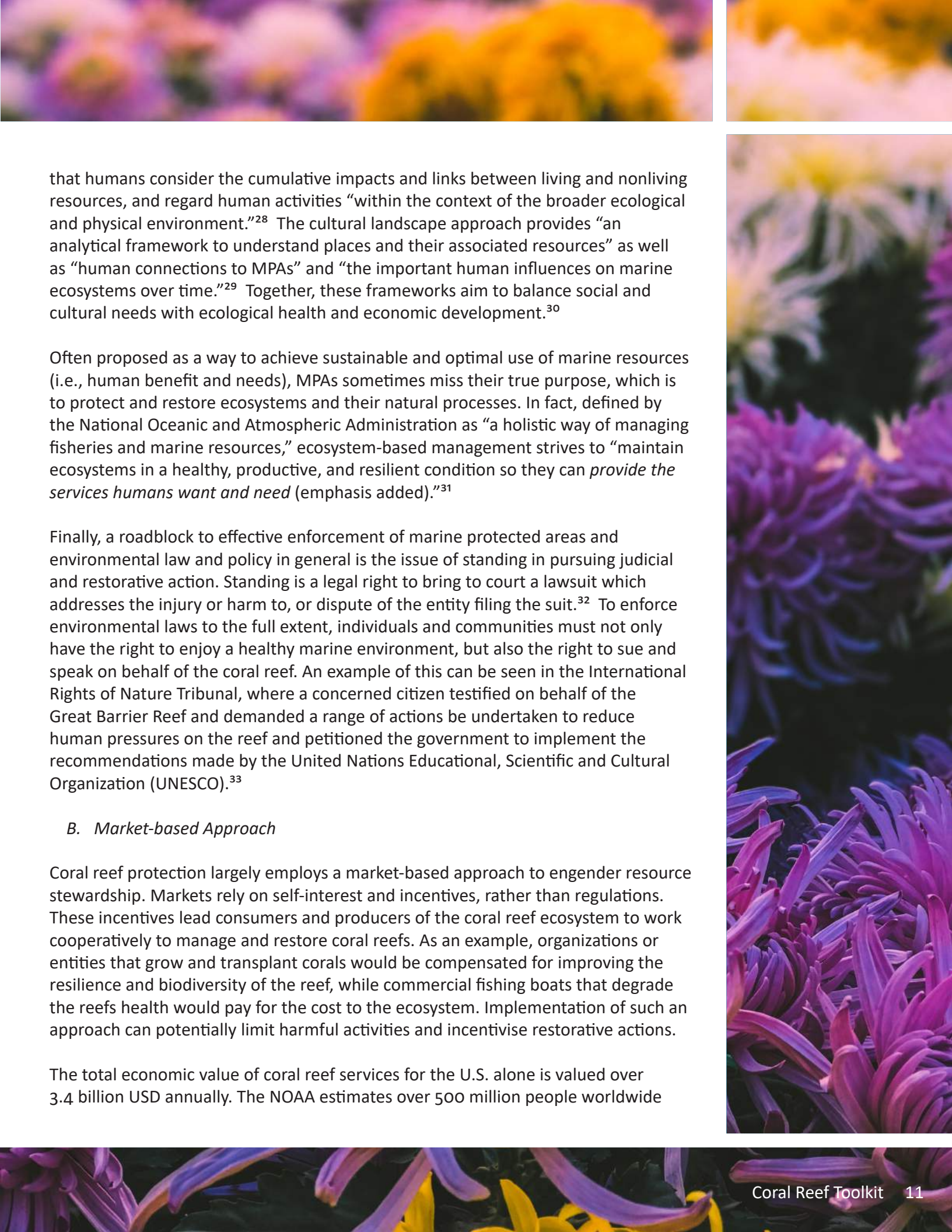
### *Limitations*

Currently, 5.3 percent of coral reefs lie inside extractive MPAs, 12 percent inside multipurpose MPAs, and 1.4 percent inside “no-take” MPAs. Considering the dire situation coral reefs are in, there exists an opportunity to protect more coral reefs in no-take zones.

Recent studies show that MPAs are more often than not, paper parks. Paper parks are protected areas that have been established the action taken has been nonexistent or insufficient to enact the changes needed. In fact, a study in Nature showed that over a quarter of the MPAs evaluated did not provide for protective benefit.<sup>25</sup> Most recently, a study in Science found that half did not have management plans and only one percent of European MPAs prohibit bottom-trawling and dredging.<sup>26</sup>

The management principles and guidelines embedded within the ecosystem-based management (EBM) and cultural landscape approach has largely guided the current, and constantly evolving, legal framework for marine protection.<sup>27</sup> EBM requires





that humans consider the cumulative impacts and links between living and nonliving resources, and regard human activities “within the context of the broader ecological and physical environment.”<sup>28</sup> The cultural landscape approach provides “an analytical framework to understand places and their associated resources” as well as “human connections to MPAs” and “the important human influences on marine ecosystems over time.”<sup>29</sup> Together, these frameworks aim to balance social and cultural needs with ecological health and economic development.<sup>30</sup>

Often proposed as a way to achieve sustainable and optimal use of marine resources (i.e., human benefit and needs), MPAs sometimes miss their true purpose, which is to protect and restore ecosystems and their natural processes. In fact, defined by the National Oceanic and Atmospheric Administration as “a holistic way of managing fisheries and marine resources,” ecosystem-based management strives to “maintain ecosystems in a healthy, productive, and resilient condition so they can *provide the services humans want and need* (emphasis added).”<sup>31</sup>

Finally, a roadblock to effective enforcement of marine protected areas and environmental law and policy in general is the issue of standing in pursuing judicial and restorative action. Standing is a legal right to bring to court a lawsuit which addresses the injury or harm to, or dispute of the entity filing the suit.<sup>32</sup> To enforce environmental laws to the full extent, individuals and communities must not only have the right to enjoy a healthy marine environment, but also the right to sue and speak on behalf of the coral reef. An example of this can be seen in the International Rights of Nature Tribunal, where a concerned citizen testified on behalf of the Great Barrier Reef and demanded a range of actions be undertaken to reduce human pressures on the reef and petitioned the government to implement the recommendations made by the United Nations Educational, Scientific and Cultural Organization (UNESCO).<sup>33</sup>

### *B. Market-based Approach*

Coral reef protection largely employs a market-based approach to engender resource stewardship. Markets rely on self-interest and incentives, rather than regulations. These incentives lead consumers and producers of the coral reef ecosystem to work cooperatively to manage and restore coral reefs. As an example, organizations or entities that grow and transplant corals would be compensated for improving the resilience and biodiversity of the reef, while commercial fishing boats that degrade the reefs health would pay for the cost to the ecosystem. Implementation of such an approach can potentially limit harmful activities and incentivise restorative actions.

The total economic value of coral reef services for the U.S. alone is valued over 3.4 billion USD annually. The NOAA estimates over 500 million people worldwide



depend on coral reefs for subsistence, coastal protection, and more.<sup>34</sup> Additionally, UNESCO determined the social, cultural, and economic value of coral reefs to be at 1 trillion USD. Climate-related loss of reef-ecosystem services is expected to equal 500 billion USD per year or more by 2100. The people most impacted will be the ones who rely on reefs for their livelihoods.<sup>35</sup>

A market-based approach acknowledges the social, economic, and environmental value of reefs as well as the challenges they face. This approach not only relies on incentives from the value of the reefs but also on organizations and people who are willing to pay to keep the ecosystems healthy and functional.<sup>36</sup> For example, local tourism organizations or hotels can engage in partnerships with eco-conscious companies to fund reef restoration and conservation. Such a partnership can allow for the incorporation and use of existing corporate social responsibility initiatives. These initiatives ensure that companies are aware of the impact their business has on society, the economy, and the environment. This could manifest itself in multiple ways including a fully sustainable supply chain and a partnership with a local community organization.

In order for a market-based approach to be successfully implemented, three core components must be present: exclusive access (i.e. the right to exclude others), tenure security (e.g. lease), and enforcement (e.g. the ability to enforce property rights).


The three components create an owner of the resource, define the extent of the rights over the resource that owner has, and how those rights can be enforced so that the ecosystem services can be sold or transferred to another owner, enabling a reward for investment in restoration.<sup>37</sup> This also means the owner can:

- limit damage to the reef by excluding those not willing to pay for its use, and the damage they inflict;
- limit access for all users by charging an access fee that contributes towards funding for restoration; and
- transfer and sell their property to consumers, like ecotourism businesses, to create a market for reef restoration.

Examples of a market-based approach to Reef management and restoration include:

- A. the Mesoamerican Reef Insurance program. Considered “insurance-for-nature...specific factors [such as hurricane destruction] trigger payments, which would be made quickly and used to repair the insured section of the Mesoamerican reef.”<sup>38</sup> This example is further expanded upon below.
- B. The Gili Eco Trust in Indonesia, where divers and local hotels and restaurants put funds into the program to go towards compensating fishermen whom





forgo dynamite fishing.<sup>39</sup>

- C. Seascope Caribbean in Jamaica has launched multiple projects including that with the Goldeneye Resort, that included the planting of corals into target areas, facilitating the initiative to create a fish sanctuary, and training of local spear-fishers into maintenance technicians.<sup>40</sup>

Box 1: Mesoamerican Reef Insurance Case Study <sup>41</sup>

The Government of Quintana Roo, Mexico, has taken an innovative approach to reef protection and restoration. In partnership with Swiss Re and the Nature Conservancy, the government is creating a Trust that will hold the insurance policy for the Mesoamerican Reef.

The steps to create the policy involved: determining the economic value of the Reef, assessing the risk and whether or not that risk is insurable, determining if the Reef can be repaired, identifying the buyers, designing the insurance, creating the institution to manage the policy, and building the capacity to repair the Reef.

The Reef was found to contribute 15 million USD in annual benefits. The costs of repair after severe hurricane events was estimated to be anywhere between 2 and 8 million dollars with a loss of 17 percent live coral cover. The policy is designed as a parametric insurance policy where a pre-agreed amount is paid out when conditions (determined as a category 4 hurricane) are met. This level of damage was found to dramatically increase restoration costs in the Mesoamerican Reef system and therefore was identified as the threshold where risk is transferred.

In this example, a private Trust, with an advisory committee of experts and scientists, will be in charge to not only buy the insurance but to ensure the funds are allocated correctly for reef restoration. The policy also provides a partial refund to the Trust when there is no significant hurricane event in a year.

This approach allows for a fast response when the Reef is damaged, to provide the funds necessary for intervention and restoration. The Trust also simultaneously trains restoration specialists and develops a protocol for intervention after hurricanes. If the reef is healthier then the premium will not be as high so an incentive exists to proactively restore the Reef, reduce risk, and minimize the cost of the insurance plan. Outside the insurance policy, other market-based approaches will begin to be developed through the Trust. For example, there is already a tax in place that coastal hotels pay towards the Trust to be used for conservation.



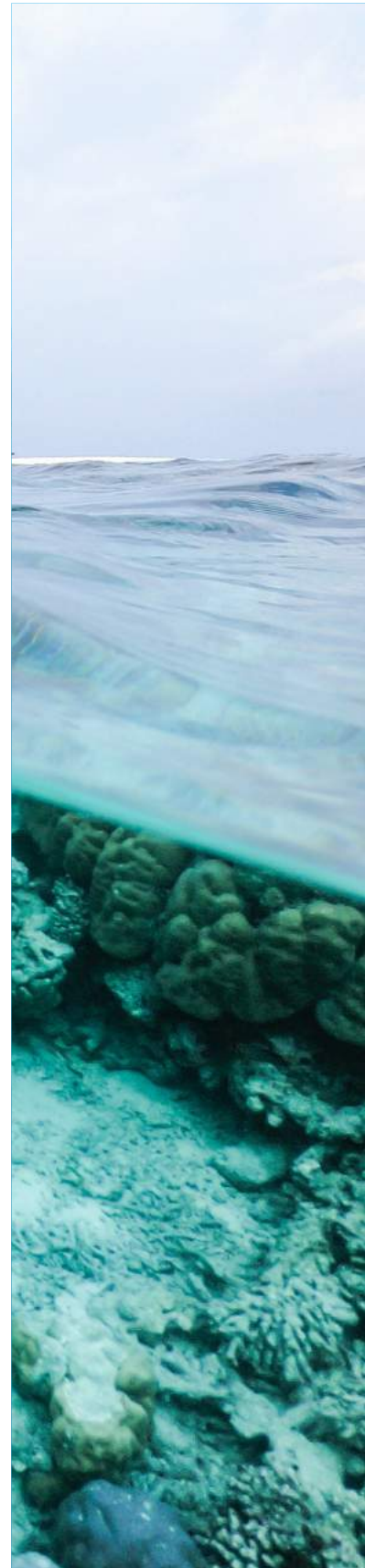
Unfortunately, risks such as water pollution and ocean acidification constantly occur and are therefore uninsurable risks, thus the insurance policy itself will not be able to protect against the systemic problems facing coral reefs. Similarly, the insurance policy as is, protects against human loss of services from the Reef, rather than ecosystem loss (that includes loss to humans) from the Reef. This number would innately produce higher, intangible values due to the value of non-human services the Reef provides. Additionally, parametric insurance is tied to the risk, not the health of the Reef, and degraded reefs have less to lose and therefore less risk, so insurance may not be a viable solution in cases where a coral reef is hanging on by its last breath.


### *Limitations*

The constraints of a traditional market-based approach include the seemingly unlimited access (e.g. tragedy of the commons economic theory), the reef as “property” with a system of property rights, and relying on the political process to determine the optimal level of reef protection.

Disagreement over rights and rules commonly causes non-compliance for protected areas.<sup>42</sup> In many cases, coral reefs are owned by Federal and State Governments or local communities which choose how to manage human activity affecting coral reefs. In other cases, “there is no clear ownership of the resource and consequently, no meaningful limit on access. As an open-access commons, there is little incentive for reef users to invest in stewardship or to limit present use for future generations. Moreover, those who visit coral reefs and those whose livelihood depends on reef visitors have no claim against parties whose actions deteriorate the resource.”<sup>43</sup> This ultimately has led to the tragedy of the commons, or the overexploitation of marine resources.

Our traditional assumptions of the ocean as an open-access resource equates to everyone having the right to the resource, and creates competition for access and use for fear of missing out on the economic benefits of exploitation and extraction. For publicly owned resources, “use cannot be restricted unless some individual or entity with legal standing objects and can show that its property or public welfare is being adversely affected by the activity.” For coral reefs and the industries they contribute to (fishing, tourism, recreation, etc.), this constraint has led to “managing the industry to protect capital investment and minimize short-term socioeconomic impacts, rather than to maintain the resource at a level provided long-term benefits.”<sup>44</sup>





Additionally, western property law is based on the idea that Nature is a resource and object for human use. Any value placed on Nature is measured in terms of the value that we can derive from its benefit to us, or “ecosystem services.” For example, the Mesoamerican Reef insurance program is largely used to protect against loss after hurricanes and to protect human interest, rather than proactive and to protect the reef for itself and the ecosystem. Ignoring the root cause of degradation and increased storm events inherently leads to continuing degradation and declining health.


Similarly, in order to determine the optimal level of reef protection, a political process that evaluates human and economic interests is required to ultimately determine what constitutes a healthy reef, and therefore how much protection is needed to obtain that level of health. An example of this anthropocentric perspective to health is the Ocean Health Index (OHI),<sup>45</sup> for which “[n]ine out of ten . . . attributes directly describe ecosystems services, or benefits to humans.”<sup>46</sup> While this approach has gained some favor, many assessment methodologies today focus on measuring ecosystem “services” and its benefits for humans, rather than on measuring an ecosystems intrinsic value outside human utility. Additionally, this model accepts the “traditional [neoclassical] economic and consumer values” that ocean scientists have already asserted “are not sustainable.”<sup>47</sup> Scientists’ characterization of this model as unsustainable raises serious questions about its utility in improving marine well-being.

### C. *Rights of Nature*

The Rights of Nature framework is emerging internationally, now implemented in over 20 countries in local, state, national and constitutional law, or through judicial decisions. This framework recognizes that Nature is a being with inherent rights to exist, thrive, and evolve, and that it is human responsibility to protect these rights.

Over two dozen municipalities in the U.S. have passed local ordinances or resolutions that recognize the rights of natural ecosystems. For example, the City Council of Santa Monica unanimously passed in 2013 a Sustainability Rights Ordinance<sup>48</sup> which recognizes the inherent rights of natural communities in Santa Monica. It further articulates the rights of Santa Monicans to self-governance, a healthy environment, and sustainable living. The city’s Sustainable City Plan sets out specific sustainability actions and goals consistent with the Ordinance concerning water, energy, food, transportation, waste control, and other matters. Most recently, the ordinance is being applied to ensure stronger protection to the city’s aquifer and therefore improve public life and secure a healthier future.

Additionally, countries are moving towards protecting ecosystems by legally



declaring them as a legal entity or legal person. A coral reef as a legal entity signifies that the ecosystem is not owned by any one person or government – transferring ownership to itself. This not only removes the property rights constraints but converts the reef from an open access commons to an entity with limits on access, where access is determined by balancing human needs with that of the reef system. The concept of property rights shift from ownership over Nature to stewardship and responsibilities owed to Nature.<sup>49</sup>

Under the Rights of Nature framework, the coral reef would then be entitled to certain rights, and humans would have the duty to respect said rights. It would also provide for prompt and full restoration and prohibits activities that will violate the reef’s rights to exist, thrive, and evolve.

In cases worldwide, “guardians” are designated to act on behalf of Nature (or an ecosystem) and represent its interests the way a guardian would act on behalf of the best interests of a child in family law. Specifically, guardians would represent the reef in decisions affecting the health and wellbeing of the ecosystem. Rather than political or economic processes deciding the optimal level of reef protection, a process that is holistic, scientific, precautionary, and proactive decides the level of protection. By doing so, guardians determine allowable activities within and surrounding the reef based on that which allows the reef to maintain its vital cycles now and into the future.

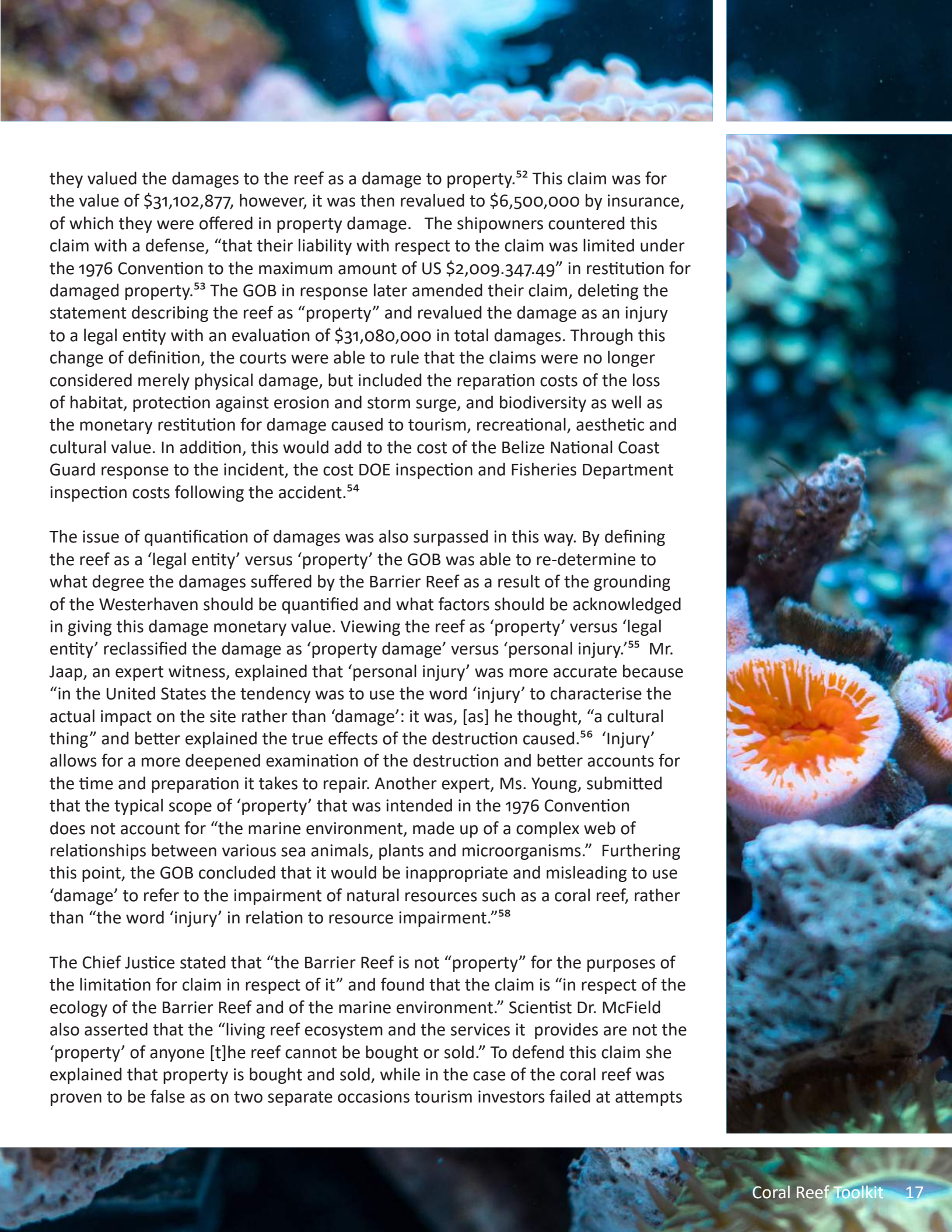
***This framework was applied judicially for the Belize Barrier Reef.***

In Belize, a recent moratorium on offshore oil exploration was put into effect. This builds off of a 2011 court decision where the government sued shipowners for harm to the Barrier Reef, which is a UNESCO World Heritage site. The Government amended their original claim against the owner of the charter ship, acknowledging itself as “the owner and custodian” of the Barrier Reef.

In the first claim the GOB approached the reparation in terms of “property damage” and in the second, identified the reef as a “legal entity;” this reidentification allowed them to revalue the reef and address more thoroughly the damage caused by the ship.<sup>50</sup> These original claim’s limitations were described as the issue of limitation and the issue of quantification. The issue of limitation brought forth by the appellant was that according to Art. 2.1(c) of the Marine Liability Act, there is a limit to the amount of monetary restitution owed in cases where damage is caused to property due to operational negligence in Maritime Litigation. Specifically, Art. 2.1(c), “claims in respect of other loss resulting from infringement of rights other than contractual rights, occurring in direct connection with the operation of the ship or salvage operations.”<sup>51</sup> When the GOB originally commenced action on this claim in 2009,







they valued the damages to the reef as a damage to property.<sup>52</sup> This claim was for the value of \$31,102,877, however, it was then revalued to \$6,500,000 by insurance, of which they were offered in property damage. The shipowners countered this claim with a defense, “that their liability with respect to the claim was limited under the 1976 Convention to the maximum amount of US \$2,009.347.49” in restitution for damaged property.<sup>53</sup> The GOB in response later amended their claim, deleting the statement describing the reef as “property” and revalued the damage as an injury to a legal entity with an evaluation of \$31,080,000 in total damages. Through this change of definition, the courts were able to rule that the claims were no longer considered merely physical damage, but included the reparation costs of the loss of habitat, protection against erosion and storm surge, and biodiversity as well as the monetary restitution for damage caused to tourism, recreational, aesthetic and cultural value. In addition, this would add to the cost of the Belize National Coast Guard response to the incident, the cost DOE inspection and Fisheries Department inspection costs following the accident.<sup>54</sup>

The issue of quantification of damages was also surpassed in this way. By defining the reef as a ‘legal entity’ versus ‘property’ the GOB was able to re-determine to what degree the damages suffered by the Barrier Reef as a result of the grounding of the *Westerhaven* should be quantified and what factors should be acknowledged in giving this damage monetary value. Viewing the reef as ‘property’ versus ‘legal entity’ reclassified the damage as ‘property damage’ versus ‘personal injury.’<sup>55</sup> Mr. Jaap, an expert witness, explained that ‘personal injury’ was more accurate because “in the United States the tendency was to use the word ‘injury’ to characterise the actual impact on the site rather than ‘damage’: it was, [as] he thought, “a cultural thing” and better explained the true effects of the destruction caused.<sup>56</sup> ‘Injury’ allows for a more deepened examination of the destruction and better accounts for the time and preparation it takes to repair. Another expert, Ms. Young, submitted that the typical scope of ‘property’ that was intended in the 1976 Convention does not account for “the marine environment, made up of a complex web of relationships between various sea animals, plants and microorganisms.” Furthering this point, the GOB concluded that it would be inappropriate and misleading to use ‘damage’ to refer to the impairment of natural resources such as a coral reef, rather than “the word ‘injury’ in relation to resource impairment.”<sup>58</sup>

The Chief Justice stated that “the Barrier Reef is not “property” for the purposes of the limitation for claim in respect of it” and found that the claim is “in respect of the ecology of the Barrier Reef and of the marine environment.” Scientist Dr. McField also asserted that the “living reef ecosystem and the services it provides are not the ‘property’ of anyone [t]he reef cannot be bought or sold.” To defend this claim she explained that property is bought and sold, while in the case of the coral reef was proven to be false as on two separate occasions tourism investors failed at attempts



to privatize portions of the Reef. Additionally the ecological services provided by the Reef surpass that capable of any other 'property.' The fact that the reef is a living growing organism that is constantly changing and adapting to the nature of the coastal region not only provides the system with fundamental services, biological and economic, but also far surpasses the description of 'property.'<sup>59</sup>

The recognition that the Barrier Reef was not property allowed a higher award for damages quoting an Italian case that found that damages were recoverable for both physical and environmental damage.

“Such damage affects intangible values, therefore, which cannot be evaluated in monetary terms according to market process, since such a standard depends on the possibility of ownership and trade of a good, whereas, in this case, the reduction of the economic value depends on the diminished possibilities of enjoying the environment as a good, which by its nature cannot be marketed.”<sup>60</sup>

This recognition allowed the shipping company to be found liable for the damages caused to the reef, with a value of \$2700 per square meter of injured reef and an award of over \$11 million to the Government for the damage caused and to help restore the reef.<sup>61</sup>

### *Limitations*

Countries that have incorporated Rights of Nature into law, are still having difficulties implementing the novel approach. This is largely due to the lack of education and behavioral changes necessary to promote the shift to holism. In other words, a value shift needs to occur, to acknowledge our dependence and reliance on a healthy ecosystem, and our responsibilities to be stewards for future generations.

Additionally, the recognition of rights brings forth arguments on human rights and how they are affected by the Rights of Nature, what rights Nature is entitled to, and how the rights will be enforced. New Zealand and other countries are showing that legal personhood produces similar results as Rights of Nature, without delving into specifics on rights. For example, the Whanganui River, was declared as a legal person and requires that any person exercising a function under another identified law must recognize and have regard to not only the legal status of the River, but its intrinsic values.<sup>62</sup>

### **Exploring Different Pathways for Reefs**

There are different ways in which 'Rights for Reefs' can be implemented. The



following pathways are meant to outline four different directions one can take in pursuing 'Rights for Reefs.' These pathways are to legally recognize the rights of coral reefs, define reefs as a legal entity, utilize a guardianship or management model, and increase proactive funding for restoration through working Nature's rights into agreements for trusts and insurance.

### 1. *Recognizing the Rights of Reefs*

In this pathway, we will define 'Rights of Reefs' by seeing them through the lens of Nature. These rights include, but are not limited to: right to exist, right to habitat, right to evolution, right to diversity, right to clean air, right to clean water, right to restoration, and right to representation.

These rights are defined as follows:

Right to exist. The right to maintain the integrity of ecosystems and natural processes, including the right to be free from human-induced coral disease occurrences.

Right to habitat. The right to exist without human disturbances.

Right to evolution. The right to evolve without volatilities that modify natural regeneration of reefs.

Right to diversity. The right to differentiate between all the things that make up an ecosystem.

Right to clean air. To preserve the functionality of the carbon cycle and limiting carbon dioxide levels that lead to acidification of oceans and alter the composition of reefs.

Right to clean water. The right to quantity and quality of water within an ecosystem, including water temperature, pollution and contamination.

Right to restoration. The right to call for timely repair of damaged reefs and ecosystems. And lastly, right to representation designates the right to recognition before law while making decisions.

By legally defining these rights, efforts towards protection and restoration of the reef can be extended past the services it provides to humans and to the needs of the reef itself. Several organizations and countries have adhered to a rights-based approach in defending Nature and its species.





## 2. *Recognizing Reefs as Legal Entities*

Another way to implement this new framework for coral reef protection is to recognize the reef as a Legal Entity. As a legal entity, Coral Reefs are defined as their own being and are not to be treated as property. They cannot be bought or sold, and are recognized under law to have intrinsic value surpassing that of their physical space.

There are several examples of this pathway's working in practice. One example of this pathway is outlined in the Rights of Nature section and refers to the success of labeling the Belize Barrier reef as a legal entity. Other examples of success can be seen in Colombia where the High Court declared it would "recognize the Colombian Amazon as an entity, subject of rights, and beneficiary of the protection, conservation, maintenance and restoration." As a result, government and people created long and short term territorial goals to combat deforestation and impacts of global warming to conserve the Amazon.


## 3. *Guardianship Model Pathway*

This pathway works by establishing an elected management body that is dedicated to protecting and restoring reefs. A guardianship board can be comprised of government officials, scientists, relevant stakeholders and local and/or indigenous peoples. However, the main difference between guardian stewardship and traditional management bodies, is that guardians are legally required to represent the ecosystems interests in decisions and disputes.

One example of this pathway in practice is in New Zealand. As per the guardian law set by New Zealand, the guardians act on behalf of the integrity and health of the entire coral reef ecosystem. In New Zealand, the guardians have to appear "before national legislative and rulemaking bodies to help clarify Reef impacts of proposed actions." Such a law allows for a balance of human activity and reef health throughout management decisions.

## 4. *Restoration Funds and Creating a Trust and/or Insurance Scheme*

In addition to realizing effective restoration through recognizing the rights of reefs, we can promote restoration through market-based techniques by setting up a fund for the reef. With a trust, funds could be collected from hotel owners, tourists, locals and government bodies who benefit from the reef to use towards its restoration, resilience, or in the case of a disaster. Funds can be obtained through various means,



including taxes and permit fees for entering coral reefs.

The pathways presented in this section can be integrated and specified to create the most productive restoration plan for a specific reef. For example, guardianship can form part of the Trust for insurance and/or the management body for the reef under existing law, therefore providing specific guidance for reef restoration. This allows for a more comprehensive and integrated co-management of human activity that may affect the reef's health.

## **Conclusion**

The well-being of the Ocean, marine species, human communities, and the global environment rely on the functioning and integrity of coral reefs. Nature and man go hand in hand. If Nature is injured, man suffers as well. If Nature flourishes, man prospers.

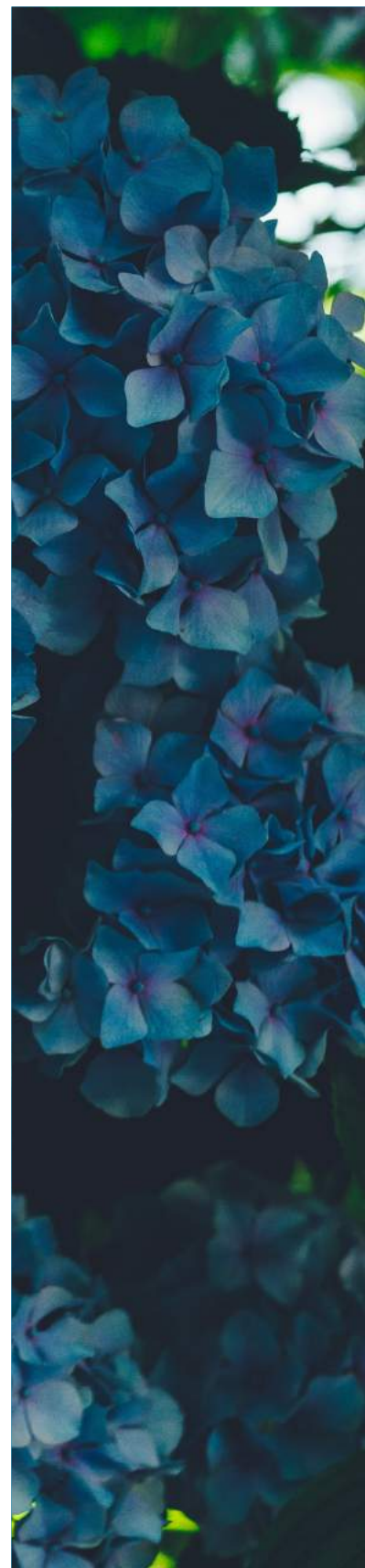
We have the power to embrace change and save the remaining coral reefs by adopting new solutions, rather than pursuing business as usual. Traditional measures, though with varying strengths, alone, are not enough to protect or restore reefs.

We have indicated the anticipated success of utilizing new approaches to protect reefs through the use of insurance models, trust funds, guardianship models, and the Rights of Nature.

Regardless of the approach pursued, it is critical that a non-anthropocentric (or Earth-centered) worldview is adopted. The health of reefs, for themselves, must remain central to the conversation, and humans must act proactively and conduct ourselves on a precautionary basis.

There are multiple pathways to implement an Earth-centered approach. Legislation designating the coral reef ecosystem as a legal entity can be drafted and passed at the local, state or national level. Current protection laws and management plans can also be amended to include the coral reef as a legal entity, and insurance policy can write-in the coral reef as a legal entity.

By recognizing legal rights for coral reefs, we move beyond the traditional model of perpetual economic growth and development, linear progress, and a mechanistic worldview consisting of separate parts. We require that decisions take into account the costs and benefits to the whole Earth community, not just the human population. It is our human responsibility to recognize, respect, and protect the coral reefs rights and save the remaining fifty percent.



## Appendix A: How could criteria for decision making look like under this framework?

### Economic Criteria

#### i. Reflecting the true cost of an activity

Adopting an Earth-centered approach includes taking the full account of negative externalities: the impacts to the entire marine environment, and the unique functions and stability these ecosystems and species provide, the human health effects caused by severe air and water pollution from extraction, production and consumption, and the increase in carbon dioxide in the atmosphere, climate change, and its subsequent effects.

#### ii. Optimum allocation may be no allocation

Adopting an Earth-centered approach requires us to include “no allocation” as an equal alternative. A no-take marine protected area is many times seen as “inefficient” when viewed in the short-term because fishermen lose their benefits, and extensive time is required both to rebuild ecosystem health and see the “spillover” of recruitment effects (in which larval activity in no-take zones “spills over” to zones outside, thus supporting fished zones).<sup>63</sup> However, no-take zones, if adequately enforced, provide refuge for coral reefs thus allowing critical functional groups to persist. This contributes to the influx of larvae and therefore improves the resilience of coral reef ecosystems.

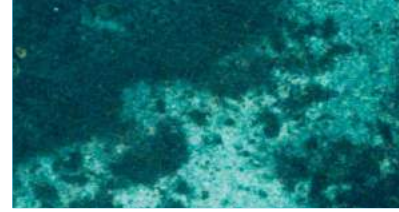
#### iii. Conversion to non-consumptive economic models

It is important for decisions regarding the coral reef to, as far as possible, be science-based and grasp the wholeness of the system.<sup>64</sup> Decisions should move past assigning a dollar value and, where achievable, evaluate the decision from a non-consumer approach.<sup>65</sup> For example, managers can employ the use of models such as ‘energy synthesis’ to provide a new method of evaluation outside current anthropocentric models.

### Governance Criteria

#### i. *The more protection, the higher the score*

To assess the strength of an MPA’s regulations, the Global Ocean Refuge System (GLORES) evaluation employs a classification system based on the number of fishing gear allowed, their ecological impact, the types of bottom exploitation and



aquaculture allowed, and the regulations relating to recreational boating (Costa et al. 2016). For MPAs with multiple zones, the evaluation uses a weighted average of the individual zone scores (weighted by the proportion of zone area to total MPA area).<sup>66</sup>

In a similar way, we can create weighted scores for conserving coral reefs. In the weighted scores, more protection receives a higher score. Assigning scores to attributes such as type of fishing gear, type of activity (extractive= lower score, tourism= higher score) and impact of activity (higher impact=lower score) can help provide a total score to help assess alternatives and make sound decisions. Additionally, scores can also drive decisions to allow an activity at the extent to which not only maximizes human benefit, but also the ecosystem’s ability to continue its vital cycles.

### *ii. Adherence to established principles*

The International Union for the Conservation of Nature (IUCN) principles are the most widely used and can serve well as a defining starting point.

The IUCN identifies these governance mechanisms as:

- Transparency- openness in decision making;
- Access to information- accurate, effective and open communication;
- Access to justice - fair mechanisms for accountability and protecting rights;
- Public participation- genuine involvement in decision making;
- Coherence- a consistent approach;
- Subsidiarity- decisions taken at the lowest appropriate level;
- Respect for human rights- interwoven with good environmental governance;
- Accountability- for economic, social and environmental performance;
- Rule of law- fair, transparent and consistent enforcement of legal provisions at all levels.<sup>67</sup>

### *iii. Application of the Precautionary Principle*

An Earth-centered approach requires that the precautionary principle guides decision making. The precautionary principle calls for early prevention, to avoid harm before it occurs, and relieve uncertain serious and irreversible damage to coral reef ecosystems.

While there is no single definition of the precautionary principle, and its multiple competing formulations are highly contested, by using the word “precautionary,” it is understood from preliminary studies that certain activities result in a degree of harm regardless of the extent or the physical distance away from coral reefs from which





that activity takes place.

In addition to being preventive rather than reactive, the precautionary principle transfers the burden of proof. Instead of one party having to prove that an action of another is potentially harmful, the burden is on those who wish to pursue the allegedly harmful action to demonstrate sufficient evidence of safety.<sup>68</sup>

Four elements of the principle can be identified; namely the level of damage, scientific criterion, remedy, and burden of proof. These elements provide a basis for a “minimum harm threshold” for when the principle takes effect in decision making so that “only those threats that present a genuinely harmful outcome will allow the principle to come into effect.” These criteria deal with the problem of how to make a decision when there is a lack of complete scientific information regarding serious damage.<sup>70</sup>

#### *iv. Public and stakeholder acceptance*

The extent and allowance of an activity or regulation should obtain broad stakeholder acceptance. Local communities, especially, should be involved throughout the decision-making process. The public also needs to be educated about the policy, which will help authorities enforce and monitor implementation. If high levels of opposition exist, decision-makers should either choose another alternative or address the aspect of opposition. An example of this criteria can be found in the IUCN’s Green List of Protected and Conserved Area Standards.


#### *v. Existence of alternative livelihoods*

Ecotourism offers a solution to replace livelihoods disrupted by fully protected areas. Research has found that for heavily exploited fisheries, developing a non-extractive activity such as ecotourism may help to overcome the dilemma between the need for long-term resource conservation and the immediate necessity to provide jobs and income to the local population.<sup>71</sup>

The development of successful alternative livelihoods requires in-context evaluations, community participation, and analyses of the biological impacts.<sup>72</sup> The Sustainable Livelihoods Enhancement and Diversification (SLED) approach, addresses the challenges and controversies in creating successful alternative livelihoods for communities relying on aquatic resources.<sup>73</sup> The three main steps of SLED are discovery; developing an understanding of current livelihoods and community members’ relationship with resources, direction; developing an understanding among the community of the need for change while understanding what is







important to local users, and doing; developing adaptive capacity, strengthening existing skills and diversity in livelihoods, and facilitating government and NGO support.<sup>74</sup>

Ecotourism is a valuable tool not only for spreading education and awareness of coral reefs, but also as income for local communities. Globally, coral reefs generate \$36 billion/year for tourism. The Nature Conservancy's Atlas of Ocean Wealth and their interactive mapping tool can be used by decision makers to recognize the value of coral reefs through economic worth, fish production, carbon storage and coastal protection values.<sup>75</sup>

Understanding these numbers should be an incentive for local businesses and governments to preserve these ecosystems. Ultimately, for ecotourism to be sustainable, companies and participants alike must take responsibility and ensure that revenue is allocated to the continued protection of the reefs. Additionally, ecotourism must be managed and take place only within moderation as mass tourism can lead to greater coral degradation physically, pathologically, or through other forms of harm.<sup>76</sup>

## Ecological Criteria

### *i. Demonstrate conservation of the ecosystem and associated values*

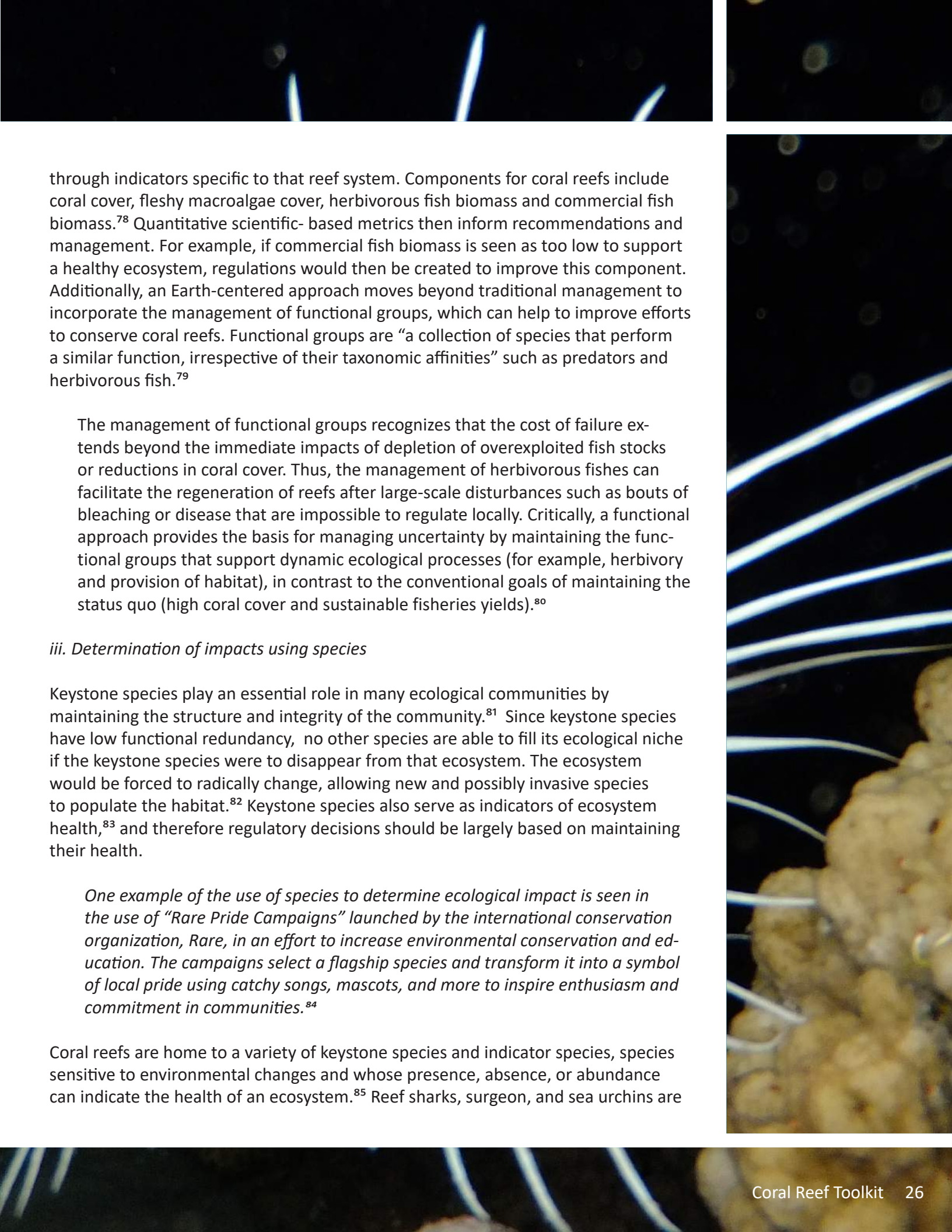
An Earth-centered approach requires that we govern coral reefs so that conservation of the reefs are the highest objective. This means that in cases of conflict, conversation is the priority, management must eliminate or prevent exploitation, and regulations aim to maintain or increase the degree of “naturalness” of the ecosystem.<sup>77</sup> Managers would determine “healthy” from the perspective of the coral reef ecosystem (i.e., what does the coral reef need to continually regenerate its capacity to support life?). If activities, either isolated or cumulative, impact the ecosystem's ability to maintain a status of “health” or “normal form and function,” managers must identify and design alternative regulations that meet this criteria.

### *ii. Determination of impacts using key ecosystem components*

Governance and management plans should include strategies and actions to identify ecological attributes and evaluate their relative importance to the functioning of the system as a whole. Goals for each attribute are identified and activities and management contribute to the realization of these goals.

We recommend core component evaluation customized for each marine protected area. For example, Healthy Reefs, in Mexico reports on the health of coral reefs





through indicators specific to that reef system. Components for coral reefs include coral cover, fleshy macroalgae cover, herbivorous fish biomass and commercial fish biomass.<sup>78</sup> Quantitative scientific- based metrics then inform recommendations and management. For example, if commercial fish biomass is seen as too low to support a healthy ecosystem, regulations would then be created to improve this component. Additionally, an Earth-centered approach moves beyond traditional management to incorporate the management of functional groups, which can help to improve efforts to conserve coral reefs. Functional groups are “a collection of species that perform a similar function, irrespective of their taxonomic affinities” such as predators and herbivorous fish.<sup>79</sup>

The management of functional groups recognizes that the cost of failure extends beyond the immediate impacts of depletion of overexploited fish stocks or reductions in coral cover. Thus, the management of herbivorous fishes can facilitate the regeneration of reefs after large-scale disturbances such as bouts of bleaching or disease that are impossible to regulate locally. Critically, a functional approach provides the basis for managing uncertainty by maintaining the functional groups that support dynamic ecological processes (for example, herbivory and provision of habitat), in contrast to the conventional goals of maintaining the status quo (high coral cover and sustainable fisheries yields).<sup>80</sup>

### *iii. Determination of impacts using species*

Keystone species play an essential role in many ecological communities by maintaining the structure and integrity of the community.<sup>81</sup> Since keystone species have low functional redundancy, no other species are able to fill its ecological niche if the keystone species were to disappear from that ecosystem. The ecosystem would be forced to radically change, allowing new and possibly invasive species to populate the habitat.<sup>82</sup> Keystone species also serve as indicators of ecosystem health,<sup>83</sup> and therefore regulatory decisions should be largely based on maintaining their health.

*One example of the use of species to determine ecological impact is seen in the use of “Rare Pride Campaigns” launched by the international conservation organization, Rare, in an effort to increase environmental conservation and education. The campaigns select a flagship species and transform it into a symbol of local pride using catchy songs, mascots, and more to inspire enthusiasm and commitment in communities.<sup>84</sup>*

Coral reefs are home to a variety of keystone species and indicator species, species sensitive to environmental changes and whose presence, absence, or abundance can indicate the health of an ecosystem.<sup>85</sup> Reef sharks, surgeon, and sea urchins are



indicator species. They maintain algae populations, species diversity, and even the feeding habits of their prey. Their actions ultimately affect the structure of reefs in determining the amount of space and food that corals receive.<sup>86</sup> Their existence can lead to the destruction or decline of coral reefs as well as the loss of commercial fisheries.<sup>87</sup>

The IUCN Green List of Species also provides metrics to measure the state of a species and guide regulatory actions. “In addition to showing the current recovery state of a species, the Green List Score [can] be calculated under different counterfactual scenarios to show how conservation actions have contributed to recovery, the dependence of the species on continued conservation, and what an aspirational but realistic goal for long- term recovery might look like.” We can use such metrics to hypothesize how and to what extent regulatory actions can contribute to maintaining the health of a species, results which can then be used to guide decision making.

## **Appendix B: Frequently Asked Questions**

### ***What does a coral reef as a legal entity mean?***

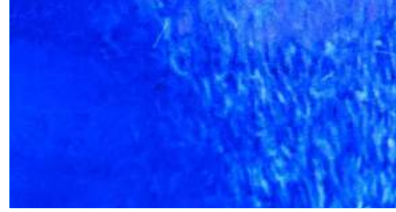
Western property law is centered around the concept of Nature as a resource to be utilized for human benefit. When oceans and coral reefs are legally considered a resource for human consumption, legal action taken in defense of the reefs is viewed through the lens of how they benefit *humans* or what loss will be inflicted on *humans*. It is not based on how the coral reefs themselves will be affected.

Instead of recognizing coral reefs as property owned by humans, coral reefs should have rights to exist as their own legal entity. Defining coral reefs as a legal entity requires the recognition, respect and protection of their rights. It would entail the provision of prompt and full restoration and would prohibit activities that will violate the coral reef’s rights. If coral reefs were regarded as a legal entity of their own, then legal action could be taken against efforts that endanger their health with coral reefs themselves as the defendant. This framework shifts the focus in the legal process away from a cost benefit analysis of how damaging corals may affect humans and towards what provides the highest benefit and meets the needs for corals reefs themselves.

### ***Why do coral reefs have inherent rights?***

Thomas Berry argues that “Rights originate where existence originates. That which determines existence determines rights.” All species and ecosystems come from the same place of existence, Mother Earth, and therefore are created with inherent





rights. Additionally, when the United Nations drafted the Universal Declaration of Human Rights, the drafting committee observed that “the supreme value of the human person...did not originate in the decision of worldly power, but rather in the fact of existing.” By using this and the above flow of logic, just as humans have rights based on our existence and being, so too does nature (i.e., species and ecosystems).

Ignorance of the rights of nature “is equivalent to denying the existence of other beings/species because as Thomas Berry said, "Rights originate from existence." So the question would be how do we deny the existence of what we physically see with our eyes; and if we accept their existence then we have to recognize their rights too.” — Fassil Yelemtu

Coral reefs exist, therefore they have rights.

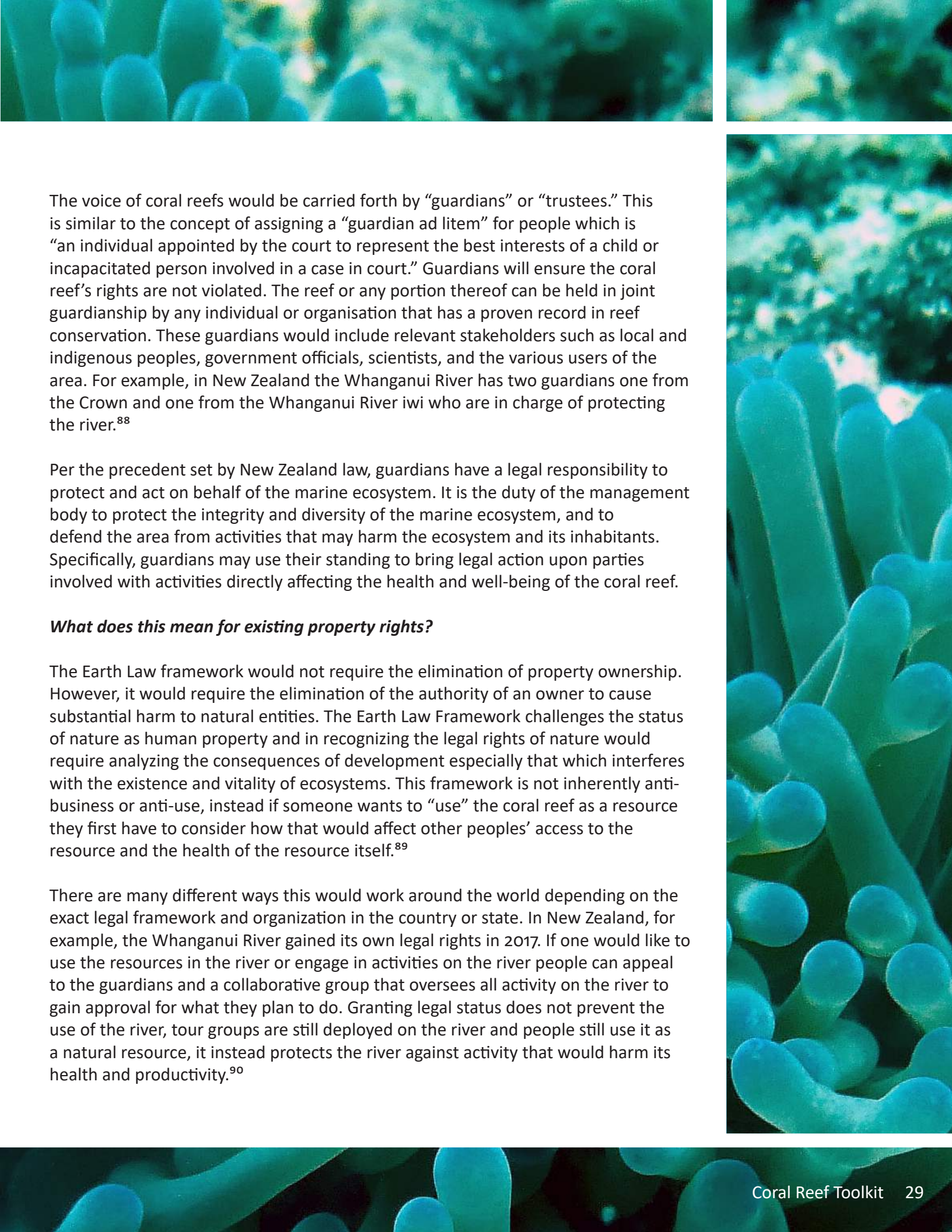
***Why not just create higher standards in law and policy?***

Changing the legal framework to the Earth Law Framework seeks to challenge the current view of coral reefs, and nature in general, as a resource to be exploited. Recognizing coral reefs as their own legal entity illustrates how humans and Nature are an interconnected whole and takes the ecosystem out of the realm of property. In the current view, oceans are considered an open access resource which leads to competition for use of the resource. As a consequence of this, the legal system tends to set limits on human activity higher than what is necessary for the oceans to be able to naturally recover. In addition, in traditional environmental law human interests are thought to outweigh the environment thus leading to decisions that benefit solely humans rather than humans along with the environment.

Higher standards in the current legal framework would still require proof of injury to human life even if you are suing on behalf of nature. Changing the legal structure to the Earth Law Framework allows Nature, i.e. coral reefs, to be the defendant in a legal suit protecting its own rights with a guardian speaking in its behalf. This enables more strict protection of ecosystems based on their right to flourish and exist.

***If coral reefs have their own rights, does this mean they “own” themselves? Who would then be in charge of defending them?***





The voice of coral reefs would be carried forth by “guardians” or “trustees.” This is similar to the concept of assigning a “guardian ad litem” for people which is “an individual appointed by the court to represent the best interests of a child or incapacitated person involved in a case in court.” Guardians will ensure the coral reef’s rights are not violated. The reef or any portion thereof can be held in joint guardianship by any individual or organisation that has a proven record in reef conservation. These guardians would include relevant stakeholders such as local and indigenous peoples, government officials, scientists, and the various users of the area. For example, in New Zealand the Whanganui River has two guardians one from the Crown and one from the Whanganui River iwi who are in charge of protecting the river.<sup>88</sup>

Per the precedent set by New Zealand law, guardians have a legal responsibility to protect and act on behalf of the marine ecosystem. It is the duty of the management body to protect the integrity and diversity of the marine ecosystem, and to defend the area from activities that may harm the ecosystem and its inhabitants. Specifically, guardians may use their standing to bring legal action upon parties involved with activities directly affecting the health and well-being of the coral reef.

#### ***What does this mean for existing property rights?***

The Earth Law framework would not require the elimination of property ownership. However, it would require the elimination of the authority of an owner to cause substantial harm to natural entities. The Earth Law Framework challenges the status of nature as human property and in recognizing the legal rights of nature would require analyzing the consequences of development especially that which interferes with the existence and vitality of ecosystems. This framework is not inherently anti-business or anti-use, instead if someone wants to “use” the coral reef as a resource they first have to consider how that would affect other peoples’ access to the resource and the health of the resource itself.<sup>89</sup>

There are many different ways this would work around the world depending on the exact legal framework and organization in the country or state. In New Zealand, for example, the Whanganui River gained its own legal rights in 2017. If one would like to use the resources in the river or engage in activities on the river people can appeal to the guardians and a collaborative group that oversees all activity on the river to gain approval for what they plan to do. Granting legal status does not prevent the use of the river, tour groups are still deployed on the river and people still use it as a natural resource, it instead protects the river against activity that would harm its health and productivity.<sup>90</sup>



### ***Will a new framework limit economic growth?***

The cumulative economic impact of poor ocean management practices costs 200 billion USD per year.<sup>91</sup> Coral reefs specifically provide goods and services estimated at 375 billion USD each year.<sup>92</sup> Much of these goods and services are through tourism and fishing. These two industries depend on having healthy reefs and thus, millions of jobs from hotels, restaurants, dive tours, fishing trips, and many more also depend on the health of the reefs. These figures estimate the value for visiting coral reefs as they are now. Therefore, since this new framework would only increase the health of coral reefs, these benefits and figures would also increase due to the Earth Law Framework.

### ***What would legal rights mean for the tourism industry?***


Tourists will not come to coral reefs that are dead or dying. In order to have a tourism industry, coral reefs need to be restored and remain healthy. Tourism accounts for millions of jobs so with the protection of coral reefs also comes more job stability for people in this industry. The tourism industry specifically from visiting the coral reefs in the Florida Keys is estimated to be worth 7.6 billion USD each year.<sup>93</sup> Total coral reef tourism around the world has been estimated to be worth 36 billion USD per year.<sup>94</sup> Legal rights would protect this industry and could also help increase its profitability through more healthy reefs. If the tourism industry is impacted by enforcing regulations that, for example, allow less boats, alternative livelihoods will be presented and/or compensated for.

### ***What would legal rights mean for the local community?***

Legal rights for the natural environment mean greater protection and preservation which provide many benefits for the local communities ranging from cultural to economic. With greater protection of the environment comes more opportunities for ecotourism and economic gain for local communities through visitation. In addition, without the protection of these ecosystems, future generations will not have access to these industries which would lead to significant loss of employment opportunities. Furthermore, future generations also have an inherent right to benefit from, utilize, and experience these ecosystems. Community members have standing to sue and hold government and industry accountable for harm done. Therefore, local communities, and those whose livelihoods depend on the reef, can have a claim against parties whose actions harm the reef.

Many local communities may have cultural connections with their environment and many campaigns for nature as its own legal entity have actually been initiated by the





local communities themselves. For example, the campaigns in New Zealand for the Whanganui River and Mt Taranaki were both started by local Māori groups.<sup>95</sup>

***Does that mean when nature and human rights conflict, human rights will get secondary consideration? What does this mean for human rights?***

The establishment of rights of nature does not eliminate recognition of human rights. It means leveling the playing field so that not only corporations and humans have rights, but nature does also. When inevitable conflicts occur between human and ocean rights, the courts will resolve – as they do when there are conflicts between human rights today. The Rights of nature intends to formulate a path by which both rights are able to function and co-exist alongside each other.

***Where has this already been implemented?***

There are many places around the world that have implemented the Earth Law Framework for the protection of their natural areas. Among these are:

*New Zealand*

New Zealand granted legal personhood to the Te Urewera National Park and Whanganui River and its tributaries. In 2013, Te Urewera National Park was granted “all the rights, powers, duties, and liabilities of a legal person.” In addition, a board was established in order to act as the “guardians” of this park to protect its interests. This means that the government gave up legal ownership of the land and lawsuits can be taken on behalf of the land itself without the need to prove personal injury first. In 2017 the Tutohu Whakatupua Treaty Agreement passed into law giving the Whanganui River legal status under the name Te Awa Tupua. Te Awa Tupua is considered a legal person and is recognized for the intrinsic connection between its health and the health of Whanganui River iwi and the community at large.<sup>96</sup> Lastly, in 2017 Mt Taranaki was also given legal personality and will be under the guardianship of the joint Crown-Iwi governance.<sup>97</sup>

*North America*

There are many instances of recognition of the Rights of Nature in North America including both natural places and entire towns and cities.

- State of Colima, Mexico  
This is the first occurrence in North America of an entire state or province recognizing the rights of Nature.
- Crestone, Colorado



The town's Board of Trustees unanimously approved a resolution that recognizes the Rights of Nature for Crestone in 2018.

- Santa Monica, California  
The Sustainability Rights Ordinance unanimously passed in 2013 which recognizes the rights of natural ecosystems to exist and prosper.
- Lake Erie, Ohio  
The Lake Erie Bill of Rights was passed into law in 2019 and represents the first law in the U.S. to secure rights for an ecosystem.

### *South America*

- Bolivia  
In 2010, the Law of the Rights of Mother Earth was passed granting nature the following rights.<sup>98</sup>  
to life and prosperity
  - \* to the preservation of biodiversity
  - \* to the preservation of the water cycle and clean air
  - \* to timely restoration
  - \* to pollution-free life
  - \* to be respected as its own legal entity

- Ecuador

In 2008, Ecuador's constitution added a chapter that recognizes nature as its own legal entity. The legal status of Ecuador's nature is no longer considered human property. Instead, nature has its own rights as an independent being. Humans then have the legal authority to defend these rights in nature's behalf, with nature as the defendant. Ecuador is also home to the Galapagos Islands where one of the world's largest marine reserves is located. The Galapagos Marine Reserve covers an area that is measured at 133,000 square kilometers.<sup>99</sup>

### ***What strategies could be used to implement the Earth Law Framework?***

There are many different approaches to the Earth Law Framework which allows it to be a very versatile system. Some different strategies for implementation include:

- One approach is to incorporate root cause analysis which looks at the most extreme level of a problem in order to prepare, address, and prevent harm. This would involve identifying and implementing proactive processes to reduce the likelihood of adverse events occurring in the future. For example, local hotels could pay a Reef Tax in order to add to a fund to protect the reefs from future







harm. A green tax for coral reefs would include the full price of all socialised costs, to be paid by parties that operate in the vicinity of reefs such as the local hotels, restaurants, dive shops, etc.

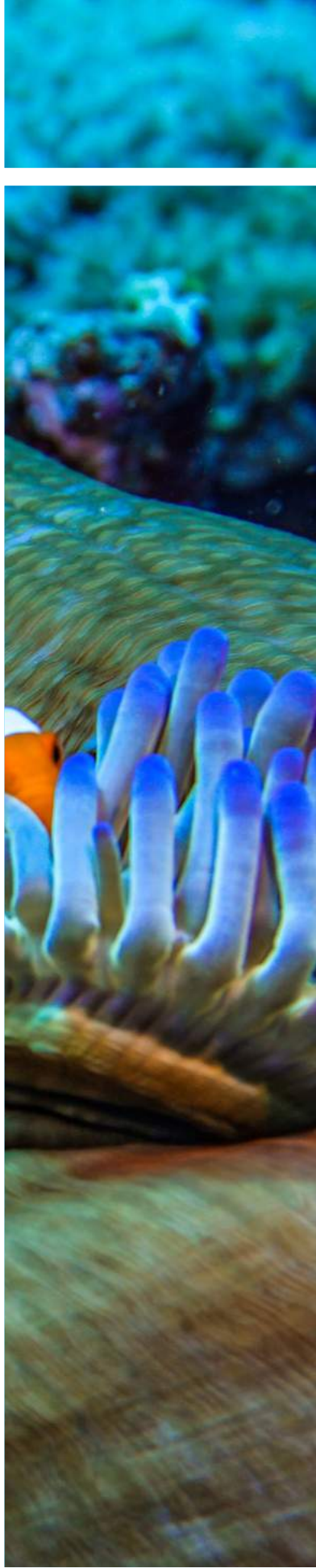
\* A subset of this green tax could be enforcement of a pollution tax mechanism that operates on a measured base level of pollutants on a periodic basis like carbon taxes. Every subsequent increase in the level of pollutants can be proffered as evidence to further strengthen the legal standing of the reef and be taxed, thus adding to a fund that can be used should restoration of the reef need to occur.

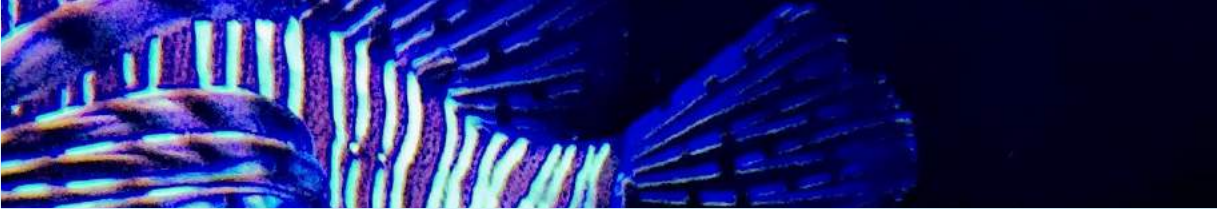
- Another strategy that builds off marine protected areas is the creation of “Buffer Zones” around the physical boundaries of the reef for the purpose of securing the reef’s legal enjoyment of its immediate waters. The reef’s right for a clean and healthy environment includes the waters and ecosystems it interacts with.
- Considering the local communities have the most daily interaction with and depend the most on reefs, they therefore have the most incentive to preserve their health leading to the possibility for inclusive conservation of reef systems. In this approach, local people are allowed to harvest designated low risk species in exchange for acting as local guardians of the reefs.<sup>100</sup>



1. "Coral Reefs." WWF, [wwf.panda.org/our\\_work/oceans/coasts/coral\\_reefs/](http://wwf.panda.org/our_work/oceans/coasts/coral_reefs/).
2. Block, B. "Coral reef loss suggest global extinction event." Worldwatch Institute. Retrieved from <http://www.worldwatch.org/node/5960>.
3. "Benefits of Coral Reefs." Benefits of Coral Reefs | International Coral Reef Initiative, [www.icriforum.org/about-coral-reefs/benefits-coral-reefs](http://www.icriforum.org/about-coral-reefs/benefits-coral-reefs).
4. *ibid*.
5. "Coral Reefs." IUCN, 14 Feb. 2017, [www.iucn.org/theme/marine-and-polar/get-involved/coral-reefs](http://www.iucn.org/theme/marine-and-polar/get-involved/coral-reefs).
6. Human, K., 2012. NOAA, "Partners: Earth's oceans and ecosystems still absorbing about half the greenhouse gases emitted by people". NOAA Research News. <https://research.noaa.gov/article/ArtMID/587/ArticleID/1412/NOAA-partners-Earth%E2%80%99s-oceans-and-ecosystems-still-absorbing-about-half-the-greenhouse-gases-emitted-by-people>.
7. "How the oceans absorb carbon dioxide is critical for predicting climate change". NOAA PMEL Carbon Program. <https://www.pmel.noaa.gov/co2/story/Ocean+Carbon+Uptake>.
8. "Ocean acidification". Reef Resilience Network. <http://reefresilience.org/coral-reefs/stressors/ocean-acidification>.
9. "Climate Interpreter." The Effects of Ocean Acidification on Coral Reefs Climate Interpreter, [climateinterpreter.org/content/effects-ocean-acidification-coral-reefs](http://climateinterpreter.org/content/effects-ocean-acidification-coral-reefs).
10. Issues brief: Ocean warming. IUCN. <https://www.iucn.org/resources/issues-briefs/ocean-warming>.
11. Dunne, Daisy. "Severe coral reef bleaching now 'five times more frequent' than 40 years ago." Carbon Brief. 4 Apr. 2018. Accessed at <https://www.carbonbrief.org/severe-coral-reef-bleaching-now-five-times-more-frequent-than-40-years-ago>.
12. "Reefs at Risk." World Resources Institute, 9 Nov. 2015, [www.wri.org/our-work/project/reefs-risk](http://www.wri.org/our-work/project/reefs-risk).
13. Waterhouse, Jane & Brodie, Jon & Audas, Donna & Lewis, Stephen. (2015). Land-sea connectivity, ecohydrology and holistic management of the Great Barrier Reef and its catchments: Time for a change. *Ecohydrology & Hydrobiology*. 16. 10.1016/j.ecohyd.2015.08.005.
14. Bellwood, D. R., et al. "Confronting the Coral Reef Crisis." *Nature*, vol. 429, no. 6994, 2004, pp. 827–833., doi:10.1038/nature02691.
15. *ibid* [827]-[833].
16. "Paris Agreement." *Climate Change and Law Collection*, 1992, doi:10.1163/9789004322714\_cclc\_2015-0176-001.
17. "Global Warming of 1.5 °C." IPCC, 2019, [www.ipcc.ch/sr15/](http://www.ipcc.ch/sr15/).
18. Campagna, C., et al.. 2017. Sustainable Development as Deus Ex Machina. *Biological Conservation*. 209. 54-61, p. 58-59. <https://doi.org/10.1016/j.biocon.2017.01.016>.
19. *ibid* [54]-[61], [58]-[59].

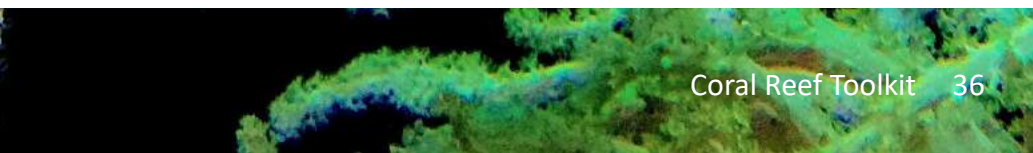
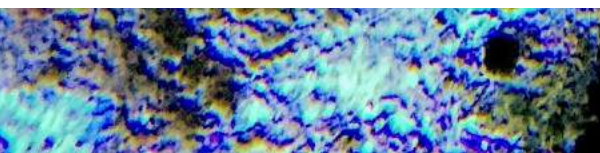


- 
20. Wilder, R.J. 1998. *Listening to the Sea: the politics of improving environmental protection*. University of Pittsburgh Press, p. 189, 203.
  21. Bellwood, D. R., et al. "Confronting the Coral Reef Crisis." *Nature*, vol. 429, no. 6994, 2004, pp. 827–833., doi:10.1038/nature02691.
  22. "Environment Guide", *Benefits of marine protected areas*, Sept. 1, 2017, <http://www.environmentguide.org.nz/issues/marine/marine-protected-areas/>
  23. *ibid.*
  24. Camilo Mora et al., "Coral reefs and the global network of marine protected areas", *Science*, 23 Jun 2006 : Vol 312, Issue 5781, pp. 1750-1751, DOI: 10.1126/science.1125295.
  25. Kendra Pierre-Louis, "The secret of successful marine protected areas?" *People, Popular Science*, Mar. 22, 2017, <http://www.popsci.com/successful-marine-protected-areas#page-2>.
  26. Manuel Dureuil et. al., "Elevated trawling inside protected areas undermines conservation outcomes in a global fishing hot spot", *Science*, 21 Dec 2018 : Vol. 362, Issue 6421, pp. 1403-1407, DOI: 10.1126/science.aau0561.
  27. Wenzel, Lauren. "Framework for the National System of Marine Protected Areas of the United States of America." March 2015. [marineprotectedareas.noaa.gov](http://marineprotectedareas.noaa.gov).
  28. *ibid* [1403]-[1407].
  29. Wenzel (n33) [1403]-[1407].
  30. Fisheries management. 4. "Marine protected areas and fisheries". *FAO Technical Guidelines for Responsible Fisheries. No. 4, Suppl. 4*. Rome, FAO. 2011. 198p.
  31. NOAA Fisheries, "Ecosystem-Based Fisheries Management", June 19, 2017, <https://www.fisheries.noaa.gov/insight/ecosystem-based-fisheries-management>.
  32. Cornell Law School, "Standing", Sept. 1, 2017, <https://www.law.cornell.edu/wex/standing>.
  33. Maloney, M., "Finally being heard: The Great Barrier Reef and the International Rights of Nature Tribunal", *Griffith Journal of Law & Human Dignity* Vol 3(1) 2015, Griffith University, Queensland, Australia, available at <https://therightsof-nature.org/finally-being-heard-great-barrier-reef-case/>.
  34. NOAA. "Office for Coastal Management". *Fast Facts: Coral Reefs*. Retrieved from the National Oceanic and Atmospheric Administration. <https://coast.noaa.gov/states/fast-facts/coral-reefs.htm>.
  35. Douvère, F., "Assessment: World Heritage coral reefs likely to disappear by 2100 unless CO2 emissions drastically reduced." *United Nations Educational, Scientific, and Cultural Organization*. <http://whc.unesco.org/en/news/1676/>.
  36. Watson, R. Howell, B. *Closing the Coral Commons to Support Reef Restoration in Florida. Conservation & the Environment: Conservative Values, New Solutions*. 11 Mar. 2013.
  37. *ibid.*
  38. Sophie Hares, "Mexican coral reef and beach get unique insurance policy against hurricane damage", March 8, 2018, *Reuters*, <https://www.reuters.com/article/>



us-mexico-environment-reefs/mexican-coral-reef-and-beach-get-unique-insurance-policy-against-hurricane-damage-idUSKCN1GK384.

39. Gili Eco Trust. <http://giliecotrust.com/>
40. Woolery, Tanayia. "Coral, Coral Nursery, Coral Garden, Snorkelling." *Seascape Caribbean*, Seascape Caribbean, 11 Sept. 2017, [www.seascapecarib.com/projects-2/2017/9/11/thegoldeneye-resort-spa-oracabessa-bay-fish-sanctuary](http://www.seascapecarib.com/projects-2/2017/9/11/thegoldeneye-resort-spa-oracabessa-bay-fish-sanctuary).
41. Nature Conservancy, *Insuring Nature: An Insurance Policy for the Mesoamerican Reef*, Webinar, Feb 28, 2018, available at <http://reefresilience.org/insuring-nature-an-insurance-policy-for-the-mesoamerican-reef/>.
42. Bender, Michelle, *An Earth Law Framework for Marine Protected Areas*. [www.earthlawcenter.org](http://www.earthlawcenter.org)
43. "Coral Restoration Foundation: United States." *Websitecoralrf*, [www.coralrestoration.org/](http://www.coralrestoration.org/).
44. Marc Mangel et al., *Principles for the Conservation of Wild Living Resources, Ecological Applications*, vol. 6, no. 2, 353 (1996), available at: [www.jstor.org/stable/2269369](http://www.jstor.org/stable/2269369).
45. *Ocean Health Index*, [www.oceanhealthindex.org/](http://www.oceanhealthindex.org/).
46. Fiorenza Micheli et al., "Ocean Health," in *Routledge Handbook of Ocean Resources and Management*, Hance D. Smith et al., eds., p. 114 (Routledge, NY, NY 2015), p. 110.
47. A.D. Rogers & D.d'A Laffoley, "International Earth System Expert Workshop on Ocean Stresses and Impacts, Summary report," pp. 6-7 (IPSO Oxford 2011), at: [https://cmsdata.iucn.org/downloads/ipso\\_workshop\\_report\\_june\\_2011.pdf](https://cmsdata.iucn.org/downloads/ipso_workshop_report_june_2011.pdf), p. 5.
48. Santa Monica, California, *An ordinance of the city council of the city of Santa Monica establishing sustainability rights*. 12 Mar. 2013.
49. Burr, I, Stephen. *Toward Legal Rights for Animals*, 4 B.C. Envtl. Aff. L. Rev. 205 (1975), <http://lawdigitalcommons.bc.edu/ealr/vol4/iss2/2>.
50. Burr, (n55).
51. *The Court Appeal of Belize A.D. 2011, Westerhaven Schiffahrts v. GOB. Civil Appeal No. 19 October 2010. Pg 3.*
52. *ibid* 6.
53. *The Court Appeal of Belize (n57) 6.*
54. *The Court Appeal of Belize (n57) [7]-[8].*
55. *The Court Appeal of Belize (n57) 9.*
56. *The Court Appeal of Belize (n57) 14.*
57. *The Court Appeal of Belize (n57) Pg 21.*
58. *The Court Appeal of Belize (n57) 21.*
59. *The Court Appeal of Belize (n57) 21.*
60. *The Court Appeal of Belize (n57) 43.*
61. *The Court Appeal of Belize (n57) [11], [56].*
62. *Te Awa Tupua (Whanganui River Claims Settlement) Act 2017, Public Act 2017 No 7, Date of assent 20 March 2017, Subpart 2(15), available at:*



- tion.govt.nz/act/public/2017/0007/latest/whole.html.
63. Craig Dahlgren, *Review of the Benefits of No-take Zones: A Report to the Wildlife Conservation Society*, March 2014.
  64. *Emergency Systems*, Center for Environmental Policy, University of Florida, 2018, <https://cep.ees.ufl.edu/emergy/resources/templates.shtml>.
  65. Mary Jane Angelo, *Harnessing the Power of Science in Environmental Law: Why We Should, Why We Don't, and How We Can*, 86 *Tex. L. Rev.* 1527 (2008), <https://scholarship.law.ufl.edu/cgi/viewcontent.cgi?article=1034&context=facultypub>, p. 1527.
  66. *Global Ocean Refuge System, Criteria 2017*, Marine Conservation Institute, at <https://globaloceanrefuge.org/refuges/criteria/>.
  67. *ibid.*
  68. Mariqueo-Russell, Atus. "Rights of Nature and the Precautionary Principle." In: "Can Nature Have Rights? Legal and Political Insights," edited by Anna Leah Tabios Hillebrecht and María Valeria Berros, *RCC Perspectives: Transformations in Environment and Society* 2017, no. 6, 21–27. [doi.org/10.5282/rcc/8211](https://doi.org/10.5282/rcc/8211).
  69. Anna Leah Tabios Hillebrecht and Maria Valeria Berros, *Can Nature Have Rights? Legal and Political insights, Transformations in Environment and Society*, 2017, [doi.org/10.5282/rcc/8164is](https://doi.org/10.5282/rcc/8164is), p. 23.
  70. Runyu Wang, *The Precautionary Principle in Maritime Affairs*, *WMU Journal of Maritime Affairs*, (2011) 10: 143. <https://doi.org/10.1007/s13437-011-0009-7>.
  71. *International League of Conservation Photographers, Changing Planet*, National Geographic, <https://blog.nationalgeographic.org/2016/10/17/marine-ecotourism-the-wealth-of-the-oceans-goes-well-beyond-fisheries/>.
  72. *Food and Agriculture Organization of the United Nations, Fisheries Management. 4. Marine protected areas and fisheries. FAO Technical Guidelines for Responsible Fisheries. No. 4, Suppl. 4. Rome, FAO. 2011. 198p.*
  73. *ibid* 114.
  74. *Food and Agriculture Organization of the United Nations, Fisheries Management (n78).*
  75. "How tourism can be good for coral reefs." *The Nature Conservancy*. 2017 Apr 25.
  76. Roberts, Matthew. "Coral reef ecotourism and its impacts." *Sustainable Business Toolkit*. 2013 Apr 25.
  77. *IUCN MPA Framework*.
  78. *Healthy Reefs for Healthy People, MesoAmerican Reef Report Card: An Evaluation of Ecosystem Healthy*, 2018.
  79. D. R. Bellwood et. al, *Confronting the Coral Reef Crisis*, *Nature*, Vol. 429, 24 Jun 2004.
  80. *ibid.*
  81. Wagner, S. C. (2010) *Keystone Species*. *Nature Education Knowledge* 3(10):51. <https://www.nature.com/scitable/knowledge/library/keystone-spe>



- cies-15786127.
82. National Geographic. "Role of keystone species in an ecosystem," at <https://www.nationalgeographic.org/news/role-keystone-species-ecosystem/12th-grade/>.
  83. Barbara Paterson; *Ethics for Wildlife Conservation: Overcoming the Human–Nature Dualism*, *BioScience*, Volume 56, Issue 2, 1 February 2006, Pages 144–150, [https://doi.org/10.1641/0006-3568\(2006\)056\[0144:EFWCOT\]2.0.CO;2](https://doi.org/10.1641/0006-3568(2006)056[0144:EFWCOT]2.0.CO;2).
  84. "What is a rare pride campaign?" Rare Conservation. <https://www.globalgiving.org/pfil/1365/projdoc.pdf>. Accessed 2019 Sep 9.
  85. National Geographic (n 88).
  86. "Visual indicators of a healthy reef." *LeisurePro: Aqua Views*. 2010 Apr. 21.
  87. "The importance of sharks." *Oceana*. <https://eu.oceana.org/en/importance-sharks-0>. Accessed 2019 Aug 18.
  88. *Earth Law Framework for Marine Protected Areas*, Appendix D.
  89. Biggs, S., Goldtooth, T., and Lake, O. (2017). "Rights of Nature and Mother Earth." *Movement Rights, Women's Earth & Climate Action Network, Indigenous Environmental Network*.
  90. *Whanganui Iwi and The Crown, 'Tutoho Whakatupua'* (30 August 2012) 9.
  91. UNDP (2012). "Catalysing Ocean Finance." *Global Environment Facility*, Vol 3.
  92. Costanza, R., et. al (1997). "The value of the world's ecosystem services and natural capital." *Nature* 387: 253–260
  93. Johns G.M., Leeworthy V.R., Bell F.W. and Bonn M.A. (2001). "Socioeconomic Study of Reefs in Southeast Florida, Final." *Hazen and Sawyer Environmental Engineers & Scientists*.
  94. Spalding, M., et al. (2017) "Mapping the global value and distribution of coral reef tourism." *Marine Policy*, 82: 104-113.
  95. *Whanganui Iwi and The Crown, 'Tutoho Whakatupua'* (30 August 2012) 9.
  96. *Te Awa Tupua (Whanganui River Claims Settlement) Act 2017, Public Act 2017 No 7*, Date of assent 20 March 2017, available at: <http://www.legislation.govt.nz/act/public/2017/0007/latest/whole.html>.
  97. *Whanganui Iwi and The Crown, 'Tutoho Whakatupua'* (30 August 2012) 9.
  98. *Ley promulgada por el Estado Plurinacional de Bolivia a ser presentada por el presidente Evo Morales en la Cumbre del Cambio Climático en Cancún, diciembre 2010*. Más información en <http://www.gobernabilidad.org.bo/>
  99. *Ecuadorian Constitution*, Art. 71-74, Ch 7.
  100. *Project Piaba Annual Report (2017)*.

