Extinction Inquiry
Surfrider Foundation Submission

Introduction

The footprint of human activity on the natural environment has become so pervasive that the current era has come to be known as the Age of the Anthropocene. Human-induced stressors have been identified across nearly every ecosystem, including the marine environment, with negative impacts on marine biodiversity. While it may be relatively straightforward to understand that marine biodiversity loss can underpin ecosystem change, an often overlooked component of marine biodiversity is what it means to human health. Human health and wellbeing is intrinsically linked to healthy ecosystems that provide us with a range of services, some of which are obvious such as availability of fresh seafood. However, others may not be so apparent such as the recreational services that healthy ecosystems provide which can have profound impacts on our physical, mental and spiritual state. I venture that many of you have sought solace in outdoor spaces and escape from the pandemic, particularly in coastal areas here in Victoria. Whether it be surfing, fishing, swimming, beach or coastal walks, they are all dependent on healthy rates of biodiversity. Unfortunately, human-dominated marine systems are experiencing increased rates of biodiversity loss, of which the main drivers can be broadly grouped into five categories; (1) exploitation of resources, (2) habitat loss, (3) pollution, (4) climate change, and (5) non-native species. Below, each issue is highlighted along with easily adaptable solutions. Whilst the below information is only a brief snapshot of the issues and potential solutions of the biodiversity and ecosystems decline, Surfrider Foundation looks forward to taking part in the upcoming Extinction Inquiry and making a more thorough testimony.

1. Exploitation of resources

The issue: Problems with fisheries, such as the Target One Million campaign. This could lead to the over-extraction of fish that have flow-on effects to the broader food web. For example, in Victoria each licensed recreational angler is allowed to take one individual (every day) of mako and thresher sharks, that are classified by the IUCN as endangered and threatened, respectively.

The solution: Enact more conservative bag limits or limit fishing in sensitive coastal areas. Increases in Marine National Parks would also ensure the protection of critical species and overall biodiversity. We can also increase human education around the proper release of bycatch and/or unwanted species to ensure their survival. We can also advocate for policy change for certain threatened species.

The issue: Resource mining and extraction related activities, such as searching for oil and natural gas via seismic testing in the Bass Strait has been shown to negatively impact the fitness and subsequent survival of marine organisms some of which have commercial importance.

The solution: Increases in marine protected areas and more robust legislation that are specifically designed to limit resource extraction. Move away from new fossil fuel projects and put our effort into more sustainable energy sources (e.g. wind and solar).

2. Habitat Loss

The issue: Port developments, such as AGL's proposed gas import terminal at Westernport would negatively impact seagrass ecosystems. These ecosystems are of paramount importance for the persistence of many populations of marine organisms as they are key juvenile feeding and refuge habitats.

The solution: Stop dangerous developments in the bays or on the coast. Alternatively, put measures in place whereby these companies must adhere to stringent funding of long-term monitoring and research and/or restore areas of habitat commensurate with the loss. All monitoring and research would be funded by the fossil fuel company, but administered by a completely independent third party, with absolutely no conflict of interest with the project and its operators.

The issue: Decline in the extent of coastal ecosystems such as seagrass, kelp forest and tidal marshes as well as declining shorebird populations (BirdLife, Shorebird 2020 Project).

The solution: Protect marine ecosystems through creation of marine parks or seasonal closures/limitations, such as Ramsar-listed wetlands. Shift the focus to an ecotourism-based approach that will raise awareness of the marine nature and biodiversity that also creates jobs.

The issue: Human activity on beaches and in bays is damaging habitat, ecosystems and threatening species. For example, horses, domestic dogs and vehicles (4WDs) on beaches that damage important nesting grounds for certain bird species (e.g. Hooded Plovers).

The solution: Focussed monitoring of damaging human activities and seasonal limitations of these activities during critical times of the year. Increased education with captivating informative signs which have a QR code leading individuals to a detailed website, including all relevant information of species in the area and the impact humans have on their ecosystems.

3. Pollution

The issue: Society's dependence on plastics, and in particular single use plastics, that are fossil-fuel based that can end up in our bays, estuaries and oceans has increased dramatically over the last 30 years. These materials can be ingested by marine animals and/or entangle them, which leads to the fish species we eat becoming filled with plastics, causing harm to human health.

The solution: Ban single use plastics. Fund and develop research and development for bio-fabrication of materials and products to replace plastics such as fungi-based materials, plant-based materials (e.g. balsa wood surfboards) that degrade at a faster rate. This also has the capacity to create increased jobs. In addition, increased education to change the disposable society we have created and encourage a reusable based life. There is also a possibility for disincentivizing single plastic use, through a single use levy and/or stronger policy which disallows certain products, hence stopping it at the source.

The issue: Discarded, lost or abandoned fishing gear, which is referred to as ghost fishing. This actually creates two problems; one of which is the obvious pollution of often synthetic material such as fishing line and nets that are long lasting, but secondly, and even more problematic, is the fact that this fishing gear continues to 'fish' which can result in increased an undocumented mortality of marine organisms.

The solution: Eliminate ghost gear (created by fishing) or increase technologies that have a faster rate of decay. For example, there are corroding mechanisms in lobster and crab traps that are meant to allow the trap to open up if the gear is lost so that organisms can get free. Increase in education campaigns and training that raises awareness regarding certain practices that lead to gear loss. Additionally, increased engagement with various stakeholders such as commercial fishing bodies, seafood processors, tourism bodies and community groups to ensure the education is met by those responsible.

The issue: Land-based chemicals discarded into waterways, such as pesticides, herbicides and even household materials. .

The solution: Invest in research and development to develop environmentally-sensitive, sustainable solutions to tackle water pollution. Decrease the amount of construction, such as roads and parking lots, that make it easier for these materials to find their ways into the marine environment. Alternatively, an increase in green spaces adjacent to construction sites and/or roads/parking lots that buffers and mitigates the amount of pollution that enters the waterways.

4. Climate Change

The issue: Rising ocean temperatures, increased frequency of storms and bushfires are impacting the ability of species to survive in their habitats and also supporting the migration of other species. For example, Black spined sea urchin - an Australian species from further north - is supported by rising ocean temperatures in the southern seas, where it is destroying the Great Southern Reefs & associated kelp forests.

The solution: Reduce greenhouse gas emissions from every known source and transition to green sustainable energy - This is only achieved through global political cooperation and will. From the individual perspective, people can consume and travel less and promote plant based diets. The benefit will be only realised if a large enough number of people participate, however, it is important to note that individual behavioural change has to be supported by political agendas. More importantly, we should move away from new fossil fuel projects and put our effort into more sustainable energy sources (e.g. wind and solar).

5. Non-native species

The issue: The main vector for non-native species transport in the marine environment is shipping. Specifically, species can be transported through ballast water and biofouling.

The solution: Strategies to minimize non-native species transport in the marine environment relate to proper vessel maintenance. For instance, the vessel can be cleaned mechanically of biofouling. The cleaning is recommended to be performed on all the submerged surfaces such as the hull, niche areas and movable structures. Whether the cleaning of the hull is applied on land or in water, the removed material, apart from biofilm and slime should be treated as waste and not be allowed to enter the water.

The issue: The Great Southern Reefs & their Kelp Forests are under threat from the Black spined sea urchin- an Australian species from further north, supported by rising ocean temperatures in the southern seas:

The solution: Whenever a non-native species is causing harm to the natural environment, species-specific assessment of the best mitigation tools is needed and even potential eradication measures can be pursued. For example, crown of thorns starfish culls on the Great Barrier Reef and urchin culls in Tasmania have had some levels of localised success.

Benefits of a Healthy Environments

In light of the current global ecological crisis there is an ever-increasing need to value how ecosystems support human well-being and identify, which management practices and policies can help to reach sustainable development goals. This is because ecosystems are threatened by increased human population resulting and in aforementioned cumulative impacts that degrade ecosystem functions and services.

Numerous benefits that people derive from healthy ecosystems are collectively termed as ecosystem services. Ecological values of ecosystem services are often placed on supporting and regulating services (e.g. habitat provision; water filtration; carbon storage & coastal protection) and interactions among them. Supporting, provisioning and regulating services create a foundation for socio-economic benefits that people derive from healthy ecosystems including recreational, cultural and aesthetic values. Economic values of ecosystem services, however, are traditionally expressed in monetary units and assigned to the services themselves, i.e. to the consumable human benefit derived from the demand and the use of the service. Estimating

economic outputs derived from coastal ecosystem services has proven to be useful for raising awareness, communicating knowledge and prioritizing conservation measures due to easily relatable monetary values.

Conclusion

The various restrictions imposed to attempt controlling COVID-19 infections has led to unprecedented changes in our impact on the environment with unprecedented confinement of the majority of the global population. This has led to positive environmental impacts such as reduced CO2 emissions and pollution. A notable example comes from Venice, Italy where the iconic canals were clear and cleaner for the first time in modern history. Consequently, a silver lining of the COVID-19 pandemic is that it has shown that as a community we can act rapidly to change our behaviour in a manner that benefits the common good. This highlights that we have the capacity to channel these behaviours into actions that mitigate drivers of biodiversity loss in the marine environment at a local and regional scale. It is important to note that any action needs to consider the triple bottom line (social, ecological and economic) that ensures intergenerational well-being as a primary driver, rather than short term profits at the peril of our future generations.