

Maritime Aboriginal Peoples Council

A Vision for Eco-Centrism; Overshadowed by a Homo-Centric Compulsion

Views on the adoption and implementation of a
post-2020 Global Biodiversity Framework

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Of Aboriginal Peoples Continuing to Reside on Traditional Homelands*

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EXECUTIVE SUMMARY

As the UN Decade on Biodiversity 2011-2020 has come to a close, it remains evident that humanity has failed to halt and reverse the global biodiversity crisis which threatens over one million species with extinction, continues the decline of most ecosystem services, and which continues to erode genetic diversity to the point of making many more species and ecosystems “functionally extinct” or unrecoverable to prior levels. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) has described the biodiversity crisis as interrelated and equal in threat to the climate change crises. The most recent Global Biodiversity Outlook reveals that after a decade of effort, not one of the 20 global Aichi Biodiversity Targets under the UN Convention on Biological Diversity was fully met and only 11 of the 60 sub-targets were met. More concerning is that half of the biodiversity targets contain elements which show no significant change over the past decade or are worse now than when the targets were established in 2011.

Biodiversity is life and humanity is being impacted daily by the loss of biodiversity, whether this means less food, more unclean water, less protection from storms and climate change, social and psychological impacts from less green space and interactions with biodiversity, and a largely unnoticed multi-generational shift in peoples’ perception and acceptance of what is pristine and what is altered. The biodiversity crisis originates from and is fueled by a homo-centric worldview of domination over nature to serve human desires for wealth.

The failure to tackle the underlying causes of biodiversity loss since the CBD’s adoption in 1992 was the reason for the adoption of the 2011-2020 Aichi Biodiversity Targets, with the vision that:

“By 2050, biodiversity is valued, conserved, restored and wisely used, maintain ecosystem services, sustaining a healthy planet and delivering benefits essential for all people.”
2050 Vision of “Living in Harmony with Nature”

However, the Aichi Targets were not met because States and other actors continue to fail to commit to measures commensurate to the biodiversity crisis, including insufficient financial resources and human capacity development to implement the measures that have been agreed upon; and, in general, we have seen only local actions attempting to dislodge the considerable inertia within government decision-making process which entrench the power and wealth of the dominant institutions, governments, and industries. The next biodiversity decade of 2021-2030 will require us to retrace our steps in many areas to get back on the right path and will require much more effort and sacrifice to meet the Vision by 2050.

Recognizing that humanity is at a biodiversity cross-roads, States are now discussing a new CBD “post-2020 Global Biodiversity Framework”, which calls on States to adopt “***transformative change***” to put humanity on the right path towards “***Living in Harmony with Nature***”.

The need to embark upon a whole-of-government and whole-of-society approach will be crucial in mainstreaming the concept and value of biodiversity throughout all of society, economy, and government, addressing the drivers of biodiversity loss instead of the consequences, and above all, in seeking *transformative change* built on the model of the *theory of change*. The new approach will require a global paradigm shift towards prioritizing the importance of conservation and sustainable use of biodiversity,

regardless of other standing national legislation and priorities. Challenges will come with not only achieving the biodiversity targets themselves, but also upon embarking upon the initial revolutionary adoption of a *theory of change*, which will require foremost humanity to create new social, economic, and political models in order to create the tools and conditions for effective change – we simply cannot rely on market-based solutions, trickle-down effects, and consumer choice to drive the types of change and magnitude of change required.

Indigenous Peoples are the most affected by the biodiversity crises, being closely connected to biodiversity and subjected to a long history of displacement by colonial governments and settler cultures. Yet, increasingly Indigenous Peoples are being sought out to substantially contribute and take responsibility for sharing their traditional knowledge, innovations, and practices to be widely shared as a part of the new path for humanity towards the 2050 Vision *Living in Harmony with Nature*. While many Indigenous Peoples recognize the magnitude of the biodiversity crisis and want to contribute toward a better future, substantial obstacles need to be overcome in order for most Indigenous Peoples to participate in meaningful actions. Foremost, the traditional knowledge, innovations, and practices being sought are generated within and remain dependent upon Indigenous Peoples’ eco-centric worldview, customs, practices, and cultural heritage. An understanding of Indigenous Peoples’ tangible and intangible culture is necessary in order to grasp the meaning of what Indigenous Peoples have to share and how Indigenous Peoples’ traditional knowledge, innovations, and practices are relevant and can be applied to biodiversity conservation, sustainable use, and equitable benefit sharing (the three pillars of the CBD).

It is through the lens of “transformative change towards living in harmony with nature” that the Maritime Aboriginal Peoples Council (MAPC) makes this commentary on the drafts and discussions for a new “post-2020 Global Biodiversity Framework”, as well as through the lenses of an Indigenous People nested within the Federation of the Peoples of Canada with over 500 years contact with Europeans and over 400 years of treaty relations based on peace, friendship, and trade. Our lens is also that of an Indigenous Peoples organization representing the “forgotten peoples” of Canada who on April 14, 2016 won a Supreme Court of Canada declaration that the large population of Indigenous persons who are not registered as having status under the Indian Act (so called “non-status Indians”) and those of mixed heritage (Métis) are still in fact “Indians” within the meaning of the Canadian Constitution and that the federal government has responsibility. MAPC is the intergovernmental leaders forum for the Native Council of Nova Scotia, New Brunswick Aboriginal Peoples Council, and Native Council of Prince Edward Island and has established, among other initiatives, the Maritime Aboriginal Aquatic Resources Secretariate as our community’s Indigenous Peoples institution dedicated to advancing our community’s rightful share to aquatic resources and aquaculture operations in the Atlantic region of Canada for our sustained, viable economic growth.

For the interest of discussion, this commentary is divided into the proposed 20 targets contained within the “zero draft” of the post-2020 Global Biodiversity Outlook CBD/WG2020/2/3 and the “updated draft” CBD/POST2020/PREP/2/1. One key take-home message from each target commentary is:

1. The transformative changes that are needed require a large and diverse set of people to openly converse and act in good will to resolve conflict and build responsibility for biodiversity. Spatial planning can be a useful tool to achieve that purpose.

2. Conservation measures, such as protected areas, can be outstanding sources of knowledge generation, human connection to biodiversity, and effective preservation; however, protected areas can also lead to displacement of Indigenous Peoples, the shifting of environmental damage to other areas, and the “greenwashing of political and economic actions”, ultimately leading to missed biodiversity goals.
3. How we do business must change to allow biodiversity to protect itself and flourish. For example, management and eradication efforts for invasive alien species are most often too little, too late, frequently requiring drastic interventions with chemicals, dramatic habitat alterations, or introductions of other alien species. Protective steps to reduce the pathways of invasion, such as reducing habitat alterations, are usually far more effective than management and eradication after the fact. Policy makers, business leaders, and economic models need to accept and support proactive measures to support biodiversity.
4. While there are massive multifaceted issues affecting biodiversity, such as climate change, one of the key drivers that humans can have immediate and effective control over is pollution. Despite a multitude of cost-effective technical solutions, there remains widespread pollution from excess nutrients, litter, and particulate matter in many developing countries and least developed countries and in the poorer areas of developed countries, which speaks volumes about the level of environmental inequity between the top 20% and bottom 50% of the world’s population.
5. There currently exists a multitude of tools at the disposal of national governments and at international levels to ensure legal and sustainable use and trade of wild species, yet serious problems remain with their implementation. Up-to-date and high quality data is essential to trigger action by decision-makers. States must demonstrate political and economic commitment to biodiversity by plugging blatant holes and work-arounds of current governance systems, such as evident by illegal, unreported, and unregulated (IUU) fishing. Decision-making frameworks must stay up-to-date with the science, especially how data is understood and used, so that the available tools stay relevant and responsive to changes in biodiversity
6. Human induced climate change must be stopped. Even if all other biodiversity targets are met, if climate change continues unabated, many species and ecosystems will become functionally extinct, if not outright extinct. The climate change crises and the biodiversity crisis are so entwined that we should refer to the current situation as the “*bio-climate crisis*”.
7. In the process of establishing new targets, it is vital to remember that biodiversity is the source of life for human-kind and the targets must meet the nutritional needs, food security, and livelihoods of all peoples. The targets must be absolutely clear and advocate this reality, lest we replace a biodiversity crisis with a human-rights crisis for the want of the basic necessities of life.
8. In many ways, the advent and advancement of agriculture can be regarded as the path by which humans have diverged from the natural world. The agricultural revolution brought about increased caloric intake, tools to reduce work, surplus food for larger populations with specialized groups, and new social frameworks that have allowed rapid growth. However, these advancements have often been unsustainable and inequitable. Tackling the problems within agriculture head on is a very worthwhile endeavour as it gets to the heart of the CBD: conservation, sustainable use,

equitable sharing, while meeting the needs of humans and nature. While there are many technical solutions, such as conservation tillage and seed development, which could have immediate tangible results, there remains systemic obstacles, such as the vast economic and legal incentives for large-scale monoculture, which if not overcome, mutes any technical achievement.

9. Some aspects of the bio-physical world are so vital to the existence of human-beings, such as access to clean water for drinking, cooking, hygiene, and movement, that they must be viewed through the lens of human-rights. Those who provide access to water, whether through grey infrastructure or nature-based infrastructure, whether government, for-profit companies, or not-for-profit organizations, must be recognized and supported as providing for human-rights, not left to the whims of markets, which are primarily accountable for wealth creation, not human needs.
10. The phenomena known as “nature-deficit disorder” plays a large role in the lethargic response towards meeting biodiversity targets. If the first law of conservation is to know what to conserve, the principle law must be to know that you have to conserve. If there is no connection or understanding of the environment, we cannot expect each individual to undertake appropriate steps. Daily interaction with the natural world is key to humanity’s journey towards the 2050 Vision, for if we can live in harmony with a nearby small area of biodiversity, we can begin to envision living in harmony with the whole of the natural world. Green spaces should be treated as opportunities to interact with biodiversity and be developed and promoted as such.
11. Access and Benefit Sharing (ABS) arrangements between genetic resources users and providers have shown a potential to be strong drivers for conservation and sustainable use of biodiversity, as well as meeting the Sustainable Development Goals. A lack of ABS legislation, programs, and infrastructure in Canada greatly hinders Indigenous Peoples entry into the growing field of genetic resources development, particularly where existing intellectual property rights laws are incompatible with Indigenous Peoples customary laws and practices. The almost complete lack of movement by the Government of Canada on the issue of ABS reveals to us the challenge of introducing any idea of “transformative change” to encourage and support Indigenous Peoples involvement in the implementation of the CBD within Canada.
12. Government subsidies, such as fuel subsidies and tax incentives, are some of the largest drivers of biodiversity loss in the extractive sectors, such as fishing. However, government subsidies can also be very strong drivers for biodiversity conservation and sustainable use, such as retraining front-line workers, unemployment benefits, and programs aimed at reducing overall extractive capacity. To be effective, policies must be clear and enforced and with political leadership for long-term change of economies, industries, businesses, communities, and personal lives; otherwise, biodiversity beneficial subsidies can be abused, becoming ambiguous or harmful toward overall biodiversity goals.
13. It is critical that States develop open and inclusive mechanisms tasked to mainstream the CBD across all sectors and at all levels of government. It should not be assumed that just because a national government ratified the CBD and prepares National Biodiversity Strategies and Action Plans and periodic reports, that all levels of government and all sectors of private and public life are involved in these efforts.

14. Though economic sectors are the primary drivers for biodiversity loss, particularly resource extraction, they are also responding to demands or movements in other sectors, such as the movement of capital and the trends in consumer purchases, which operate within a system of profit maximization. Transforming economic sectors to meet biodiversity targets must occur in tandem with transformation in other sectors. While financial incentives for conservation and sustainable use can be useful tools, we will not be able to transition fast enough to meet the 2050 Vision through good will and incentives alone. Governments must be willing to send strong signals and set robust standards through regulation and policy.
15. In a global economy driven towards profit maximization, adequate resources to implement the CBD will remain the single greatest challenge. It is vital that industrial users of resources and industrial polluters are adequately taxed to support biodiversity initiatives, as well as being held accountable for damages to the environment. However, we must find ways to prevent such measures as simply becoming the “cost of doing business”, which is passed onto consumers. Vulnerable populations (e.g., Indigenous Peoples, racialized communities, and the poor) cannot bear either the cost of the biodiversity problem nor the cost of solutions that are driven by the markets. The growing disparity between the rich and the poor further compounds the problem, when the lower and middle classes increasingly lack the purchasing power, investing power, and volunteer time and resources to provide the human capacity and financial resources for biodiversity conservation and sustainable use.
16. The CBD is in need of strong leadership from Heads of State and national ministries, particularly in developed countries, such as Canada, to address the root causes of biodiversity loss. The recent example of how a Canadian company, in developing a new genetically modified organism (GMO), was able to seemingly skate through a regulatory process not designed for GMOs to gain government approval for their product, raises questions about Canada’s commitment towards the whole of the CBD. Despite the widely stated immediate need for the *Cartagena Protocol on Biosafety* soon after the CBD’s entry into force, Canada has yet to ratify it.
17. Well informed consumers can, and often do, make good choices for sustainable products if it is within their budget, but a gauntlet of misinformation, green-washing, distractions, and pressure techniques employed by companies to market their products, makes acquiring the necessary information virtually impossible for most consumers. While people everywhere should be encouraged to take measurable steps towards sustainable consumption and lifestyles, governments and industry must support those efforts through honest leadership, including regulation, so that consumers are not just left with the “best of the worst” to choose from or who are unwittingly engaged in “aspirational biodiversity conservation, sustainable use, or benefit sharing”.
18. While it has been shown that the traditional knowledge, innovations, and practices of Indigenous Peoples is essential to the implementation of the CBD, the almost complete lack of movement by States on Aichi Target 18, raises serious questions about how a post-2020 Target 18 will be met. A post-2020 Target 18 must be framed by the recognition of Indigenous Peoples’ rights, including those enunciated by the *UN Declaration on the Rights of Indigenous Peoples*, making State engagement with Indigenous Peoples an obligation and with supports for Indigenous Peoples’ full and effective participation.

19. The CBD must come to grips with the reality of the *UN Declaration on the Rights of Indigenous Peoples* and that Indigenous Peoples have rights to resources and the right to free, prior, and informed consent (FPIC) in decision-making in all areas that affect them. While a post-2020 target promoting the full and effective participation of Indigenous Peoples in decision-making related to conservation and sustainable use of biodiversity is important, it must be through a framework that ultimately seeks FPIC – anything less for Indigenous Peoples amounts to a modern manifestation of continued colonialism.
20. As the past 28 years of CBD implementation has shown, States must do more to take the lead to bring about the necessary change. The 2050 Vision of *living in harmony with nature* is also the means to achieving the post-2020 targets. A desire for a good quality of life and the means to make sustainable choices can be exceptionally strong forces for positive change. The question before Canada and the rest of the world is whether the CBD and the 2050 Vision of *living in harmony with nature* trumps economic objectives. The current path has not only destroyed biodiversity, but also drowns out the voices and actions for change in a sea of economic, social, and political inequality.

INTRODUCTION

To advance the discussion towards a new global framework for the conservation of biodiversity, sustainable use of its components, and equitable sharing of the benefits arising out of the use of genetic resources (the post-2020 global biodiversity framework) currently being drafted by States party to the *Convention on Biological Diversity* (CBD), which includes the drafting of new global biodiversity targets to be met by 2030, as well as to help initiate discussion on the implementation of the framework and targets as soon as possible, the Maritime Aboriginal Peoples Council (MAPC) offers this commentary on the initial drafts of the framework (zero draft CBD/WG2020/2/3 and updated draft CBD/POST2020/PREP/2/1).

MAPC is the regional intergovernmental body of the: Native Council of Nova Scotia, New Brunswick Aboriginal Peoples Council and Native Council of Prince Edward Island, collectively representing the 24,900 (Nova Scotia), 15,295 (New Brunswick), and 1,785 (PEI) Mi'kmaq/Maliseet/Passamaquoddy/Aboriginal/Indigenous Peoples/S. 91(24) Status and non-Status Indians continuing to reside on their Traditional Ancestral Homelands and Territories (off-reserve) in the Maritimes Region of eastern Canada [Canada 2011 Census Aboriginal identity numbers].

Throughout this paper, the term Aboriginal Peoples (Canadian constitutional language) is used synonymously with Indigenous Peoples (accepted international language), noting that there are 73 nations of Aboriginal/Indigenous Peoples remaining nested within the federation of the peoples of Canada, some of whom are recognized by the Government of Canada as having 'status' under the Indian Act (often referred to as 'First Nations') and others not recognized (colloquially referred to as 'non-status'). Canada also has a large population of mixed heritage "Métis" peoples, some of whom have distinctive Métis communities and many others who do not fit the government's preferred dichotomous definition of an Aboriginal person as having 'status' before the Indian Act and living on an Indian Act Reserve. The result in Canada are the large populations of non-status, urban, and "mixed blood" Aboriginal Peoples, who are socially or economically mistreated as "Indian" or "native", but who are not recognized by governments for political reasons.

It is also important to recognize the adversarial litigative nature of the Crown's treatment of Aboriginal Peoples, including the 17 year court battle to definitively settle the matter that Non-Status Indians and the Métis are in fact Indians within the Canadian constitutional list of powers reserved to the federal government (Section 91.24), meaning that the federal government has responsibilities towards Non-Status Indians and the Métis. Even though the Supreme Court of Canada made such a declaration in the *Daniel's Decision* on April 14, 2016, the federal government maintains that the Supreme Court declaration does not compel it to legislate, drawing the curtain wider open to the world to witness the Crown's treatment and attitudes towards Non-Status Indians and the Métis. The Supreme Court described Non-Status Indians and the Métis as the most disadvantaged people in Canada, a political football passed back and forth by the federal and provincial governments, and collaterally damaged by government policies which do not take into account the situation of Aboriginal Peoples who do not reside on an Indian Act Reserve. The discrimination remains evident today in *the Principles Respecting the Government of Canada's Relationship with Indigenous Peoples, 2018* which promotes a "distinctions-based approach" favouring a relationship with some groups which the Government of Canada chooses to exclusively define as Indigenous Peoples, in contravention of the *UN Convention for the Elimination of All Forms of Discrimination* which clearly includes 'distinctions-based' in the definition of discrimination, as well as, contravening Canada's *Constitution Act, 1982* which already provides an inclusive definition of Aboriginal Peoples.

MAPC has a long-standing history following the CBD, which parallels in many ways the development of declarations and the entrenching of Aboriginal Peoples rights within Canada and around the world, including Canada's *Constitution Act, 1982*, which recognizes the paramountcy of Aboriginal Peoples treaty rights (Section 25), as well as affirms and guarantees Aboriginal Peoples aboriginal rights (Part II, Section 35), and the early discussions on what would become the *United Nations Declaration on the Rights of Indigenous Peoples* (UNDRIP), which foremost recognizes the rights of Indigenous Peoples to be free and equal to all other peoples (Art. 1 & 2); to self-determination (Art. 3); to autonomy or self-government (Art. 4); and to participate in matters of the State, to redress from the State, and to own and develop their resources, cultures, peoples, and institutions to ensure their continuation and development as Indigenous Peoples (raised throughout UNDRIP), and that:

"The rights recognized [within UNDRIP] constitute the minimum standards for the survival, dignity and well-being of the Indigenous Peoples of the world." (Art. 43)

It is through this lens that the CBD is viewed, as well as the lens that the CBD is one of the most widely adopted conventions in the UN family and that its goals and mechanisms are multi-faceted to address a global dilemma of unequitable and unsustainable development that has led to a human-caused mass extinction event of species, ecosystems, and even the genetic make-up of life. Nothing but of the largest and most abrupt change in the short history of humanity's intercourse with the rest of nature is required if humankind is to continue. The double blow of the climate crisis and the biodiversity crisis (the "**bio-climate crisis**") increasingly shows that none are immune, and that many segments of society and the economy are vulnerable to rapid change.

Though this commentary is arranged according to the 20 proposed targets, it is not an attempt to cover all aspects of each target, and is in general a discussion of the framework as a whole, to be implemented with the intent of "**transformative change**" to put humanity on track towards the 2050 Vision of "**living in harmony with nature**". This commentary is meant for both CBD diplomats and Canadian officials during discussions on the development of the framework and targets and its implementation internationally and nationally, specifically Canada; as the development and implementation are intrinsically intertwined and both must be thought about simultaneously to have lasting effect. It is also meant to help spur conversation within our Aboriginal community and those who we live amongst and work with on a daily basis living in Eastern Canada under pre-Confederation treaties of peace, friendship, and trade. This commentary is also in addition to several other commentaries prepared by MAPC over the last several years reviewing Canadian actions and proposals for impact assessments, fisheries management, and species at risk legislation and policies in addition to Canada's implementation of the *Aichi Biodiversity Targets 2011-2020* and the access and benefit sharing objective of the CBD.

If there is one lesson that should be understood from the *2011-2020 Decade for Biodiversity*, it is that much was accomplished by persons working directly on biodiversity issues, but we failed to address the underlying causes of biodiversity harm and thus failed to fully meet any of the 20 Aichi Biodiversity Targets. Of the few areas where there was considerable movement, e.g., the establishment of protected areas, the biodiversity results are undetermined and may remain so for many years. We do not believe that the path for "**living in harmony with nature**" is necessarily intrinsic to adopting tougher targets. We need focus on targets and target implementation that forces individuals, governments, institutions, and the drivers of our economies to reflect on our relationship with Mother Earth and all our relations. The power to objectify nature, whether for natural resources exploitation or for conservation, is the root-cause of biodiversity loss. If conservation is not advanced with the belief and operational framework of interconnectedness and interdependency of all biodiversity, which includes humans, conservation can easily become the rationalization of off-setting harm to another place or time, leading to a systematic or

institutionalization of biodiversity harm. *Living in harmony with nature* means in all places, at all times, and in all circumstances – not destroying a forest during the week and visiting a park on the weekend, so to speak.

Living in harmony with nature must be developed as a personal ethic, a community principle, and a prevailing government objective, as well as international vision.

Since the 1980s, a significant amount of faith has been placed in industry and corporations to “do the right thing” and for governments to enable such action through deregulation and shifting policy objectives to “those captains of industry best situated to make change”. Three decades of too little action on the CBD, as well as on climate change, sustainable development, and other social-environmental issues, is unacceptable. The next three decades will not be so kind as societies and Mother Earth are nearing breaking points, highlighted by such organizations as Oxfam, the Intergovernmental Panel on Climate Change, and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. This is not to say that businesses should not be encouraged to undertake sustainable practices; but market-forces, guided on the principle of “the most efficient use of capital and labour” cannot itself propel us towards *transformative change* – or at least has not shown *transformative change* over the last three decades on the scale required for *living in harmony with nature*.

The window is fast closing for voluntary efforts to bring humanity back into balance with the natural world, replaced by increasingly desperate calls on governments to impose change. We know what needs to be done, but the question remains “who will bear the cost”. In the Mi’kmaq eco-centric worldview, all our relations (human and non-human) benefit from the life forces provided by Mother Earth and the Creator. It is the role of humans to bear the burden to care for Mother Earth to maintain balance. The question that must be reconciled now is who shares this eco-centric worldview, who carries this burden, and how will power and resources be shifted away from those who exploit under the homo-centric worldview and made available to those who nurture under a homo-centric worldview? Homo-centrism, neo-liberalism, and radical nationalism must be checked and those who have exploited such views for profit must be handed the bill. The annual trillions of dollars costs associated with habitat destruction and pollution is not owed equally by 7 billion people when the top 1% wealthiest own over ½ of the world’s wealth and when environmental quality and health has long been a privilege of the wealthy and entitled.

UN agreements are full of language such as:

*“We are resolved to free the human race from the tyranny of poverty and want and to heal and secure our planet. We are determined to take the bold and transformative steps which are urgently needed to shift the world on to a sustainable and resilient path. As we embark on this collective journey, we pledge that no one will be left behind.”*¹

However, the same also declares:

*“We reaffirm that every State has, and shall freely exercise, full permanent sovereignty over all its wealth, natural resources and economic activity.”*²

¹ UN General Assembly, Preamble to *Transforming our world: the 2030 Agenda for Sustainable Development* as adopted by the General Assembly, 25 September 2015, A/RES/70/1.

² Ibid. Paragraph 18.

An assertion that is fervently guarded in the CBD as well. What is the extent of a State's real sovereignty when international corporations avoid regulation by moving capital, when the mega rich avoid taxes through tax havens and high-priced accountants, and when in place of good governance is "neo-philanthropism" (when corporate philanthropy directs a public good because the government's ability to undertake the public good has been reduced by neo-liberal policies advocated by corporations)?

After three decades, the international call for States to adopt a new biodiversity framework that foremost seeks *transformative change* is indicative of the scale and degree to how much the past frameworks have failed us.

*Humanity stands at a crossroads with regard to the legacy it leaves to future generations. Biodiversity is declining at an unprecedented rate, and the pressures driving this decline are intensifying. None of the Aichi Biodiversity Targets will be fully met, in turn threatening the achievement of the Sustainable Development Goals and undermining efforts to address climate change. The COVID-19 pandemic has further highlighted the importance of the relationships between people and nature, and it reminds us all of the profound consequences to our own well-being and survival that can result from continued biodiversity loss and the degradation of ecosystems.*³

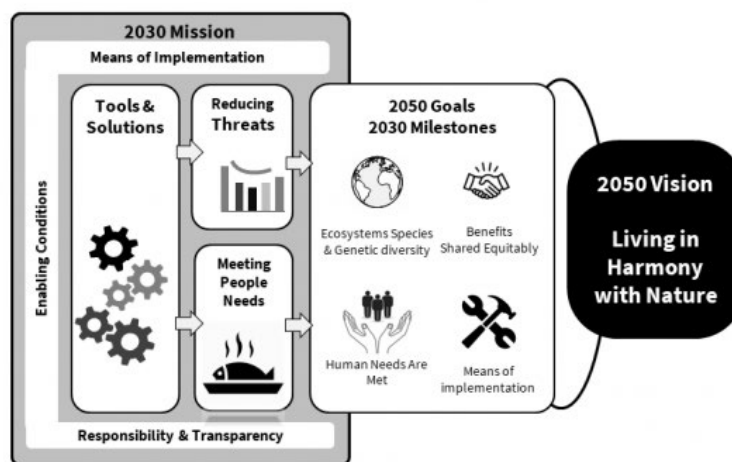
Obviously, any new biodiversity framework needs to have succinct, tangible actions by which we can measure progress and there is value in setting targets and indicators to hold States accountable. It would be missing the point of *transformative change* though to compartmentalize targets, to only adopt certain targets at a national level, or to "negotiate to death" the new framework. Even at a fairly shallow review of the science and policy history that gives substance to each of the proposed targets, it is obvious the interconnectedness and interdependency of each target and that they should have a cumulative effect, greater than the sum of the target indicators. For example, controlling pathways of invasive species (Target 3) should reduce the need for biocides (Target 4); creating mechanisms for equitable benefit sharing (Target 11) should help enhance nature-based solutions (Target 9) and reforming sectors towards sustainable principles (Target 14) should enable people to take measurable steps towards sustainable consumption (Target 17).

Four points need to be recognized to avoid the constant wrangling over text, uncertainties of resulting language, modifications of language during national implementation to suit entrenched interests, lack of coherent reporting, and a number of other issues that have plagued the Aichi Biodiversity Targets.

1. The synergies between targets are not limited to the obvious examples, like those listed above. For example, Aboriginal Peoples understand the importance of reducing pollution in order to encourage Aboriginal Peoples to share traditional knowledge, or how shifts towards sustainable consumption can promote the full and effective participation of Indigenous Peoples in decision-making.
2. Although the synergies amongst the targets can be foreseen, this does not mean that they in fact exist or will materialize without sustained intervention. For example, the creation of a park may offer enjoyment, education, and conservation to the benefit of some, but at the expense of dislocation and loss of livelihood to others.

³ Secretariat of the Convention on Biological Diversity. (2020) *Global Biodiversity Outlook 5 - Summary for Policy Makers*. Paragraph 1. Montréal.

3. The targets themselves are not the goals – *transformative change* is. States must focus on changing the “enabling conditions”, the “means of implementation”, and “responsibility & transparency” in order to create the tools and solutions that will in turn work on the targets (i.e., the post-2020 Overarching Framework of the Theory of Change).
4. “Unleashing the values of responsibility” (Target 20) is probably the most important of the targets. Evading responsibility for personal actions and the actions of peers and associates, and remaining willfully ignorant of the links to past wrongs or wrongs committed in far away places, are at the core of how humanity has reached these cross-roads. Not only does Target 20 seek dialogue and actions for new social norms, it directly invokes the “theory of change”, by which values of responsibility may be unleashed. It is our view that if the mechanisms for “*transformative change*” are achieved and responsibility assumed, all of the other 19 biodiversity targets should be easier to achieve.



Most vital for the post-2020 global biodiversity framework is that States adopt it in principle as a map toward the 2050 Vision, as well as the functional elements (targets) that layout possible paths. While it is important that States have some common language and targets by which to hold each other accountable and to measure progress, *it is more important that States recognize that the framework and targets are the minimum standards for the continued survival of humanity.* Adoption must include both agreement to the targets and commitment to advance the framework at regional, national, and sub-national levels through additional target setting. The world must see leaders unequivocally adopt the theory of change for *transformative change* and commit to new “enabling conditions”, new “means for implementation”, and new “responsibility & transparency” mechanisms necessary to create the new tools for change.

As a sign of *transformative change*, States now have the opportunity and the platform to commit to the new framework and targets although we do not know what the future may bring or how we are going to achieve those targets, and to make that commitment based on the framework of human rights and human development interconnected and interdependent with the rights of Mother Earth and all creation.

For our community of Mi'kmaq, Maliseet, and Passamaquoddy Aboriginal/Indigenous Peoples continuing on traditional ancestral homelands and territories throughout Eastern Canada, the post-2020 global biodiversity framework and targets would need to address:

- ***Biodiversity is life***, the CBD is the international treaty concerned most about how life is conserved, used, and shared, and States' implementation of the CBD is through a rights-based lens.
- A right to use biodiversity comes with it the burden of responsibility, which cannot be denied, avoided, dismissed, paid off, diminished, plea-bargained, absolved, or circumvented, and must be commensurate with the level of potential harm.
- The measure of *living in harmony with nature* cannot be judged against the current biodiversity situation or even that of living memory in most places of the world. There exists the reality of a “shifting base-line” from generation to generation of what is viewed as natural, which must be discussed so that we are able to recognize when we are on/off the path to *living in harmony with nature*.
- There must be a strong commitment to implement the third objective of the CBD (access and benefit sharing) by States within their countries with Indigenous Peoples, as well as internationally through the Nagoya Protocol.
- Many communities, including Indigenous Peoples, who interact with biodiversity and who are the most affected by development policies and biodiversity policies are environmentally racialized communities. The path forward for the conservation, sustainable use, and equitable benefit sharing of biodiversity must be one of environmental justice, which guarantees the fair treatment and meaningful participation of all peoples in decision-making processes about biodiversity and development, which at a minimum must include:
 - the free and ready access to information,
 - community placed and community paced mechanisms and capacity-building for communities to equitably engage in participatory governance, and
 - access to a wide variety of mechanisms for redress of environmental harms, including through the courts.

VIEWS ON THE 20 PROPOSED TARGETS FOR THE POST-2020 GLOBAL BIODIVERSITY FRAMEWORK

PROPOSED TARGET #1: *Retain and restore freshwater, marine and terrestrial ecosystems, increasing by at least [50%] the land and sea area under comprehensive spatial planning addressing land/sea use change, achieving by 2030 a net increase in area, connectivity and integrity and retaining existing intact areas and wilderness.*

The process of spatial planning requires a concerted effort to map land and sea use, as well as changes over time, and requires decision-makers to prioritize the weight of the resulting evidence. This level of information is viewed as imperative in modern resources management in order to retain and restore freshwater, marine, and terrestrial ecosystems, particularly where there are many diverse and often competing uses of resources and spaces, which, without such timely information, decision-makers can easily slip into mismanagement by reacting to the “issue of the day” or the current “squeaky wheels”.

While spatial planning has proven to be a tremendously useful tool that has been honed over years of study and implementation around the world, spatial plans can only be as effective as the efforts put into collecting, analyzing, communicating, and mapping spatially and temporally high-resolution data particular to the spatial planning area. As some say, it is all about “more data” or “more and better data produces better results”. The spatial planning process can be useful as it helps to focus and guide the work. With a collective mix of actors involved, including resource users, politicians, government bureaucrats, academics, community members, Indigenous Peoples, advocates, and others, it can produce a lasting statement about the value of a space and the principles and mechanisms by which humans will govern themselves in the space to achieve conservation, sustainable use, and a fair and equitable sharing of the resources.

At some level, spatial plans assume that future decision-makers understand and value its contents and intentions, including the multitude of uncertainties and biases in the environmental, biodiversity, and human-use data that forms its foundation, the statistical arguments and expressions of scientific confidence in the results obtained from the data, (which is then used to lay the reasoned groundwork for the decision-making framework), and many other caveats that develop throughout the process, i.e., “what the data can or cannot say or what the spatial plan can or cannot do”. Particularly in situations where a final decision rests with a private land-owner or where government decision-makers have historically responded to the wants or demands of many small independent resource users, such as in fisheries management, spatial planning-based decision-making would require a great deal of on-going education about the underlying philosophy, tools, and parameters in which spatial planning can be effectively used, as well as involvement in an on-going, ever-developing process to update the plan in order to respond to new information. Thus, spatial planning is more about a process than a product. Spatial planning can also be an invaluable tool to identify areas of particular interest for preservation or conservation areas which have a particular sensitivity for which human activity must be diligently managed to prevent unacceptable pressure. The spatial planning process is also an excellent avenue for identifying cumulative effects and analyzing multiple stressors and can be an important tool itself in undertaking a root-cause analysis of a particular stressor or environmental effects.

While understanding that the intention of the Zero Draft (and presumably the resulting Post-2020 Biodiversity Framework document) is not to prioritize the biodiversity targets, nevertheless, it is only human nature that the biodiversity target in the leadoff position will garner more attention than the others. It is very useful to have spatial planning included in the first target, as its execution, if done well, should

bring in a number of other targets or elements of targets, e.g., resources to acquire and use information, strong communications, and collective decision-making to advance all three pillars of the CBD together. Even if spatial planning is not prioritized over other biodiversity targets, its inclusion in the first target should help to reinforce the idea that all of the targets are interdependent in some way and that the interlinkages between targets need to be explored and addressed to advance the Post-2020 Biodiversity Framework as a whole, beyond merely a checklist of targets.

The inclusion of spatial planning in Target 1, also underpins the necessity that in order to attain conservation objectives, there must be strategic plans in place. A lesson arising out of 28 years of the CBD is that humanity can no longer treat conservation, protection, and restoration as spheres separate from the daily sphere of human activity and personal interests. Protecting one area and altering another or disturbing an area today and leaving to future generations to restore it, is not sustainable and does not get at the root cause of the global biodiversity crisis. *Living in harmony with nature* means that people must first learn how to directly interact within it. It should be required that conservation, sustainable use, and equitable benefit-sharing be intrinsically included in strategic planning and that those plans are followed, in order to experientially learn. For this reason, the inclusion of spatial planning in the first target provides an opportunity to meaningfully advance the CBD beyond a “parks and endangered species conservation” mindset.

As shown in multiple studies, the marine, aquatic, and terrestrial environments are all linked (e.g., “enhanced sediment load from land clearing is often responsible for losses of nearshore coral reefs and hinders their capacity to recover from coral bleaching”).⁴ As these environments are intrinsically connected, so too must be resources management, regardless of political or administrative boundaries. Well executed spatial planning achieves this by engaging as much as possible of the diversity of users, title holders, government departments, and other interests and “working the problem” first, followed by determining what is possible within the existing framework and where additional tools may be needed to achieve the objectives of the spatial plan. The adaptive nature of spatial planning involves exploring alternative ways to meet management objectives, predicting the outcome of alternative management measures, implementing one or more of these management options, monitoring to learn about the effects of management, and then using results to update knowledge and adjust management actions. The spatial planning process should, as a matter of course, identify particular areas of interest for resource use, areas of high biodiversity or high sensitivity for protection, and areas for other uses at a scale that is relevant to the users of the area. The spatial planning process should also enable the early identification of potential conflicts between conservation objectives and resource use objectives, as well as conflicts between resource users, giving time and space for conflicts to be resolved. By being relevant in time and space to the continually changing natural environmental systems, the changing needs and wants of human activities, and even their own changing understanding of those, spatial planning can be more responsive and more acceptable to stakeholders and the public than traditional top-down decision-making frameworks, and should prove to be a more resilient decision-making framework.

This all assumes that there is currently good spatial data, such as in urban planning which among other things seeks to adequately separate industrial areas from housing in order to improve human health. While there are a number of newer relatively cheap tools, such as remote sensing platforms and geographic information systems (GIS), there remains challenges to map areas of personal property and remote areas,

⁴ Duarte, C.M., Agusti, S., Barbier, E., Britten, G.L., Castilla, J.C., Gattuso, J-P., Fulweiler, R.W., Hughes, T.P., Knowlton, N., Lovelock, C.E., Lotze H.K., Predragovic, M., Poloczanska, E., Roberts, C., & Worm, B. (2020). Rebuilding marine life. *Nature*, 580(7801), 39–51. <https://doi.org/10.1038/s41586-020-2146-7>

such as areas beyond national jurisdictions, which arise not only from the cost of doing the work, but the question of who will pay. In Canada, considering the vast amount of lands and waters that are managed by federal, provincial, and territorial governments, focus should be on those areas, with the full and effective participation of Indigenous Peoples, seeking their free, prior and informed consent. Arguments can be made both for and against prioritization of less disturbed areas (the “protect what we have left” argument) or prioritization of more disturbed areas (the “fix the problems we have” argument). The vision of the biodiversity framework being to *live in harmony with nature* would seem to favour the latter argument, but the realities of the current biodiversity crisis, such as expressed in the several Global Biodiversity Outlooks, show that humanity is still a long way off from accepting a paradigm shift and spatial planning in areas considered to be “low hanging fruit” may yield more immediate results.

We suggest that governments consider when and how to use spatial planning to not only achieve Target 1, but as a lesson facilitating a paradigm shift towards *living in harmony with nature*. For example, spatial planning can and should be used to design an appropriate decision-making framework early on in a relatively undisturbed or unused area, thus making quick minor achievements and starting some momentum. Spatial planning cannot rest on those laurels alone, as they are in fact minor compared to the impact of the Anthropocene. The true test is whether a major shipping port can operate with resident whales, or agricultural systems can contain extensive native genetic pools, or urban areas can support fully functioning wetlands, for example.

Although 50% spatial planning coverage has been suggested for this target, Canada should strive for comprehensive spatial planning of all lands and waters managed by the federal, provincial, or territorial governments to the extent possible, even at an extremely high level, regardless of its current use and/or natural integrity. In essence, these plans should be viewed as country wide Strategic Impact Assessments (SIA) in order to better allow and plan for protection in areas with:

- the highest biodiversity,
- the highest number of species,
- areas that are most sensitive to change,
- areas currently the least impacted,
- areas of refuge within impacted areas that have potential for spillover into adjacent areas,
- corridors and areas of connectivity.

Different countries (and areas within countries) will have varying amounts of land use planning based on current land uses; however, both marine and freshwater spatial planning should be completed at near 100%, in a reasonable time. Spatial planning tools allow the quantification of land/sea use changes to a reasonable degree of certainty, thus enabling timely ecosystem-based management decisions that respond to the usage changes without jeopardizing other objectives within the spatial planning area.

The spatial plan of all these areas should include current land/sea use, projected use under no protection, and proposed use and/or protection. These are all possible using modern GIS software and much of the data is likely already available, such as in Canada, where provincial, federal, and territorial governments, as well as many large private land owners, large resource extraction companies, and various non-governmental organizations (e.g., The Nature Conservancy of Canada) hold a considerable amount of spatial data and many utilize land use planning to some extent already. Given the current global biodiversity crisis, as well as national and subnational biodiversity issues, spatial planning should begin by looking at the areas where high biodiversity is near any expanding urban centers, industrial activities, large-scale or high-impact extractive industries, or where roads, transmission lines, pipelines, and other long-distance infrastructure

may fragment the landscape/seascape. The boundaries of these plans should match up to geographic/oceanographic features, such as a watershed, and convey what should be the expected biodiversity and ecosystem functioning (e.g., species numbers, numbers and concentrations of individuals, and community compositions, which could be obtained by looking at the historical rate of species and habitat loss documented by the IUCN and other organizations, such as the Committee on the Status of Endangered Wildlife in Canada). In essence, this would hold each and every spatial plan accountable for its contributions towards either biodiversity conservation or further biodiversity loss. For example, planning at a watershed level (or 'super' watershed level) would, by necessity, include surface freshwater systems, ground water, adjacent lands and biodiversity, and possibly the airshed and microclimate. Planners would need to look at systems within the plan, such as hydrological cycles or nutrient movements. The current process of looking at freshwater and land-based systems separately, because often the same government department does not have responsibility for both, undermines good efforts for habitat protection and restoration. For example, logging can have dire consequences on the rivers and lakes in a watershed, even where large buffer zones are employed if there is not a thorough understanding of soil composition, microbial and fungal activity, and water movements, which if not understood could lead to massive nutrient loading into the freshwater, while also stripping nutrients away from the forest, hindering its own restorative abilities. While spatial planning should be required in all areas, as biodiversity conservation and sustainable use is humanity's responsibility, spatial planning should also explore wherever possible the creation of multi-use areas and small parks, as well as, community to community trail ways (cycle/walking) in urban/suburban and rural areas, as a means to meet humankind's physical, emotional, and spiritual needs and to advocate for wild spaces beyond large (often distant) nature/biodiversity preservation areas, such as national parks.

In the marine system, because a significant amount of the biodiversity moves across oceanographic features, a spatial plan could be based on grids (e.g., fishing area zones), but should still line up generally with ecozones, bottom topography, estuaries, and other natural features where possible. Two important areas for delineation in marine spatial areas to benefit local communities, as well as drive local conservation and restoration efforts, are low-impact local tourism and small-scale restorative aquaculture (i.e., unfed mariculture and/or macroalgae), such as in deep bays and areas behind barrier islands. It is important that land and sea are connected within plans and increase efforts to educate the public that the ecumene of the coast does not end at water's edge. The nearshore, mid-shore, and offshore are a part of the natural heritage of human-kind. It is important when developing spatial plans to delineate within areas that are designated as primarily economic areas, commercial areas, and housing areas, additional sub-areas, corridors, and special management efforts where possible that will benefit natural life and also encourage the interaction of people and the natural environment (i.e., humanity living **within** biodiversity, not just **visiting** biodiversity).

PROPOSED TARGET #2: *Protect sites of particular importance for biodiversity through protected areas and other effective area-based conservation measures, by 2030 covering at least [60%] of such sites and at least [30%] of land and sea areas with at least [10%] under strict protection.*

Canada has the world's longest coastline stretching over 243,000 kilometres along three oceans and yet only 13.81% of Canada's marine and coastal areas are protected (most of which was established in the past few years).⁵ In 1997, Canada established the *Oceans Act* and, in conjunction, developed *Canada's Federal Marine Protected Areas Strategy* which clarifies the roles and responsibilities of the federal departments and agencies that establish, maintain, and manage the *Oceans Act* Marine Protected Areas (MPAs) (Fisheries and Oceans Canada), Marine Wildlife Areas (Environment and Climate Change Canada), and Marine Conservation Areas (Parks Canada).⁶ According to *Canada's Federal Marine Protected Areas Strategy*:

Oceans Act MPAs were established to protect and conserve important fish and marine mammal habitats, endangered marine species, unique features and areas of high biological productivity or biodiversity;

Marine Wildlife Areas were established to protect and conserve habitat for a variety of wildlife including migratory birds and endangered species; and

National Marine Conservation Areas were established to protect and conserve representative examples of Canada's natural and cultural marine heritage and provide opportunities for public education and enjoyment.

Nested within these three core marine protected area programs are Migratory Bird Sanctuaries and National Wildlife Areas (Environment and Climate Change Canada) and National Parks (Parks Canada). Marine refuges are established and maintained by Fisheries and Oceans Canada (DFO) and are separate from MPAs which are created under the *Oceans Act* and *National Marine Conservation Act*.⁷ Currently in Canada, protected areas, and other effective area-based conservation measures (OEABCM) contribute to marine conservation targets, and to date, all areas that qualify as OEABCM are closed to fisheries and are known as marine refuges.⁸ These protected and conservation areas all have widely different rules and regulations.

OEABCM can be established much more quickly than *Oceans Act* MPAs; however, they may only protect one species, and the legislation cannot restrict or prohibit harmful activities such as mineral or oil and gas exploration and exploitation. This means that if an *Oceans Act* MPA is near a marine refuge or an

⁵ Fisheries and Oceans Canada. (2005). *Canada's Federal Marine Protected Areas Strategy*. DFO/2005-799. Ottawa: Fisheries and Oceans Canada. Retrieved from <https://waves-vagues.dfo-mpo.gc.ca/Library/315822e.pdf>

⁶ Fisheries and Oceans Canada. (2017). *Federal Marine Protected Areas Strategy*. Government of Canada. Retrieved from <https://www.dfo-mpo.gc.ca/oceans/publications/fedmpa-zpmfed/index-eng.html>

⁷ Aten, T. & Fuller, S.D. (2019). *A technical review of Canada's other effective area-based conservation measures: Alignment with DFO guidance, IUCN-WCPA guidance, and CBD SBSTTA guidance*. SeaBlue Canada. Retrieved from https://seabluecanada.org/wp-content/uploads/2019/01/SeaBlue-OECM-Report-FinalJan17_WEB.pdf

⁸ Fisheries and Oceans Canada. (2019). *Canada's marine protected and conserved areas*. Government of Canada. Retrieved from: <https://www.dfo-mpo.gc.ca/oceans/conservation/areas-zones/index-eng.html>

OEABCM, the MPA can still be exposed to the negative human impacts occurring in the marine refuge. If a marine refuge is closed to protect marine ecosystems and species, should not oil and gas activity be banned within the same marine refuge, especially if that marine refuge is near an *Oceans Act* MPA, or a part of the protected areas network? If Canada wants to protect its marine ecosystems, why would it preclude one industry (fishing), while allowing another that has different harmful impacts (oil and gas activity)? The answer lies in understanding the jurisdictional battle between federal ministries and between the federal government and the provincial governments. For example, both the Government of Nova Scotia and the Government of Canada lay claim to oil and gas resources occurring offshore, and have agreed to disagree about ownership and, instead jointly manage the resource. The issue arises where the Province of Nova Scotia, being billions of dollars in debt, opposes MPAs or OEABCM which would restrict development of the oil and gas resource. The Canada-Nova Scotia Off-shore Petroleum Accord, signed over 30 years ago, does not cover the topic of MPAs and thus the Government of Canada is now in the position of having to allow oil & gas exploration to continue in areas of interest for MPA designation or having to compensate oil & gas companies for their potentially lost interests should an MPA be established in an area and the company excluded.

In a report published in 2017 by SeaBlue Canada, a collaboration of six national conservation organizations, indicated that most of Canada's marine refuges do not meet globally accepted protection standards, and stronger standards are needed to better protect ocean diversity.⁹ In this report, it was noted that only 40% of areas closed under the federal *Fisheries Act* meet the highly protected marine refuge criteria, and when compared to DFO's own guidelines, 27% of the 54 areas protected under the Act did not meet the criteria to be counted as protected. Recently, new oil and gas leases were awarded by the Canada-Newfoundland and Labrador Offshore Petroleum Board for areas that fall within the Northeast Newfoundland Slope Conservation Area. This conservation area prohibits all bottom-contact fishing activities to protect vital fish habitat of sponges and corals, yet allows oil and gas exploration and exploitation. Allowing oil and gas activities in the same conservation areas that prohibit fishing activities, loses the trust and cooperation of the fishing industry and Canadians as a whole.

For example, there is a growing conflict between DFO and fishers over MPAs, which has recently manifested in outright opposition to a proposed coastal MPA in the province of Nova Scotia. DFO struggles to make any in-roads with the community to protect the nearshore waters as an MPA despite the sentiment that the community, as a whole, is conservation oriented. Most of the offshore islands in the area have some form of formal or informal protection with a strong campaign to raise money for protection of the remaining islands, and the fishing industry prides itself on sustainability and being part of the movement to prevent potentially destructive open-net pen aquaculture in the region. The top-down approach of establishing MPAs in recent years in Canada has created a significant amount of apprehension among resource users and community members concerned that their priorities and values are not being considered in the rush for the federal government to meet their internationally agreed to targets. Even personal visits from the Minister of Fisheries and Oceans with clear guarantees to the fishing industry that the establishment of an MPA will not affect the majority of the fishing industry in the area has not alleviated fears. Prime Minister Trudeau's new push to more than double (25%) MPA coverage by 2025 and triple (30%) coverage by 2030, has been met with resentment from the fishing community and it is impossible to see how the government will meet

⁹ Aten, T. & Fuller, S.D. (2019). *A technical review of Canada's other effective area-based conservation measures: Alignment with DFO guidance, IUCN-WCPA guidance, and CBD SBSTTA guidance*. SeaBlue Canada. Retrieved from https://seabluecanada.org/wp-content/uploads/2019/01/SeaBlue-OECM-Report-FinalJan17_WEB.pdf

its objectives, unless it only intends on creating paper protected areas in remote locations that are not being used, or with such caveats that they would not meet a reasonable international assessment of protection.

While some progress has been made protecting Canada's marine species and ecosystems, little progress has been made protecting Canada's freshwater and surrounding habitats. According to a study by the World Wildlife Fund, the majority of Canada's freshwater ecosystems are currently in trouble.¹⁰ For many years, Canada failed to collect accurate and timely information on a national scale about the health of freshwater ecosystems. With increasing urbanization and agriculture encroaching on freshwater habitats, increasing pollution and obstructing waterways, freshwater must now, more than ever, be conserved and protected. In Nova Scotia, Wilderness Areas,¹¹ Nature Reserves,¹² Migratory Bird Sanctuaries,¹³ and Provincial Parks all play a role in protecting Canada's freshwater species and ecosystems.¹⁴ Wilderness Areas are provincially protected, and used for scientific research, education, and a variety of tourism activities including kayaking, hiking, sport fishing, and hunting. Nature Reserves are provincially protected under the *Special Places Protection Act* and established to provide areas for scientific research and education, and for the protection of rare or endangered native plants or animals in their natural habitats. Additionally, land trust organizations such as Nova Scotia Nature Trust and Nature Conservancy of Canada, play a vital role in protecting lands. Many land trust organizations are given land by private landowners, and use property guardians to maintain these protected lands. Working with and allocating more funding to the various land trust organizations throughout Canada will go a long way in establishing and maintaining protected land.

Many Canadians see the establishment of newly protected areas, and the expansion of already established protected areas, as progress in the right direction. However, lack of funding, capacity, and resources is impeding the protection of the areas already listed as protected. For example, Environment and Climate Change Canada's Canadian Wildlife Service manages 49 national wildlife areas and 94 migratory bird sanctuaries on an annual budget of \$1.7 million CAD (15 cents per hectare). Without adequate resources, many of these sites are not actively maintained and the ecological integrity of these sites are at risk.¹⁵ Many of these sites, and the wildlife inhabiting them, have fallen victim to invasive species, unregulated poaching and boating, and agricultural and urban encroachment.

While using volunteers to manage *Oceans Act* MPAs and marine refuges is logistically very difficult, many National Wildlife Areas, Migratory Bird Sanctuaries, Nature Reserves, Wilderness Areas, and Provincial and National Parks would benefit greatly from increased supports for volunteer involvement in

¹⁰ World Wildlife Fund. (n.d.). *Freshwater*. Retrieved from <http://www.wwf.ca/conservation/freshwater/>

¹¹ Government of Nova Scotia. (2018). *Wilderness Areas*. Retrieved from <https://novascotia.ca/nse/protectedareas/wildernessareas.asp>

¹² Government of Nova Scotia. (2018). *Nature Reserves*. Retrieved from <https://novascotia.ca/nse/protectedareas/naturereserves.asp>

¹³ Reed, A. (2015, March 4). *Bird sanctuaries and reserves*. The Canadian Encyclopedia. Retrieved from <https://thecanadianencyclopedia.ca/en/article/bird-sanctuaries-and-reserves>

¹⁴ Government of Nova Scotia. (2013). *Our parks and protected areas: A plan for Nova Scotia*. Retrieved from <https://novascotia.ca/parksandprotectedareas/pdf/Parks-Protected-Plan.pdf>

¹⁵ Canadian Nature Federation. (2002). *Conserving wildlife on a shoestring budget: Opportunities and challenges for Canada's nation wildlife areas, migratory bird sanctuaries, and marine wildlife areas*. Toronto: CNF. Retrieved from <https://www.ibacanada.ca/documents/conservingwildlifeonashoestringbudget.pdf>

the management of these lands. Several organizations in Canada have demonstrated their abilities to organize sustained volunteer involvement by holding day-long workshops where the volunteers are trained, for example to spot and record recreational vehicle use, illegal dumping, invasive species, and species at risk sightings. Volunteer organizations also maintain important biodiversity databases, which are available to enforcement officers, scientists, and other government officials for timely action.

For Indigenous Peoples, the preeminent issue of land ownership has not yet been resolved, and thus, despite court recognition of underlying *sui generis* title, there has been little effective participation by Indigenous Peoples in government decisions about land designations for protection, resource extraction, or other uses, and little sharing of benefits, except where more explicit ownership has been settled via a land-claims agreement. A telling example of the situation in Canada is the Federal Court (2012) and Supreme Court (2014) case of *Tsilhqot'in Nation vs. British Columbia*, where Indigenous Peoples had to resort to a lengthy legal challenge in order to be involved in the decision-making process over timber licenses. The only remedy that the court could find in which the provincial government could not abrogate or derogate the Tsilhqot'in Nation's land rights was to take the extraordinary step of granting Aboriginal title of the land to the Tsilhqot'in people. Yet the Tsilhqot'in people continue to be forced into exhausting legal battles over the use of their Aboriginal titled land as the government chooses to ignore the intent of the Supreme Court's jurisprudence. In Eastern Canada, much of the traditional ancestral homelands and territories of Aboriginal Peoples was agreed to be shared with settlers through treaties of peace, friendship, and trade, which were further recognized and protected via the *Royal Proclamation of 1763*, a founding document recognized and protected in the Canadian Constitution. Indigenous Peoples in the Maritime provinces initiated tripartite processes with the federal and provincial governments to negotiate a comprehensive modern land-claims settlement, but after almost 30 years, successive governments have succeeded in a policy of divide and conquer, and spending millions of dollars on endless studies to no result but a few small areas for Indian Act band economic development. For Aboriginal Peoples, protected areas must progress in conjunction with rights recognition and economic development, lest Aboriginal Peoples are again colonized – this time in the name of conservation.

PROPOSED TARGET #3: Control all pathways for the introduction of invasive alien species, achieving by 2030 a [50%] reduction in the rate of new introductions, and eradicate or control invasive alien species to eliminate or reduce their impacts by 2030 in at least [50%] of priority sites.

In the current climate of controlling invasive alien species, including agricultural weeds and pests, there is a large emphasis put on the eradication of invasive species rather than an effort to control the pathways by which they are introduced and spread. Eradication typically takes the form of broad-band applications of herbicides, insecticides, or piscicides to target the entire species' inhabit. Though other methods are also often used, e.g., mechanical removal and biological control agents such as predators and diseases, alternate methods are often less effective, most costly, and may take several life cycles to see measurable impacts, sometimes taking more than a decade to achieve effective control. The methods that rely on the mass use of toxic agents are comparatively cheap and quick, but invariably kill large numbers of untargeted species and may damage the ecosystem or pollute the ecosystem with persistent chemicals. The trade-off often rationalized by chemical control proponents is that it is better to deliberately damage an ecosystem for a few seasons/years than to leave the invasive species unchecked, which may cause long-term ecosystem change. Despite best efforts and practices, these eradication programs can still fail to eradicate the targeted invasive species through a singular or multiple application of the toxic agent.

The proposed use of a piscicide in Miramichi Lake, in the Province of New Brunswick, Canada, perpetuates this failed methodology which has historically been detrimental to ecosystems throughout Canada. Invasive smallmouth bass (*Micropterus dolomieu*) were discovered in Miramichi Lake in 2008, almost certainly introduced several years earlier by recreational sport fishermen who desired to establish the species in the lake specifically to turn the lake into a prime sport fishing location. In 2008, a barrier was erected to stop the spread of the invasive species from migrating downriver. Mechanical methods, such as the use of electro fishers were the first attempt to remove the fish from the lake but were ultimately unsuccessful. It was estimated that only one in every four smallmouth bass were removed from the lake.

Then, in the summer of 2019, smallmouth bass had been detected at least 15 kilometres downstream; this renewed a proposition to use rotenone, a broad-band piscicide, to attempt to eradicate the local population of smallmouth bass and save the current watershed ecosystem. The proposition acknowledges that the use of rotenone will inevitably kill the majority of fish species in the lake. Historically, rotenone has been demonstrated to have a 50% chance of successfully eradicating the entire smallmouth bass population in the first application.¹⁶ The time it will take for the lake to recover its full biodiversity is unknown, and it may never. What is certain is during the time that the ecosystem is disturbed and recovering from the rotenone, it is much more vulnerable to other invasive species who may take the opportunity to establish themselves while there is less competition. This methodology also does not address how the smallmouth bass were introduced in the first place, and puts no system in place that will ensure that they are not introduced again.

¹⁶ Hisata, J. S. (2002). *Lake and stream rehabilitation: rotenone use and health risks. Final supplemental environmental impact statement*. Washington Department of Fish and Wildlife, Olympia. Retrieved from <https://wdfw.wa.gov/sites/default/files/publications/01990/wdfw01990.pdf>

Targeting the pathways by which invasive alien species are introduced is a feasible alternative to allowing those species unimpeded entry into new environments. These pathways include any means which a species is transported from its natural habitat to a new one. This can include seeds being embedded into a hiker's boot, or a mussel attaching itself to a cargo vessel and being deposited across the world. Effective practices to control introduction pathways have already been devised; however, there is little regulation to enforce the use of these practices and even less infrastructure and education in place to give access to those methodologies to the public and business alike.

The shift of focus from eradication to prevention can be achieved in many ways. One such way is the proposition of new regulations that affect the popular pathways by which alien species are introduced. An example is regulating the mandatory cleaning of aquatic vessels, especially those that change water bodies, in order to remove any invasive species that may have attached themselves to the hull or infiltrated ballast water. Actions such as this, and the installation of cleaning stations, or platforms for larger vessels, that encourage the cleaning, draining, and drying of vessels has the potential to prevent entire invasions, such as the current zebra mussel (*Dreissena polymorpha*) invasion of the Great Lakes. Since control of invasive alien species pathways means controlling the movement of people and the goods people consume, public education is an important tool. For example, the installation of boot brush and shoe disinfectant stations, tire brush stations and warning signs at trail heads, parks, protected area entrances and zoos/aquariums can prevent the further transportation of seeds and diseases, as well as aid in developing awareness of invasive alien species pathways and why controlling them is vital. Changes are also needed to current practices that disturb habitats, preventing them from naturally repelling invasive alien species, such as the clearing of land and movement of vehicles through cleared land, including roadway maintenance, building sites near waterways, and large commercial clear-cutting operations. During these practices, the environment undergoes a severe and rapid change that invasive species use to their advantage to be introduced, and then proliferate into the surrounding environment via natural seed dispersal and attachment to vehicles. Adequate capacity to address the pathways by which invasive alien species are easily introduced and spread throughout disturbed ecosystems can relegate the practice of eradication to only be used as a last resort in the direst of circumstances.

The phrase "priority sites" is a new term in the world of invasive alien species that raises a few questions: what are the criteria for a site to be considered a priority, what is the process to have a site classified as a priority, and who is involved in this decision? Experience in Canada has shown that prioritization processes for other biodiversity conservation measures has had the effect of slowing down or stalling necessary work. Bureaucratic and political processes interfere with scientific urgency, for example, some species at risk remain in conservation limbo as federal or provincial governments go through processes to list species and identify important or critical habitat, and develop recovery strategies. This lengthy process then leads to years, sometimes decades, before funding is prioritized for their recovery. Other examples include the site prioritization process for the clean-up of contaminated lands and the listing of toxic chemicals in Canada, both of which processes have only produced relatively small regulatory schedules, compared to the issue at hand, despite decades of efforts by non-governmental organizations to add to the lists.

There is opportunity to shape this process when new language such as "priority sites" is being used. This allows for opportunity for a collaborative approach that invites the input from communities, especially Indigenous communities who possess invaluable traditional knowledge. Integrating traditional knowledge into the process by which priority sites are identified could expedite the process for invasive alien species occurring on recognized traditional lands, but results will be mixed at best, if pathways outside of the control of Indigenous Peoples are not effectively controlled.

In regards to new language being used to construct this target, it is also important to realize that the expedition of picking these sites as well as identifying and controlling invasive pathways is of utmost importance. There is a large potential for more invasive species to accomplish their journey and establish themselves if this process is drawn out, which would be altogether detrimental to achieving this target by 2030. If choosing a priority site takes as long as a species takes to invade that same site, then controlling the pathway by which that invasive species was introduced becomes inconsequential. This leaves the only course of action to be eradication in an attempt to revert that priority site back to its original state, a prospect that remains inconclusive and potentially dangerous for biodiversity as a whole.

PROPOSED TARGET #4: *Reduce by 2030 pollution from excess nutrients, biocides, plastic waste and other sources by at least [50%].*

Target 4 is essential in achieving the 2030 Mission to put biodiversity on a path to recovery for the benefit of the planet and humanity itself. Relative to Aichi Target 8 in reducing pollution including excess nutrients, the addition of biocides and plastic waste are key components in eliminating environmental threats. However, it is difficult to estimate a reduction percentage that will reflect levels that are necessary for achieving the 2030 Mission. While a specific percentage reduction target is useful for “putting humanity on the path”, it is at least as important that the target aims to reduce pollution from excess nutrients, biocides, plastic waste and other sources to levels that are not detrimental to ecosystem function and biodiversity. This requires the need to greatly expand knowledge pertaining to the ecological toxicity of chemicals, including microplastics, endocrine disrupting compounds, nanomaterials, and the cumulative effects from multiple chemical exposures and increased sensitivities to chemicals. Such studies are still quite new with respects to human health and almost non-existent with respects to impacts on the natural environment. *Transformative change* requires an in-depth review of assessment models and the state of science regarding ecotoxicity.

As the world’s populations rise, so too does the demand for food production, placing considerable strain on agriculture to get higher production yields out of the same acreage. The increased use of biocides – products intended to destroy natural organisms that thrive in large monoculture areas with few predators, has become the “go to” method for reducing crop damage. Over application of nutrients has also increased yields. While biocides and excess nutrients have been profitable, i.e., the dollar value of the increased harvest justifies the expense of applying biocides and excess nutrients, the environmental costs have been mostly masked from the equation. As pests and weeds have become more resilient, there has been an increased use of pesticidal and herbicidal chemicals which has led to significant impacts on local biodiversity, including primary producers and primary consumers, which support the base of the food web and in some cases bioconcentrate those chemicals to toxic levels for higher life forms. At a minimum, States should require adequate vegetation buffer zones (sized according to slope and soil type) along waterways to sequester excess nutrients, biocides, and soil particles from entering the water.

As GM crops remain at the forefront of crop production, more scientific knowledge is needed to assess the impacts that they and their respective chemicals have on all aspects of the ecosystem, such as how GM crops sprayed with glyphosate reduces mycorrhizal fungi and other soil organisms that support plant growth. In some cases, reverting to more traditional crop varieties and using less chemical dependent agricultural methods, including integrated pest management, crop rotation, and intercropping can provide better overall biodiversity outcomes, and may even result in comparable net profits for farmers who may not have as high yields, but who are also not outlaying as much money, time, and effort to apply excessive amounts of biocides and nutrients.¹⁷ Funding towards research and implementing sustainable agricultural techniques must be forefront for this target. Developing new crop varieties that can significantly reduce or eliminate the need for chemical control and excess nutrients should also be prioritized. Integrated pest management practices are required to understand the pest’s interaction within the ecosystem and devise preventative control measures and more ecologically friendly responses to pest outbreaks, which are less reliant on chemicals, especially broad-band pesticides. A recent three-stage well-being evaluation of GM corn and organic corn systems, using the true cost accounting methods of The Economics of Ecosystem

¹⁷ Morrison, K. (2013). Agrobiodiversity: Past and Present. People in Conservation Biodiversity Conservation and Livelihood Security. 5. 4-5. Retrieved from https://www.academia.edu/34790143/Agrobiodiversity_Past_and_Present

and Biodiversity for Agriculture and Food estimates that GM corn has a natural capital (environmental cost) of \$179 USD per hectare per year and human capital (health cost) of \$427 USD per hectare per year. While GM corn yields approximately 30% more per hectare, organic corn averages more than double the price per metric tonne.¹⁸

It is also important to increase and communicate knowledge about the direct and cumulative impacts that excessive nutrients and biocides have on human health. Many airborne environmental pollutants directly impact the human endocrine (hormone) system which is vital for regulating estrogen and androgen levels for reproductive health and function. In addition, these pollutants have also been linked to heart and lung diseases, impairing the immune system and changes in energy metabolism contributing to obesity, diabetes and cardiovascular disease.¹⁹ These endocrine disrupting chemicals (EDCs) not only pertain to wide-spread airborne applications of pesticidal spray, but also common household products such as personal care products, combustion chemicals from vehicles, and common paints and glues.

It is known that excessive levels of nitrogen, phosphorus, particulate matter, and sulfur in the air and water are primary contributors to pollution. Certainly, great strides can be made towards improving human health at the population level by reducing these pollutants. Although many airborne pollutants, especially particulate matter, can be dramatically reduced through technological improvements that have been around for several decades, many countries lack the political will or financial means to implement cost-effective solutions. There also needs to be a stronger focus on assessing and dealing with the multitude of other pollutants, some of which are now ubiquitous (e.g., microplastics), some of which can be very toxic (lead), some of which there is little information on toxicity (e.g., nanomaterials), some of which have a slow moving toxicity or are toxic only at a specific life stage (e.g., endocrine disrupting chemicals), some of which are exacerbated by socio-economic conditions (e.g., polyaromatic hydrocarbons (PAH) and polychlorinated biphenyl (PCB)), and almost any of which can become problematic because they interact with other chemicals or are the “straw that broke the camel’s back” after years of multiple chemical exposures or increased chemical sensitivities.

Plastic waste also has detrimental effects on the wildlife inhabiting terrestrial and marine ecosystems. Through ingestion or entanglement, many species (including those already at risk) face serious threats from plastic waste. In addition to the direct threat to biodiversity, there is concern over human consumption of plastic waste, specifically microplastics, via seafood consumption. As marine life ingests microplastics, they can continuously transfer up the trophic cycle, ending up on the marketplace for human consumption. Additionally, studies show that microplastic ingestion can be attributed to tap and bottled water, added sugar and even in the air necessary for life.²⁰ Still, there is limited research to examine the toxicity and concentration levels that will impair human health.

¹⁸ Sandhu, H., Scialabba, N.E., Warner, C., Behzadnejad, F., Keohane, R.H & Fujiwara, D. (2020). Evaluating the holistic costs and benefits of corn production systems in Minnesota, US. *Sci Rep* 10, 3922. <https://doi.org/10.1038/s41598-020-60826-5>

¹⁹ Hamanaka RB, Mutlu GM. *Particulate Matter Air Pollution: Effects on the Cardiovascular System. Front Endocrinol (Lausanne)*. 2018;9:680. Published 2018 Nov 16. doi:10.3389/fendo.2018.00680

²⁰ Cox, K. D., Covernton, G. A., Davies, H. L., Dower, J. F., Juanes, F., & Dudas, S. E. (2019). Human consumption of microplastics. *Environmental Science Technologies*, 53, 7068–7074.

As consumers are becoming increasingly aware of their use of single-use plastics and are demanding for effective recycling or reduction programs, so too should plastics manufacturing companies take responsibility for their products. Consumers have been increasingly calling for a movement away from excessive plastics by boycotting single-use plastic straws, bags, and cutlery. Some countries, including Canada, have moved to adopt the ban of some single-use plastics (the Canada-wide Strategy on Zero Plastic Waste will commence in 2021). In addition, Canada has vowed to work with plastic producers and manufacturers that sell items with plastic packaging to become responsible for their plastic waste. To achieve this target nationally, there is a call for an incentive program that inflicts an additional charge to manufacture products with plastic and offer subsidies for alternative packaging methods to encourage change. Suggested strategies include setting targets for the reduction of plastic waste by 2025 to have full implementation by 2030.

While the importance of recycling plastic waste has been instilled into Canadians, a lot of seemingly recyclable plastic waste cannot be recycled in Canada and a hodgepodge of municipal recycling programs across the country create great confusion about what is and is not accepted. A 2019 report stated that only nine percent of plastic waste in Canada was recycled and the remainder was landfilled.²¹ There is now a public calling for direct intervention by the government to change and harmonize recycling regulations to make more types of plastic waste recyclable in more areas. Low-cost disposal methods, including landfilling, far outweigh recycling alternatives, and in many cases, municipalities simply cannot afford mass recycling, except for a few types of plastics, and only if those are diligently separated and cleaned by the end-consumer. Simply put, Canadians think that they are recycling, and largely remain unaware of what happens to waste that is thrown into the “blue bin”. The Canadian goal of a transformation to a zero plastic waste economy must require at its centre that plastic producers are responsible for their product from “cradle to grave” or “cradle to cradle”, and not pushing the problem down the line by citing the common trope of “just responding to consumer demand”. In particular, better packaging and product design which promotes longer use, alternative uses, and which considers environmental conditions and the end-life of the product could promote demand for a new skilled workforce. Considering Canada’s international leadership to reduce plastics, the federal and provincial governments need to lead by example through coordinated efforts of strong regulations, incentive programs, public education, and cooperation across all sectors as plastic products make their way through the economy.

²¹ Deloitte & Cheminfo Services Inc. (2019). *Economic study of the Canadian plastic industry, markets and waste*. Environment and Climate Change Canada. Retrieved from: http://publications.gc.ca/collections/collection_2019/eccc/En4-366-1-2019-eng.pdf

PROPOSED TARGET #5: *Ensure that by 2030 that the harvesting, trade and use of wild species, is legal and at sustainable levels.*

Much of the developed world has taken a fisheries management approach that focuses on Maximum Sustainable Yield (MSY) as a target for harvesting. This antiquated MSY approach receives significant criticisms because it is not precautionary – in fact, this approach is driven by a surplus production model which bases advice on removing all of the so-called “extra” fish, but does not account for ecosystem disturbance that arises from fisheries operations (like bycatch) or fisheries independent factors, like climate change. Consideration and implementation of an ecosystem-based approach to fisheries management (EBFM) has been on the rise; however, the MSY approach is embedded within major international agreements, like the *United Nations Convention on the Law of the Sea* (UNCLOS), as well as within voluntary guidance, like the Food and Agriculture Organization of the United Nations’ (FAO) *Code of Conduct for Responsible Fisheries*. In spite of the UN Fish Stocks Agreement which established that MSY should be considered as a limit and not a target,²² the MSY approach is largely entrenched into the facets of fisheries management globally as a target level. More specifically, in Atlantic Canada, there has been little attention given to the implementation of the additional components that would enable a more holistic (and ecosystem-centred) approach to assessments.

Recalling Article 61 of UNCLOS, Conservation of the living resources, paragraph three sets out MSY as a target harvest level, but also includes taking into account the interdependence of stocks which is further described in paragraph four:

In taking such measures the coastal State shall take into consideration the effects on species associated with or dependent upon harvested species above levels at which their reproduction may become seriously threatened.

The fourth paragraph of Article 61 is rarely discussed in terms of fisheries management or is only brought forward in specific conversations, but there is a general lack of data to support the understanding of interdependence between species. The study of food webs and trophic levels are often an academic exercise that do not make its way into fisheries science and management regimes to be considered. Some nations of Indigenous Peoples around the world have long practiced rotational harvesting strategies to avoid overharvesting and/or damaging the ecosystem by harvesting at inappropriate times. Without complicated equations and computer models, traditional Mi’kmaq harvesters understood patterns and trends in the environment, harvesting fish, fowl, and plants when the time was right – in other words, when the environmental cues were received.

Canada has recently amended the federal *Fisheries Act* to give authority to the Minister to “take into consideration” the Indigenous knowledge of the Indigenous Peoples of Canada which is in line with the Government of Canada’s reconciliation initiatives, but like the reconciliation initiatives, there are no teeth to the provision and the mechanism of implementation is wholly unknown. The CBD has identified that it acknowledges the importance of biodiversity to Indigenous Peoples around the world and recognizes the positive influence on conservation and sustainable use of biological diversity that can arise from the sharing of Indigenous traditional knowledge.

²² United Nations, General Assembly, Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, A/Conf.164/37 (September 8th, 1995).

There is tremendous power in the *Akwé: Kon Voluntary Guidelines* adopted by the Conference of Parties of the CBD at its fifth meeting (May, 2000) that can be used as guidance beyond impact assessments to foster the contributions and melding of traditional knowledge and the results of scientific assessments and analyses. The path forward must be a shared one and it cannot be postponed.

A number of binding or voluntary agreements and instruments exist that call upon nations to implement an ecosystem-based approach to fisheries management. As noted above, UNCLOS includes additional provisions related to EBFM, and, while not binding, the FAO *Code of Conduct for Responsible Fisheries*²³ is significantly more explicit in its guidance under section 7.2 Management Objectives which describe the measures that management objectives should provide; these include (among others):

7.2.2 (d) biodiversity of aquatic habitats and ecosystems is conserved and endangered species are protected;

7.2.2 (e) depleted stocks are allowed to recover or, where appropriate, are actively restored;

7.2.2 (f) adverse environmental impacts on the resources from human activities are assessed, and where appropriate, corrected; and

7.2.3 States should assess the impacts of environmental factors on target stocks and species belonging to the same ecosystem or associated with or dependent upon the target stocks, and assess the relationship among the populations in the ecosystem.

While some countries have taken strides to work within this regime, for example, the United States federally adopted an ecosystem-based approach to fisheries management policy and road map in 2016 to set out goals and steps to implement them, although their progress began earlier in 1996 with amendments to the *Magnuson-Stevens Act*,²⁴ few other countries are actively implementing these new fisheries management standards. In contrast, Canada has been holding ecosystem-based approaches on the backburner for over a decade; in 2007, the Department of Fisheries and Oceans Canada (DFO) published *A New Ecosystem Science Framework in Support of Integrated Management*, but only in 2019 was a working group established to work on identifying methods of implementing ecosystem considerations into science advice. While some components of the framework have made their way into practice (recovery potential of depleted species, for example), the progress and movement forward has been painfully slow – although it is known that biodiversity does not have the luxury of time. This is a call to action to all nations allowing critical policy and guidance on maintaining, conserving, preserving, and improving biodiversity to renew efforts and revise those tools where necessary to put them at the forefront of fisheries science and management priorities.

Like any sort of population or abundance modelling, fisheries science will never be exact (except in extremely rare circumstances where a population is small enough to be fully known), but getting at the best approximation and following through with truly precautionary management measures is a necessary step.

²³ Food and Agriculture Organization of the United Nations. Code of Conduct for Responsible Fisheries. Rome, 1995. (select sections, pp. 9-10).

²⁴ Townsend, H., Harvey, C.J., deReynier, Y., Davis, D., Zador, S.G., Gaichas, S., Weijerman, M., Hazen, E.L., & Kaplan, I.C. (2019). Progress on implementing ecosystem-based fisheries management in the United States through the use ecosystem models and analysis. *Frontiers in Marine Science*, 6. 6(641) 1-17. DOI: 10.3389/fmars.2019.00641

In his post-war address to the United Nations, Michael Graham noted that: [t]he world does not stand still while scientists get their minds in order” (1949)²⁵. This world also can not afford the time for resource management officials to make poorly informed decisions in the meantime. Duarte et al. (2020)²⁶ brought forward the optimism needed in their review of post-conservation interventions that led to successful recovery of marine populations, habitats, and ecosystems, specifically highlighting that “substantial recovery of the abundance, structure and function of marine life could be achieved by 2050, if major pressures – including climate change – are mitigated.” Obviously, this is no small feat and will require significant ramping up of monitoring activities and more than half-hearted political will.

In the Maritimes region (the federal DFO management region in Atlantic Canada encompassing the Bay of Fundy and waters around the southern and eastern coasts of Nova Scotia extending to the limits of the 200 km Exclusive Economic Zone), there have recently been efforts to implement Management Strategy Evaluation (MSE). In particular, MAPC has been involved in the preliminary stages of the MSE development for one spawning component of Atlantic herring (*Clupea harengus*) in which there has been significant conversations around how to best incorporate environmental parameters into the modelling. Throughout these exercises, there has been immense difficulty in securing adequate and appropriate data sources to input into the models because, in many cases, the datasets simply do not exist. While countries like Canada may not be ready for broad-scale implementation of advanced equipment and technology like the Environmental Defense Fund’s Smart Boat Initiative which modernizes data acquisition and reporting using high-tech sensors, artificial intelligence, and takes advantage of the increase in broadband coverage,²⁷ other ways of acquiring data could include mining for secondary data collected in normal operations which are not applied directly to the fishery being monitored - for example, bycatch that is not a species at risk may be denoted in an “other” or “notes” column in a database that is not normally queried in the process of ordinary assessments. Also, academic institutions often hold huge amounts of fisheries related data that is not peer-reviewed for inclusion in DFO stock assessments. At a conference in 2018, Dr. Amanda Bates, Memorial University, described this hidden data as “dark data” that may be hindering Canadian efforts at predicting and changing the trajectory of biodiversity losses.²⁸ Exploring and appropriately cataloguing the data that exists may mean collaborating with researchers and scientists outside of a traditional field, but in considering all that remains unknown or uncertain, there is strength in expanding the boundaries.

Additionally, it is critical that nations become better informed about the state of biological diversity within their realm of management and policy. Many nations have enacted some form of legislation that provides for the protection of species at risk (e.g., *Species at Risk Act*, Canada; *Endangered Species Act*, USA; *Nature Conservation Act*, Australia). For Canada, the capacity to act upon conservation provisions under legislation is stymied by the lack of existing data, pushing DFO to a political choice to use or not use the precautionary principle. A number of well documented criticisms have been leveled against DFO concerning the considerable weight given to the economic importance of the commercial fisheries when marine species have been proposed for a *Species at Risk Act* listing. The repeated reason of successive

²⁵ Michael Graham, in his address to the UN Scientific Conference on the Conservation and Utilisation of Resources, Lake Success, New York, 1949.

²⁶ Duarte, C.M. et al. (2020). Rebuilding marine life. *Nature*, 580(7801), 39–51. <https://doi.org/10.1038/s41586-020-2146-7>

²⁷ Environmental Defense Fund. (2019). New Technologies to Revolutionize Sustainable Fishing in the Digital Age: EDF’s Smart Boat Initiative. Webinar, August 22nd, 2019.

²⁸ In the plenary entitled “Three “grand” challenges for predicting marine biodiversity change in the Anthropocene era”, presented at the 4th World Conference on Marine Biodiversity in Montreal, QC, Canada, May 16th, 2018.

Ministers of Fisheries and Oceans since the enactment of the *Species at Risk Act* in 2002 has been that listings of marine species (whether target species, by-catch, or incidentally harmed) present a limiting factor in the ordinary operations of the commercial fishing industry.

Canada's approach instead has been to track fisheries progress on "major stocks", which are a subset of fisheries management stocks that are determined to be of importance for cultural, economic, or environmental reasons, based on results of a "fisheries sustainability survey". On paper, this appears to be a solid mechanism of understanding the state of individual major stocks; however, the representation of information does not provide any information with respect to the inter-dependence of the major stocks, as well as, the state of "minor stocks", unmanaged species, or ecosystems; rather Canada's primary fisheries management approach is almost singularly informed by stock data sets (e.g., weight, length, age, sex of landed fish) of the individual major stocks. Additionally, there is little public reporting of the progress history of fisheries management using the Precautionary Approach Framework for each stock, without delving into the periodic stock assessments of each stock and compiling the data to know whether a fish stock is improving, declining, or remaining relatively constant and then inferring whether fisheries management decisions were the driving factors. Of the 177 stocks reported on in the 2018 survey²⁹, 41% (73 of 177) had a status of uncertain, 11% were in the critical zone (19 of 177), 15% were in the cautious zone (27 of 177), leaving only 33% of those stocks in the healthy zone, yet many consider these estimates to be very conservative, based on the poor quality of timely data. Canada often touts itself as a world leader in fisheries management, but with the large suite of policies, frameworks, guidance, and governance systems this country has in place, the country should be able to demonstrate better results than, at best, 33% of reported stocks in the healthy zone.

Canada recently submitted an interim progress report to the United States regarding the management measures in effect (or soon to be in effect) to mitigate fisheries interactions with marine mammals. This exercise reaffirmed that the suite of instruments available to the Government of Canada is vast, but also demonstrated that there is a severe lack of cohesion and political will to apply them to the conservation and preservation of marine biodiversity. True world leadership in fisheries management will require reconciliation of the existing tools and put into practice precautionary decision-making and transparency.

There is near-universal ratification by countries around the world with the Convention on the International Trade in endangered Species of Wild Fauna and Flora (CITES), but the black market demand for endangered species remains. Where there is demand, someone will step up to supply. For example, the Chinese demand for the swim bladder of totoaba (*Totoaba macdonaldi*), a large fish endemic to the Gulf of California, itself Critically Endangered (assessed in 2007 by the IUCN),³⁰ has resulted in an illegal fishery off the west coast of Mexico. The demand for the totoaba (in addition to the gill net shrimp fishery

²⁹ Fisheries and Oceans Canada. (2019). *Sustainability Survey for Fisheries*. Government of Canada. Retrieved from <http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/survey-sondage/index-en.html>

³⁰ Findley, L. (2010). *Totoaba macdonaldi*. The IUCN Red List of Threatened Species 2010: e.T22003A9346099. <https://dx.doi.org/10.2305/IUCN.UK.2010-3.RLTS.T22003A9346099.en> Retrieved April 9th, 2020.

in the Sea of Cortez) has also resulted in the near extinction of the vaquita porpoise (*Phocoena sinus*), which become entangled in the nets and drown; a population last estimated to be less than ten individuals.³¹

While Mexico did implement a ban on gill nets in the vaquita's habitat,³² there have been minimal efforts to enforce the prohibition on fishing with gill nets. In October of 2019, the controversial activist group Sea Shepherd observed and documented more than 70 fishing vessels in a protected refuge in the Gulf of California, with local fishermen highlighting that they had originally abided by the ban, but compensation payments that the Mexican government had promised as part of the agreement to ban gill nets had stopped, leaving those fishermen to return to their previous activities.³³ Black market products, like the totoaba swim bladder, often sell for exorbitant amounts of money which may override conservation obligations for lower income harvesters. CITES, at the 17th session of the Conference of Parties agreed to a resolution encouraging the development of demand reducing strategies to combat illegal trade in CITES-listed species which included targeted evidence-based campaigns, enhancing policy, legislation, and enforcement, active research on the demand for illegally-traded CITES-listed species, and significant education components.³⁴ Recognizing that there are numerous challenges in standardizing methodologies to estimate the rates of illegal activity, documenting the development, implementation, and, where possible, the enforcement of strategies aimed at eliminating the demand for illegally traded endangered species by parties to CITES could be a first step for monitoring the intent to reduce illegal trade.

WildAid, a non-profit organization focused on ending illegal wildlife trade by addressing demand, has extensively used celebrity-driven campaigns to eliminate the demand for shark fins which resulted in an 80% decline in consumption in China, but now seeing the demand for shark fin is growing in other parts of Asia.³⁵ While many countries around the world have implemented a ban on shark finning (specific to the practice of slicing of shark fins at sea and discarding the rest of the animal), Regional Fisheries Management Organizations (RFMOs) like the International Commission for the Conservation of Atlantic Tunas (ICCAT) have not implemented a full management area ban on the practice (there was a recent joint proposal in 2018 by the countries of Albania, Belize, Canada, EU, France (on behalf of St. Pierre and Miquelon), Gabon, Ghana, Honduras, Liberia, Nigeria, Norway, Sao Tomé and Príncipe, Senegal, South Africa, UK-OT, and the United States which did not move forward), leaving the door open to satisfy the demand. Understanding that enforcement on the high seas is extremely challenging, particularly for developing nations that have difficulties in enforcing their own waters, transboundary RFMOs need to do more for the protection of

³¹ In his presentation December 10th, 2019 during the plenary session: Conservation Interventions of the World Marine Mammal Conference, Barcelona, Spain.

³² Secretaría de Gobernación. (2017). Diario Oficial de la Federación (DOF): 06/30/2017 - AGREEMENT that prohibits gears, systems, methods, techniques and schedules for carrying out fishing activities with small vessels in marine waters of federal jurisdiction of the United Mexican States in the Northern Gulf of California, and establishes landing sites, as well as the use of monitoring systems for such vessels (translated from Spanish). Retrieved from http://www.dof.gob.mx/nota_detalle.php?codigo=5488674&fecha=30/06/2017

³³ Mongabay. (2019, October 29) '*Rampant*' fishing continues as vaquita numbers dwindle. Retrieved from <https://news.mongabay.com/2019/10/rampant-fishing-continues-as-vaquita-numbers-dwindle/>

³⁴ CITES. (2017). Demand reduction strategies to combat illegal trade in CITES-listed species, CONF. 17.4. Retrieved from https://cites.org/sites/default/files/document/E-Res-17-04_0.pdf

³⁵ Dehghan, S.K. (2019, June 4). *Marine 'gold rush': demand for shark fin soup drives decimation of fish*. The Guardian. Retrieved from <https://www.theguardian.com/environment/2019/jun/04/marine-gold-rush-demand-shark-fin-soup>

endangered species highly valued on the black market; thus, in addition to monitoring the actions of countries to have disincentive strategies in place, agreements and recommendations by management bodies directed at eliminating the ability to harvest endangered species for illegal trade should also be documented for effectiveness.

Illegal, unreported, and unregulated (IUU) fishing is globally recognized as a major contributor to overexploitation and a limiting factor in the recovery of depleted fish stocks. The earlier totoaba/vaquita example demonstrates that, in spite of regulations or mechanisms in place to prevent and deter illegal fishing, the ability and political will to enforce them is paramount. For developing countries, or those where corruption runs rampant, developing and enforcing laws and regulations may well be a limiting factor in the prevention and elimination of illegal fishing. The impacts from IUU fishing are widespread, often affecting countries outside of the immediate zone of activity – consider the high seas, for example; as a result, there is an immediate need to depart from current, common-place fisheries management approaches.³⁶ A number of fisheries intelligence systems exist, for example, the Canadian National Fisheries Intelligence Service under the Protection Branch of Fisheries and Oceans Canada belongs to the North Atlantic Fisheries Intelligence Group and INTERPOL’s Fisheries Crime Working Group. Particularly recognizing that illegal fishing often coincides with other crimes, such as drug or human trafficking, increased support for intelligence-based investigations into both the illegal fishing activity and identifying the black market have an important role in preventing and deterring illegal fishing efforts and eliminating the supply chain. Taking an approach of criminalizing, rather than using administrative-based sanctions, acknowledges the seriousness of illegal fishing efforts and reinforces a nation’s commitment to preventing and deterring IUU fishing.

As has recently been seen in the United States with the implementation of the import provisions of the *Marine Mammal Protection Act* (MMPA), trade controls may be an effective deterrent, reducing market access for irresponsibly harvested fish. Briefly (and simplistically), the MMPA sets out provisions which require nations wishing to export fish and fish products to the U.S to achieve a “comparability finding” meaning that the exporting nation has provided verifiable proof to the U.S that their fishing activities have caused a comparable amount or less serious injury or incidental mortality to marine mammals compared to U.S. based fisheries. The vaquita case has resulted in a widespread prohibition on the import of fish and fish products from Mexico that are harvested using gill nets and further expanded to include other gear types in the upper Gulf of California.³⁷ Similarly, catch traceability documentation, like the electronic Bluefin Tuna Catch Document program under ICCAT requires documentation unique to every fish to accompany the fish from harvester to the final market and reviewed at all points of entry/exit along the way there. While the MMPA example is specific to harm coming to marine mammals, as an example of trade controls, both types of tools can limit the entry of products that are the result of harmful and illegal fishing practices.

³⁶ de Coning, E., & Witbooi, E. (2015). Towards a new ‘fisheries crime’ paradigm: South Africa as an illustrative example. *Marine Policy*, 60, 208-215.

³⁷ NMFS. (2020, March 9). *Implementation of Fish and Fish Product Import Provisions of the Marine Mammal Protection Act-- Notification of Revocation of Comparability Findings and Implementation of Import Restrictions; Certification of Admissibility for Certain Fish Products from Mexico*. Federal Register, Notice, 85 FR 13626. Retrieved from <https://www.federalregister.gov/documents/2020/03/09/2020-04692/implementation-of-fish-and-fish-product-import-provisions-of-the-marine-mammal-protection>

The Food and Agriculture Organization of the United Nations (FAO) published the *International Plan of Action to Prevent, Deter, and Eliminate IUU Fishing* (IPOA-IUU) – a voluntary instrument setting out comprehensive measures to be implemented by nations (or RFMOs). There are also a number of national plans of action implemented around the world based around the IPOA-IUU (17 listed on the FAO website). Other international agreements exist addressing the prevention and deterrence of IUU fishing, such as the *Port State Measures Agreement* and UNCLOS, among others. The mechanisms exist, but the capacity to enforce the compliance is lacking. Even in more developed nations, like Canada, there are difficulties in effectively executing monitoring, control, and surveillance (MCS) – the need for improvement of such capacity is described in *Canada’s National Plan of Action for IUU*. Documenting and monitoring the efforts towards improving and acting on the capacity for MCS by nations with plans in place, as well as aiding the efforts to develop and implement other plans of action for those nations without one in place can help to identify areas with a higher risk of IUU activity occurring.

Lastly, efforts should be prioritized to eliminate the “open register system” which allows for vessels engaging in illegal fishing activities (among other illegal activities) to fly a flag of convenience (FOC) or a private flag. A 2018 joint report by INTERPOL and the North Atlantic Fisheries Intelligence Group discussed FOCs as they relate to “secrecy” (described as “investigators don’t know what they don’t know”) and inhibit effective investigation and enforcement.³⁸ Since the bulk of these open registers exist in developing countries (97.5% according to the North Atlantic Fisheries Intelligence Group and INTERPOL, 2017), international aid should be encouraged to assist in closing these systems. Documentation of the removal of countries from the list of FOC states may prove an easy indicator.

³⁸ North Atlantic Fisheries Intelligence Group & INTERPOL. (2018). *Chasing Red Herrings: Flags of Convenience, Secrecy and the Impact on Fisheries Crime Law Enforcement*. Copenhagen: Nordisk Ministerråd. <https://doi.org/10.6027/TN2017-555>

PROPOSED TARGET #6: *Contribute to climate change mitigation and adaptation and disaster risk reduction through nature-based solutions providing by 2030 [about 30%] [at least XXX MT CO₂=] of the mitigation effort needed to achieve the goals of the Paris Agreement, complementing stringent emission reductions, and avoiding negative impacts on biodiversity and food security.*

Target 6 draws attention to the direct impacts that climate change has on biodiversity, and vice-versa. Understanding that these two go hand-in-hand is crucial in developing strategic management and action plans. The Paris Agreement, considered a landmark environmental accord, aims to reduce greenhouse gas emissions and limit global temperature increases. Major emitting countries have committed to reducing their climate-altering pollution and the success of this goal will contribute greatly to all targets of the CBD as rising global temperatures have severe consequences on flora and fauna species and habitats globally. Additionally, SDG-3 to “take urgent action to combat climate change and its impacts” will undoubtedly be improved with the progress made from this target.

Although, as promising these targets may be, they are not easily achievable due to other standing economic priorities. Canada previously committed to the Paris Agreement and has aimed to reduce its greenhouse gas emissions by 30% below 2005 levels by 2030. Additionally, Prime Minister Trudeau committed to net-zero emissions by 2050, an even more ambitious target to help achieve the goals of the Paris Agreement. Although Trudeau’s targets are aspirational, Environment and Climate Change Canada reported that considering current policies and those under development, the best-case scenario would see Canadian emissions only 19% below 2005 levels by 2030.³⁹ While more policies need to be implemented, and green technology advanced, it is also important for Canada to focus on carbon offsetting to reach their net-zero emissions target. Through nature-based solutions including afforestation and reforestation (tree planting), forest restoration and management practices, natural environments that act as carbon stores could help limit the excess CO₂ impacting the atmosphere, and create healthy, diverse ecosystems in return.

In Canada, the current challenges facing the Arctic’s polar bear (*Ursus maritimus*) is often-publicized as a high priority climate change and biodiversity issue. With global temperatures rising, the sea-ice is melting leaving historically shorter ice-cover periods annually. This directly impacts the distribution range of the polar bear and inhibits its ability to hunt as it requires the ice cover to hunt seals.⁴⁰ Polar bears have been studied and recently have shown a decline in body condition, lower weights and fewer cubs surviving due to the lack of ice access and inability to hunt.⁴¹ As apex predators, they are vital in balancing the populations of other species in the ecosystem, and providing ecological stability. In addition, as temperatures rise, excessive amounts of methane are being released throughout the Arctic region. Permafrost, which acts as a methane-sink, is beginning to melt releasing this powerful greenhouse gas into

³⁹ Environment and Climate Change Canada. (2020). *Canadian Environmental Sustainability Indicators: Progress towards Canada’s greenhouse gas emissions reduction target*. Government of Canada. Retrieved from <https://www.canada.ca/content/dam/eccc/documents/pdf/cesindicators/progress-towards-canada-greenhouse-gas-reduction-target/2020/progress-ghg-emissions-reduction-target.pdf>

⁴⁰ Wiig, Ø., Aars, J., Born, E. W. (2008). Effects of Climate Change on Polar Bears. *Science Progress*, 91(2), 151–173.

⁴¹ Derocher, A. & Stirling, I. (2011). Aspects of survival in juvenile polar bears. *Canadian Journal of Zoology*, 74, 1246-1252. <https://doi.org/10.1139/z96-138>

the air which plays a major role in accelerating global warming. For this reason, it is necessary to consider the intersecting, compounding factors that contribute to climate change in order to make strategic mitigation plans.

While climate change threatens Canada's Arctic biodiversity, conversely, the country's economy potentially stands to benefit greatly from the retreating sea ice. As the ice melts during the summer months, the Northwest Passage is becoming an increasingly attractive shipping route that would cut shipping costs and thousands of kilometres for ships that would normally have to go through the Panama Canal in Central America or transverse the southern tip of South America. Although the shipping season through the Arctic is currently short, scientists predict that the passage will become increasingly more accessible by 2040-2059 as temperatures continue to rise.⁴² Current challenges in this area include a lack of charted waters, unpredictable weather and drifting sea ice capable of damaging ships; but, these too will become less daunting in the future as technology advances and climate change persists. While there is still debate on whether these navigation routes are considered Canadian internal waters or international waters under the *United Nations Convention on the Law of the Sea*, Canada may stand to substantially gain economically from the melting of polar ice; as well as, Canada may gain a new influential position international, similar to what the US has achieved through the use of the Panama Canal as a geo-political tool for international negotiations on a myriad of matters. Though Canada could opt to limit the number of passing ships to protect Arctic ecosystems from heavy traffic, Canada has much more incentive to improve port infrastructure throughout the passage in order to create an enticing trade route. Although there is potential for economic advancement, most local Innu and Inuit communities demand that Canada prioritize efforts to mitigate climate change and reducing the negative impacts on the environment and biodiversity.

As the impacts of climate change increase globally, there must be an emphasis placed on the benefits of nature-based solutions – particularly for disaster risk reduction. As the Earth faces drastic changes including air pollution, rising temperatures and sea levels, nature-based solutions should be considered to build resilience against disaster risks and mitigate climate change. *The Nature-based Solutions for Climate Manifesto* (influenced from a seminal 2017 report: *Natural Climate Solutions*),⁴³ delivered at the 2019 UN Climate Action Summit stated the importance of nature-based solutions as cost-effective long-term solutions, supporting vital ecosystem services, biodiversity and also meeting the SDGs by contributing to provide fresh water, improve livelihoods and food security. For example, mangrove forests along coastal waters moderate waves and wind, and their impact on the shore and coastal communities, reduce erosion and sequester CO₂, all while providing prime habitat for aquatic species and creating a healthy, biodiverse ecosystem near shorelines. Nature-based solutions need to be mainstreamed and implemented into policies as a national effort. In development planning and processes, including building of infrastructure and roads, developers should be required to obtain quotes and explore nature-based solutions and possibly receive incentives from national governments to make more environmentally-friendly decisions.

⁴² Smith, L.C. & Stephenson, S.R. (2013.) New trans-Arctic shipping routes navigable by mid-century. *Proceedings of the National Academy of Sciences*, 110(13), E1191–E1195.

⁴³ Griscom, B.W., Adams, J., Ellis, P.W., Houghton, R.A., Lomax, G., Miteva, D.A., Schlesinger, W.H., Shoch, D., Siikamäki, J.V., Smith, P., Woodbury, P., Zganjar, C., Blackman, A., Campari, J., Conant, R.T., Delgado, C., Elias, P., Gopalakrishna, T., Hamsik, M.R., ... Fargione, J. (2017). *Proceedings of the National Academy of Sciences*, 114(44), 11645–11650.

In Canada, rising sea levels are threatening to flood the Tantramar floodplains – a disaster that will flood the low-lying area that connects Nova Scotia to the rest of Canada. Historically, man-made dikes were used to increase the agricultural land available and protect the surrounding farms and cities against rising Bay of Fundy tide levels. Over time, the dikes have settled and become compacted while the sea level continues to rise. It is anticipated that the water will eventually breach these barriers, flood the plains and the closest city (Sackville, New Brunswick) if no action is taken. In 2014, the Intergovernmental Panel on Climate Change (IPCC) projected that ocean levels could rise by at least 0.6 metres by 2100.⁴⁴ Since the Trans-Canada Highway, the Canadian National Rail Line, and the Nova Scotia Power main grid transmission line (three vital infrastructure connections to the rest of Canada) run through the floodplains immediately behind 150 year-old protective dikes, the government will have to act quickly to prevent an environmental and economic disaster.

In 2010, provincial governments began work that would allow water to breach the dike and flood 16 hectares of agricultural land back into a salt marsh.⁴⁵ Salt marshes are an effective nature-based solution as they are tolerant to tide fluctuations and are able to trap sediment from rising sea levels and accumulate organic material to naturally increase their own height and protection strength; (most nature-based solutions strengthen over time, making them an excellent long-term solution).⁴⁶ In addition, they can recycle and metabolize excess nutrients and improve water quality by filtering chemicals and sediment out of the water. More nature-based solutions need to be considered for this case and cases nationally, and implemented to deliver long-lasting methods that adapt to and mitigate further effects of climate change and to support healthier environments and communities. Yet the bulk of effort is the engineering of “protective hard works”, e.g., raising the height of dikes to deflect energy and keep out water, rather than in nature-based solutions which can absorb energy and adapt to occasional flooding in a healthy ecosystem.

While the “polluter pays” principle needs to be more widely adopted globally to promote limited emissions, this principle should also be further modified to act as an incentive for producers of pollutants to develop more sustainable, greener methods of operating. The principle shifts the burden of responsibility for cleaning-up and repairing the environment to polluters, such as oil companies and mines, for any impacts they cause. Often this principle is applied through the environmental assessment process for large operations. We suggest that governments begin to identify the many smaller operations that have comparatively smaller individual impacts on the environment, but which can accumulate into comparatively large impacts over time; and to put those operations on notice that they too will soon have to pay their share of the cumulative impact.

Relative to this, Parties should ensure that they have present, strict regulations that limit the permissible emissions from companies and financially sanction those that exceed these limits. While governments can continue to vouch to reduce their emissions by a certain date, it will not happen unless concrete legislative regulations are implemented and acted upon. Cap and trade systems are a strong tool to help reach these goals. By setting emission cap limits on different industries, and sanctioning them if they exceed these limits, companies have economic motives to reduce their emissions to avoid paying overages, especially if they can sell their surplus of unused allowances to other companies. The trading of allowances instills an

⁴⁴ IPCC. (2014). *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. IPCC, Geneva, Switzerland, 151 pp.

⁴⁵ Government of New Brunswick. (2010, Oct 18). *Salt marsh restoration project launched*. Retrieved from https://www2.gnb.ca/content/gnb/en/departments/dti/news/news_release.2010.10.1657.html

⁴⁶ Broome, S., Seneca, E.D., & Woodhouse Jr., W.W. (1988). Tidal salt marsh restoration. *Aquatic Botany*, 32(1), 1–22.

economic incentive upon companies to make more environmentally conscious decisions to limit their emissions production and stay within their limit. Over time, as governments reduce cap sizes, companies are forced to implement greener, more energy-efficient technologies and practices to reduce the amount of released pollution. In addition, when industries are forced to pay overage charges to the government upon exceeding their allotted allowance, this money should be directly placed into initiatives and projects aimed towards mitigating climate change, including practices such as the utilization of nature-based solutions. Since the money was accrued from harm to the environment (greenhouse gases), it should be transparently spent on making improvements to the environment it affected. Similarly, since the money was accrued from harm to environmentally racialized communities, its expenditure should also be for the communities' direct benefit for a healthier environment.

The United States' Acid Rain Program (ARP) is perhaps one of the most successful cap and trade systems in place to date. This implementation drastically reduced the levels of sulphur dioxide (SO₂) and nitrous oxide (N₂Ox) pollution (major contributors to acid rain) which can be devastating to ecosystems. In 2018, SO₂ levels had been reduced by 92% since 1980 (1.2 million tons) and similarly, NO_x levels reduced by 84%.⁴⁷ Compliance with these regulations have been reported at 99% of industries and the success of this system has been attributed to stringent, automatic penalties for not staying within limits, strong economic incentives and a requirement that ensures that excess emissions are offset by the polluting company themselves.

⁴⁷ United States Environmental Protection Agency. (2018). *Power Sector Programs – Progress Report*. United States Government. Retrieved from https://www3.epa.gov/airmarkets/progress/reports/pdfs/2018_full_report.pdf

PROPOSED TARGET #7: *Enhance the sustainable use of wild species providing, by 2030, benefits including enhanced nutrition, food security and livelihoods for at least [X million] people, especially for the most vulnerable, and reduce human wildlife conflict by [X%].*

Considering the direct threat to many populations of wild species by current unsustainable practices and the insidious ways in which unsustainability and impacts on the world's poor is hidden from consumers in an ever-increasing global market, a target that seeks “to *enhance* the sustainable use of wild species” for a certain percentage of the world's population is weak and ignores the urgency of both the 2050 vision of the CBD and the SDGs. Enhancing or tweaking systems built upon a dominant worldview of human control over the natural world and other humans risks doing nothing but to “show good practices” while heavy harvesting practices and exploitation continues unabated. Particularly, if too low of a number of benefactors are chosen, this may easily create a loop by which X million benefit by 2030, but X million also wind up on the wrong side of the equation. A better step forward for achieving the SDGs would be to focus this target solely on improving access, food security, nutrition, and livelihoods by a demonstrable amount for the lowest (X%) of the human population.

The proposed phrasing also perpetuates a worldview that biological resources and ecosystem services (provisioning services: e.g., food, water, timber, genetic resources) exist solely to serve humanity. Instead, the emphasis needs to be focused on creating an action-oriented target ensuring the sustainable use of Mother Earth's biological resources so that they will continue to contribute to nutrition, food security and well-being well beyond 2030, not just for humankind, but for all-kind. This is essential in conserving biodiversity but also a key component in contributing to the SDGs, particularly goal 1, 2 and 3 to achieve peace and prosperity for both people and the planet into perpetuity.

SDG 1 – End poverty in all its forms everywhere

SDG 2 – End hunger, achieve food security and improved nutrition and promote sustainable agriculture

SDG 3 – Ensure healthy lives and promote well-being for all at all ages

As the list of species added to the IUCN Red List of Threatened Species continues to grow, there is an urgency for Parties to revise their policies to reflect an expanding green economy. Parties need to consider long-term economical and ecological sustainability regarding their use of biological resources. Examining a major resource concern, recent studies have suggested that continuing on with current fish harvesting rates globally could lead to a non-viable commercial fishery collapse as soon as 2048.⁴⁸ In this instance, the financial cost of switching to more sustainable options such as aquaculture solutions to reduce the pressure on wild stocks may pose great hurdles in the start-up phase; but, it is incomparable to the future economic and environmental losses caused by a fisheries collapse.

The United Nations Environment Programme (UNEP) has expressed that governments have the necessary funds and are capable of changing course; however, few countries are currently committing to concrete changes towards a greener, more sustainable future, and even less implementing the legislative

⁴⁸ Worm, B., Barbier, E., Beaumont, N., Duffy, J.E., Folke, C., Halpern, B.S., Jackson, J.B.C., Lotze, H.K., Micheli, F., Palumbi, S.R., Sala, E., Selkoe, K.A., Stachowicz, J.J., & Watson, R. (2006). Impacts of biodiversity loss on ocean ecosystem services. *Science*, 314(5800), 787–790. <https://doi.org/10.1126/science.1132294>

changes to do so. Smarter management policies and alternative strategies need to be adopted and implemented to enhance the sustainable use of resources. Catch shares, which are incentives given to fishermen to help conserve stocks, have already been proven to reduce overfishing, decrease ghost fishing and improving biological and economic performance relative to prior management strategies.⁴⁹

To mitigate human-wildlife conflicts and prevent the further extinction of vulnerable species, there is a need for a concerted effort between Parties, ENGOs, scientists, and others particularly in regard to transboundary species. For example, the North Atlantic Right Whale Consortium (NARWC) is a collaborative effort to identify, mitigate and raise awareness of the direct and underlying threats targeting the species. With only roughly 400 North Atlantic right whales (*Eubalaena glacialis*) left,⁵⁰ transboundary protected areas (TBPAs) need to be established to protect neighbouring national boundaries, as set out in Goal 1.3 of the CBD *Programme of Work on Protected Areas*. For example, in 2003, when Canada moved shipping lanes in the Bay of Fundy to reduce vessel strikes, the United States followed by narrowing and moving their shipping lane over the Stellwagen Bank in addition to reducing ship-speed along the U.S east coast.

Furthermore, there needs to be a joint effort between Parties to share knowledge of wild species management practices to enhance sustainable use and make improvements to wildlife management globally. The CBD guidelines on the *Sustainable Use of Biodiversity: Bushmeat and Sustainable Wildlife Management* provide a strong starting point for Parties to share management practices for sustainable harvesting. Canada has a long-standing, ever-developing management system for the conscious harvesting and conservation of wildlife (both flora and fauna) as well as agreements with Indigenous communities for subsistence and cultural harvesting, something many Parties could potentially learn from. While the CBD strongly recognizes each Parties sovereign rights over their own natural resources and rights to manage those resources, sharing of knowledge and management practices between Parties could be of great benefit, particularly between developed and lesser developed countries, where a great portion of biodiversity is found. Similarly, actions deriving out of the *Addis Ababa Principles and Guidelines* should be commonly shared to recognize how policies and frameworks are being developed and used to ensure the sustainable use of biodiversity components internationally.

Unless there is a strong understanding in the importance of ecological integrity and recognition that species within an ecosystem are all interconnected, people cannot simply overharvest a single wild species without affecting the system as a whole. The importance of sustainably harvesting is vital to avoid an imbalanced chain-reaction and the collapse of an ecosystem. Research funding for sustainable resource management practices, coupled with increased awareness of complex species interactions, will greatly benefit the sustainability of biological resources for future generations.

⁴⁹ Branch, T.A. (2008). How do individual transferable quotas affect marine ecosystems? *Fish and Fisheries*, 10(1), 39-57. <https://doi.org/10.1111/j.1467-2979.2008.00294.x>

⁵⁰ Pettis, H.M., Pace III, R.M. & Hamilton, P.K. (2020). *North Atlantic Right Whale Consortium 2019 Annual Report Card*. Report to the North Atlantic Right Whale Consortium. Retrieved from <https://www.narwc.org/uploads/1/1/6/6/116623219/2019reportfinal.pdf>

PROPOSED TARGET #8: *Conserve and enhance the sustainable use of biodiversity in agricultural and other managed ecosystems to support the productivity, sustainability and resilience of such systems, reducing by 2030 related productivity gaps by at least [50%].*

Going forward, the success of Target 8 will be essential in contributing to global food security and the sustainable use of biodiversity. Similar to the success of many other targets, this will require a paradigm shift from economic growth to focus on productivity, sustainability and long-term resilience. Modern agricultural sectors and other managed ecosystems are primarily focused on economic growth and producing more goods and services from the same or less work. While modernizing and industrializing sectors may be profitable and support increased productivity, this results in very limited, and in most cases, negative contributions towards sustainability and the resilience of systems. The current global agricultural industry is not sustainable, especially considering rapidly rising populations and the demand for food placing strain on managed ecosystems. The issue remains as to what the solution will be to get humanity out of their unsustainable practices and move towards conserving and enhancing the sustainable use of biodiversity in these sectors. Additionally, the target should be modified to reduce productivity gaps to the extent necessary in achieving the other goals of the Post-2020 Global Biodiversity Framework.

In addition to agriculture, it is suggested that this target also include the sustainable use of biodiversity in aquaculture and forestry industries. Making resilient food systems and ensuring food security is enabling for multiple SDGs, specifically goal 2, zero hunger. For example, innovation in aquaculture technology (e.g., land-based recirculating systems), science (e.g., developing domesticated fish breeds), and practices (e.g., multi-trophic systems and siting smaller facilities closer to consumers) can contribute greatly to reducing productivity gaps without placing additional pressures on local ecosystems. Placing the emphasis on maintaining and increasing biodiversity within and around aquaculture systems can result in greater overall productivity, though at an initial higher effort and cost to build and manage. The long-term pay-off being resilience against fungal or disease outbreaks within a system, reducing exposure to market volatilities by supplying more than one buyer, climate-change adaptation/resilience, and eco-certification.

For the CBD, the conservation and sustainable use of biodiversity is recognized as being directly tied to the SDGs, i.e., by improving the lives of humans, biodiversity can be improved. As it is suggested in this target that it be measured by reducing “productivity gaps” in managed ecosystems, such as agriculture, it is important to consider what a productivity gap is, how it comes about, and what are the transformative actions that can be taken to “address productivity gaps” for the benefit of biodiversity.

There exists in all countries, especially in developing countries, a marked difference between the agricultural sector and non-agricultural sectors in regards to the amount of labour inputs and economic outputs, referred to as the “agricultural productivity gap”. Despite several economic revolutions in industry, infrastructure, and communications, which have drawn people away from an agrarian lifestyle and towards an urban/sub-urban lifestyle, as well as an agricultural revolution of mechanization and bio-chemical inputs which has reduced labour costs and increased profits on the farm, there remains a persistent statistic that agricultural sectors around the world have a much higher labour input per unit of production output compared to non-agricultural sectors, in developing countries as much as three to four times.⁵¹ Much of the past economic theory has regarded this as being the fault of the agrarian life-style, which has “fallen behind” the rest of society particularly in education and innovation.

⁵¹ Gollin D., Lagakos D., Waugh M. (2013) *The Agricultural Productivity Gap*. National Bureau of Economic Research. NBER Working Paper Series 19628. Cambridge, USA. <https://www.nber.org/papers/w19628>

Certainly, where persons lack the means to invest in their labour potential, e.g., attaining adequate education and access to capital (including land and resources) to ply their trade, they can, and often do, fall victim to labour exploitation. Thus, the value of their labour is diminished, reducing their negotiation power with prospective employers. A long-held proposal for achieving sustainable development goals has been to invest in the productive labour potential of rural and poor areas, thus “catching them up with the rest of society”. However, when the values of society emphasize economic productivity above all else, such as in consumerism, the basic human rights of a labourer in such circumstances are also threatened.

Two issues can be raised with the traditional approach of “industrializing people”. First, social and political advancement is not a product of economic output. As it is well understood by now, and the reasons for the call for “transformative change”, achieving the CBD goals and targets will require social change and political will, not economic advancement, to divorce humankind from or at least dramatically curtail an economic model designed to commodify and exploit. Before assuming that the agricultural sector is below the gap because it has much less economic output per unit of labour input, the question of what is the economic output of the top tiers of society compared to the agricultural sector should be considered. Is the movement of capital any more or less productive than the production of food? Furthermore, what is the effect on biodiversity from the movement of capital in a system designed to maximize profits compared to an agrarian lifestyle which still maintains a connection to biodiversity, yet who’s survival is increasingly dependent upon adopting biodiversity destructive practices? A transformative thought would be to ask whether non-agricultural sectors are overvalued, versus assuming that agricultural sectors are below the productivity gap.

Second, it is very difficult to raise the value of agricultural products in order to reduce the agricultural productivity gap, as the value of those products are directly tied to nations’ measures of poverty, e.g., Canada uses the Household Food Security Survey Module to determine the number of individuals who are moderately or severely food insecure (pre-COVID-19, 10.5% of households and much higher during COVID-19).⁵² Generally, as the price rises for a “basket of goods” (e.g., due to increased labour costs and other costs in the agricultural sector), so too should wages in non-agricultural sectors rise, otherwise risking increased poverty. Thus, the remaining factor which could be used to balance the agricultural productivity gap equation is to reduce agricultural inputs, including relocating persons to take up non-agricultural jobs. However, such moves, particularly if economic conditions force their relocation away from family, friends, and their culture, and if they are a minority, without social and economic supports to take up non-agricultural jobs, e.g., training and job placement aid, increases their exposure to other forms of exploitation, such as domestic servitude, forced criminality, and sexual exploitation. While the economic measure of their productivity may have increased, it cannot be equated that their overall situation has improved.

Making the link to biodiversity – each person removed from their natural environment, is one less who can directly experience and understand humanity’s direct connection within the natural world. These “hidden effects”, because they are not considered in economic models, even manifest in developed countries where many educated, productive individuals can become trapped by their own successes, e.g., because they have specialized skills and education and working in a field that is undergoing changes, or because they are so efficient and productive that companies are inclined to reduce other labour and “lean-on” them, or because their work requirements conflict with their own needs and desires. While the economy may value the productive capacity of an individual above all else, individuals view their productive capacity

⁵² Statistics Canada (2020). *Food insecurity during the COVID-19 pandemic, May 2020*. StatCanda COVID-19: Data to Insights for a Better Canada. June 24, 2020. <https://www150.statcan.gc.ca/n1/pub/45-28-0001/2020001/article/00039-eng.htm>

as a means to achieving their own goals of being valued in society, for providing a good quality of life for themselves and their family, and for providing a better future for their children – a worldview that encompasses all aspects of life and the human capacity to continue life.

It is wrong to assume in all instances that an “agricultural productivity gap” exists because there is something wrong with the agricultural sector. While some may desire to be more economically productive to attain more money to meet their needs and desires, others may see such a move as a false promise, or may value some aspects of the agrarian lifestyle, such as a close interaction with nature and close family and community ties. Furthermore, where as factories, financial institutions, mega resource extraction companies, and almost all of the service industry is a product of the industrial revolution, in many ways modernization has been forced upon the agrarian lifestyle by a substantial movement of capital. A reoccurring issue among many small acreage farmers in North America is that it is becoming too costly for them to keep farming. The United States Department of Agriculture (USDA) reports that the consolidation into larger farms is occurring in nearly all sectors and as of 2015, most of the value of U.S farm production came from farms with at least one million dollars in sales. The USDA also notes with caution that increasingly large corporate firms play a significant role in the control of farming practices through the use of “futures contracts”, the financing of high-priced farm equipment, and through the sale of genetically modified seeds and their associated chemicals.⁵³ While some may point out that enforced mechanization and industrialization of farms contributed to ending slavery on farms, it must first be reconciled that slavery was perpetuated on the farm because some desired to develop a highly profitable agricultural system before such innovations as the tractor and thresher. The fact that the agricultural productivity gap remains even in industrialized countries should raise that the problem is not with agrarian peoples, but with an overvaluing of industrialization.

In assessing the increasingly industrialized agricultural industry, especially crop production, it is evident there are sustainability issues that need to be addressed. Large chemical/seed companies dominate the market with plant varieties that are tolerant to extremely toxic chemical pesticides and over fertilization, resulting in dramatic increases in their use globally. While modifying crops is an ancient human practice, taken to the industrial scale, it has resulted in the use of chemicals that pollute the soil and water and harm wild species, including pollinators, which are essential for long-term ecosystem health, including that of the in-situ agricultural field. Large seed companies have been accused of profiting more from the sale of their chemical pesticides and fertilizers than their intention to create productive seeds, calling into question what incentive exists to transition the agricultural sector towards ecosystem harmony.

Additionally, modern agriculturalists have been slow to acknowledge the level of knowledge of previous agrarian generations or that of modern science about biodiversity-farm interaction and co-dependence, particularly with regard to soil health. Modern tilling practices, which were widely adopted during the war years as a means to quickly bring land into intense agricultural production, continues decades later often because that is simply “the way it’s done”. However, long-term intense tilling degrades the natural soil conditions by destroying soil biomes, disturbing keystone species, such as worms, creating a “till-pan”, and exposing particles to erosion forces, resulting in increased pests, disease, and nutrient runoff which creates a demand for further study and education about “conservation tillage”, such as no-till, chisel-till and strip-

⁵³ MacDonald J., Hoppe R., Newton D. (2018) *Three Decades of Consolidation in U.S. Agriculture*. United States Department of Agriculture. Economic Research Service. Economic Information Bulletin Number 189. March 2018

tilling.⁵⁴ Having created an agricultural system dependant on the constant destruction of land so that only one type of plant can grow, without legislative change and subsidized help from governments, farmers will remain dependent on the system.

There needs to be emphasis placed on the research and development of agricultural practices that promote sustainability not just within the managed ecosystem themselves, but also in the surrounding natural ecosystems. Instead of focusing on seeds that produce the most pound per acre, research should be allocated to developing seeds that can withstand the long-term effects of climate-change, naturally repel pests and diseases, and require less fertilizer, dramatically reducing or eliminating the need for chemical inputs and intensive tilling.

This target is also lacking the incorporation of traditional knowledge into modern day agricultural practices - a key to increasing productivity, sustainability and resilience in today's systems. Before there were mechanical plows and chemical fertilizers, Indigenous Peoples and local communities developed and managed their own unique, holistic, place-specific sustainable and productive food systems. These practices ultimately limited the impacts on biodiversity and work with the surrounding natural environment. These traditional systems are more resilient against climate change and extreme weather conditions including storms and droughts, while also reducing pests and soil erosion, building upon improved soil conditions. Agroforestry for example, is a combination of agriculture and forestry techniques to develop a microclimate using trees that better protects crops against extreme conditions. This method not only provides resilient and protected crops, but also timber and improves carbon levels. Similarly, crop rotation practices, meaning, rotating crop variety on a given plot annually, will help contribute to the productivity of the soil and manage nutrient requirements. In line with today's demand for high yields on little acreage, intercropping, a practice that allows for two or more crops to simultaneously grow in the same year produce higher and more diverse yields on just one crop. For example, coffee and banana intercropping is often used in Eastern and Central Africa where the bananas provide shade for climate-sensitive coffee crops which lay closer to the ground, creating a biodiverse and productive environment. This particular intercropping system increased revenue per unit area by over 50% opposed to monocrop systems without affecting yield.⁵⁵ No-till farming should also be considered to minimize harmful environmental impacts and improve upon modernized farming practices. This eliminates tilling practices completely and allows the soil structure to remain intact and reduce the soil erosion and runoff into nearby water sources.

As mentioned above, without subsidized help from governments, farmers are not in a position to take economic risks and adopt alternative, more traditional agricultural practices for fear of a loss in yields and profits. In order for change to be effective, this target must prompt government and industries to either make regulatory changes to the most unsustainable practices and offer incentives to those willing to adopt alternative practices and contribute to sustainable use of biodiversity. The lasting struggle will be to develop practices that ensure for sustainable food production, while meeting food security levels needed for an ever-increasing global population.

⁵⁴ Busaria M.A., Kukul S. S., Kaur A., Bhatt R., Dulazi A. A. (2015) *Conservation tillage impacts on soil, crop and the environment*. International Soil and Water Conservation Research. Volume 3, Issue 2, June 2015, Pages 119-129. <https://doi.org/10.1016/j.iswcr.2015.05.002>

⁵⁵ Ekong, J. (2015). *Putting banana-coffee intercropping research into action*. CCAFS Outcome Study no. 2. CGIAR Research Program on Climate Change, Agriculture and Food Security. Retrieved from <https://ccafs.cgiar.org/publications/putting-banana-coffee-intercropping-research-action>

Without viable, feasible indicators to monitor success, it is unrealistic to expect change in the productivity gaps or in managed ecosystem productivity and resilience. Labour force surveys are an applicable tool that can be used to monitor the reduction of productivity gaps by assessing the number of employees and hours worked compared to an organization's total productivity over time. However, this does not provide insight into the progress made towards the conservation and enhancement of the sustainable use of biodiversity, nor the contributions towards sustainability and the resilience of such systems. There needs to be sector-specific environmental indicators to monitor direct changes within these managed ecosystems over time. One suggested monitoring indicator for the agricultural industry is soil health. Although soil health varies in natural environments, at different elevations and most importantly, changes over long periods of time; it is still a viable indicator to determine soil function, the presence of organisms critical for fertility and productivity over time. Additionally, pollinator presence surveys and reporting of all pesticides used (both chemical and natural) should be made mandatory for all farmers so governments can monitor the changing annual amounts used and implement regulations as needed.

Additionally, it is important to note that aquaculture operations are managed ecosystems. As the world's population continues to rise and with it, the demand for food, aquaculture is becoming an increasingly attractive solution to solving the world's food demands. While fish farming is sometimes praised for its contributions towards taking some pressure off of over-harvested wild fish stocks, it is crucial that aquaculture also be managed in a sustainable, responsible manner, and in a way that does not impact natural ecosystems. For instance, land-based recirculating aquaculture systems (RAS) are known to have a lesser impact on surrounding ecosystems than the more common open-net pen systems placed nearshore in the ocean. Although start-up costs may be higher, RAS systems have more environmental and economic benefits long-term including avoiding interaction with natural ecosystems, eliminating the spread of diseases to wild fish species, the ability to control nutrient waste and eliminating the possibility of farmed fish escaping into the wild.

Additionally, land-based operations can be established in areas closer to markets or travel hubs which drastically lessens transportation needed and additional costs required, and contributes to other targets as well such as lowering carbon emissions. It is crucial that environmental matters be prioritized over economic means. Moving forwards, aquaculture, particularly those in natural environments, should require strict monitoring and reporting protocols to closely assess their environmental impacts and to ensure measures are taken to support the productivity, sustainability and resilience of natural systems. The Canadian government is currently in the process of developing its first federal *Aquaculture Act*, as the government has recognized that managing and regulating aquaculture operations will require specific policies as more sites and operations are developed.

PROPOSED TARGET #9: *Enhance nature--based solutions contributing, by 2030, to clean water provision for at least [XXX million] people.*

It is impossible to live a healthy life without access to clean water, which is why at an international level, access to clean water is considered a basic human right. Within Canada though, there is no explicit law, regulation, or legislation that guarantees citizens the right to clean drinking water. To provide substantive protections, it falls to Canadians to protect natural water purification, storage, and transportation processes (blue-green infrastructure), such as wetlands, to provide affordable access to water, while also reducing the commodification of water by companies using human engineered processes (grey infrastructure).

Access to clean drinking water is on average a less important issue to most Canadians due to relatively good accessibility to naturally clean drinking water sources; the Great Lakes for example, contain 18% of the world's fresh water. Canada's natural abundance of relatively clean water allows for local utilities and companies to provide potable water through grey infrastructure, with relatively little purification processing, to be sold at cheap prices that most Canadians can afford. However, where local natural water sources are polluted or access has been cut off, and water has to be delivered over a long distance, a sharp inequality is created between most Canadians whose "affordable" water is essentially free and those, particularly lower income, rural, Indigenous communities, who have to pay a significant amount for bottled water.

Canada's Aboriginal population is a prime example of this inequality and an expression of some of the worst outcomes if investments into nature-based solutions are not taken. Indian Reserves in Canada are frequently in turmoil over their inability to obtain clean drinking water. Many Indian Reserves lack basic water treatment facilities and instead are reliant upon ordinances requiring households to boil their own water for drinking and cooking or otherwise pay high prices for bottled water. This is not due to Aboriginal Peoples choosing poor locations for settlement, but is the result of forced relocation.

For example, the Shoal Lake 40 Indian Reserve was created after the expropriation of 3,000 acres of land from the Ojibwa to secure clean lake water for the city of Winnipeg. Between 1912-1919, the original village was relocated by the government to a peninsula on the other side of the lake and a canal was dug across the peninsula, effectively cutting off access to Shoal Lake 40. In addition to being forced from their land, isolated to a man-made island, and construction activities disturbing burial grounds, the Reserve was not allowed access to what is now referred to as Winnipeg's water supply, and have been under water boil-orders for decades. Despite multilateral agreements between the community and the municipal, provincial, and federal governments dating back to 1990, governments have avoided building the necessary infrastructure. Only after years of high-level publicity, did the federal government construct a year-round road to make travel less dangerous, particularly in the winter. On multiple occasions, applications by the Reserve for economic development have been opposed by the City of Winnipeg, citing that the projects could impact their water supply. To this day, the Reserve spends \$240,000 CAD per year to bring in bottled water, which the City of Winnipeg sells to them.⁵⁶

⁵⁶ Greene, C. & Paul, A. (2011, January 8). *So near, so far: At the mouth of the aqueduct, there's no water to drink*. Winnipeg Free Press. Retrieved from: www.winnipegfreepress.com/local/so-near-so-far-113126539.html

As Canada's clean water becomes diminished and more sought after by outside influences, the price of water purified by grey infrastructure will go up, and many more citizens will join the ranks of those who are not able to afford such a basic necessity for a healthy life. Nature-based solutions (i.e., blue-green infrastructure) in Canada will most likely take the form of wetlands due to their common abundance, as well as the relative ease in which man-made wetlands can be constructed due to Canada's geomorphology. Wetlands purify water by slowing down the flow to allow particulates, such as sediment, to settle out of the water column, providing long contact time with microbes which consume chemicals, and filtering water through sediment layers.

Due to the process by which wetlands purify water, quantifying the amount of water that will be cleaned and subsequently how many people will be provided with clean water is difficult to estimate, making progress measurement equally difficult, if not impossible. Despite difficulties to quantify benefits, a concerted effort to implement nature-based solutions still needs to be made, which may cause funding difficulties where cash-strapped municipalities increasingly need to justify expenditures and corporations need to turn a profit. Wetlands are capable of cleaning a sizable sum of water, and investing in nature-based solutions is a guaranteed method to protect Canadian's right to clean drinking water and become less reliant on grey infrastructure; however, the question remains as to who will pay for it. There are several low-cost solutions which have been explored academically and could be implemented if incorporated into early stages of development projects.

Without investing in nature-based solutions, all Canadians open themselves up to succumbing to a similar situation that has befallen the Shoal Lake 40 Indian Reserve. While most Canadians feel their access to clean water is secure due to Canada's natural abundancy, the gravity of the potential outcomes that may occur if there is not an investment in nature-based solutions is very real and very heavy. The Canadian government does not guarantee a human right to water, only a right to affordable water. Through the generation of wetlands and other nature-based solutions, citizens could protect their own rights to clean water, by providing a fundamental way to acquire it. A first step, and the 2030 target for Canada, should be securing free access to potable water, primarily through green infrastructure, for the 1.6 million Aboriginal Peoples in Canada.

PROPOSED TARGET #10: *Enhance the benefits of green spaces for health and well-being, especially for urban dwellers, increasing by 2030 the proportion of people with access to such spaces by at least [100%].*

Responding to urban public demands over the past few decades, some more affluent, post-industrial North American cities have been adopting green space requirements in their urban planning. However, the short history of urban greening has been, in many cases, haphazard and unequitable, such as the density of parks and integrated green space in more affluent suburban communities or gentrified city cores compared to lower income areas which have higher densities of industrial space and brown-fields.

Currently the Halifax Regional Municipality (HRM) of Nova Scotia, Canada, which incorporates three geographically close urban areas and surrounding rural areas into a city, requires property developers to include a green space to blunt the edges of urbanization and keep greenery in the city.⁵⁷ In practice however, the requirements have been poorly implemented and the requisite green space is often limited to just a strip of bushes or plants separating the sidewalk from the building and does not provide any measurable benefits to citizens or urban biodiversity. HRM is in the process of implementing a new plan, *Regional Centre Secondary Municipal Planning Strategy*, and guidelines for developers that will support improved green landscaping on properties, including rooftop landscaping, sustainable landscape practices, and planting native, non-invasive species. Nested within this plan are goals to increase canopy cover to help manage temperature and provide bird habitat, engineering urban wetlands to manage storm water, uncovering or “day-lighting” creeks and streams that have previously been developed over, and new regulations to allow urban agriculture (e.g., backyard bees and chickens).^{58,59} Developers could also be required to pay into a fund that can be used to convert previously built space into green space outside of a new development, such as community parks.

Over the past few decades, some municipalities, including HRM, have experimented with incentivizing developers to directly create green spaces, environmentally friendly infrastructure, and public amenities within or attached to their developments through a program of “incentive zoning” or “bonus zoning”, where in return, the developer is permitted to have more tenant density. During rezoning processes, some municipalities have been able to use “density bonusing” and “community amenity contributions” to acquire these community spaces and services in community areas outside individual developments by requiring developers to contribute as a condition of their development permit approval.

⁵⁷ Halifax Regional Municipality. (2019). *Regional Centre Secondary Municipal Planning Strategy*. Retrieved from <https://www.halifax.ca/sites/default/files/documents/city-hall/boards-committees-commissions/Attachment%20A%20-%20Regional%20Centre%20Package%20A%20SMPS.pdf>

⁵⁸ Halifax Regional Municipality. (2013). *Urban Forest Master Plan*. Retrieved from https://www.halifax.ca/sites/default/files/documents/transportation/streets-sidewalks/HALREG%201246%20UrbanForestReport_HighRes_SINGLEPAGE_Mon20_Combined.pdf

⁵⁹ Halifax Regional Municipality. (2018). *Halifax Green Network Plan Council Report*. Retrieved from https://www.halifax.ca/sites/default/files/documents/about-the-city/regional-community-planning/HGNP-Final%20Report_20180726_updated.pdf

Incentivizing developers has gained a lot of attention, as it pushes the cost of green spaces and community amenities onto the developers themselves. While New York City's "skyscrapers surrounded by parks" experiment failed, the philosophy is still quite enticing for cash-strapped municipalities. One problem with the approach is that density bonusing, incentive bonusing, and community amenity contributions, are all premised on real community needs, beyond the development itself, and there is a significant cost and time effort required to survey and articulate a community's needs and want for any extra-developmental infrastructure. Even where a municipality requires the developer to undertake this primary information gathering and community engagement, the municipality still requires sufficient resources itself to verify the information and draw its own independent conclusions. The primary objective of a developer is to provide returns upon investment, not providing free public services. Many developers, especially large urban developers, have very significant engagement with zoning officials in order to acquire as favourable terms as possible for development. An example is where some "green belting" initiatives have been substantially lessened by allowing developers to determine what qualifies as meeting the communities' needs and desires, such as the rampant building of cookie-cutter pocket parks and parklets.

Pocket parks are urban open spaces, usually no larger than ¼ acre, that are scattered throughout a city, providing a safe and inviting environment for community members.⁶⁰ The functions of pocket parks include small event spaces, play areas for children, spaces for relaxing or meeting friends, and taking lunch breaks.⁶¹ Parklets are smaller green spaces with fewer amenities and seating built on sidewalk extensions for the purpose of increasing space on the sidewalks or expanding a public space, sometimes as small as two or three car parking spaces. Pocket parks and parklets are not sprawling diverse green spaces, offering a wide range of activities, but rather are intended to be immediately accessible by a short walk and are frequently visited often as part of a daily routine outside the house, school, or work place. They are often touted as meeting the varied and diverse needs of the community,⁶² but in fact are very similar to one-another, and most often are previously bulldozed spaces that have been planted with grass and a few trees and which provide some play equipment for children and seating for their parents, not at all a "natural space". This is not to say that pocket parks and parklets are undesirable, or that they cannot increase biodiversity or people's interaction and appreciation of biodiversity. In fact, some communities have been very active to control and convert their spaces into virtual "small urban bio-reserves" and biodiversity educational spaces, but these are comparatively rare. However, it remains important that people have easy access to larger green spaces, which can provide a more natural experience and interaction with nature for both their physical and mental health.

⁶⁰ Seymour Jr., W.N. (1969). *Small Urban Spaces: The Philosophy, Design, Sociology and Politics of Vest- Pocket Parks and Other Small Urban Spaces*. New York University Press, New York.

⁶¹ National Recreation and Park Association. (2012). *Creating Mini-Parks for Increased Physical Activity*. Ashburn, Virginia, USA. Retrieved from <https://www.nrpa.org/contentassets/f768428a39aa4035ae55b2aaff372617/pocket-parks.pdf>

⁶² City of Vancouver. (n.d). *Parklet Program*. Retrieved from <https://vancouver.ca/streets-transportation/parklets.aspx>

Though the incentive to appease the public may be strong, municipalities should not limit their scope to just focusing on spaces that people may use for recreation. Utilizing road right-of-way's, including on/off ramps, roundabouts, and the boulevard or verge space between sidewalks and streets, as well as spaces around sewage plants, water treatment plants, and other government infrastructure that is not publicly accessible, could provide much more ecological contributions than just grass, such as the creation of "rain garden" infrastructure to slow-down and trap rain water, reducing impacts on storm water systems, water treatment systems, and localized flooding.⁶³ Municipalities should also keep forefront how overall development vision and goals impact biodiversity and not just rely on "after-the-fact" projects to off-set development impacts. For example, Barcelona, Spain, is beginning to make changes to the city streets to direct vehicle traffic around "super-blocks", thus converting previous street space inside the super-block into community space, including green spaces. Another strategic area to look at are the "brown-field to green-field" initiatives, such as affordable community solar in low-income areas in Chicago, U.S.A., and new parkland development on old coal-fired electrical generation stations around the Great Lakes.

That being said, none of those goals will be possible if municipalities and provinces continue to sell their land to private owners. For example, the secret delisting of Owls Head Provincial Park Reserve from Nova Scotia's *Our Parks and Protected Areas Plan* in March 2019, so that the provincial government could sell 285 hectares of land to golf course developers, betrayed public trust and is expected to negatively impact biodiversity. Strong opposition from local residents who formed a group to oppose the sale, including taking the provincial government to court over "betrayal of public trust", caused the federal government to rescind its offer to sell adjacent federal lands, and should have made the sale virtually dead, yet the provincial government has yet to reinstate the protections.⁶⁴ A favourable Supreme Court of Nova Scotia decision could set a precedent and have a significant effect on over 100 other sites within the province that were announced previously as protected areas, but which never received formal protection from the provincial government. Municipal park boards, such as that for the city of Vancouver, British Columbia, Canada, which are distinct regulatory entities independent from city hall, could be useful for wide adoption to advance community interests in acquiring and protecting green spaces and ensuring new developments do not harm the city's parks.

Additionally, during the planning and implementation of Target 10, it is important to remember that those living in rural areas are not necessarily benefiting from green spaces. In fact, private land-ownership, lack of public infrastructure, including public transportation, and a comparatively smaller voice, place many rural and sub-rural communities and individuals at a disadvantage to accessing natural green spaces. While some may be in close proximity to a park or may own their own wild lands, the majority of people in North America must take long drives and incur other costs to interact with nature. National and subnational governments need to review and consider improvements to beach access, trail access, and trespass laws so that more rural citizens can better engage with nature for their health and well-being.

⁶³ Jeremy, D. (2009, Sept 19). *Passive Rainwater Harvesting*. The Rainwater Observer. Retrieved from <https://web.archive.org/web/20091223200107/http://www.rainwatercollecting.com/blog/?p=448>

⁶⁴ Grady, C. (2020). *The delisting of Owls Head provincial park reserve*. Canadian Parks and Wilderness Society (CPAWS). Retrieved from <https://cpawsns.org/the-delisting-of-owls-head-provincial-park-reserve/>

PROPOSED TARGET #11: *Ensure that benefits from the utilization of genetic resources, and related traditional knowledge, are shared fairly and equitably, resulting by 2030 in an [X] increase in benefits.*

Increasingly, it is being recognized that building mechanisms to foster working relationships between genetic resources researchers, industry, and Indigenous Peoples and local communities to develop the genetic resources and associated traditional knowledge held by Indigenous Peoples and local communities and equitably share in the benefits (Access & Benefit Sharing – ABS) is proving to be a powerful driver for sustainable development goals.⁶⁵ Unfortunately, Canada has invested very little nationally in this most important third pillar of the CBD. As a partial explanation, due to Canada’s considerable emphasis on securing and protecting real property and intellectual property rights which forms the base of the Canadian economy, there is generally legal uncertainty about who grants consent for access and through what mechanisms, and to whom and how should equitable benefits be shared. Due to the lack of any legislation, or legal definition of how ABS should be conducted within Canada, there exists exposure to legal action against a user of genetic resources by Indigenous rights holders of genetic resources and associated traditional knowledge, should the genetic resources user develop a resource without Indigenous Peoples’ consent. “[case law] implies Canada is not currently in possession of *de jure* sovereignty over the whole of the territory that it claims and renders any ability to unilaterally extinguish Indigenous rights, at any point in time, legally dubious.”⁶⁶

It is also fair to say that in general Canada does not see itself as a genetics resource provider or recognize the opportunity of ABS for the Indigenous Peoples of Canada to meet their own sustainable development needs. To address both of these issues, Canada must engage Indigenous Peoples to help guide the development of legislation for equitable benefits sharing. Larry Chartrand, one of several Canadian experts on ABS in Canada and contributor to *Genetic Resources, Justice and Reconciliation: Canada and Global Access and Benefit Sharing*, discusses ABS from the perspective of the Dene Peoples who inhabit the northern boreal and Arctic regions of Canada.

*“Indigenous nations and peoples in what is now called Canada have always had their own laws and legal orders... To engage in a true nation-to-nation relationship, the Government of Canada must recognize Indigenous law as a legitimate source of law in Canada. [T]hose interested in working with ‘genetic resources’ and traditional knowledge associated with those resources must recognize the multi-juridical nature of the Canadian legal landscape and respect Indigenous legal authority over aspects of the natural environment and its non-human entities”.*⁶⁷

⁶⁵ United Nations Development Program – Global Environmental Finance (2018) *ABS is Genetic Resources for Sustainable Development*. UNDP-GEF Sustainable Development Cluster, Bureau for Policy and Program Support. Ex. Prod. Midori Paxton. New York, USA

⁶⁶ Nichols, J. (2019). *Unsettling Canada’s Colonial Constitution: A Response to the Question of Domestic Law and the Creation of an Access and Benefit-Sharing Regime*. *Genetic Resources, Justice and Reconciliation: Canada and Global Access and Benefit Sharing*. Ed. Chidi Oguamanam. Cambridge University Press. Pages 63-79. Creative Commons Open Access <http://dx.doi.org/10.1017/9781108557122>

⁶⁷ Chartrand, L. (2019). *Applying Dene Law to Genetic Resources Access and Knowledge Issues*. *Ibid*, Pages 138-139.

For a functional legislative framework to exist in Canada for those who wish to participate in ABS, it is essential that a framework be developed by those who understand Aboriginal culture and by extension their law. Chartrand stresses the importance that in order for the new generation of lawyers to understand Indigenous legal principles, they need to appreciate that there is a constitutional distinctiveness of Indigenous societies which are rooted in an interdependence with and value of nature, which will require law schools to ground their pupils in the ‘lifeworlds’ of Indigenous Peoples.⁶⁸ Much of Indigenous law and Indigenous knowledge is unwritten and is passed down from generation to generation through ceremonies, songs, and oral narratives. Through these methods, new interpretations are meant to be made by new knowledge holders to help resolve current problems while maintaining Indigenous principals. Chartrand reveals how differently the Dene view their relationship with the natural world compared to western legal concepts. Instead of laying claim to rights over control, Chartrand relates several stories that embody Dene Law which show the extent to which the Dene have obligations to Denendeh (the Land of the People) and all life. The first law of the Dene is to ‘share everything you have’, which includes sharing with all non-human life. Control or rights to the Dene is a means to fulfill this obligation, not something that provides an exclusive benefit to humans.

“If the Dene wish to grant access to their genetic resources for profit via ABS agreements, then Dene law impose obligations in terms of how those agreements are to be crafted and understood. Researchers, industry and other stakeholders must equip themselves to meaningfully engage with Indigenous legal traditions that govern how genetic gifts are to be harvested, used and disposed of in a manner that demonstrates proper respect and ensure sustainability.”⁶⁹

While it is not expected that company CEOs, lawyers, and researchers will immediately understand and respect Indigenous Peoples’ customary laws or knowledge, by requiring genetic resource users to engage with Indigenous Peoples to obtain their free, prior and informed consent (FPIC) through mutually agreed terms (MAT) that respect their customary laws, Indigenous Peoples will have a means to ensure they meet their obligations to share benefits equitably with all life. At the same time, by having a clear outline within any ABS contract, those same organizations will have clear guidelines as to how to produce those shared benefits, forming a line of trust between the two parties.

A very wide path has been cleared for Canada to begin down the road of a “nation-to-nation” relationship with the Indigenous Peoples of Canada, which is prerequisite to any meaningful ABS policy in Canada. In the eyes of Indigenous Peoples, virtually any potential legal blockage for the federal government to meaningfully engage Indigenous Peoples has been significantly reduced, if not eliminated:

- Decades of progressive jurisprudence on the rights of the Aboriginal Peoples of Canada have reaffirmed their treaty rights and Aboriginal rights and made increasingly clear that those rights are modern, *sui generis*, and foundational to the Canadian rule of law.
- Canada has adopted the *United Nations Declaration on the Rights of Indigenous Peoples* without qualifications, as well as the *American Declaration on the Rights of Indigenous Peoples* by the Organization of American States.
- Canada accepted the final report of the Truth and Reconciliation Commission and committed to implementing its 94 Calls to Action.

⁶⁸ Ibid, Pages 141-142.

⁶⁹ Ibid. Page 150.

- Canada accepts the principle of free, prior and informed consent.
- Canada, soon after adoption of the CBD, developed its NBSAP, *Canadian Biodiversity Strategy*, which includes 7 strategic objectives specific to Indigenous Peoples, as well as the principle that biodiversity benefits should be shared.
- Canada’s guiding policy “*Principles Respecting the Government of Canada’s Relationship with Indigenous Peoples*”, clearly articulates that the government’s relationship with Indigenous Peoples goes well beyond consultation or involvement, and is to be based on recognition and respect for Indigenous Peoples’ rights, including the right to self-determination, and is to seek Indigenous Peoples’ free, prior, and informed consent, and advance towards a transformative change that will “reconcile the pre-existence of Indigenous Peoples and their rights and the assertion of sovereignty of the Crown”.
- Progressive changes have also been made to research ethics, such as the inclusion of a chapter specific to research involving Indigenous Peoples into the *Tri-Council Policy Statement – Ethical Conduct for Research Involving Humans, 2018*, applicable to the Canadian Institutes for Health Research, Natural Sciences and Engineering Research Council of Canada, and Social Sciences and Humanities Research Council, which expands the normal codes of practice to emphasize Indigenous Peoples’ rights and the paramountcy of building equitable relationships, such as through strengthening Indigenous Peoples research capacity and prioritizing research that is relevant to Indigenous Peoples’ needs.

Yet, the 2017 concluding observation report by the UN Committee on the Elimination of Racial Discrimination on Canada’s combined 21st to 23rd periodic reports (CERDS), raises considerable concerns about Canada’s follow through on commitments:

- Canada does not have a renewed national plan on the elimination of racial discrimination, since the previous plan lapsed in 2010.
- Canada has yet to develop an action plan to implement the recommendations of the Truth and Reconciliation Commission.
- Canada has not adopted the UN Declaration on the Rights of Indigenous Peoples Action Plan, nor has a legislative framework for the implementation of UNDRIP within Canada.
- Canada continues to violate the land rights of Indigenous Peoples.
- The Canadian legal system is continuing to fail Indigenous Peoples, especially women and girls.

Most telling of the current relationship between Canada and Indigenous Peoples is that the Committee warned that Canada must “end its practice of substituting costly legal challenges as post facto recourse in place of obtaining the full, prior and informed consent of Indigenous Peoples”.

Perron-Welch and Oguamanam also raise that for Indigenous Peoples movement on ABS there remains one seemingly insurmountable obstacle – the power of provincial governments.

Perhaps the most troubling dimension of the expected nation-to-nation Aboriginal engagement is the not-so-proactive involvement of provincial and territorial government in comparison to [the] federal government’s visibility on the Aboriginal and, by vicarious and potential extension, the ABS file. While the federal government’s initiative has an inspirational significance on all other tiers of government, it is important to note that the bulk of its jurisdictional leverage on Aboriginal matters is political and is radically constrained by the Indian Act. In relation to

*control and ownership of natural resources, the provinces and territories wield stronger jurisdictional influence due to s. 92A of the Constitution Act, 1867 and thus constitute the strongest site for heavy lifting on an Aboriginal-sensitive ABS policy”.*⁷⁰

Though the Government of Canada claims otherwise, Canada does not really see itself as both a genetics resource user and provider, thus skewing its actions towards fostering the development of genetic resources obtained from other countries (and increasingly through digitally sequenced information), such as through the granting of intellectual property rights, while shrugging off Indigenous Peoples’ call for an Indigenous sensitive ABS policy in Canada. The long history of the adversarial and litigative nature of securing Aboriginal Peoples rights in Canada has deeply seeded a distrust by Aboriginal Peoples towards any government action (including initial discussions on ABS). Despite government officials proclaimed sincerity in early ABS discussions, Aboriginal Peoples continue to expose ample evidence of government “sharp dealings” regarding Aboriginal Peoples rights, especially frequent government attempts to change or qualify language in order to lessen its obligations towards Aboriginal Peoples, e.g.:

- the Government of Canada uses an **exclusive definition** of Indigenous Peoples that includes 3 groups recognized by the government (First Nations, Inuit, and the Métis Nation), whereas the Constitutional terminology of Aboriginal Peoples explicitly uses an **inclusive definition** to include all of the Aboriginal Peoples in Canada, which includes off-reserve Non-Status Indian and Métis not represented by First Nations (*Indian Act* Bands) or the Métis Nation;
- the Government of Canada is actively engaged in a “distinction-based approach” in its “nation-to-nation relationship” with Indigenous Peoples, which discriminates against off-reserve Non-Status Indian and Métis peoples;
- the Government of Canada reduces the standard for free, prior and informed consent (FPIC) from the international standard ‘to obtain FPIC’ to Canada only ‘aiming to secure FPIC’ in all but the most legally strong cases of Aboriginal title lands.

Aboriginal Peoples found Canada’s initial draft of an ABS policy to have so many deficiencies regarding what is necessary for their meaningful participation that it was unworkable and could not be supported. The haphazard approach (though in some cases well intentioned by government officials) of the government to engage Aboriginal Peoples on ABS and a last-minute calling of a national meeting of Aboriginal representatives in 2010 to discuss the proposed Nagoya Protocol, only seems to have had the effect of justifying Canada’s refusal to sign the Nagoya Protocol. Canada’s 2010 lament to the other CBD Parties that it cannot sign-on to the Nagoya Protocol at that time because it lacked a national policy and framework further sows distrust and anger by Aboriginal Peoples where Canada has done almost nothing over the past decade to “enable its signature”. “Following the Protocol’s adoption and during the one-year period to sign the Protocol, budgets and human resources were significantly diminished. The result was a beclouding of earlier and genuine efforts... Canada appears to have subsequently lost interest in pursuing them seriously; after an initial burst of activity, Canada ceased significant consultations, postponed a final determination on whether or not to sign and ratify the Nagoya Protocol, and effectively relegated the ABS issue to the margins as other issues and priorities diverted staff, material resources, and political attention.”⁷¹

⁷⁰ Perron-Welch, F. & Oguamanam, C. (2019). *Implications of the Evolution of Canada’s Three Orders of Government for ABS Implementation*. Ibid. Pages 98-116.

⁷¹ Hodges, Timothy J. and Jock R. Langford (2019). *Canada and the Nagoya Protocol: Towards Implementation, In Support of Reconciliation*. Ibid, Page 28.

Canada's response to the Aichi Targets, the *2020 Biodiversity Goals and Targets for Canada*, do not reflect upon Aichi Target 16 (the operationalization of the Nagoya Protocol), nor are there any targets for Canada's adoption of the Nagoya Protocol. There is no target for the establishment of an ABS policy and other necessary structures to operationalize ABS within Canada. There are no targets to increase the protections for and sharing of traditional knowledge associated with genetic resources or ensuring that any benefits derived therefrom are shared equitably with the holders of such knowledge, such as through establishing national ABS laws to give meaning to the qualifier "subject to national legislation" in CBD Article 15.1. There are no targets to develop mechanisms to inform Indigenous Peoples about potential uses for their traditional knowledge and to inform potential users of traditional knowledge about their obligations; nor supports to develop community protocols, set minimum requirements for free, prior and informed consent (FPIC) and mutually agreed terms (MAT), or develop model contractual clauses. There are no targets to facilitate opportunities for Aboriginal Peoples and non-Aboriginal Peoples to understand each other's worldviews, customs, and laws in the context of genetic resources, associated traditional knowledge, and intellectual property rights.

*"[It] appears that the drivers of action or determinants of inaction in Canada on ABS over the past decade have predominantly been those related to concerns of certain industry and research sectors over implications for intellectual property rights and the transaction costs of introducing ABS governance in Canada. Such concerns have been amplified by the enduring misperception of Canada as solely a user of genetic resources."*⁷²

Though the proposed ABS target for the post-2020 Global Biodiversity Framework may make sense in South Africa or India, where laws and mechanisms to operationalize ABS are in place, and thus the target seeks to increase their reach and effectiveness, the measure for Canada must be aligned more toward the old Aichi Target 18 regarding the full and effective participation of Indigenous Peoples at all levels for the full integration of traditional knowledge, innovations, practices, and customary use of biodiversity. As the old saying goes "a 1,000% increase over 0 is still 0". "ABS agreements provide an opportunity to mandate compliance with Dene law through contractual obligations... they may write into ABS agreements certain provisions which bind researchers to Dene law. For instance, the Dene could negotiate non-monetary benefits on behalf of the non-human genetic resources affected by the ABS agreement... Dene law principles indicate that non-human genetic forces are equal to humans and that as such, relationships between human and non-human genetic forces must be reciprocal in nature."⁷³ This is a concept that is truly transformative to put Canada on the path towards ABS.

The open access book *Genetic Resources, Justice and Reconciliation: Canada and Global Access and Benefit Sharing*, was developed in part through the ABS Canada partnership, which includes the Maritime Aboriginal Peoples Council. Covering 14 ABS topics in 279 pages, 15 authors provide a detailed, current assessment of what is required to begin to realize movement in Canada on access & benefit sharing of genetic resources and the associated traditional knowledge of the Indigenous Peoples of Canada.

⁷² Ibid, Page 32.

⁷³ Ibid. Page 151.

PROPOSED TARGET #12: *Reform incentives, eliminating the subsidies that are most harmful for biodiversity, ensuring by 2030 that incentives, including public and private economic and regulatory incentives, are either positive or neutral for biodiversity.*

In 2016, the UN Conference on Trade and Development (UNCTAD), FAO, and the UN Environment Programme issued a joint statement that identified four minimum outcomes that could contribute to the end of harmful fisheries subsidies:⁷⁴

- Accurate, additional, practical and feasible provisions for the transparent notification of all relevant fisheries subsidies;
- Clear prohibition of subsidies that contribute to overfishing and overcapacity, including subsidies linked to illegal, unreported, and unregulated (IUU) fishing, and those that undermine sustainable development, food and nutritional security, jeopardizing the livelihoods of coastal populations;
- Adequate and appropriate instruments and tools to deter introduction of new harmful subsidies; and
- Special attention and treatment to developing countries, in particular, the least developed ones and Small Islands Development States (SIDS), so that they can continue to use their marine resources sustainably.

The 2018 Living Planet Report described exploitation as the biggest driver of biodiversity decline in fishes, followed closely by habitat loss or degradation – it is clear that capacity-enhancing fisheries subsidies must be eliminated.⁷⁵ Over half of the estimated fisheries subsidies go toward enhancing capacity (more than \$20 billion of the estimated \$35 billion USD) and the greatest contribution of those are fuel subsidies.⁷⁶ There has been positive progress in the fight against harmful fisheries subsidies; for example, the World Trade Organization (WTO) through the Buenos Aires Ministerial Decision, 2017 decided to adopt an agreement that would prohibit certain forms of fisheries subsidies that contribute to overcapacity and overfishing and eliminate subsidies that contribute to illegal, unreported, and unregulated fishing (recognizing special/differential treatment for developing countries).⁷⁷ The WTO is continuing negotiations with officials to respond to two proposals which will help to inform the first iteration of the consolidated text for the prohibition of harmful subsidies.⁷⁸

⁷⁴ UNCTAD-FAO-UNEP. Joint Statement. *Regulating fisheries subsidies must be an integral part of the implementation of the 2030 sustainable development agenda*. Fourteenth session of the United Nations Conference on Trade and Development, Nairobi, Kenya, 20 July 2016.

⁷⁵ WWF. (2018). *Living Planet Report – 2018: Aiming Higher*. Grooten, M and Almond, R.E.A. (Eds). WWF, Gland, Switzerland. Retrieved from https://wwf.panda.org/knowledge_hub/all_publications/living_planet_report_2018/

⁷⁶ Sumaila, U.R., Ebrahim, N., Schuhbauer, A., Skerritt, D., Li, Y., Sik Kim, H., Mallory, T.G., Lam, V.W.L., & Pauly, D. (2019). Updated estimates and analysis of global fisheries subsidies. *Marine Policy*, 109, 103695. <https://doi.org/10.1016/j.marpol.2019.103695>

⁷⁷ WTO. (2017). Fisheries Subsidies: Ministerial Decision of 13 December 2017. WT/MIN(17)/64. Retrieved from https://www.wto.org/english/tratop_e/rulesneg_e/fish_e/fish_e.htm

⁷⁸ WTO. (2020, March 23). *WTO members aim to keep up momentum in fisheries subsidies negotiations*. Retrieved from https://www.wto.org/english/news_e/news20_e/fish_23mar20_e.htm

Canada, and North America in general (as well as the Oceanic region), largely provide “beneficial” subsidies (those that “can be considered investments in the promotion of fishery resource conservation and management”; in contrast, most subsidies provided by other countries were categorized as capacity-enhancing.⁷⁹ For example, one of Canada’s most commonly used subsidies is that which permits self-employed fishers to be eligible for unemployment insurance benefits, which allows for the maintenance of a consistent work force from experienced harvesters when a fishery closes (be it from reaching quota or ordinary season closures). Sumaila et al. also describes an additional category as “ambiguous”, which are subsidies that could result in positive management outcomes or overexploitation depending on the delivery. In order to get a better grasp on eliminating the harmful subsidies, clarifying those that are ambiguous will be a necessary step as there is often a penchant for decision-makers to “not stick their necks out” by wording policies and strategies in such a way to give them wiggle room or an out or so the hard decisions of institutional or cultural change are left to others down the road.

Since 2009, tax exemption subsidies have experienced the largest increase, globally increasing by \$4.1 billion USD, but more positively, those in support of marine protected areas have also increased by \$0.9 billion USD.⁸⁰ As the world moves toward a shift in how fisheries subsidies are allocated, it may be useful to consider incentivizing the direct change from capacity-enhancing subsidies to those in support of biodiversity conservation, preservation, or restoration. The infamous Northern cod (*Gadus morhua*) collapse resulted in Canada establishing several programs to help fish harvesters and adjacent industries transition out of the fishery through training and the buying back of licences; however, rather than resulting in a decrease in fishermen, the monies largely went toward income assistance which left long-time fishermen with short term support rather than additional skills development.⁸¹ Using the above example, it is evident that caution must be exercised to ensure that the anticipated results align with the actual results and are likely to result in decreased pressure on the resource and ecosystem as a whole.

⁷⁹ Sumaila, U.R. et al. (2019). Updated estimates and analysis of global fisheries subsidies. *Marine Policy*, 109, 103695

⁸⁰ Ibid.

⁸¹ FAO. (n.d.). *Subsidies and Fisheries*. FAO. Retrieved from <http://www.fao.org/3/Y4647E/y4647e06.htm>

PROPOSED TARGET #13: *Integrate biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts, ensuring by 2030 that biodiversity values are mainstreamed across all sectors and that biodiversity-inclusive strategic environmental assessments and environmental impact assessments are comprehensively applied.*

It is critical that biodiversity values be known, integrated, and respected among all sectors of national and local planning and development processes. Biodiversity is often overlooked or undervalued in economic models of a free market economy, such as Canada, while in fact, biodiversity is essential for the environment and for sustaining human health and welfare. Cleaning air and water, controlling natural hazards, carbon sequestration, regulating temperatures and providing food security can only be achieved in an equitable way through the maintenance of healthy diverse ecosystems. Article 6 of the CBD requires States to develop strategies and take actions to integrate the other Articles of the Convention throughout all sectors and cross-sectorial processes. Mainstreaming the CBD throughout national and local planning and integrating biodiversity values into national and sub-national laws are the lynchpins that take the CBD beyond an aspiration document for a better future and brings it within the jurisdiction and laws of Parties.

Biodiversity conservation, sustainable use, and equitable sharing of benefits has always been problematic to implement in Canada. This is largely due to the fact that Canada is a federation of colonies turned provinces, with Crown-Indian treaty alliances, using a legal and political system built upon compromise to maintain a balance of power among the provinces and federal government and to carefully guard the resource-based economy to extract the natural wealth of Canada, most often in violation of Indian treaties. While Canada, led by the federal government, was the first industrialized State to sign the CBD, and ratification followed soon after, the management responsibility for natural resources and public lands, as well as most authorities for issuing industrial permits, approving environmental impact assessments, education, establishment of municipalities, and laws over property rights all rest exclusively with the provinces. This leaves Canada's signature (the federal government) with little room to actually implement the CBD other than to try to persuade or entice the provinces to contribute.

In 1995, a federal/provincial/territorial working group produced the *Canadian Biodiversity Strategy* (CBS) as Canada's initial required response to show that implementation of the CBD was occurring within the country. The strategy promised to "enhance coordination of national efforts aimed at the conservation of biodiversity and the sustainable use of biological resources", in addition to its intention to "invite and encourage all Canadians to take action in its support".⁸² From an Indigenous Peoples' point of view, the CBS is deeply flawed in that it has not been integrated into the laws and processes of the provincial jurisdictions, and in particular does not involve Indigenous Peoples in its implementation. Despite words inviting participation, little has been done over the past 25 years to support Indigenous communities and to develop an approach for implementing the Convention (7.1), encourage the development of an Indigenous community analysis of the Convention (7.2), develop joint mechanisms for sharing traditional knowledge (7.3), jurisdictional reporting on the implementation of the Strategy (6.2), and jurisdictional mechanisms for Indigenous Peoples and others involvement in the implementation of the Strategy (6.3).

⁸² Minister of Supply and Services Canada (1995). *Canadian biodiversity strategy: Canada's response to the Convention on Biological Diversity*. Environment Canada: Hull, Québec.

Although progress on the CBS has been slow, it has produced some cross-sectoral initiatives including Canada's *Species at Risk Act, 2002* and *National Accord for the Protection of Species at Risk, 1996*, which work to have cooperation between federal, provincial and territorial governments to protect wildlife species at risk nationally. Nationally enforced and policed legislative changes have played the key role in the success of SARA for some species, yet for those harmed by commercial activities, e.g., by-catch in marine fisheries, the government refuses the protections afforded by SARA. Similarly, in 2004, Canada produced the *Invasive Alien Species Strategy for Canada*, a strategy that aimed to strengthen the cooperation among jurisdictions and regions to respond to and manage invasive species and their environmental impacts, yet progress remains elusive where jurisdictions do not want to impede trade or economic activities which are potential pathways for invasive species.

The importance of including biodiversity strategies into environmental planning and assessments cannot be understated. With the current primary threat to biodiversity being habitat loss due to human activity, it is crucial that biodiversity concerns are prioritized during planning and development processes. Conservation-based, biodiversity-inclusive management approaches are necessary in assessing and limiting the threats to biodiversity and to create action plans to mitigate current threats. For example, to mitigate the impacts of highway traffic on wildlife in Banff National Park, Parks Canada has built wildlife-exclusive overpasses that allow animals to safely travel over the highways without risk. In addition to reducing the direct threat of human-wildlife conflicts, this alternative ecosystem-based management approach contributes to increased biodiversity as studies have shown that the increased movement across the otherwise challenging barrier restores some gene flow within species.⁸³

According to Canada's new *Impact Assessment Act, 2019* (IAA) when proposing an activity that may have adverse effects on the surrounding area, an environmental assessment must be undertaken to identify the risks to the environment. As detailed in the IAA, the "environment" means the components of the Earth including:

- (a) Land, water and air, including all layers of the atmosphere;
- (b) All organic and inorganic matter and living organisms; and
- (c) The interacting natural systems that include components referred to in paragraphs (a) and (b).⁸⁴

While conceivably the definition covers biodiversity, there needs to be a more definitive addition of biodiversity protection into the legislation and in development planning to ensure that all aspects of biodiversity (genetics, species, ecosystems) are considered and protected. Environmental assessments must be meaningful in that they consider ecological integrity, chain-reaction events when even the smallest of organisms are impacted, multiple stressors, and long-term impacts. This process also needs to be regulated and implemented amongst regional and provincial levels.

⁸³ Sawaya, M. A., Kalinowski, S. T., & Clevenger, A. P. (2014). Genetic connectivity for two bear species at wildlife crossing structures in Banff National Park. *Proceedings. Biological sciences*, 281(1780). <https://doi.org/10.1098/rspb.2013.1705>

⁸⁴ Impact Assessment Act, SC 2019, c. 28, s. 1.

In Canada, there is often jurisdictional battles as to who should oversee and approve an environmental assessment, and often development proponents will design projects so as not to trigger a legislative requirement of an environmental assessment or for reduced requirements, even splitting up projects into multiple separate phases so as not to trigger higher levels of accountability, which would be required for one large project. Disregarding local activities that are too small to trigger a provincial or federal environmental assessment has led to cumulative effects that have slowly degraded biodiversity.

The question is increasingly being asked, who pays for the remediation of past impacts? The existing projects that already have their legal approvals? The new projects that did not create the problem? The public, many of whom see conservation and restoration as an increasing burden competing for precious resources that are directed away from health care, schooling, etc? Canada does not have a good model for assessing the multitude of impacts from small local projects, beyond the Harmful Alteration, Disturbance, or Destruction (HADD) provisions of the *Fisheries Act*, which requires any proposed works, undertaking, or activity on or adjacent to water be assessed for impacts to the surrounding environment and that those impacts be avoided, mitigated, or off-set through the restoration of a comparable near-by area. The HADD policy has skirted the issue of cumulative effects by, at most, asking project proponents to restore nearby habitats that are comparable to what will be impacted by their project in a ratio of at least 1:1 of area or biodiversity value.

PROPOSED TARGET #14: *Reform economic sectors towards sustainable practices, including along their national and transnational supply chains, achieving by 2030 a reduction of at least [50%] in negative impacts on biodiversity.*

Given the loftiness of Target 14, coupled with the current economic paradigm, it is unlikely that this target will succeed by 2030 unless drastic measures are taken. Considering that the economic sectors constitute the majority of direct and indirect impacts on biodiversity, this target must challenge humanity as its success or failure will have significant impacts on other targets in the Post-2020 Global Biodiversity Framework. **Changes in consumption, how industry facilitates or impedes progress on the Framework, and how humankind defines progress, quality of life, and the value of life are the guiding questions for *transformative change* sought through the framework.**

It is important that this target includes all economic sectors and that implementation efforts are multifaceted to draw up strategies for each sector, sub-sector, and individual businesses with those sectors, which are clearly linked to others along the supply chain so that business leaders can see their and other's biodiversity impacts. Primary (raw materials), secondary (finished goods), tertiary (service sector), and quaternary (intellectual services) all have varying impacts and intensities and could all undertake substantial reforms towards more sustainable practices. To be effective, the approach must be broad to encompass the whole supply chain, the entire life of products, and the movement of capital so that efforts in one area are not undermined by another.

The approach must also be specific to individual companies, shareholders, and customers so that there is a tangible ownership of the target and the business model incorporates customer values. The classical Friedman doctrine holds that a company's responsibility is to its shareholders. That has long been assumed to mean that profit maximization is the goal of companies, but there are many companies that have failed using that model and many others that contribute greatly to society without focusing on maximized profits, including the rise in the number of B Corporations, sustainability certification systems, and socially responsibility investment funds. While a company needs to be profitable in order to continue operations, shareholders are a means, not an end to success and the primary goal is meeting the needs of a customer, and by extension society. Naturally, the inclination will be to seek to reform the economic sectors that are the biggest contributors to biodiversity loss, most often the primary and secondary sectors such as resource extraction, energy production and transportation. Though, it can be argued, and must be taken into consideration, that the primary and secondary sectors are responding to the needs and wants of consumers, including the service sectors, and the movement of capital which is facilitated by the service sectors and intellectual sectors.

While this target will be construed and implemented differently in each country depending on circumstances, it is important that it results in tangible outcomes at the level of primary and secondary sectors, whether the actions to achieve those come from primary/secondary sectors or the tertiary/quaternary sectors. Implementing sector-specific national and subnational regulations and effective enforcement are strong starting points towards reforming sectors to adopt more sustainable practices. Policies, incentivized programs and certification and performance standards are all potential tools to help reform economic sectors. The *Summary for Policymakers of the IPBES Global Assessment Report on Biodiversity and Ecosystem Services* states that "a key component of sustainable pathways is the evolution of global financial and economic systems to build a global sustainable economy, steering away from the

current, limited paradigm of economic growth”.⁸⁵ The IPBES also stresses the need for *transformative change* through adaptive governance approaches, multi-sectoral planning, and strategic policies to transform sectors at local, national and global levels. While Parties may be hesitant in adopting reformative policies due to fear of or the inability to commit financially, it is imperative that the focus be shifted from economic growth to *living in harmony with nature* and reducing negative environmental impacts.

While educating the consumer on sustainable products and practices is wise, it is not solely enough to change the market. While products can be labelled with certain performance standards detailing their environmental and social principles, unless there is regulatory and policy changes to facilitate accessibility to biodiversity friendly products and services, including a comparable cost to those which are not biodiversity friendly, consumers will lack motivation and/or the financial ability to choose the more sustainable options. For this reason, Parties should be encouraged to ban or disincentivize products and practices that threaten biodiversity, rather than trust that consumers on their own will make the sustainable choices and boycott unsustainable products and services – an idealistic option that is more or less a myth. For example, in order to protect freshwater and marine ecosystems, in 2018, the Canadian government placed a ban on manufacturing, importing and selling toiletry products in Canada that contain plastic microbeads.⁸⁶ After being flushed down the drain, microbeads contribute to plastic pollution in fresh and marine water systems. With the strict ban detailed in the *Microbeads in Toiletries Regulations*, the Government of Canada has proven that it is capable of banning products that have a direct impact on ecosystems. Therefore, there is no reason that Canada cannot instill additional bans on biodiversity-destructive products, forcing economic sectors to develop more sustainable products in response.

Recognizing the ecological footprint of different economic sectors and industries will be key to prioritizing actions needed for this target. While it would be difficult, if not impossible, for governments to directly reform all sectors, especially given jurisdictional levels and divisions of powers, governments will need to be selective in their actions to target the worst offenders contributing to biodiversity loss, thus showing commitment to the targets, which should encourage change throughout all sectors. Globally in 2010, transportation was the fourth biggest contributor to global warming through air pollution and greenhouse gases.⁸⁷ The recent development of electric and hybrid cars has the potential to reduce fossil fuels burned and greatly decrease the need for gasoline and diesel, mitigating factors contributing to global warming. Studies have shown that electric, or green-technology, cars produce drastically fewer pollution emissions over their lifetime opposed to those with internal combustion engines.⁸⁸

⁸⁵ Díaz, S., Settele, J., Brondízio, E., Ngo, H., & Guèze, M. (2019). *Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. IPBES secretariat, Bonn, Germany. 56 pages. <https://doi.org/10.5281/zenodo.3553579>

⁸⁶ *Microbeads in Toiletries Regulations*, SOR/2017-111.

⁸⁷ IPCC. (2014): *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C.Minx (Eds.). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA

⁸⁸ Wilson, L. (2013). *Shades of Green: Electric Cars' Carbon Emissions around the Globe*. pp. 1–28. Retrieved from <https://trid.trb.org/view/1246039>

In an effort to encourage consumers to make more sustainable choices, the Government of Canada and several provinces have instated rebate incentives, up to \$5,000 CAD to encourage the purchasing of green-technology vehicles.⁸⁹ While the costs for electric vehicles has dropped by 85% since 2010,⁹⁰ the cost of a new vehicle is still very high and, in many cases, out of reach of those who would most benefit. The government should consider low interest rate loans or partnership with manufacturers and retailers to subsidize the cost to make these vehicles more financially attractive to consumers, particularly lower income individuals. Canada has an ambitious set of targets of 10% electric vehicles sales by 2025, 30% by 2030, and 100% by 2040. Considering that emissions from transportation make up one quarter of Canada's carbon emissions, meeting the electric vehicle target could take a sizable chunk out of the 77 megatons shortfall between Canada's carbon target and current projected emissions for 2030. Norway saw 52% of new car sales in 2017 being electric and in 2020 just under 60% are fully electric and a further 15% are hybrids. The surge has been attributed in large part to generous tax breaks, free or subsidized parking, tolls and charging, and special privileges, such as using the bus lane on the highway. It makes more financial sense to own an electric vehicle rather than a gasoline or diesel vehicle for many Norwegians.^{91,92} With Parties taking strict regulatory approaches in addition to incentivizing programmes, biodiversity stands to benefit greatly as the world moves towards more sustainable economic sectors.

Generally speaking, present-day supply chains are built upon getting customers their product as quickly as possible, for as little money as possible; they do not currently consider impacts on biodiversity. Recently, green initiatives are becoming increasingly streamlined; but still, current operations focus on transportation method, transit time, and total cost including fuel and carriers hired. Instead, there needs to be an emphasis on selectively choosing partners throughout the supply chain to develop sustainable practices, or *green supply chains* with reduced negative impacts on biodiversity and the environment as a whole. Companies should seek partners with sustainability performance standards that help contribute to their own environmental commitments. Green supply chains integrate environmentally friendly concepts into all levels of the supply chain: purchasing, distribution, transportation, manufacturing and disposal. Many companies fail to see the benefit in green supply chains and instead see it as an added burden or cost to source, manufacture and distribute a product. However, after possible initial or implementation costs, the benefits of a sustainable, green supply chain can increase efficiency in the use of energy, natural resources and material needed in addition to reducing environmental impacts. For instance, by minimizing waste during the packaging process, less money will be spent on materials and disposal costs. The World Economic Forum suggests that companies that consider profitability, social awareness and environmental goals can see supply chain cost reductions of 9-16% while increasing revenue by 5-20%.⁹³

⁸⁹ *EV Incentives*. (n.d). Electric Mobility Canada. Retrieved from: <https://emc-mec.ca/ev-101/ev-incentives/>

⁹⁰ Huges, J. (2018, March 22). *Electric Cars May Be Cheaper Than Gas Guzzlers in Seven Years*. Bloomberg. Retrieved from: www.bloomberg.com/news/articles/2018-03-22/electric-cars-may-be-cheaper-than-gas-guzzlers-in-seven-years

⁹¹ Knudsen, C. & Doyle, A. (2018, January 3). *EVs, hybrids are more than half of new car sales in Norway*. Autoblog. Retrieved from: <https://www.autoblog.com/2018/01/03/ev-hybrid-car-sales-norway/>

⁹² Henley, J. & Ulven, E. (2020, April 19). *Norway and the A-ha moment that made electric cars the answer*. The Guardian. Retrieved from: www.theguardian.com/environment/2020/apr/19/norway-and-the-a-ha-moment-that-made-electric-cars-the-answer

⁹³ World Economic Forum. (2015). *Beyond Supply Chains: Empowering Responsible Value Chains*. Geneva

Though short-lived, Canada recently launched a Green Freight Assessment Program to help on-road freight carriers reduce their environmental footprint. This program aimed to assess a company's operations, seek environmental deficiencies and provide recommendations in areas that could be improved to help reduce greenhouse gas emissions and operate more sustainably. This mainly included suggesting better route and load planning and the implementation of fuel-reducing technology. Natural Resources Canada contributed up to \$10,000 CAD per assessment and up to \$100,000 CAD to help the implementation of fuel saving technology. While this program aimed to help offset the upfront cost and risk of implementing changes, there was an evident deficit in funding. While this may be a start for small-scale trucking operations, this funding is insufficient to make effective change in larger national companies, those producing the most emissions.

Then lies the question as to who is to assume the responsibility, role and cost of making sustainable changes? Throughout all levels of the economic sectors, companies will be hesitant to do so voluntarily due to the financial hurdles and risks involved in modifying or changing their current operations. If sustainable performance standards and practices become mandatory and enforced, it will require subsidies and assistance from the government to protect the financial stability of companies nationally. Along national and transnational supply chains, there needs to be a concerted effort between Parties to develop partnerships and work together in achieving this goal globally, as it will involve a significant number of actors. Supply chains are constantly changing to find cost-cutting solutions and faster production to customer timelines. Utilizing regulations and strategies, as well as strategic enforcement, governments need to send strong signals about national priorities, which includes a safe and enticing investment climate in order to achieve a much sought after, but often elusive paradigm change.

PROPOSED TARGET #15: *Resources, including capacity-building, for implementing the framework have increased from all sources so that by 2030 resources have increased by [X%] and are commensurate with the ambition of the targets of the framework.*

Direct dedicated funding to advance the objectives of the CBD at all levels, including dedicated resources for capacity-building, continues to be the single largest hurdle, particularly where conservation is viewed as a cost or hindrance toward economic development and land ownership. These could include needing to purchase land or land-rights in order to protect an area, needing to overcome financial resistance because revenues from natural resources extraction are already leveraged far into the future, or because adequate stewardship is generally costly without producing any tangible economic wealth and is thus generally treated as a loss on the ledgers of the national GDP or those who donate time or materials. The majority of resources counted towards the implementation of the CBD are charitable in nature or something States should do to remain in good standing with their citizens, trading partners, and the UN. Those resources come about despite (not because of) the considerable pressure and flow of consumerism, markets, and the movement and employment of capital to produce economic wealth.

Despite the growing alarm about the environmental disaster time-bomb, capacity, unless volunteer-based, remains largely tied to specific pots of directed funding resources, the vast majority of which is spent on specific, immediately measurable results, not tied into long-term objectives or addressing root causes. The volunteer base has diminished in many areas commensurate to an increasing economic gap, leaving more and more households in a situation where they simply cannot afford the money, time, or effort to take on something as challenging as “saving the world”. While many still engage in conservation, sustainable use, and equitable benefit sharing in their personal daily lives, many personal efforts go unrecognized and are generally at a cost to themselves or places them at an economic disadvantage, e.g., the sustainable choice is usually the more expensive option to the consumer. Thus, the prevailing economic “natural selection” is inherently counter to the objectives of the CBD. It is in this light there is objection towards “throwing money” at conservation, while continuing to allow destructive practices and a destructive worldview which drives the major economies.

Public education regarding the importance of biodiversity conservation, sustainable use, and equitable benefit sharing remains very low in developed countries, despite the global realization that humanity is perpetuating a mass extinction event and that the biodiversity crisis is at least as great, if not greater, than the global climate crisis. From experience, MAPC has found that funds diverted toward biodiversity education removes that money from projects for direct conservation, leaving the conservation community arguing amongst itself whether more funding should be put towards education in order to change the philosophy and values of individuals (i.e., addressing the root cause of biodiversity loss). Others may argue that at this point, in the midst of a global biodiversity crisis and mass extinction, one simply cannot wait for generational changes and instead the focus should be on immediate tangible results. There is also the prevailing view among many that no amount of education will change the operations of big business, who are the immediate direct perpetrators of much of the biodiversity destruction seen throughout modern history. This destruction continues to this day and some have suggested that only “charging for destruction” will make any tangible difference. Yet, the global market economy is much more complex than simply penalizing one product or company or trusting that individual consumers can and will make well-informed choices for biodiversity. Clearly, building capacity will need to be a multifaceted and concerted endeavor to build awareness and education, re-evaluate human values and how people ascribe worth, redistribute large sums of resources to address the root causes for biodiversity loss, and to tap into and build the potential of each person.

As a starting point for capacity building, it would be advantageous for each Party to the CBD to have a requirement that biodiversity be a part of the curriculums for children and young adults throughout their schooling. As a similar example, the benefits of STEM (science, technology, engineering, and math) programs aimed at girls and young women are beginning to become apparent, which are changing the attitudes and culture towards their acceptance in those traditionally male-dominated fields and are additionally seeing large benefits to women, as well as benefits in their respective fields of work and in all areas of life and society at large. Similarly, schools can be the thrust for the transformative change desperately needed to begin working towards the path of *living in harmony with nature*. Mainstreaming biodiversity and the objective of the CBD within school curriculums, would be negligible in cost if applied to existing programs (e.g., solving conservation-based problems in math class, mapping pollution in geography class, or exploring the functions and interconnections in nature through art projects). In essence, every class would be, in some way, about nature, not limited to one hour a day in biology class. Aside from the benefits of a general education about the natural world through all the senses and areas of instruction, the biological sciences themselves would greatly benefit as the technical material would become much more relatable and enticing for students, thus greatly increasing the human-capacity to meet biodiversity objectives and targets regardless of a person's chosen profession or further areas of study.

Although the ideal vision is for conservation, sustainable use, and equitable benefit sharing to be the norm, to the point that it is intrinsic or unspoken, humankind, particularly in the developed world, is a long way off from *living in harmony with nature*. The path for the foreseeable future will include more destructive activities but must address those the moment they arise or before, versus continually using restoration projects in a never-ending chase of biodiversity destruction. There is a growing call for “off-setting projects” that seek to quantify the impacts of a project or activity before it starts and then design a restoration project for the purposes of enhancing a separate area so that the benefits of the later compensate or off-set the impacts of the former. These off-setting projects are to be supported, as a condition of permit approval, by the perpetrator of the expected harm. While this should be an obvious requirement for anyone who is conscious of the limited resources and balance of ecosystem functioning on Mother Earth, it is vital to remember that a “one for one” off-set or replacement at best maintains the current situation. Cumulative effects, historic loss, and many hidden or inadvertent impacts will continue to drive biodiversity loss, despite well intentioned off-setting projects. As such, any activities resulting in biodiversity loss should be required to undertake or support activities for additional conservation efforts, including financial supports towards education, protected areas, and other efforts not directly related to the off-setting of the direct, immediate impacts of the project.

Canada has some good examples of how off-setting or “polluter pays” principles can be applied, such as the Harmful Alteration, Disturbance, or Destruction policy under Canada's *Fisheries Act* and the new carbon pricing scheme under the *Pan-Canadian Framework on Clean Growth and Climate Change*. By charging a realistic value to damage a habitat, those who would economically benefit from the habitat destruction would be responsible for the restoration rather than shirking the cost to taxpayers and future generations.

In areas where an alteration, disturbance, or destruction of a habitat will occur it is vital to determine the value of what will be lost, even if the loss is temporary, so that an appropriate “conservation tax” or surcharge can be applied in order to compensate for what is lost. The more ecologically damaging the practice, the higher the tax rate should be (e.g., selective cutting vs. clear cutting or beam trawl vs. trolling). By having a sliding taxation rate, informed by a proper evaluation of the biodiversity and ecosystem services, a much fairer system of taxes, royalties, licencing, leasing, and permitting can be employed – one

which is more fair toward Mother Earth and which is also more fair to humankind, where there currently exists a great inhuman disparity between the rich living in healthy environments and the poor living in damaged environments.

Not only would a fair system of conservation taxes entice more sustainable practices and discourage unsustainable ones, funds could be applied directly towards building conservation/restoration capacity, education, and directed at larger conservation efforts within the country of origin, preferably at the local level in the same habitat area (i.e., fish tax for marine conservation). These funds will not only help efforts towards conservation but could also create jobs in rural and economically depressed areas for conservation work – offsetting the local costs of lost revenues with local economic gains from increased conservation capacity.

One area where a considerable amount of resources can be raised and which can be directly applied to on-the-ground conservation and restoration efforts, as well as significantly contribute to advancement of the UNDP Sustainable Development Goals and the implementation of the UNDRIP is through equitable sharing of the benefits arising out of the use of resources. The CBD *Nagoya Protocol* is one avenue with considerable importance going into the future as the world seeks more genetic resources for medicine, agriculture, industrial chemicals, cosmetics, foodstuffs, and more. While vital for building capacity and resources for the implementation of the CBD, it is also important to remember that the access & benefit sharing provisions were a negotiated compromise and that full implementation requires a more equitable sharing of all the benefits arising out of the use of biodiversity in all its forms. These forms include: species and ecosystems, and including equitable sharing of incentives, research, training, public education and awareness, technology, the exchange of information, technical and scientific cooperation, distribution of biotechnology, and intellectual property rights. Progress towards this target should include measures of direct and indirect resource mobilization, as well as the impacts of those monies and efforts.

The goal of increasing resources, including capacity, commensurate with the ambition of the biodiversity targets and vision of *living in harmony with nature* needs to be multipronged. Just taxing to raise monies for implementation or to make harmful practices too costly is not enough as those costs will inevitably be passed down to the consumer, whom in the developed world may not see or value the benefit and whom in the developing world or Indigenous Peoples cannot bear the increased cost. A robust target for increasing resources hinges on education, fair and realistic valuing of biodiversity and ecosystem services, and ensuring that benefits flow back to the persons and communities most affected.

PROPOSED TARGET #16: *Establish and implement measures in all countries by 2030 to prevent potential adverse impacts of biotechnology on biodiversity.*

While the advancement of biotechnology has increased economic development for some and provided substantial benefits to human health in some cases, there are many other instances where biotechnology has had negative impacts or has provided benefits to some at the cost of impacts to others, including unquantified impacts to ecosystems. Preventing adverse impacts of biotechnology was raised as one of the most pressing issues during negotiations throughout the CBD, resulting in further negotiation of the *Cartagena Protocol on Biosafety*. Since the majority of biotechnology is used to modify genetic materials, creating living modified organisms (LMOs), including genetically modified organisms (GMOs), for some proposed human benefit or consumption, such as pharmaceuticals, crops and livestock, foremost, this necessitates the need to also seek out and promote the creation of new knowledge in order to fully assess the true benefits and costs to humankind and the environment. Even if the end product of biotechnology (LMO/GMO) has a direct benefit, it can have indirect or cumulative adverse effects if not carefully engineered, handled, distributed, and introduced into the environment following strict protocols. While the *Cartagena Protocol* prescribes mechanisms for notification, risk assessment/management, and handling of LMOs, and through its *Nagoya – Kuala Lumpur Supplementary Protocol*, requires States to establish processes to identify and evaluate damages arising from the use of LMOs and to require redress; however, there is no concrete enforcement mechanism within the CBD that compels Parties to adopt and implement all measures. To achieve this target, Parties should develop stronger standards and regulatory frameworks by 2025 to have full implementation by 2030.

As global populations rise, and additionally the growing need for advancement on Sustainable Development Goals, e.g., to end hunger, improve nutrition, and halt land degradation, there is an unavoidable demand for increased food production without clearing more land. Increased use of biotechnology, particularly in the agricultural sector, is continually promoted as producing higher yields and incomes for farmers. However, it is important to recognize the growing evidence of reduced agrobiodiversity, increased environmental contamination, questionable animal welfare, and growing concerns over food safety.

In 2014, the United States – the world’s largest producer of genetically modified crops, used GMO seeds for 90% of corn, soybeans and cotton grown in the country.⁹⁴ A 2008 report by the ETC Group found that the 10 largest seed companies in the world had, since the mid-20th century, acquired intellectual property rights ownership over two-thirds of commercially grown seed. The top three companies owned almost half.

The use of biotechnology to create and patent LMOs (which now accounts for the majority of commercial seed production), and the tremendous vertical integration of agri-business, which also has the top seed companies in a controlling interest of other agricultural inputs, e.g., Roundup Ready seed varieties, raises great concern regarding food security.⁹⁵ Unconscionable is the growing number of people living in food insecurity, while the profits of the top agri-business companies soar. Recent years has witness further amalgamation of these companies, e.g., Bayer-Monsanto and DowDuPont.

⁹⁴ Fernandez-Cornejo, J., Wechsler, S., Livingston, M., Mitchell, L. (2014). *Genetically Engineered Crops in the United States*. Economic Research Report ERR-162. U.S. Department of Agriculture, Washington, DC.

⁹⁵ ETC Group. (2008). *Who Owns Nature? Corporate Power and the Final Frontier in the Commodification of Life*. *Communique*, #100. Ottawa: ETC Group.

There is also an increase in the use of biotechnology to produce GM animal products that cut production costs, shorten market time and create a more profitable market product. The Canadian company AquaBounty, has now begun to genetically modify Atlantic salmon (*Salmo salar*) at a facility located in Prince Edward Island, Canada, and are set to harvest Canada's first GM salmon in early 2021, which if not for delays from a court challenge would have also been the first GM animal in the world for human consumption. Through the introduction of a growth hormone gene from chinook salmon (*Oncorhynchus tshawytscha*) and genetic material from ocean pout (*Zoarces americanus*), they are able to produce market sized fish in 18 months opposed to current market time of three years (AquaAdvantage salmon). This accelerated growth allows them to use 25% less feed (derived from wild fish stocks) than average farmed salmon, and leads to higher production rates. Using less wild derived feed can reduce pressures on wild fish stocks; however, there is well documented and reasonable concern of farmed fish being released into Canadian waters unintentionally via transportation methods or weather incidents, especially if the facility is near an estuary. Scientists from the Department of Fisheries and Oceans Canada have confirmed that if GM salmon were to potentially spawn with native populations, the results will be catastrophic for to the evolutionary genes of native Atlantic salmon,⁹⁶ of which several populations are classified as endangered or threatened and one population of which is protected under the federal *Species at Risk Act*. Also, in 2014, the Government of Panama fined AquaBounty for breaches to numerous environmental laws during its research and development of the GM salmon – eggs that were shipped from Canada.

In Canada, court challenges have been raised that questioned the adequacy and veracity of the science used to support Canada's approval of AquaAdvantage salmon, as well as raising several issues with the process and lack of transparency which produced the government's decision.⁹⁷

In Canada, the federal ministries of Environment and Climate Change Canada and Health Canada share responsibility for approving GMOs; however, there remains no regulatory framework for the unique situation of GMOs, relying instead on a "Significant New Activity" (SNAc) process designed for the management of chemicals in Canada. In the case of AquaAdvantage salmon, the Ministers waived some requirements for AquaBounty to provide data on the environmental impacts of AquaAdvantage salmon, despite expert review by the federal Department of Fisheries and Oceans which characterized AquaAdvantage salmon as posing a "high with reasonable uncertainty" environmental hazard. Thus, a SNAc process to approve a limited production of GM eggs at one contained facility for export purposes only, was hi-jacked to the result that AquaAdvantage salmon can be grown-out at any facility in Canada that meets a general list of containment criteria. While the Ministers in their decision required that AquaAdvantage salmon be contained in land-based systems to avoid potential environmental impacts of more commonly used open-net pen systems (e.g., escapes, algal blooms, biowaste accumulation, and the distribution of pathogens), the appellants and many others argued that does not mean that potential environmental contamination can be dismissed. In 2017, the Federal Court of Appeals upheld the decision on the grounds that the SNAc process had been followed and, that while the Ministers' decision

⁹⁶ Devlin, R.H. et al. (2015). Assessing ecological and evolutionary consequences of growth-accelerated genetically engineered fishes. *Bioscience*, 65, pp. 685-700.

⁹⁷ Canada, Federal Court of Appeal, Memorandum of Fact and Law of the Appellants Ecology Action Centre and Living Oceans Society, in the case of Ecology Action Centre and Living Oceans Society v. Minister of Environment and Climate Change, Minister of Health, and AquaBounty Canada Ltd., (2016). Court File No. A-37-16.

significantly expanded the use of AquaAdvantage salmon beyond AquaBounty's SNAc notification (and the expert review processes), it was within the Ministers' discretion to do so.⁹⁸

The final decision regarding safety for human consumption rests with Health Canada to examine development methods, nutritional profile and toxicity levels before GMOs can be placed on the marketplace. However, there are still concerns regarding Health Canada's reliance on proponent produced data and conclusions, small sample sizes, questionable scientific methods, and lack of independent peer review. Additionally, there are concerns from scientists about the use of the IGF-1 hormone which is used to quickly grow out AquaAdvantage salmon, as it has numerous links to various cancers.⁹⁹ Another concern is the lack of regulations for the labelling of GM products in Canada. To date, Health Canada has approved over 140 GM foods for consumption, yet there are currently no laws in Canada that require GM foods to be labelled differently to indicate their method of production. According to a poll in 2015 from the Canadian Biotechnology Action Network (CBAN), 45% of Canadians said they would not eat GM salmon; only 11% said they would; and 88% of people surveyed said they want a mandatory labelling of all GM foods,¹⁰⁰ yet Canada has failed to respond and remains, along with the U.S and Mexico, the only major countries not to have any mandatory labelling laws for GMO in food.

When utilizing biotechnology, States are to take a precautionary approach, as is the objective of the *Cartagena Protocol*. The effects and impacts of a genetically modified organism are, to date, poorly understood, especially during the developmental stages of a new GMO and early stages of its release into the environment and food system. Recognizing this, the *Cartagena Protocol* not only requires a predictable system to be in place in order to notify Parties about GMOs, and for the development of risk assessment and risk management systems, the Protocol Articles 20, 22, 23, and 26 requires Parties to proactively seek out new information, cooperate, share knowledge, and raise awareness about LMOs. The Meeting of the Parties for the *Cartagena Protocol* have several times acknowledge the need for a strong foundation of science-based knowledge and additional funding directed into research and development methods that include safe handling, risk assessment and containment methods. Canada signed the *Cartagena Protocol* in 2001, shortly after its adoption, yet almost two decades have passed without Canada's ratification. To date, Canada remains one of four G20 countries not to ratify the Protocol, despite having, at least theoretically, the basis of mechanisms in place for its implementation. This leaves uncertainty as to if Canada's ratification will ever come, where national laws and processes for approving products remain subjugated to market driven processes and desires and where the precautionary approach has not been adjudicated in Canada. Canada's position is not what one would expect of the first industrialized signatory to the CBD and home of the CBD Secretariat.

⁹⁸ Canada, Federal Court of Appeal, Memorandum of Fact and Law of the Appellants Ecology Action Centre and Living Oceans Society, in the case of Ecology Action Centre and Living Oceans Society v. Minister of Environment and Climate Change, Minister of Health, and AquaBounty Canada Ltd., (2016). Court File No. A-37-16.

⁹⁹ Hansen, Michael. Comments of Consumers Union on Genetically Engineered Salmon, Food and Drug Administration Docket No. FDA-201034-N-0001, Veterinary Medicine Advisory Committee Meeting. Rep. Consumers Union, 16 Sept. 2010.

¹⁰⁰ 2015 Consumer Poll. (2015). Canadian Biotechnology Action Network. Retrieved from www.cban.ca/2015poll

PROPOSED TARGET #17: *People everywhere take measurable steps towards sustainable consumption and lifestyles, considering individual and national cultural and socioeconomic conditions, achieving by 2030 just and sustainable consumption levels.*

For an ambitious target to succeed, it is not enough to state “people everywhere” and expect change, particularly if referring to people at an individual level. For this target to see progress and see measurable change, there needs to be the inclusion of industries (of all levels), and governments. It cannot simply be expected that individuals globally change their consumption patterns and lifestyles without help from industries and governments to provide clarity and to reform sectors that have attributed to unsustainable living practices. The steps taken need to be coordinated with consistent messaging, something that should be achievable if adopted at a national level. If emphasis is not placed on the need for measurable steps within industries and governments, as well as supporting measures of personal responsibility towards a sustainable lifestyle, there will be an inevitable disconnect between the social desire for sustainability and the personal realities of individuals. This target should be a prompt for governments to not only promote sustainable alternatives to consumers at the individual level, but to also work with consumer advocacy groups to address systemic issues which hinder individual adoption of sustainable consumption and lifestyles. Furthermore, a target linked to sustainable consumption should inevitably be closely intertwined with SDG-12, responsible consumption and production. The emphasis on doing more and better with less, shrinking the global material footprint, increasing resource efficiency and promoting sustainable lifestyles are all applicable goals linked to Target 17 and, comparatively, the indicators for SDG-12 are applicable to monitor success.

There is still a (mis)conception from industry that adopting sustainable practices are a financial burden and an added cost for no feasible or tangible return; however, long-term sustainability has the potential for a return in economic benefits as well as environmental benefits. Corporations need to buy into the *idea* of sustainability and ensure that their industry has the capability to make sustainable consumption and lifestyles available to those wanting to make steps towards *living in harmony with nature*.

This target should also impose action for the need to educate consumers on sustainable living practices. The stereotype that people must live off-the-grid and lead a minimalist lifestyle is not necessarily what is required for sustainable living. In a consumer driven society, transitioning to a sustainable lifestyle entails at least being aware of personal choices and one’s individual ecological footprint followed by acting on that knowledge, within ones financial means, and learning from their choices to reinforce sustainable behaviour. Individuals need to become aware of the importance of reducing their own waste and making informed, sustainable purchases which will reduce the constant demand for new products. Through purchasing decisions, consumers are supporting corporate practices both socially and economically, for good or for ill, whether they acknowledge it or not. Having knowledge about where a product comes from, how it was manufactured, shipped, and sold, and how it will be disposed of is vital if relying on consumers to drive biodiversity conscious decision-making. This is often promoted by public awareness platforms, source of origin disclosures, and eco-certification labelling. However, government officials should be cautioned against falling for the fallacy of the informed consumer; as acquiring the requisite level of information to make sustainable choices is well beyond many social and cultural norms that frame most peoples’ decisions. Cost, trust in certain brands, and peer-influence are usually the overriding factors influencing individual’s decisions for particular products and services; and companies invest heavily in advertising to convince consumers to buy their product, including greenwashing or making/implying false claims.

The biggest hurdle to achieving this target will be changing behaviours towards sustainable living. Developed, high-income countries have substantially larger material footprint per capita (13 times larger than that of low-income countries).¹⁰¹ Consumer demand in a user country can have more environmental harm than domestic consumption in the provider country. The need for behavioural change among the wealthy is paramount to the success of this target, especially as poorer peoples and nations aspire to the standards of living of the wealthy.

Even when consumers are committed to changing their lifestyles, many obstacles exist, including any sort of accessible national plan or financial supports. Where a personal transition can take years or decades, because sustainability is as much a psychological and social change, as it is personal finance, there is a general hesitancy to begin the transition, let alone see wide-spread adoption and it is questionable whether this target is achievable by 2030. A 2017 study showed that while 65% of consumers globally said they would like to buy sustainable products, only 26% were actually doing so because of a lack of awareness of sustainable products and other economic priorities.¹⁰² Through public awareness initiatives and regulatory implementation and subsidized support from government, sustainable choices should be promoted across all industries over the economic choice because even if mindsets change, sustainable options are often highly priced. To limit this intention-action gap amongst consumers, governments need to support sustainable consumption measures through their suit of regulatory and non-regulatory powers to make sustainable choices available at equal or lower costs in order to give effect to “individual and national cultural and socioeconomic conditions”.

One example which needs immediate action is food waste. One-third of food produced globally for human consumption is wasted (1.3 billion tonnes a year).¹⁰³ From this figure, it is important to note that over 40% of waste comes from retail and consumer levels in industrialized countries. For example, produce and other “perishables” in a grocery store (retail level) will be thrown away simply because it has past an arbitrary “expiration date” or “best before date” or may begin to show signs of age or blemishing even through it is still perfectly fit for human consumption. Then, individuals (consumer level) will throw out portions of their food for the same reasons or because they are unable to finish larger-than-necessary serving sizes in prepackaged or “take-out” food. Reduced trends in home cooked meals is alarming, as not only do food preparation skills increase food security, but cooking at home, especially with seasonal produce and employing frugal practices, is much more sustainable than prepackaged food. While public awareness and changing people’s attitude towards food waste is a step in the right direction, there also needs to be broader changes made including public perceptions of food freshness and safety, the perceived desire for many choices of what is essentially the same products, eating within season, and a broader consumer understanding that while the food being thrown away is “organic” and poses no threat to the environment, there was still a considerable amount of effort and resources that went into its production, some of which may have been harmful – environmental harm with no benefit. For example, while maintaining a large display of food in a grocery store may increase sales, it also leads to increased food waste. Also, investments in local food production, local storage facilities, and local supply chains can dramatically reduce the post-harvest food loss by reducing handling.

¹⁰¹ UNDP. (2019). *The Sustainable Development Goals Report 2019*. UN, New York. <https://doi.org/10.18356/55eb9109-en>

¹⁰² Globescan & BBMG. (2017). *Brand Purpose in Divided Times – Four strategies for brand leadership*. Retrieved from https://globescan.com/wp-content/uploads/2017/11/BBMG_GlobeScan_BrandPurposeReport_2017.pdf

¹⁰³ FAO. (2011). *Global food losses and food waste – Extent, causes and prevention*. Rome.

In contrast to inaction on food waste, there have been many recent country initiatives to dramatically reduce the use of single-use plastics, such as plastic shopping bags. By implementing plastic bag fees, consumers are encouraged to bring their own re-usable bags each time they shop. While a complete plastic bag ban could be considered, several Canadian provincial governments and municipalities have opted to use plastics reduction strategies that utilize the *reduce, reuse, recycle* motto, also adding that the oil in the plastic can be “recovered”, i.e., burned as a carbon-based fuel source. These strategies aim to raise awareness, educate and encourage gradual change in consumers’ behaviours towards their choices. By taking an educated consumer approach, and instilling a slight fee while considering socioeconomic conditions, behavioural changes are able to take effect gradually towards a more sustainable lifestyle. However, in 2018 Canadians learned that they had been lied to for decades about plastics recycling, when China implemented new purity standards and stopped accepting Canada’s plastic waste in order to get a handle on their growing problem of stockpiled/landfilled plastics which could not be recycled because they were of poor quality, mixed plastics, or dirty.

Virtually overnight, many Canadian municipalities were caught holding tens of thousands of tonnes of shopping bags, bread/produce bags, and the like, with nowhere to dispose of it, now that China would not take it. Some municipalities spent hundreds of thousands of dollars to try to “clean up” the shipments, i.e., sort through and pull out offending materials, ultimately losing large amounts of money, while others simply landfilled the plastic. Many Canadians felt betrayed by their government and the plastics industry, when so many had gone to great effort to sort their trash to recycle as much as possible, only to learn that it was being landfilled. Canadians demanded immediate changes, leading most municipalities and provincial governments to immediately implement bag bans, with a federal ban on single-use plastics to come into effect in 2021 – realizing effective change in four years versus what had previously been tiny ineffective steps promoted by the plastics industry over decades.

The importance of an educated consumer cannot be understated; but, the responsibility cannot only be assigned to “people everywhere”. The emphasis of this target needs to be placed on regulatory and fiscal measures to force change and to support consumers to make the right choice without having to run a gauntlet of mis-information, distractions, perverse incentives, or to simply pick the “best of the worst”, when the best option is only marginally better than the worst.

PROPOSED TARGET #18: *Promote education and the generation, sharing and use of knowledge relating to biodiversity, in the case of the traditional knowledge, innovations and practices of Indigenous Peoples and local communities with their free, prior and informed consent, ensuring by 2030 that all decision makers have access to reliable and up-to-date information for the effective management of biodiversity.*

Going forward, the importance of traditional knowledge, innovations and practices of Indigenous Peoples and local communities must be emphasized for effective management of biodiversity. Given the tumultuous history of States not recognizing the rights of Indigenous Peoples, including the right to participate in State governance matters through their own self-determined representatives and institutions, it should not be left to interpretation who provides free, prior, and informed consent. It needs to be clearly stated that Indigenous Peoples and local communities are included in the decision-making processes and have the right to full and effective participation in the management of biodiversity. There must also be transparent, honest and effective collaborative and communicative platforms between Indigenous Peoples and other decision-makers. Additionally, the timeline of this target could be improved by ensuring that by 2025, all decision makers (including Indigenous Peoples and local communities) have access to reliable up-to-date information for the effective management of biodiversity by 2030.

In 2019, a study evaluated biodiversity significance within three countries: Australia, Brazil and Canada.¹⁰⁴ They found that Indigenous-managed lands were equal-or-higher in biodiversity to that of protected areas in all three study sites. This emphasizes the need for traditional knowledge, innovations and practices to be recognized and used with the full and effective participation of Indigenous Peoples for effective conservation and management of biodiversity. As Indigenous Peoples and local communities have been stewards of the land for millennia, it is vital that Parties consider both current and traditional management perspectives and knowledge generating systems. In Canada, Mi'kmaq Elder Albert Marshall coined the term “two-eyed seeing” to describe how both knowledge systems can be incorporated. Although there are two eyes, seeing the world in a different way, those two eyes are connected to the same brain, which must accept both images and rationalize a reality from their combination. Two-eyed seeing requires the individual decision-maker to be knowledgeable in both systems.

Indigenous Peoples have tenure rights to over a quarter of the world's surface, and approximately two-thirds of Indigenous Peoples' lands still remain in their natural condition, abundant in biodiversity.¹⁰⁵ Aboriginal Peoples in Canada depend on healthy, thriving ecosystems, and have for thousands of years, to provide harvesting and foraging opportunities for their livelihoods, food, and cultural and ceremonial needs. For this reason, it is imperative that their values, practices and knowledges be respected, shared and utilized in biodiversity conservation.

¹⁰⁴ Schuster, R., Germain, R., Bennett, J., Reo, N., & Arcese, P. (2019). Vertebrate biodiversity on indigenous-managed lands in Australia, Brazil, and Canada equals that in protected areas. *Environmental Science & Policy*, 101, 1-6. [10.1016/j.envsci.2019.07.002](https://doi.org/10.1016/j.envsci.2019.07.002)

¹⁰⁵ Garnett, S.T., Burgess, N.D., Fa, J.E., Fernández-Llamazares, A., Molnár, Z., Robinson, C.J., Watson, J.E.M., Zander, K.K., Austin, B., Brondizio, E.S., Collier, N.F., Duncan, T., Ellis, E., Geyle, H., Jackson, M.V., Jonas, H., Malmer, P. McGowan, B., Sivongxay, A., & Leiper, I. (2018). A spatial overview of the global importance of Indigenous lands for conservation. *Nature Sustainability* 1, 369–374. <https://doi.org/10.1038/s41893-018-0100-6>

“There is an ageless history of biological harmony between Indigenous Peoples and their environment, a history going back uncounted thousands of years. This benign balance was grounded in use, spirituality, and long-term survival. As such, it transcends industrialized peoples' constant need to find justifications for the protection of that environment.”¹⁰⁶

The importance of recognition and respect for traditional knowledge is not solely linked to the CBD. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) produces global-scale biodiversity assessments and brings Indigenous and local knowledge to the forefront. Recognizing that Indigenous Peoples are key to protecting biodiversity into the future makes understanding their knowledge, practices, values and actions in conservation necessary for effective management and to allow for meaningful discussions with policymakers. Similarly, the Food and Agriculture Organization of the United Nations recognizes that mobilizing the expertise of Indigenous Peoples is essential for facing modern food and agricultural challenges. This can be attributed to their documented successful, more traditional, resilient agricultural practices, conservation of biological resources, traditional diets and management of expansive biodiverse areas.

The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) recognizes free, prior and informed consent (FPIC) as an inherent right of Indigenous Peoples, which allows them to give or withhold consent to projects that may affect them or their traditional land.

Article 19 states:

States shall consult and cooperate in good faith with the Indigenous Peoples concerned through their own representative institutions in order to obtain their free, prior and informed consent before adopting and implementing legislative or administrative measures that may affect them.

Article 32 states:

States shall consult and cooperate in good faith with the Indigenous Peoples concerned through their own representative institutions in order to obtain their free and informed consent prior to the approval of any project affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources.

FPIC must be unquestionably included in the sharing and use of knowledge in the case of traditional innovations and practices. Good faith, and in other words, transparency, honesty and respect between governments and Indigenous and local communities is vital to ensure effective and beneficial cooperation. The *Mo'otz Kuxtal Voluntary Guidelines* provide a strong framework for Parties to build fair and positive partnerships with traditional knowledge holders while ensuring free, prior and informed consent.¹⁰⁷

¹⁰⁶ Wiersema, A. (2003). *Sharing Common Ground: A Cautionary Tale on the Rights of Indigenous Peoples and the Protection of Biological Diversity in Linking Human Rights and Environment*. Arizona: University of Arizona Press, 2003.

¹⁰⁷ Secretariat of the Convention on Biological Diversity (2019). *Mo'otz Kuxtal Voluntary Guidelines for the development of mechanisms, legislation or other appropriate initiatives to ensure the “prior and informed consent”, “free, prior and informed consent” or “approval and involvement”, depending on national circumstances, of indigenous peoples and local communities for accessing their knowledge, innovations and practices, for fair and equitable sharing of benefits arising from the use of their knowledge, innovations and practices relevant for the conservation and sustainable use of biological diversity, and for reporting and preventing unlawful appropriation of traditional knowledge*. Montréal, 9 pages. (CBD Guidelines Series).

Additionally, UNDRIP recognizes the important connection that Indigenous Peoples have with the land and resources, and their ability to preserve and protect their territories.

Article 25 states:

*Indigenous Peoples have the right to maintain and strengthen their distinctive spiritual relationship with their traditionally owned or otherwise occupied and used lands, territories, waters and coastal seas and other resources and to uphold their responsibilities to future generations in this regard.*¹⁰⁸

The promotion and utilization of traditional knowledge has been emphasized time after time but Parties are slow to incorporate or even seek out traditional knowledge for decision-making. Aichi Target 18 was hopeful that:

*“By 2020, the traditional knowledge, innovations and practices of Indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of Indigenous and local communities, at all relevant levels.”*¹⁰⁹

The Global Biodiversity Outlook 4, published in 2014, reported that while Parties had made progress in all areas of the target, the magnitude remained too small to put it on track for success by 2020 and the recently published *Global Biodiversity Outlook 5* had the same results, despite an additional 6 years of effort.

Some countries reported that little to no action was taken to achieve this goal – including Canada, a country with diverse Aboriginal populations and a political agenda to seek reconciliation with Aboriginal Peoples. Included in Canada’s *2020 Biodiversity Goals & Targets for Canada* is a complementary Target 15, that states:

*“By 2020, Aboriginal traditional knowledge is respected, promoted and, where made available by Aboriginal Peoples, regularly, meaningfully and effectively informing biodiversity conservation and management decision-making”.*¹¹⁰

Canada’s 6th National Report to the CBD (2018) stated that there were not enough measures adopted and actions taken to meet this deadline by 2020 nor had Canada sought any communication from Aboriginal groups to share traditional knowledge.¹¹¹ The phrasing “*where made available*” is clearly the Canadian government sidestepping around the obligation to seek out traditional knowledge in conservation management.

¹⁰⁸ UN General Assembly, *United Nations Declaration on the Rights of Indigenous Peoples*: resolution / adopted by the General Assembly, 2 October 2007, A/RES/61/295.

¹⁰⁹ Secretariat of the Convention on Biological Diversity (2014) *Global Biodiversity Outlook 4*. Montréal, 155 pages.

¹¹⁰ Environment and Climate Change Canada. (2016). *2020 Biodiversity Goals & Targets for Canada*. Government of Canada. Retrieved from https://biodivcanada.chm-cbd.net/sites/biodivcanada/files/inline-files/3499%20-%202020%20Biodiversity%20Goals%20%26%20Targets%20for%20Canada%20-%20%20Final_ENG.pdf

¹¹¹ Environment and Climate Change Canada. (2019). *Summary of Canada’s 6th National Report to the Convention on Biological Diversity*. Gatineau, QC: Government of Canada.

Indigenous Peoples are still waiting to share their values, views and practices regarding effective biodiversity management, yet they are often approached as a “last thought”, legal requirement, or bureaucratic check box, if considered at all. While the status of the Ad Hoc Open-ended Working Group on Article 8(j) and Related Provisions remains unsecured, Target 18 is devoid of any obligation or enforcement mechanism to ensure obligations for Article 8(j) are met. It is difficult to envision circumstances where reporting on the progress of the target will result in any positive change towards biodiversity goals, let alone the transformative change required for *living in harmony with nature*, when the proposed 2021-2030 Target 18 is so much reduced in regards to traditional knowledge, innovations, and practices compared to the 2010-2020 Aichi Target 18. Parties, including Canada, will likely continue to avoid the wide adoption of traditional knowledge and wide inclusion of Aboriginal Peoples in decision-making, disregarding evidence of the importance of traditional knowledge for successful conservation management, except in instances where it is advantageous to the State.

PROPOSED TARGET #19: *Promote the full and effective participation of Indigenous Peoples and local communities, and of women and girls as well as youth, in decision-making related to the conservation and sustainable use of biodiversity, ensuring by 2030 equitable participation and rights over relevant resources.*

Since time immemorial, Indigenous Peoples have pre-existing rights to the natural resources occurring within their traditional ancestral homelands and territories by virtue of their occupation of their lands and waters. Colonization of these lands by European settlers to the detriment of Indigenous Peoples, is now regarded as little more than outright theft and subjugation of Indigenous Peoples, through means of force and renegeing on treaty promises, and rationalized through a fervent doctrine of ordained superiority of the colonizer over Indigenous Peoples. The *doctrine of terra nullius* and the *doctrine of discovery*, have been thoroughly debunked by many expert historians and legal professionals as having never been the case at time of European contact in much of, if not all of, the Americas and Australia, and some shedding light on them only being modern manifestations to shore up a crumbling justification for colonization, and by extension the continuance to the modern day of fundamental principles and structures of modern governments legally grounded in those of their precedent colonial laws and legal norms, with no recognition or consideration of the customary laws and norms of the pre-existing Indigenous Peoples.

For example, the Mabo Decision by the High Court of Australia in 1992 and the inclusion of the *Royal Proclamation, 1763* into the *Canadian Constitution Act, 1982*, clearly acknowledge that there was, and remains, Aboriginal title and Aboriginal law. The impact today being that land title in Australia and Canada are subject to Indigenous Peoples rights and that a claim of Crown sovereignty is becoming more legally uncertain with each passing Court decision. It is becoming more evident that for these two modern States to survive, governments and Indigenous Peoples must reconcile such things as the English common law concept of land tenure with Indigenous Peoples' customary law expressions of Indigenous land rights and obligations.

It is through this Indigenous lens that the procedural right to participation and the substantive rights over lands and resources must be understood. Without explicit expressions from the government that the relationship between the government and Indigenous Peoples must be based on mutual respect, recognition of Indigenous Peoples rights, and for the express purpose of reconciliation, the full and effective participation of Indigenous Peoples in decision-making about lands and resources cannot be obtained. Too often Indigenous Peoples find themselves 'token Indians', responding to requests for consultation and other forms of involvement dictated by legal and bureaucratic checklists, or responding to the desires and pace of industrial developments or political agendas, and often without the means to provide their free, prior and informed consent (FPIC). There is concern that this target leaves out the need for Indigenous Peoples participation in decision-making about access and benefit sharing (ABS). Although ABS is raised in Target 11, it is only concerned with the sharing of benefits, not with participation in the decision-making process leading to the establishment of ABS infrastructure or specific agreements, and Target 11 does not explicitly refer to the participation of Indigenous Peoples in benefit sharing. As several examples by Indigenous Peoples have shown, ABS can be a vital means for the development of human capacity and Indigenous institutions that can facilitate the full and effective participation of Indigenous Peoples in resource management, including the CBD and country NBSAPs.

Through the Indigenous lens, if FPIC granted through Indigenous Peoples' self-determined representative institutions and mechanisms is not the goal, then 'full and effective participation' is little more than a publicity exercise or a legal procedural malignment. MAPC strongly objects to any target for the participation of Indigenous Peoples in decision-making where FPIC is not the goal.

In Canada, there exist some mechanisms for Indigenous Peoples participation in resource decision-making which could be reviewed by the Ad Hoc Open-ended Working Group on Article 8(j) and Related Provisions as case studies to determine the capacities and expectations of a modern State, Party to the CBD, and the Indigenous Peoples nested within that State. For example, the federal Department of Fisheries and Oceans Canada (DFO), has entered into 285 fisheries agreements with Indigenous Peoples to support their access to the fisheries resource for individual food, social, and ceremonial purposes. DFO also licenses Indigenous fisheries entities to access commercial fisheries via Aboriginal Communal Commercial Fisheries Licenses which are somewhat regulated separately from normal commercial fisheries, as well as provides other resources for Indigenous fisheries entities to access the commercial fisheries, such as supports for the purchase of boats and gear, and training programs for captains and deck hands.

DFO also initiated the Aboriginal Aquatic Resources and Oceans Management (AAROM) program, which establishes Indigenous-led AAROM bodies to facilitate DFO's engagement with Indigenous fisheries and to build the human capacity for Indigenous Peoples to be involved in decision-making in all areas of fisheries and oceans management. For example, there has been a substantial growth over the past three decades in Indigenous Peoples' participation in the fisheries and their acceptance by non-Indigenous fishers at the wharf and in fisheries advisory committee meetings. In recent years, there has also been substantive involvement of Indigenous Peoples in the review of national fisheries and environmental legislation, regulations, species strategies, and science reviews, particularly for species conservation under the federal *Species at Risk Act*, in addition to Indigenous-led on-the-ground conservation projects.

In spite of increased involvement, Indigenous Peoples participation in the fisheries in Canada is still fraught with obstacles and are still a long-way off from "full and effective participation in order to seek the free, prior and informed consent of Indigenous Peoples". Much of the ground gained for Indigenous Peoples' rights to natural resources has come at the expense of a long series of time-consuming and expensive litigation to have the courts overturn government actions aimed at preventing Indigenous Peoples from accessing resources in accordance with their rights, priorities, and means, and for the courts to declare what governments are reluctant to accept – that the Indigenous Peoples of Canada do have rights and that the Crown has a duty to protect those rights and act honourably in its dealing with Indigenous Peoples. To this day, the Crown tightly holds onto its control of the fisheries, opting to accommodate Indigenous Peoples rights to the resource through a regulation under the federal *Fisheries Act* versus engaging with Indigenous Peoples to work out equitable shares of the aquatic resources. The Aboriginal Fisheries Strategy (AFS) arrangements first agreed to in the early 1990s supported an Indigenous managed access to aquatic resources for food, social, and ceremonial purposes and were based on the understanding that they would lead to co-management arrangements. However, for the past several years, DFO pushes its unilaterally designed AFS template, which has fallen silent on the idea of co-management and in fact, explicitly states that it is not to be interpreted as acknowledging any rights of Indigenous Peoples, leaving the Native Council of Nova Scotia, for example, in the position of agreeing to an arrangement that runs against the promise of reconciliation, lest it be viewed as not holding up its end of the AFS arrangement.

In addition, because of the mismanagement of fisheries and poor oversight by DFO, many Indigenous communities have not seen the promised benefits from their fisheries and remain reliant on year to year funding which waxes and wanes with government priorities and policies, including that of the *Indian Act* and *Indian Policy* which remain for the purpose of “protecting the Indian from the unscrupulous settler”, which is telling of the lens through which the government views Indigenous – non-Indigenous relations.

In addition to these struggles for Indigenous Peoples’ participation in the fisheries in Canada, the situation is overshadowed by the fact that provincial governments have the bulk of powers regarding natural resources, while the federal government has exclusive jurisdiction over “Indians and lands reserved for Indians”. Even where the federal government has constitutional jurisdiction (e.g., fisheries) much is delegated to the Provinces, several of whom opposed the inclusion of Aboriginal Peoples in the Canadian *Constitution Act, 1982*, included the non-abrogation and non-derogation of rights in Section 25 and the affirmation of Aboriginal Rights in Part II, Section 35, in addition to rights guaranteed to every Canadian through the *Charter of Rights and Freedoms*. By-in-large, relations have not substantially improved between Indigenous Peoples and provincial governments, except where a provincial government might be able to leverage good will overtures to Indigenous Peoples in order to obtain something from the federal government. Off-reserve, non-status Indians and Métis also have to constantly battle through a melee of bureaucratic processes designed to ignore or exclude them from having a “place and a face at the table”, where the government prefers to only deal with *Indian Act* band councils, over which it has considerable economic, political, and administrative sway.

The UN Declaration on the Rights of Indigenous Peoples (UNDRIP), clearly draws a link between participation and consent:

Article 18 states:

Indigenous Peoples have the right to participate in decision-making in matters which would affect their rights, through representatives chosen by themselves in accordance with their own procedures, as well as to maintain and develop their own Indigenous decision-making institutions.

Article 19 states:

States shall consult and cooperate in good faith with the Indigenous Peoples concerned through their own representative institutions in order to obtain their free, prior and informed consent before adopting and implementing legislative or administrative measures that may affect them.

Additionally, as agreed to by States in Article 44 of UNDRIP, these and the multiple other articles in UNDRIP, “constitute the minimum standards for the survival, dignity and well-being of the Indigenous Peoples of the world”. For Indigenous Peoples, this requires a CBD target for the full and effective participation of Indigenous Peoples in decision making related to conservation and sustainable use of biodiversity to also include ABS and be for the purpose of seeking Indigenous Peoples’ full, prior and informed consent – anything less for Indigenous Peoples amounts to a modern manifestation of continued colonization.

PROPOSED TARGET #20: *Foster diverse visions of good quality of life and unleash values of responsibility, to effect by 2030 new social norms for sustainability.*

While there is a clear need to redefine the social norms regarding sustainability, the revisions must be accessible and easily understood if they are to achieve long-term societal change and a vision shift towards *living in harmony with nature*. Vaguely, this relates to Aichi Target 1 to address the underlying causes of biodiversity loss and that people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

For a target to be achieved, there needs to be a means to monitor and indicate its success. While biodiversity levels can be relatively easily quantified through existing governmental processes, e.g., environmental monitoring programs, development impact assessments, species status reports, etc., there are much fewer tools to measure a person's understanding and valuing of biodiversity. Social norms cannot be directed through a legislative effort or strategy and even if such are attempted, they do not simply take effect, but evolve as cultural products. The intention of this target seems to be that fostering cultural growth will lead to its success, though this can be a problematic assumption in western cultures which emphasize human control over the environment opposed to living in harmony with the environment. A paradox of sorts arises in liberal western democracies where a vision or worldview to *live in harmony with nature* is necessary to make meaningful progress on the CBD, yet the culture can long resist accepting a worldview that moderates individual freedoms or restricts opportunities to acquire wealth and so progress is reframed as a multitude of disparate or unconnected actions.

Diverse visions and individual values and responsibilities can be fostered, but particularly in a country the size and diversity of Canada, it cannot be assumed that those will be shared and accepted towards new social norms. In Canada, Indigenous Peoples have struggled for many generations to be recognized as existing peoples and to be treated as more than a government inconvenience, let alone to be acknowledged as a part of the federation through the many treaties and adhesions which form the legal fabric of Canada's sovereignty. For generations, Indigenous Peoples' visions for a good quality of life, values of responsibility, and social norms for sustainability have been ignored, belittled, or culturally appropriated without understanding, while at the same time Indigenous Peoples' culture has been greatly eroded through overwhelming influence from the values and cultural practices of the dominant western society. Achieving Target 20 in Canada necessitates diligent work on decolonization, which continues to the modern day, but which many in power still refute or do not recognize as continuing as modern manifestations, including Canada's concepts of conservation. As colonialization was and continues to be a many generational process, so too will be decolonization.

Suggested indicators to measure humanity's understanding of biodiversity could be through the Union for Ethical Biotrade (UEBT) Biodiversity Barometer which monitors the level in which consumers are aware of biodiversity and its values, and how it affects their purchasing decisions, which in theory can encourage businesses to adopt a business model that embraces biodiversity. Similarly, the Conservation International's Global Biodiversity Engagement Indicator monitors the success of Aichi Target 1 by collecting data globally online to monitor trends in biodiversity awareness over time.

In liberal western democratic societies, there is a growing myth promoted by government of the "informed consumer", who upon recognition and awareness of the importance of biodiversity and preventing its loss, will begin to make sustainable choices and with the massing and vocalization of like-minded individuals will encourage or embolden political leaders to adopt a "political will" to examine

existing policies and strategies to identify the areas that require change to meet the demands of the majority of informed consumers. In reality, consumers are severely impaired from making just choices caused by a lack of verifiable and timely information and the complexities of the market, including the lack of ‘source of origin’ labelling and the mixing and rebranding of products, eco-certification schemes, the “greenwashing” of products, the overwhelming investments in marketing and advertising to the point of costing more than the products themselves, and the lack of education and time to go through the effort to make the most sustainable choices. The overriding consideration for the vast majority of consumers is cost, prior association with the product or brand, and peer group. In particular for low-income families, remote or rural communities, and those who are marginalized, there simply is no “choice”, but must pick from what is available. There is no visible market answer for transformational change in Canada. To begin implementing and adopting policies for this target, there must be a new discussion about the role of consumers, that realizes that humanity cannot buy its way out of environmental devastation.

Recently in Canada, there has been a monumental shift in reformulating legislation concerning environmental assessments. Prior to Canada’s current *Impact Assessment Act, 2019* (IAA), environmental assessments were governed by the *Canadian Environmental Assessment Act, 2012* (CEAA) which was “An Act respecting the environmental assessment of certain activities and the prevention of significant adverse environmental effects”.¹¹² The use of the terms “significant adverse environmental effects” solely looked at the effects of an activity on the biophysical environment alone such as habitat loss and air pollution. Now, the new legislation forces decision-makers to articulate and consider not only the known or anticipated effects on the biophysical environment, but all potential impacts, no matter if the mechanism of impact is not known, including impacts on the economic and social aspects of the local community, as well as impacts on Indigenous Peoples. Now, under the IAA, decision-makers must consider how the project will impact the “quality of life” with new changes to include the:

- project’s contribution to sustainability which is defined in the Act as “*the ability to protect the environment, contribute to the social and economic well-being of the people of Canada and preserve their health in a manner that benefits present and future generations*”;
- the implementation of mitigation measures;
- potential impacts on Indigenous groups in Canada and their rights as recognized and affirmed by section 35 of the *Constitution Act, 1982*; and
- the extent of impacts which hinder Canada’s obligations and commitments to mitigate climate change.

A problem arises though in Canada where the considerations of impacts on the “quality of life” are not upheld by the courts. In 2008, a joint federal-provincial environmental assessment panel rejected a U.S company environmental assessment for an aggregate quarry and export terminal in Nova Scotia, citing among other things that the impacts of the quarry outweighed the benefits to the local community and thus would not have a positive impact on the local resident’s quality of life. The company sued the governments and took the case to the North American Free Trade Agreement (NAFTA) arbitration panel, where it won. The NAFTA panel stated that community core values was not a rational government policy. In 2018, environmental groups and residents appealed the NAFTA decision to the Federal Court of Canada, raising the very real concern that the NAFTA ruling will greatly diminish Canada’s ability to enforce environmental laws based on the “quality of life” and other environmental and social principles, reducing rights in Canada to merely procedural rights. The Federal Court upheld the NAFTA decision. Although

¹¹² Canadian Environmental Assessment Act, SC 2012. c. 19, s. 52.

Canada's environmental legislation included the words "quality of life" as a principle for assessing impacts from a project, it is meaningless without concrete follow-up measures in the legislation to implement the principle in the decision-making process.

Though a "good quality of life" cannot easily be depicted or defended, it can be strongly linked to many (if not all) of the UNDP Sustainable Development Goals, and very rightly should have a prominent place among the CBD targets. Ending poverty and hunger, having access to clean water and sanitation, having healthy marine and land ecosystems are all goals that aim to achieve basic human needs. As in natural ecosystems, these humanitarian goals are all interconnected - when one thing is achieved, it contributes positively to others. The question before Canada is whether the SDGs, CBD, and the vision of *living in harmony with nature* trump economic objectives, otherwise the voices for change are drowned out in a sea of inequity.

CONCLUSIONS

A Call for Transformative Change

It is clear by now that the current trends threatening biodiversity need to be immediately halted and reversed. For climate change, pollution, population growth and unsustainable production and consumption, the latest IPBES and Global Biodiversity Outlook reports clearly show that current trend trajectories did not meet the Aichi Biodiversity Targets, and we are in danger of not meeting other environmental accords including the 2030 Sustainable Development Goals and the Paris Agreement on climate change. Furthermore, the reports suggest that these current trends will continue to at least 2050 mainly due to increasing human use of land and water, increased exploitation of species, and human induced climate change.

However dire, the situation can be reversed, because it is the result of human activities, which can be managed by good governance that considers a healthy and clean environment as a human right and a right of Mother Earth, and which seeks an equitable and sustainable use of the environment, and which values the non-consumptive aspects of the environment as greater than the desire for wealth creation. Simply put, biodiversity is life, life is the spark of creation, and humans are a part of biodiversity. Indigenous Peoples' eco-centric worldview is that human-kind is no greater or no lesser than any other part of creation, and we must bear the burden of caring for Mother Earth.

Humanity has the power to address many direct and indirect drivers of biodiversity loss at individual, national, and international levels. Our examination of the Zero Draft of the Global Biodiversity Framework identifies areas for improvement within economic sectors, governance, and individual actions that could contribute to multiple targets or which are foundational actions necessary to have meaningful advancement on the targets. It is crucial that political powers, including States, use their voice and actions to send a clear message that biodiversity is life and biodiversity is paramount. Activities such as industrialized agriculture, the use of fossil fuels, deforestation, and overharvesting of wild species all require immediate actions both to reverse trends and to signal a new era of biodiversity value and respect. The lack of progress on the Aichi Biodiversity Targets clearly raises that States alone either could not or would not take the lead for a whole of society approach to fundamentally change how humanity interacts with biodiversity. Who will lead from 2021-2050?

Addressing biodiversity drivers proactively, as opposed to attempting to off-set the consequences, must be the focus going forward. This could mean impact assessments which include impacts on Indigenous Peoples' rights, cultures, and economies. This could also mean the use of nature-based solutions to mitigate impacts on the environment and ensure that any project has a net improvement for biodiversity.

Regardless of whether humans recognize it, nature is vital for the survival of humanity and our physical and mental well-being and opportunity for future generations to attain a good quality of life. The limited actions that States have taken to date are very worrisome. Creating protected areas or saving a species at risk or eradicating an invasive species, in of itself does not address the underlying issues leading to biodiversity loss. The post-2020 global biodiversity framework must incorporate new ways to raise to the masses that *transformative change* is necessary for the survival of humanity. New tools and processes are required to bring together humanity to work on its "common concern" and "natural heritage" of living biodiversity. Foremost, the vision of *Living in Harmony with Nature* requires an ethos or worldview of humanity interconnected and interdependent with the natural world.

As understood by now, for targets to be achieved, they must be explicit in their intention, well-worded and well understood in addition to having feasible indicators to monitor success (i.e., S.M.A.R.T. targets). They must have definitive indicators and a robust monitoring framework in place so that States can track success with unbiased data, to publicly report progress, and to make informed decision throughout implementation that is responsive to the changing needs of biodiversity and humanity.

There needs to be an obligation to transparently monitor and publicly report on the progress of the post-2020 targets and to have each States' implementation of the CBD peer-reviewed by experts and other States to ensure that citizens (the caretakers of Mother Earth) have the information and means to hold States, other organizations, and each other to account and that progress is adequate to the vision of humanity *living in harmony with nature*. For years, targets of the CBD have fell by the wayside due to a lack of commitment to change, to a lack of mainstreaming biodiversity and the CBD among the public and private sectors, and an aversion to any sort of compliance or oversight mechanism which could be perceived as publicly shaming a State or infringing on its sovereign rights to do whatever it wants with its in-situ biodiversity. It is vital for States and the global citizenry to understand why the Aichi Biodiversity Targets failed and why progress now requires *transformative change*.

Humanity has faced several periods of challenge during its 300,000 years of existence on Mother Earth, including several global shifts since the rise of human civilizations some 6,500+ years ago, including the fall of all of the major classical civilizations during a relatively short period of time. Modern civilization benefits from a large body of research about how and why political, economic, social, and environmental systems, and entire civilizations, have risen and failed in the past, as well as a tremendous technological and resource advantage over our ancestors. We must collectively agree to use our advantage to avoid a similar fate.

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services suggests that *transformative change* is feasible but can only be achieved through substantial progress on:

- Incentives and capacity building,
- Cross-sectoral cooperation,
- Pre-emptive action,
- Decision-making in the context of resilience and uncertainty, and
- Environmental law and implementation.¹¹³

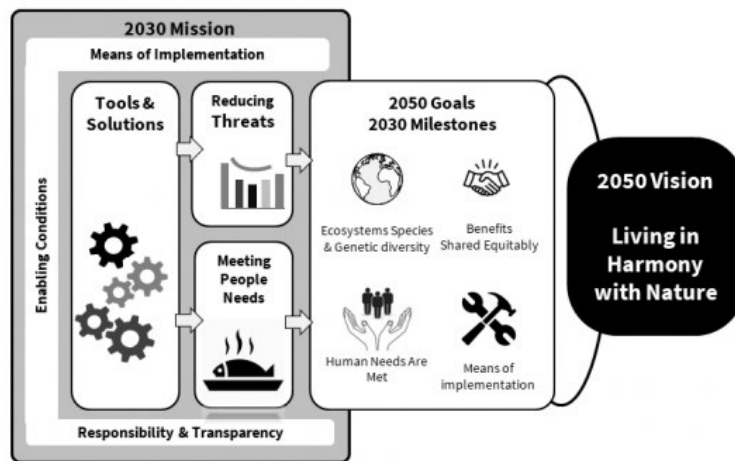
It is crucial that States begin to take action to advance *all* targets, not just to pick and choose which ones work best for individual circumstances or to reword targets to their own liking. The current qualifying terms “*subject to national legislation or circumstances*” mentioned in several targets and other CBD Decisions and guidance documents has allowed States to skip over certain target aspects that cause discomfort or may impact economic activities, political postures, or the distribution of wealth and power. For example, Canada made measurable progress towards Aichi Target 11 to protect inland and coastal waters; however, it made little to no progress to advance Aichi Target 18 to integrate traditional knowledge and innovations and to seek the full and effective participation of Indigenous communities - something that acknowledged as being

¹¹³ IPBES (2019): Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. S. Díaz, J. Settele, E. S. Brondizio E.S., H. T. Ngo, M. Guèze, J. Agard, A. Arneth, P. Balvanera, K. A. Brauman, S. H. M. Butchart, K. M. A. Chan, L. A. Garibaldi, K. Ichii, J. Liu, S. M. Subramanian, G. F. Midgley, P. Miloslavich, Z. Molnár, D. Obura, A. Pfaff, S. Polasky, A. Purvis, J. Razaque, B. Reyers, R. Roy Chowdhury, Y. J. Shin, I. J. Visseren-Hamakers, K. J. Willis, and C. N. Zayas (eds.). IPBES secretariat, Bonn, Germany. 56 pages.

key to advancing other targets. The meaningful advancement of each target relies on the implementation of all other targets, as well as the advancement of other commitments, such as the Sustainable Development Goals and the UN Declaration on the Rights of Indigenous Peoples. It is strongly suggested that qualifying terms such as “*subject to national legislation or circumstances*” greatly hinders progress towards the vision of *living in harmony with nature* and should either be removed, or alternatively, CBD guidance should be developed to aid States to achieve all targets within the constrictions of their existing laws and national circumstances, and suggestions about how national laws or circumstances may be changed in order to facilitate the transformative change necessary for meeting biodiversity objectives.

In Canada, the ability to act upon and implement measures of the CBD carries the problem of jurisdictional boundaries and powers. While the Canadian federal government signed onto the CBD, there is little cooperation or even consistent platforms for cooperation among the provincial and territorial governments to participate in a coordinated way in the overall implementation of the CBD in Canada and little that the federal government can do to force subnational governments to take specific actions in several CBD areas, such as forestry, mining, industrial developments, and urban developments. Jurisdictional boundaries and governance powers need to be aligned in their goal of conserving biodiversity despite their other economic and political priorities.

The concept of *transformative change* being proposed as the guidance and a tool for achieving the post-2020 biodiversity framework and goals, if diligently contemplated and mainstreamed among all sectors of society, should encourage the development of new biodiversity plans and actions based on expressions of customary norms, as well as newer expressions of contemporary values for the conservation of biodiversity. The path forward cannot be the tweaking of previous targets, which were hindered by economic priorities and lack of political leadership. Regardless of the final agreed to wording of the target text, the Post-2020 Global Biodiversity Framework must be championed as an ambitious generational project to “rewire” the existing system to enable a fundamental shift in the relationship people have with the natural world, built upon respect and value. The ultimate measure of success should be future generations looking back on today’s international, national, and local circumstances and seeing the truth of them as the hurdle impeding biodiversity conservation, sustainable use, and benefit sharing, and understanding why it was necessary to adopt a new “*theory of change*”.



Responsibilities and Incentives

It is crucial that individuals around the world have the means and opportunities to take responsibility for their own environmental footprint. This means at the least, individuals being aware of their actions (or inactions) and the resulting impacts on the natural world and at least have the economic and political security to make their choices real. In consumer driven societies, this, at minimum, would require information about products, e.g., where and how a product was produced and in what labour and environmental conditions, as well as, considering the packaging it came in, and how it will be treated at the end of its useful life. This also requires the policing of labels and advertising claims to curb the ‘greenwashing’ of products and other methods which place more value on the brand than on the people and resources that made the product or service.

While changing the mindsets and behaviours of individuals is a starting point, it cannot be relied upon solely to change the market and eliminate unsustainable products and practices. While the educated consumer provides a platform for market changes, there currently remains only a diffuse responsibility within governance bodies and companies themselves to make sustainable products, which has in effect limited most consumers choices for sustainable products. Governments have the ability to regulate the market, subsidize sustainable practices, and ban biodiversity-harmful products, something that cannot be accomplished through individual choices alone.

A common thread that seems to be apparent throughout the action targets and previous CBD developments is for governments to utilize their powers to incentivize or subsidize actions that can be taken to achieve desirable outcomes as efficiently as possible, such as financial incentives to increase sales of sustainable products. For example, some Canadian jurisdictions provide rebate incentives for consumers purchasing electric or hybrid cars or installing solar or wind power on homes in order to reduce greenhouse gas emissions. Some governments are also implementing cap and trade systems which disincentivize, or financially charge those industries that exceed their allotted carbon emission limits.

While many incentivizing programs are intended to protect the environment and global biodiversity, there are instances where they are not always in line with the target goals expressed in the Post-2020 Global Biodiversity Framework, but rather may give rise to perverse incentives, which ultimately harm biodiversity. For example, national governments may incentivize local governments or private citizens to protect lands in order to achieve national protected areas targets, but if human activity is excluded an important opportunity to “learn to live with the in-situ biodiversity” is missed, resulting in continued or even increased harms to lands outside the protected area. Such an incentive could be particularly harmful if it results in the dislocation of Indigenous Peoples who embody traditional lifestyles, knowledge, and eco-centric worldview. It is also important that governments look at all their policies, programs, and activities, not just direct subsidy programs to determine if there is an incentive, disincentive, or perverse incentive (direct or indirect, intentional or unintentional) that could affect biodiversity or human’s interaction with the natural world, particularly Indigenous Peoples.

Economic sectors will always be hesitant to alter the way they do business unless there is the potential of an economic advantage and will be reluctant or adversarial or undermining towards more sustainable operations and products which put them at an economic disadvantage. Whether acknowledged or not, biodiversity is the world’s economic backbone, which is increasingly being assessed for its economic value for ecosystem services to clean water and air, regulate the climate, provide storm protection, provide natural resources for consumption, and provide opportunity for scientific and technological advancement through the use of genetic resources. A recent study has estimated these services to be worth globally approximately

\$125-140 trillion USD per year.¹¹⁴ Work such as this helps make the value of biodiversity more relatable in societies based on market economics, where goods and services are evaluated and a “fair price” is agreed to between users and providers. However, market forces fail where the provider (Mother Earth) cannot negotiate a “fair price” with the user (humans). The responsibility and the burden must fall to humans to act in both the interests of humanity and Mother Earth.

Between 1997-2011, an estimated \$4-20 trillion USD was lost per year due to land-cover change alone, and an additional \$6-11 trillion USD per year from land degradation.

“If the world made equivalent losses in share prices there would be a rapid response and widespread panic, as we saw during the recent economic crisis. The loss of biodiversity, crucial to life on earth, has, in comparison, produced little response. By ignoring the urgent need for action we stand to pay a much higher price in the long term than the world can afford.”

Bill Jackson, Deputy Director General of the International Union for the Conservation of Nature

Indigenous Peoples’ Rights and Capacity

The importance of recognizing the rights of Indigenous Peoples to the use and protection of biodiversity and the importance of building Indigenous Peoples’ capacity to fully and effectively participate in decision-making processes for the implementation of biodiversity targets cannot be understated.

Aboriginal Peoples have been present in Canada for over 10,000 years. Aboriginal Peoples *eco-centric worldview* grounds Aboriginal Peoples ability to utilize Mother Earth’s bounties without negatively impacting the ecological integrity of the environment. Aboriginal Peoples’ *eco-centric worldview* is that people “are interconnected and interdependent with all life and life-giving forces”, which brings forth the necessity for the concurrent, in-situ, equally valued objectives of *conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits*. The Mi’kmaq People would refer to this as *netukulimk*, which English speaking people translate as “harvesting”. However, much is lost in that translation, where *netukulimk* encompasses the three objectives of the CBD and the principles of the precautionary approach, ecosystem-based management, and personal responsibility. To facilitate the sharing of Indigenous Peoples’ knowledge and worldview requires more than an aspirational extending of the hand towards Aboriginal Peoples. The full and effective participation of Indigenous Peoples requires foremost capacity development and relationship building that is open, honest, and that meets the needs of Aboriginal Peoples and is at Aboriginal Peoples’ pace.

Transformative change requires a new foundation for how people relate to and value biodiversity that includes humanity as interconnected and interdependent with Mother Nature. Understanding Aboriginal Peoples’ *eco-centric worldview*, that humans and nature are valued equally, is crucial to engaging Aboriginal Peoples in discussions about biodiversity. *Transformative change* is change away from the *homo-centric worldview* towards one that values and respects biodiversity and where humanity accepts to bear the burden of responsibility for Mother Earth.

¹¹⁴ Costanza, R., de Groot, R., Sutton, P., van der Ploeg, S., Anderson, S.J., Kubiszewski, I., Farber, S. & Turner, S.K. (2014). Changes in the global value of ecosystem services. *Global Environmental Change, Vol. 26*, pp. 152-158, <http://dx.doi.org/10.1016/j.gloenvcha.2014.04.002>

One of the largest obstacles for encouraging the full and effective participation of Indigenous Peoples to share their knowledge and worldview of *living in harmony with nature* is that in a large part of the world, Indigenous Peoples do not have adequate access to lands and resources to sustain their cultures, languages, and institutions necessary to preserve and share their knowledge and eco-centric worldview – they are environmentally racialized and “homeless on their own homelands”. States must reconcile existing laws and policies regarding land ownership, rights to access, and intellectual property with the pre-existence of Indigenous Peoples and their customary laws and practices.

Indigenous Peoples’ views of States’ promises and actions towards conservation and sustainable use is dimmed by a dark cloud of mistrust when the underlying causes of biodiversity loss are not addressed, e.g., limited or no restrictions for harvesting or alterations on ‘private land’ and government managed ‘public’ or ‘Crown’ lands to require conservation or sustainable use, or when Indigenous Peoples’ rights are not recognized or reconciled, e.g., limited or no access to their traditional ancestral homelands and resources or an equitable share of the benefits that arise from the use of their stolen lands. In Canada, recourse for Indigenous Peoples seems to inevitably fall to the courts, including several Supreme Court of Canada decisions which repeatedly raise that the path forward must be reconciliation of the assertion of the Crown’s sovereignty with the pre-existence of Aboriginal Peoples. Otherwise the courts, whom view themselves as also being a part of reconciliation, are left with no other option than to step into the chambers of governments, such as in the Tsilhqot’in Case where the Supreme Court declared Aboriginal title over a large area of land. The adversarial route of the courts is particularly damaging towards Indigenous-Canada relations where in Eastern Canada their still exists pre-confederation treaties of peace, friendship, and trade which are founding relationships for the settlement of Canada by Europeans and are founding documents of the Constitution of Canada by reference of the *Royal Proclamation of 1763*.

While spatial planning, protected areas, harvesting reference points, and other tools for biodiversity conservation and sustainable use may conceptually be advantageous to advance the CBD, it is vital to ask “who receives the advantage?” an “who bears the burden?”. Wide sweeping aspirations that “all will benefit” or “all will share the burden” are not cognizant of the long history of dispossessing Indigenous Peoples of their lands and resources, disinherit them from their rights, and denying that anything is wrong through a plethora of actions to “protect the Indian from the unscrupulous settler” or in the name of economic development or jobs, or citing a need for conservation. Indigenous Peoples are not inherently for or against conservation, just as they are not inherently for or against development. Indigenous Peoples require for their survival that the proposed actions of States, economic sectors, and others be viewed through and reconciled with Indigenous Peoples rights, including those expressed as the “minimum standards necessary for the survival of Indigenous Peoples” in the *UN Declaration on the Rights of Indigenous Peoples*. By extension reconciliation natural flows to biodiversity because Indigenous Peoples hold an eco-centric worldview of interconnectedness and interdependency with the natural world which requires bearing the burden of responsibility for Mother Earth and all our relations.

There is no other species on Earth capable of manipulating the environment to the extent that humans can. Additionally, no other species are able to fix the current problems that have arisen. Humanity needs to recognize that daily actions are contributing to the sixth mass extinction of biodiversity. Humanity must recognize how the homo-centric worldview has blinded and stymied efforts for biodiversity conservation, sustainable use, and equitable sharing and that a new path requires new tools developed from a different way of thinking. The objectives of the Convention on Biological Diversity, Sustainable Development Goals, and the UN Declaration on the Rights of Indigenous Peoples must be reconciled with the flow of power, capital, and capacity, and the national and sub-national laws and institutions that enable and entrench those as modern societies.

*The questions guiding the implementation of the post-2020 Global Biodiversity Framework need to be framed in language of environmental justice and respect for the natural world. MAPC is hopeful that with widespread mainstreaming, capacity development, and strong leadership together we can find a path towards **transformative change** to an **Eco-Centric Worldview of Living in Harmony with Nature**.*

