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Nature-based climate solutions

With well-designed protocols, Canada's natural assets could provide significant carbon offsets

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Executive summary

Human impacts on nature must be addressed if Canada and the world are to limit global warming to less than 1.5 degrees Celsius. While direct emissions reductions are the most effective way to safely limit warming, and there are concerns around the credibility of carbon offsets through nature-based solutions (NBS), these offsets have a role to play — if they are done right. Nature-based offsets can mobilize private capital to reduce emissions effectively in the short term, while we seek feasible solutions for emission sources that are currently difficult to abate.

Nature-based offsets can contribute to meeting biodiversity and conservation targets. They are also an important opportunity to support Indigenous communities by creating economic opportunities that draw on Indigenous natural stewardship and best practices.

Long term, once current and historic land use emissions are mitigated and with further study, NBS could contribute to removing carbon from the atmosphere, which will likely be necessary to limit global temperature rise.

But to successfully implement NBS offsets, Canada must develop credible protocols at the provincial and federal levels. These include strong rules around verification and quantification of outcomes that address the complexity and cost of monitoring and verification. Strict guidelines that accurately value the long-term carbon absorption properties of possibly impermanent assets must be put in place. This is particularly important for efforts in reforestation, which are susceptible to natural forces such as wildfire and insect infestation. Verification standards for offsets in the voluntary market will have to be consistent, not just in Canada but globally, to provide buyers with confidence.

NBS offsets are one part of the solution to climate change. They cannot be approached as an alternative to mitigation, but must be considered as another prong in a multi-pronged approach. They are needed in the short term as the economy transitions to low-carbon energy. However, as Canada gets closer to achieving net-zero emissions, the role of offsets will diminish, and shift toward purely negative emissions offsets. In the interim, if correctly implemented and monitored, NBS offsets are an opportunity worth pursuing.

1. Introduction

As global action accelerates to mitigate the effects of climate change, governments worldwide are looking to harness natural assets to reduce carbon in the atmosphere. Harnessing the carbon sequestration potential of forests, peatlands, wetlands and grasslands could become a powerful tool in keeping the global temperature increase below 1.5 degrees Celsius, and Canada is well situated to deploy those assets due to its abundant natural resources.

Canada has 9% of the world's forested land, at 347 million hectares (in comparison, Germany has 1.4 million hectares).[1,2] Peatland covers 12% of Canada's total land mass, mostly in the boreal and Arctic regions. This is the world's largest peatland carbon store.[3] The country is also home to roughly one-quarter of the world's remaining wetlands, covering 13% of land.[4] The carbon mitigation potential from Canada's existing natural assets is estimated at 209 million tonnes (Mt) to 320 Mt per year.[5] The country's total emissions in 2018 were 729 Mt.

Natural ecosystems can help reduce the risk of dangerous climate change by removing carbon from the atmosphere; protecting, restoring, managing and otherwise intervening in natural assets can prevent carbon releases and preserve or increase carbon absorption. To harness the carbon absorption capabilities of natural assets, Canada can protect ecosystems to avoid land use changes that would release greenhouse gases; plant trees in areas impacted by forest fires or pine beetles; carry out selective tree harvesting; reduce soil erosion with low- or zero-till agriculture; and undertake many more nature-based solutions practices. The deployment of these natural assets to absorb and prevent the release of carbon — known as nature-based solutions (NBS) — can also result in additional benefits to conservation, the economy, and community-building.

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[1] Natural Resources Canada, "How much forest does Canada have?" https://www.nrcan.gc.ca/our-natural-resources/forests-forestry/state-canadas-forests-report/how-much-forest-does-canada-have/17601

[2] Deutschland.de "Forest culture heritage in Germany" https://www.deutschland.de/en/topic/environment/how-large-are-germanys-forests-facts-and-figures

[3] "How much forest does Canada have?"

[4] Government of Canada "Extent of Canada's wetlands" https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/extent-wetlands.html

[5] The International Conservation Fund of Canada, *The potential for nature-based climate solutions in Canada: A brief overview* (2020), 1. https://icfcanada.org/files/ICFC_brief_Natural_Climate_Solutions_for_Canada.pdf

It is important that NBS solutions are not approached as an alternative to direct emission reduction activities such as electrification or energy efficiency, but rather as an additional complementary measure with climate and other benefits. For example, NBS projects can help landscapes adapt to or prevent physical damage from climate change, intersecting the two frequently siloed fields of climate and conservation. If implemented correctly, these projects can grow and restore habitats and migration paths, while increasing the carbon absorption capacity of the land.

But to contribute significantly to Canada's planned target of net-zero carbon emissions by 2050, NBS must be aligned with a rigorous and standardized system of measurement and verification and a carbon offset system that is consistent and trusted by the public and investors. This builds an incentive framework that underwrites the conservation and climate benefits of NBS and provides longer-term confidence in the offset market. Such a system, rolled out nation-wide, would also remove existing barriers to the successful deployment of Canada's natural assets in mitigating climate change.

Growing interest and investment in nature-based solutions

While the concept of managing and preserving land to yield measurable and verifiable climate benefits is not new, the idea of nature-based carbon offsets is growing in popularity. In the past two decades governments and the private sector have increasingly bought into the potential of NBS. Beginning in 2005, organizations such as the World Bank, the International Union for Conservation of Nature, the Nature Conservancy, the World Wildlife Fund and others began releasing reports tracking significant milestones in the development of the popular concept of NBS.[6] Since then, given increasing global commitments to tackling climate change, many organizations and governments have been drawn to the climate benefits of natural assets.[7] In recent years, Canada has also made commitments to the principles of NBS (Table 1).

[6] Emmanuelle Cohen-Stacham, Gretchen Walters, Christine Janzen and Stewart Maginnis (eds.), *Nature-based Solutions to address global societal challenges* (International Union for Conservation of Nature, 2016), 4. https://portals.iucn.org/library/sites/library/files/documents/2016-036.pdf

[7] *Nature-based Solutions to address global societal challenges,* xxi.

Table 1. Recent commitments by the Government of Canada toward nature-based solutions

Commitment	Investment	Commencement Date
The Nature Legacy initiative establishes new protected areas and works to recover endangered and threatened species over five years[8]	$1.3 billion	2018
Canada commits to conserve 25% of Canada's land and oceans by 2025 and 30% by 2030[9]	n/a	2019
Government of Canada promises to plant two billion trees [10]	$3 billion	2019
Canada joins the High Ambition Coalition for Nature and People to advocate for the target of conserving 30% of the world's lands and oceans by 2030[11]	n/a	2020

Many private sector companies have also identified NBS as a way to meet their own emissions reduction targets. Globally, as of 2020, more than 250 companies including Microsoft, Apple, ENI, Shell and BP have committed to restoring ecosystems as part of achieving emissions reduction targets.[12] For example, Apple signed on to work with The

[8] Government of Canada, *Budget 2018,* 24. https://www.budget.gc.ca/2018/docs/plan/budget-2018-en.pdf

[9] Office of the Prime Minister, "Minister of Environment and Climate Change Mandate Letter." Available at https://naturecanada.ca/wp-content/uploads/2019/12/Minister-of-Environment-and-Climate-Change-Mandate-Letter-_-Prime-Minister-of-Canada-1.pdf

[10] Liberal Party of Canada, *Forward: A real plan for the middle class* (2019). https://www2.liberal.ca/wp-content/uploads/sites/292/2019/09/Forward-A-real-plan-for-the-middle-class.pdf

[11] Environment and Climate Change Canada, "Canada joins the High Ambition Coalition for Nature and People," news release. September 28, 2020. https://www.canada.ca/en/environment-climate-change/news/2020/09/canada-joins-the-high-ambition-coalition-for-nature-and-people.html

[12] Leslie Hook, "Business turns to nature to fight climate change," *Financial Times*, July 27, 2020. https://www.ft.com/content/7d940587-4502-4468-acea-a67b7bf6a523

Ucilia Wang, "iForest: Apple gets into forest conservation in China and the US," *The Guardian*, May 14, 2015. https://www.theguardian.com/sustainable-business/2015/may/14/apple-forest-conservation-china-world-wildlife-fund

Joel Makower "Trend: Companies warm to nature-based solutions," *GreenBiz*, January 27, 2020. https://www.greenbiz.com/article/trend-companies-warm-nature-based-solutions

Conservation Fund, World Wildlife Fund, and Conservation International to conserve and improve forest management in China, the United States, Colombia, and Kenya.[13]

[13] Apple Inc., "Apple commits to be 100 percent carbon neutral for its supply chain and products by 2030," news release, July 21, 2020. https://www.apple.com/ca/newsroom/2020/07/apple-commits-to-be-100-percent-carbon-neutral-for-its-supply-chain-and-products-by-2030/

2. Building a nature-based carbon offset system

Nature-based offsets cannot be approached as an alternative to mitigation, but rather in addition. To help ensure carbon removal and offsets do not substitute for direct emissions reductions, and that their deployment is consistent with safely reaching net-zero by 2050, it has been suggested that carbon removal and carbon offset targets be separated from mitigation targets.

Some emission sources will be technologically and economically challenging to abate in the next decade. Offsets where the carbon-sequestration attributes have been appropriately quantified are a way to reduce emissions from sources such as these in the interim. Carbon removal through steep, short-term emissions reductions will put Canada on the best path toward our climate objectives, and nature-based offsets have the added benefits of potential long-term conservation, ecological restoration, and habitat preservation.

Nature-based offsets are a market-based tool that can leverage private capital to reduce emissions while conserving and managing landscapes for the future. But to be effective as an investment and climate solution they must be consistently defined, verified, and monitored.

2.1 Defining regulated and voluntary offset markets

Regulated offset markets, as a market-based approach, allow organizations to purchase emissions reductions from other entities, taking the place of their own carbon reductions by other means in order to meet government-imposed sectoral emissions limits. Carbon offsets can be purchased by individuals, organizations, or governments; offering private organizations flexibility in meeting both regulatory requirements and voluntary commitments to reducing emissions. On the flip side, companies are incentivized to generate credits by continuing to reduce their own emissions after they have complied with the regulated limit, in order to sell those credits for a profit. Offsets, then, can be traded in a regulated carbon market with organizations buying or selling

carbon credits. The key to confidence in these markets is that outcomes are verifiable and will deliver stated emissions reductions.

Voluntary carbon markets arise when companies, organizations, or individuals are motivated to reduce their own carbon emissions separate from government-imposed limits.This is often done in the private sector to enhance a company's environmental performance, or to demonstrate corporate social responsibility. While voluntary markets represent only a fraction of global carbon markets, they have benefits including flexibility with financing, technologies, and a wider array of buyers because they are not limited by the same legislative and legal barriers the regulated market has.

Voluntary markets operate in tandem with regulated markets, increasing opportunities to develop new carbon offset projects that might not be feasible in the regulated market.[14] They can also be less constrained than regulated markets, which require enabling legislation such as carbon pricing systems. Although the size of the voluntary market in Canada is quite small, its protocols have informed the implementation of regulated systems, providing a testing ground for technologies, measurements, methodology and market readiness.

NBS offsets in Canada

The first NBS offsets in Canada were created in Alberta in 2007 as part of a wide-ranging carbon-pricing policy that came into place that year. With interest growing in the possibilities around carbon offsets in mitigating the effects of greenhouse gases, the Government of Canada has started developing more robust policy around offsets. As part of the second iteration of the federal Greenhouse Gas Pollution Pricing Act, the proposed Greenhouse Gas Offset Credit System Regulations (Canada) include early-phase NBS-related protocols for systems including forest management and organic soil management.[15]

Environment and Climate Change Canada has also committed to studying and potentially developing further protocols, as more data on offsets becomes available.

[14] Corporate Finance Institute, "Voluntary Carbon Market," https://corporatefinanceinstitute.com/resources/knowledge/other/voluntary-carbon-market/

[15] Government of Canada, "Greenhouse Gas Offset Credit System Regulations (Canada)," Canada Gazette, Part I, Volume 155, Number 10, March 6, 2021. https://canadagazette.gc.ca/rp-pr/p1/2021/2021-03-06/html/reg1-eng.html

While the province of Alberta has more than 20 protocols, only one was related to NBS projects.[16] The Conservation Cropping protocol was an updated version of the Tillage System Management Protocol, introduced in 2007, which increased soil carbon levels through no-till management (decreasing erosion through minimal soil disturbance) and reduced greenhouse gas emissions from lower fuel use.[17] In early 2021 the Government of Alberta discontinued the protocol, because the farming practices it was designed to reward became business as usual for a high percentage of agricultural operators and no longer met the definition of 'additionality'.[18] At the same time, the province began developing a policy framework to support future protocols specific to forestry practices.[19]

The Government of Saskatchewan has been developing a carbon offset management program, with protocols for landfill gas capture, aerobic composting, farming and ranching.[20] The program proposes external, third-party development of protocols, measurement and verification for transparency and consistency.

British Columbia repealed its protocol for forest carbon offsets, initially enacted in 2008 and applicable to all forest carbon offset projects on provincial crown land. [21] Some projects approved under the Greenhouse Gas Reductions Target Act were grandfathered in prior to the 2016 repeal (including the Coastal First Nations' Great Bear Rainforest project).[22] Research from 2017 found that the impact of the policy before it was repealed was limited to a very small number of offset projects.[23]

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[16] Government of Alberta "Alberta Emissions Offset System" https://www.alberta.ca/alberta-emission-offset-system.aspx

[17] Government of Alberta "Agricultural carbon offsets – Conservation Cropping Protocol" https://www.alberta.ca/agricultural-carbon-offsets-conservation-cropping-protocol.aspx

[18] Government of Alberta "Quantification protocol for conservation cropping. Version 1.0" https://open.alberta.ca/publications/9780778596288

[19] Government of Alberta, "Emission Offsets and TIER," webinar presentation, November 21, 2019. https://www.alberta.ca/assets/documents/aep-tier-emission-offsets-webinar-presentation.pdf

[20] Government of Saskatchewan, "Saskatchewan Begins Development Of Prairie Resilience Carbon Offset Framework," June 3, 2019. https://www.saskatchewan.ca/government/news-and-media/2019/june/03/carbon-offset-framework

[21] Katherine Monahan, Ben Filewood, John McNally and Shabnam Khalaj, *Nature-based solutions: policy options for climate and biodiversity* (Smart Prosperity Institute, 2020), 33. https://institute.smartprosperity.ca/sites/default/files/nbsreport.pdf

[22] Government of British Columbia, *Protocol for the Creation of Forest Carbon Offsets in British Columbia,* https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/consulting-with-first-nations/agreements/other-docs/forest-carbon-offset-protocol.pdf

[23] Guillaume Peterson St-Laurent, Shannon Hagerman, George Hoberg, "Barriers to the development of forest carbon offsetting: Insights from British Columbia, Canada," *Journal of Environmental Management,* 203 (2017).

The B.C. government has recently begun developing a new forest carbon offset protocol to quantify greenhouse gas emissions reduction and removal.[24]

2.2 Creating and verifying NBS offset protocols

Proponents are often drawn to nature-based solutions carbon offsets because of their low cost relative to other emission reduction options and the additional benefits they may bring to ecosystems and communities. Globally, offsets can cost as little as US$5 per tonne of CO_2 mitigated.[25] The Smart Prosperity Institute estimated that the cost per tonne of carbon reduction from the Government of Canada's two billion trees program will be around $20 per tonne of CO_2, which is well below the federal carbon price of $50 per tonne in 2022.[26]

But there is still uncertainty in the cost-effectiveness of NBS projects, and inconsistencies that lead to distrust of the offset market. In any NBS project, the level of carbon offset will differ based on the conditions and carbon mitigation capabilities of a given location.[27]

As in all markets, supply and demand are key factors in deciding price — and the volume of available NBS offsets isn't unlimited. Canada's recently announced climate plan includes an increase in the carbon price to $170/t by 2030, which will likely drive companies to look for new ways to reduce their emissions and create greater demand for offsets.

The carbon sequestration in nature-based assets can also be reversed. This has resulted in growing concerns over the legitimate climate benefit of some nature-based carbon offsets. For example, the Lionshead fire in Oregon in September 2020 destroyed 190,000

https://www.researchgate.net/publication/318636202_Barriers_to_the_development_of_forest_carbon_offsetting_Insights_from_British_Columbia_Canada

[24] British Columbia, "Offset protocol consultation" https://www2.gov.bc.ca/gov/content/environment/climate-change/industry/offset-projects/consultation

[25] Terry Slavin, "How Shell's offsetting move could help unlock flood of finance for forests" *Reuters Events*, September 2, 2019. https://www.reutersevents.com/sustainability/how-shells-offsetting-move-could-help-unlock-flood-finance-forests

[26] Dave Sawyer and Seton Stiebert, "There's promise in planting billions and billions of trees" *Smart Prosperity Institute,* December 17, 2019. https://institute.smartprosperity.ca/content/there-s-promise-planting-billions-and-billions-trees

[27] Richard A. Betts, "Offset of the potential carbon sink from boreal forestation by decreases in surface albedo," Nature 408 (2000), 1. https://www.nature.com/articles/35041545

acres of forest, including almost the entirety of a section of forest dedicated to creating carbon offsets. Before the fire, 2.6 million tonnes of sequestered carbon dioxide had already been issued as offsets; these literately went up in smoke.[28] Other reversals can occur as a result of infestations, or from land use changes such as changes to management practices or conversion of land for agriculture or urban development. In addition to the risk of reversal, questions of additionality, proper quantification and verification represent real challenges for nature-based carbon offsets. Particularly in the voluntary offset market, lack of trust can have a significant impact on the demand for an offset. However, these challenges can be overcome with proper design of the offset protocol system and supporting policies.

Design considerations

Additionality

The project developer must prove that the carbon absorption an offset is claiming would not have occurred anyway, without the project. The U.S.-based Nature Conservancy has found itself under fire recently for selling NBS offsets from trees not at risk of being cut down, benefiting some of the country's largest corporations while making NBS offset protocols less trustworthy.[29]

Leakage

The offset proponent must ensure that leakage potential has been assessed, minimized, and accounted for in the quantification of benefits. Leakage occurs when greenhouse gas reduction in one region causes an increase in emissions somewhere else. It is a particular concern for projects that involve forest protection. For example, protecting a forest in one location could simply shift logging to another forested area in a new location and result in no net climate benefit.[30]

[28] Emily Pontecorvo and Shannon Osaka, "This Oregon forest was supposed to store carbon for 100 years. Now it's on fire.," *Grist,* September 18, 2020. https://grist.org/climate/this-oregon-forest-was-supposed-to-store-carbon-for-100-years-now-its-on-fire/

[29] Ben Elgin, "These Trees Are Not What They Seem" *Bloomberg*, December 9, 2020. https://www.bloomberg.com/features/2020-nature-conservancy-carbon-offsets-trees/

[30] Tim Adams, Bill Winters, Annette Nazareth, and Mark Carney, *Taskforce on scaling voluntary carbon markets* (Institute of International Finance, 2021), 44. https://www.iif.com/Portals/1/Files/TSVCM_Report.pdf

Verification and quantification

A project must also be verified by an accredited third party and have accurate quantification. Data collection methods vary based on project and location and can include light detection and ranging (LIDAR), infrared imagery, dry combustion, or satellite imagery.[31]

Permanence

The project must also be permanent. Any possible reversals of verified carbon storage must be considered, planned and accounted for. For example, offset values must account for the projected life cycle of a forest, including potential for fire and infestation.

Global verification mechanisms

Verification standards and government protocols are used to certify the validity of projects and their impacts. These outline the rules and measurement requirements for offsets. All projects in both the regulated and voluntary markets must be verified by an independent third party.

For regulated offsets, governments determine specifications for third-party verifiers with a set of pre-selected qualifications.[32] Projects on the voluntary market are not limited in their choice of verifier and the verification process is not consistent across the regulated and voluntary markets.[33] More than 90% of voluntary carbon credits use one of the following verification mechanisms:[34]

- Verra's VCS program (Washington, DC) launched in 2006. VCS has the world's largest voluntary carbon offset program, with more than 1600 verified projects.[35]

[31] Gillian Petrokofsky et al., "Comparison of methods for measuring and assessing carbon stocks and carbon stock changes in terrestrial carbon pools. How do the accuracy and precision of current methods compare? A systematic review protocol," *Environmental Evidence* (2012). https://environmentalevidencejournal.biomedcentral.com/articles/10.1186/2047-2382-1-6#Sec34

[32] Government of Alberta, *Standard for Greenhouse Gas Emission Offset Project Developers,* (2019), 29. https://open.alberta.ca/dataset/ba00d7a0-e37b-4792-a050-f56bfd968187/resource/33fa6665-7dfb-4483-8639-c8bb1a5d695a/download/aep-standard-for-emission-offset-project-developers-v3-2019-11.pdf

[33] *Taskforce on scaling voluntary carbon markets,* 20.

[34] *Taskforce on scaling voluntary carbon markets,* 37.

[35] Verra "Who We Are," *About Verra*, https://verra.org/

- The Gold Standard (Geneva, Switzerland) established in 2003 by World Wildlife Fund and other NGOs. The Gold Standard has more than 1800 projects worldwide.[36]
- American Carbon Registry (Little Rock, Arkansas) founded in 1996. The ACR oversees registration and verification of both voluntary projects and projects in California's regulated market. The ACR has verified over 400 projects.[37]
- Climate Action Reserve (Los Angeles, California) founded in 2001. The Reserve acts as an Offset Project Registry for California's cap–and-trade program and has developed standards for voluntary projects. The Reserve has more than 600 projects.[38]

2.3 Barriers to monitoring and measuring NBS offsets

While there is increasing interest in nature-based carbon offsets, the size of voluntary and regulated markets is still limited by barriers that exist in both markets.

To enable the growth of NBS carbon offset markets in Canada, provincial and federal governments must develop robust protocols and proper verification processes that allow buyers and sellers to have confidence in their investments. Fragmented markets across provincial borders limit both demand and supply, and will ultimately prevent the growth of the market. Monitoring and verification can also be more complex for NBS, compared to the relatively easily measured volumes in carbon mitigation technology. There is currently little certainty in the voluntary market surrounding NBS projects and offsets, and buyers have been put off by lack of information, understanding and verification.

The Taskforce on Scaling Voluntary Carbon Markets is an international private-sector-led initiative organized under the Institute of International Finance. The taskforce recommends a list of Core Carbon Principles, creating baseline standards the market can align on.[39] These establish minimum quality criteria for carbon offsets and verification mechanisms to ensure the environmental credibility of offsets and to minimize adverse social and ecological effects.[40]

[36] Gold Standard "Vision + Impacts" *About Us,* https://www.goldstandard.org/about-us/vision-and-mission

[37] American Carbon Registry, "Our Mission" *About Us,* https://americancarbonregistry.org/about-us/mission

[38] Climate Action Reserve, "About Us" https://www.climateactionreserve.org/about-us/

[39] *Taskforce on scaling voluntary carbon markets*

[40] *Taskforce on scaling voluntary carbon markets,* 10.

Even with this increased focus, the normalization and growth of these markets will only happen with increased demand, with clear and consistent protocols, with more companies and organizations holding themselves to meaningful climate targets, and with commitments to offset land use and historical emissions.

Accounting for land use emissions

Often, emissions from land use, land change and forestry are overlooked. Globally, about 23% of total emissions were the result of land disturbance from agriculture, forestry, and other industries.[41]

In Canada, project impact assessments fail to account for land disturbance. For example, the environmental impact assessment for the recently withdrawn Teck Frontier oilsands mining project in northern Alberta estimated that operations would emit 4.1Mt CO_2e per year.[42] Building the project would also have disturbed ground cover resulting in the loss of that carbon absorbing ecosystem and an additional 1 Mt per year of GHG emissions — but those emissions weren't accounted for in Teck's project proposal.

Accurate accounting of natural assets and larger-scale deployment of nature-based solutions can help address and eventually offset land use emissions currently not on the national ledger.

[41] United Nations Climate Change "Land Use, Land-Use Change and Forestry (LULUCF)" https://unfccc.int/topics/land-use/workstreams/land-use--land-use-change-and-forestry-lulucf

[42] Alberta Energy Regulator and Canadian Environmental Assessment Agency, *Report of the Joint Review Panel: Teck Resources Limited Frontier Oil Sands Mine Project* (2019), 179. https://iaac-aeic.gc.ca/050/documents/p65505/131106E.pdf

3. Co-benefits

Proponents of a system of NBS carbon offsets often include co-benefits among the advantages. These include potential conservation of land, improved biodiversity, and financial and social benefits for adjacent communities, including Indigenous communities.

Governments can legislate conservation and biodiversity requirements into protocols, incentivizing proponents to improve local ecosystems. One way to do this is through offset stacking, which allows a single project to account for multiple benefits. For example, values for carbon credits and increased biodiversity could be sold separately, adding incentives to investing in NBS projects.[43] While markets for environmental benefits other than carbon do not currently exist, climate and conservation are inextricably linked, and this type of policy would allow government and private industry to prioritize both at the same time, which may help build broad stakeholder support for NBS offsets.

A recent report outlined some of the logistical and financial hurdles for Indigenous-led NBS offset projects. These included a lack of clarity surrounding land tenure and carbon ownership, the cost of hiring external consultants to model and verify the quantity of carbon offset, and the lack of appropriate protocols for entry into regulated markets.[44]

There are only limited examples of Indigenous involvement in NBS carbon offset projects, but Indigenous communities could potentially benefit from project development and operations, while incorporating traditional knowledge around conservation and land stewardship. Active partnerships led by Indigenous decision-makers could create unique opportunities in this area.

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[43] Forest Trends, *Theory and Practice of 'Stacking' and 'Bundling' Ecosystem Goods and Services: A Resource Paper* (2018) https://www.forest-trends.org/wp-content/uploads/2018/11/Stacking-Bundling-Resource-Paper-01-11-18.pdf

[44] Justine Townsend and Mary-Kate Craig, *Nature-Based Solutions: Indigenous-led Conservation and Carbon Storage in Canada* (Conservation Through Reconciliation Partnership, 2020) https://metcalffoundation.com/site/uploads/2020/02/CRP_Indig_NatureBasedSolutions_2020Report_final.pdf

4. Conclusion

Nature-based carbon offsets are an opportunity to mobilize private capital to reduce emissions and conserve large swaths of nature, as a supplement to mitigating and abating carbon emissions. They can be a credible way to address emission sources that are difficult to abate in the near term while operational and technological improvements are made. In both the voluntary and regulated markets, strict guidelines around quantification, verification, monitoring, and reporting are needed to ensure projects deliver the promised benefits. A standardized approach to this will increase buyer confidence and ultimately grow the market as more people, companies, and governments understand and trust the benefits of buying carbon offsets.

Further to delivering on promises, projects need to ensure they have effectively engaged with surrounding Indigenous communities to verify that projects follow the principle of do-no-harm and incorporate traditional knowledge to ensure project success.

Overall, the value of NBS offsets in maintaining global warming below 1.5 degrees is promising but limited. Nature-based offsets should be used to enhance mitigation from direct emissions reductions, and only if they are done consistently in a way that improves on the country's performance so far. Breaking down net-zero targets into three parts — direct reduction, carbon removal, and emissions neutralized through offsets — can help create transparency and ensure we are deploying the right tools for the right challenges on our pathway to net-zero.