Enhancing Canada's Climate Change Ambitions with Natural Climate Solutions

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Peatlands Hudson Bay. Photo: Andre Erlich/istock

Vedalia Biological Inc.

IUCN WCPA World Commission on Protected Areas

Nature Conservancy Canada

Webinar Outline

NATURAL CLIMATE SOLUTIONS:

CONTEXT

KEY PRINCIPLES

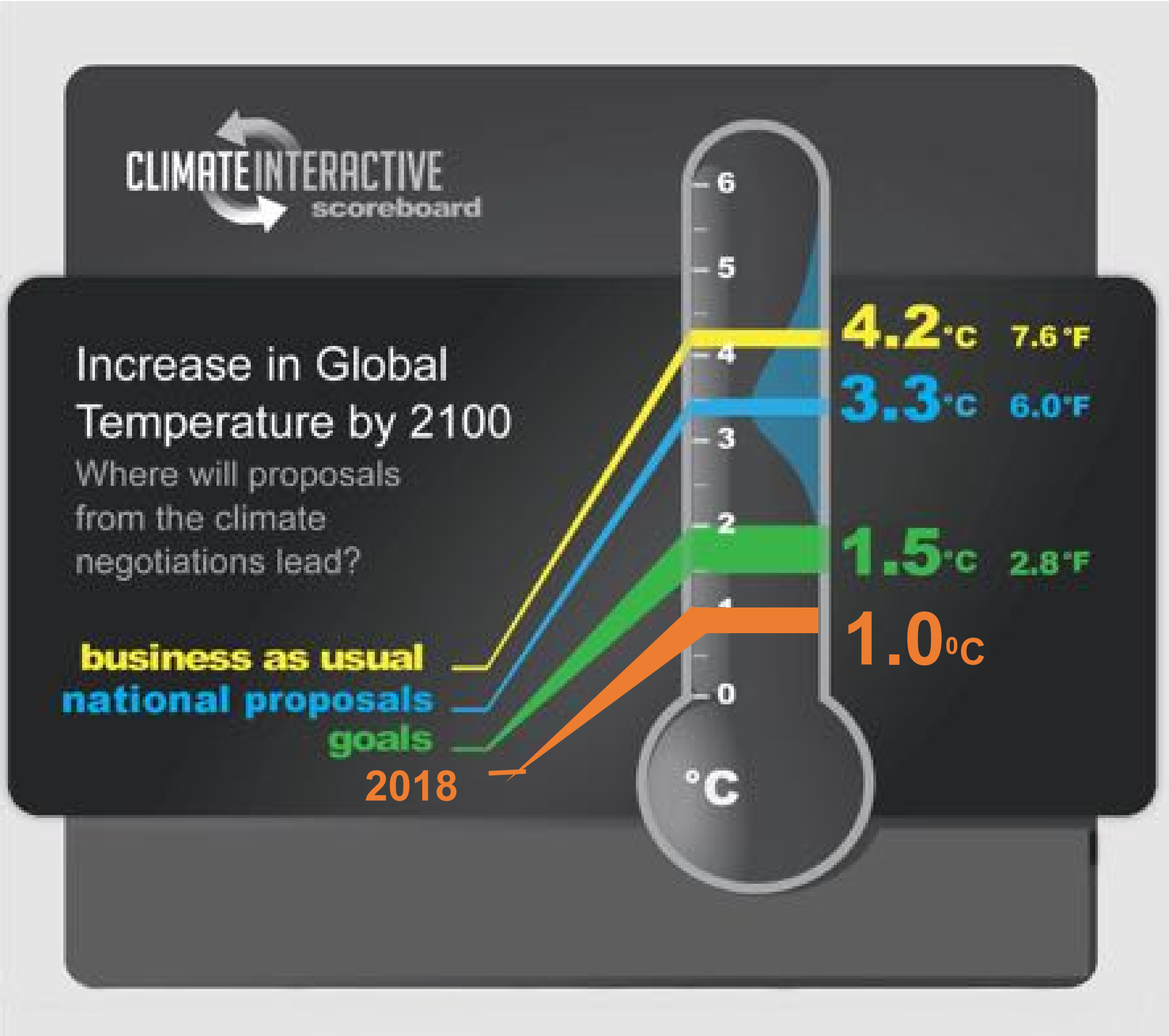
FINDINGS & RECOMMEND-ATIONS

CARBON OFFSETS & DISCUSSION

Photos left to right: V. Krivosheev, Timothy Epp, David Denning, Vlad Silver

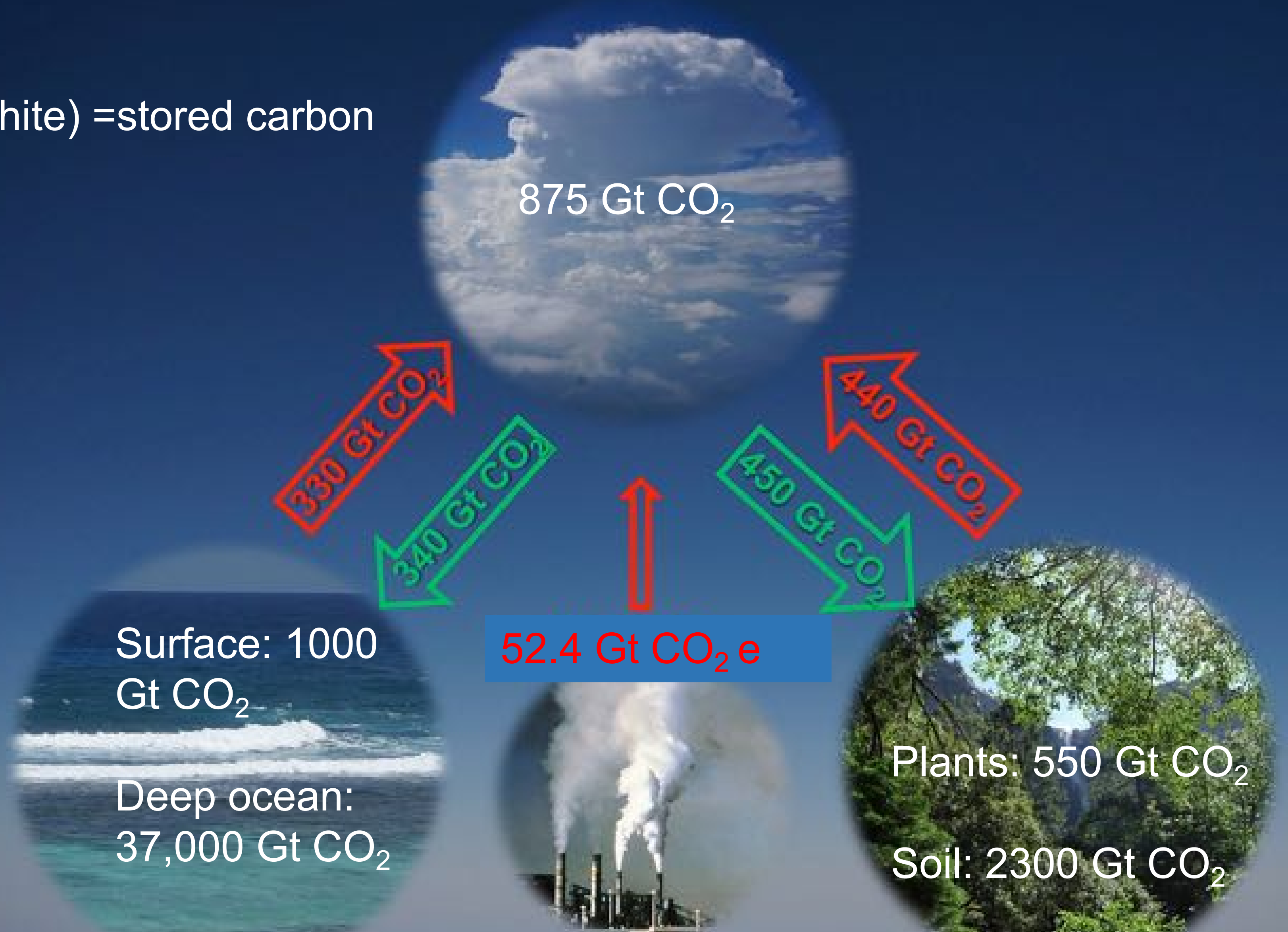
PARIS CLIMATE AGREEMENT

Limit global warming to "well below 2^0C" above preindustrial levels and to "pursue efforts to limit it to 1.5^0 C" by end of the century

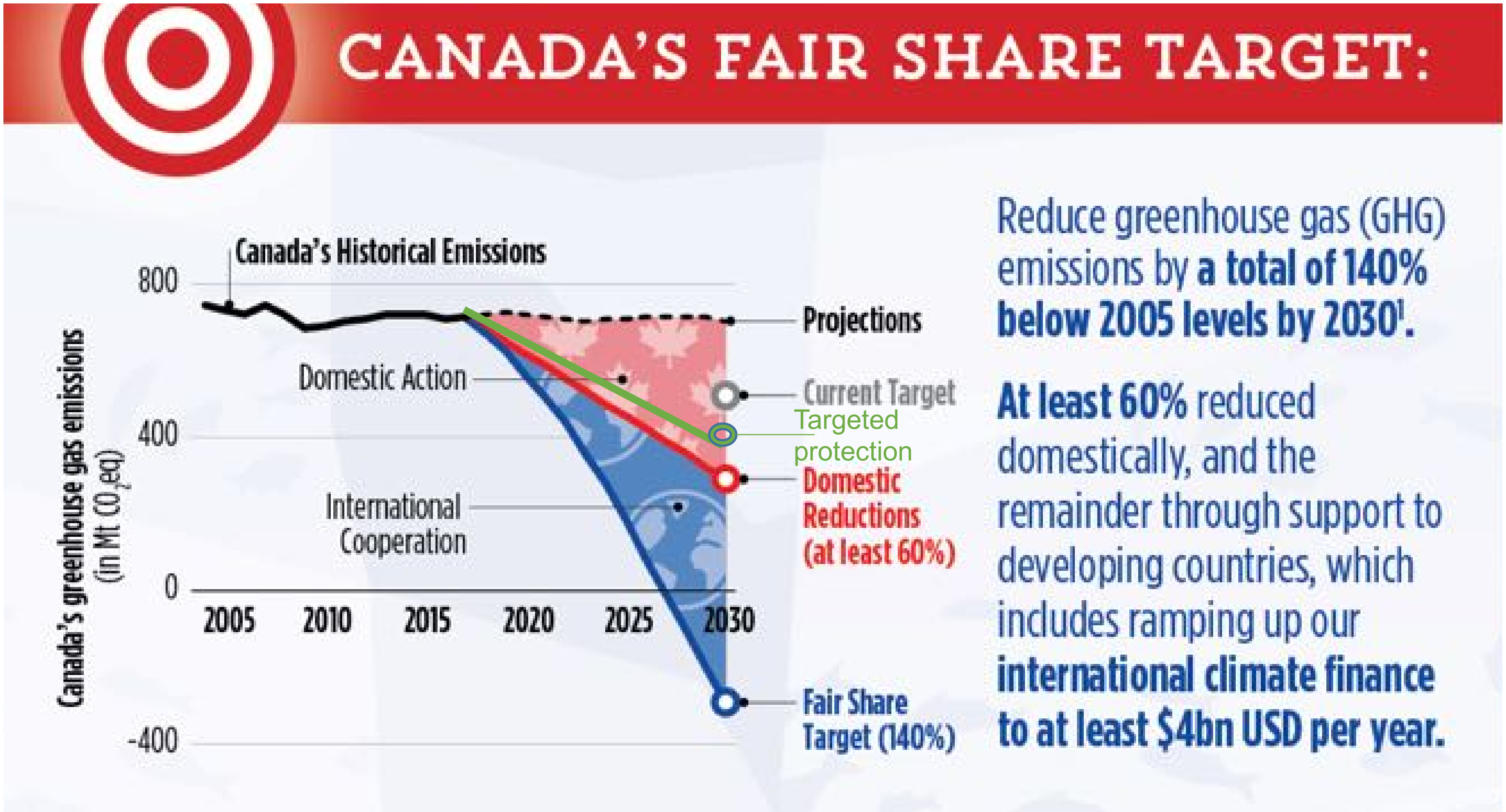


The Global Carbon Cycle

(White) =stored carbon

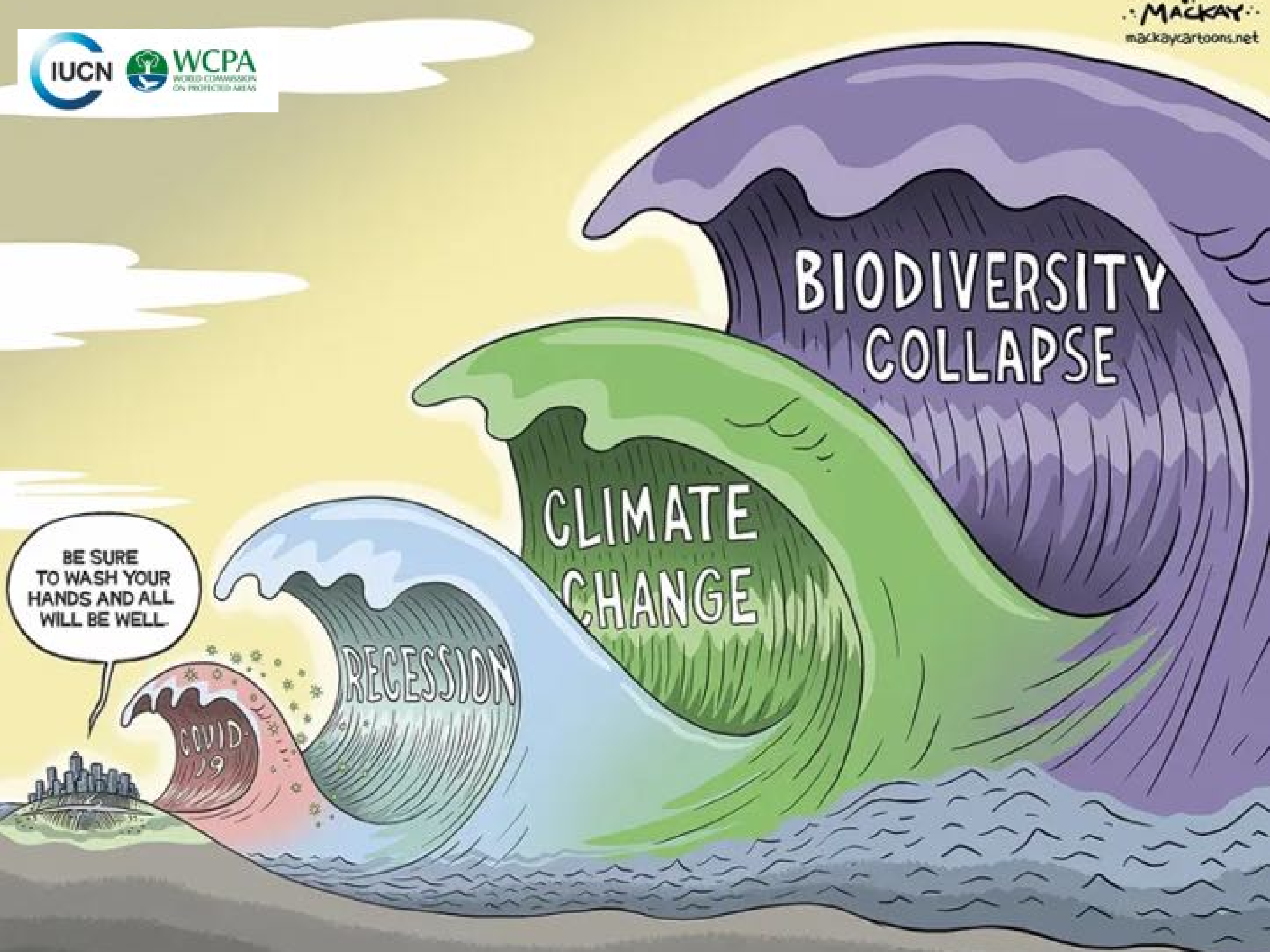


Adapted from NASA 2018, Global Carbon Budget 2019 and UNEP Emissions Gap Report 2020



Source: Adapted from Climate Action Network Canada

IUCN WCPA WORLD COMMISSION ON PROTECTED AREAS



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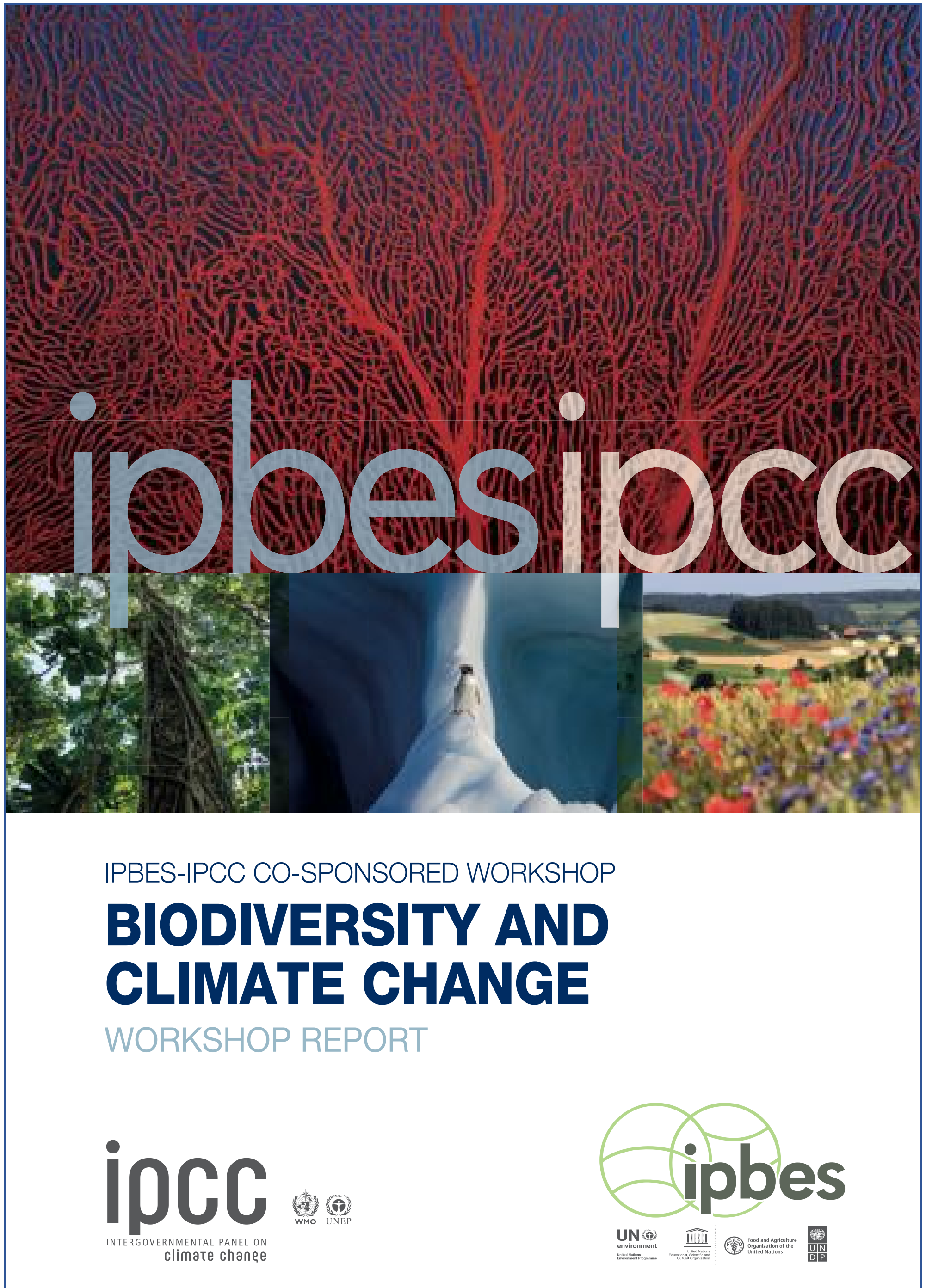
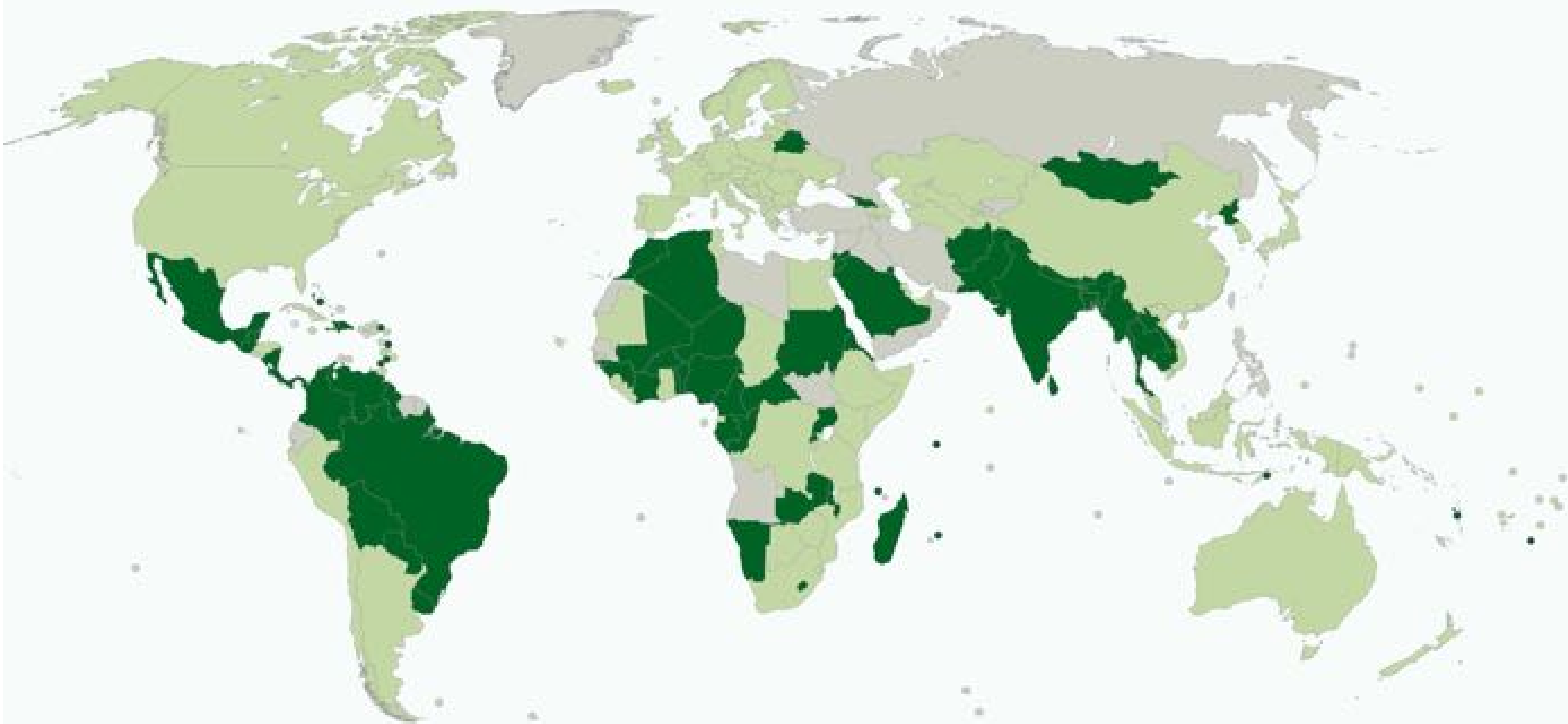


Countries with References to Protected Areas In Nationally Determined Contributions to the Paris Agreement



NDC includes specific reference to protected areas or equivalent term

NDC does not reference protected areas or equivalent

Source: Hehmeyer, A et al 2019

Catch and Store Carbon in Terrestrial & Coastal Ecosystems

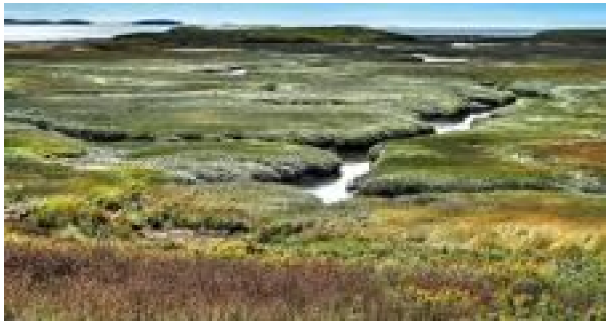
Natural Peatland
(Pi-Lens/Shutterstock)

Boreal Forest
(Lily Marcheterre/istock)

Coastal Temp Rainforest
(Timothy Epp/Shutterstock)

Grassland Kamloops
(Miroslav_1/istock)

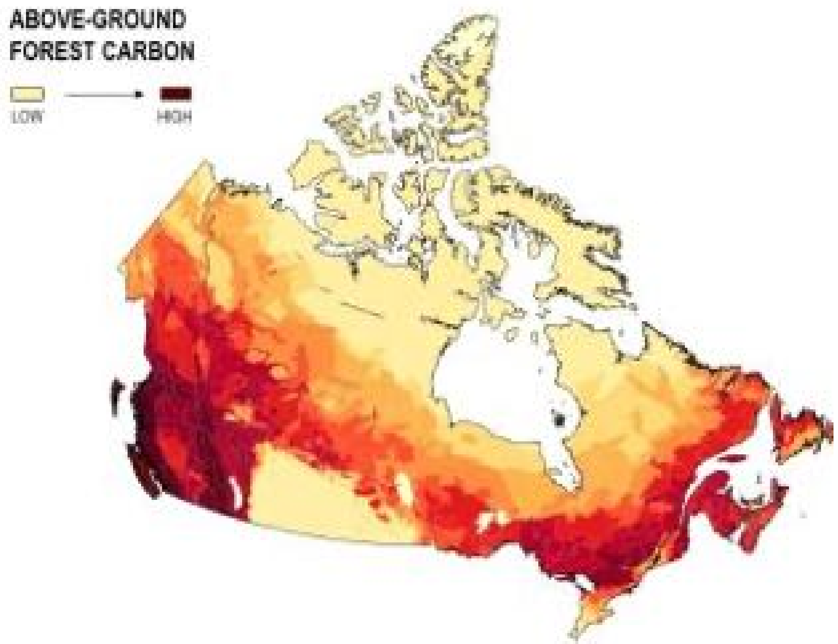
Prairie Grassland
(Nafinney/istock)

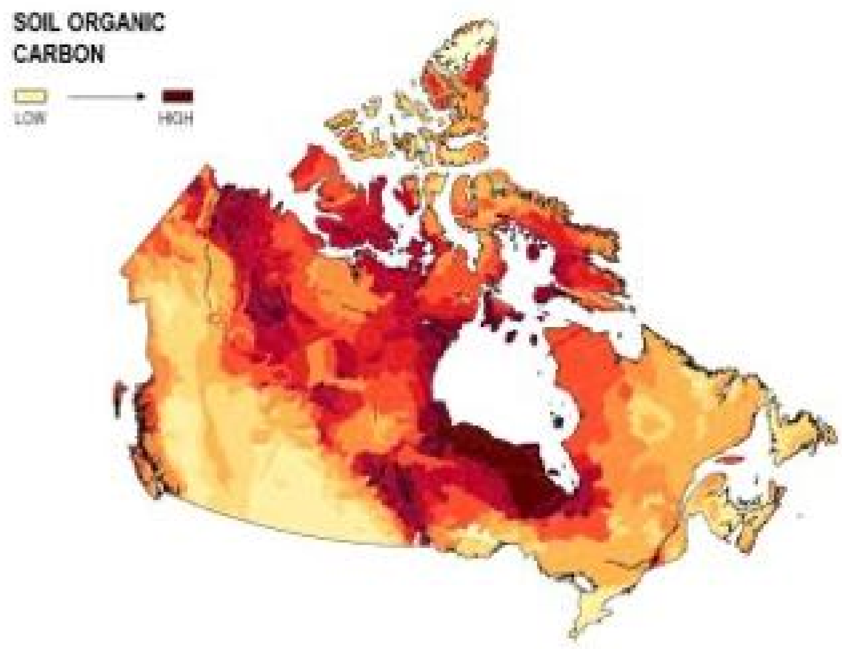


Saltmarsh Bay of Fundy
(Lisa Szabo-Jones/Alternatives Magazine)

Eelgrass Vancouver Island
(D. Denning)

Carbon Storage in Canada's Ecosystems



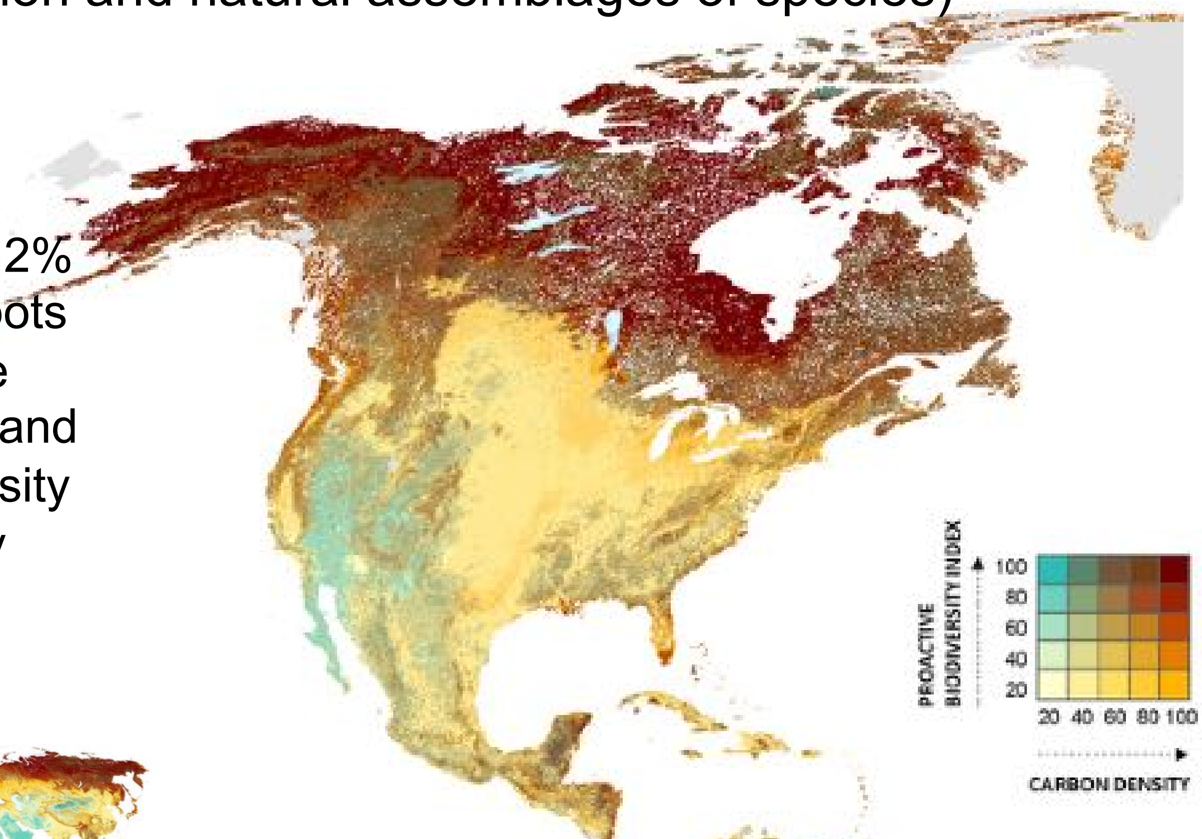


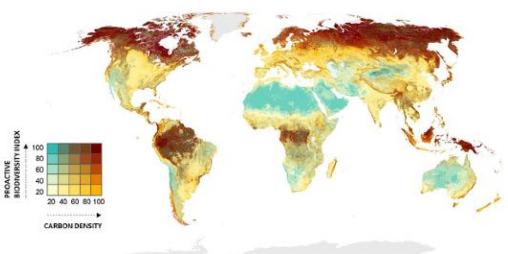
Data from Soto-Navarro et al. 2020
Map by WWF-Canada

Carbon-Dense/High Biodiversity Areas

(Proactive Biodiversity is irreplaceable, intact, with good habitat condition and natural assemblages of species)

- Globally, ~ 12% of the hot spots for Proactive Biodiversity and Carbon Density are currently protected

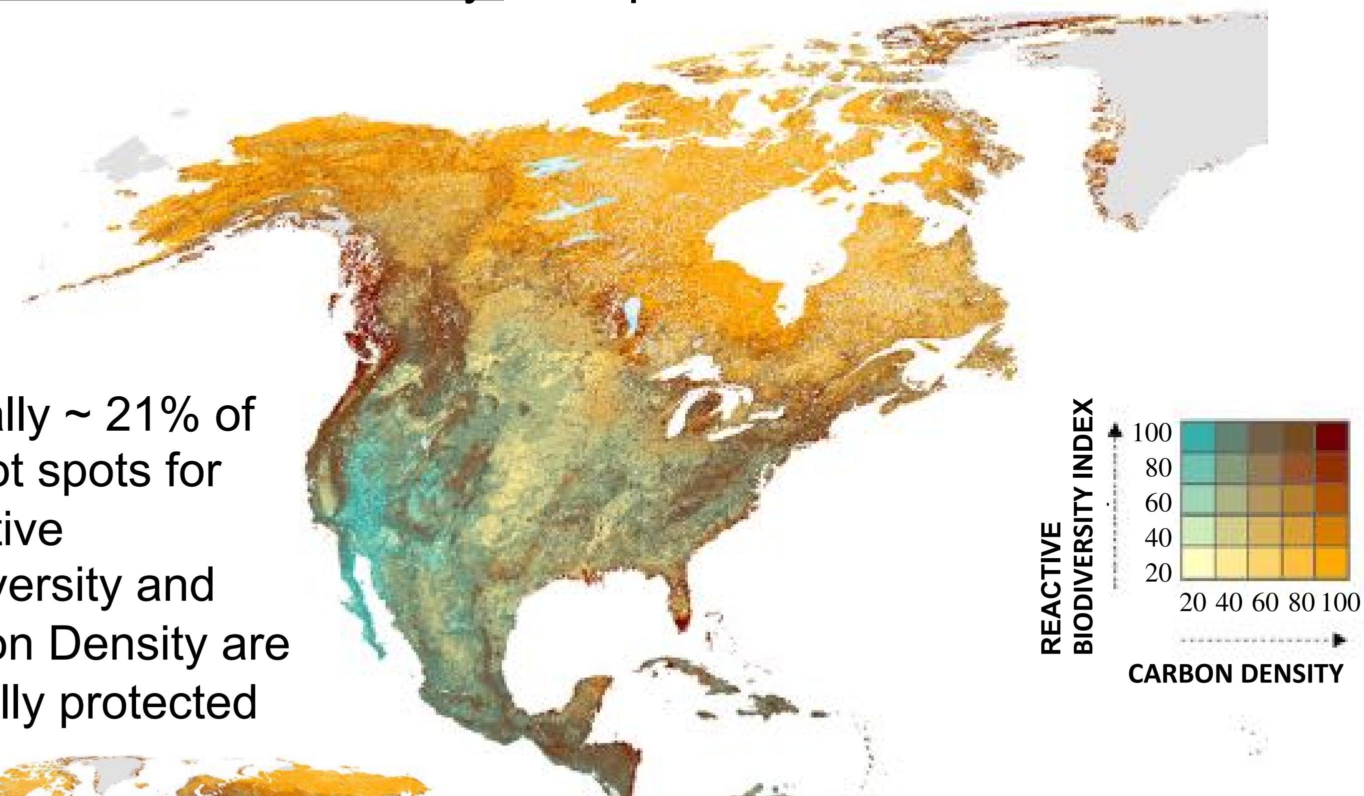




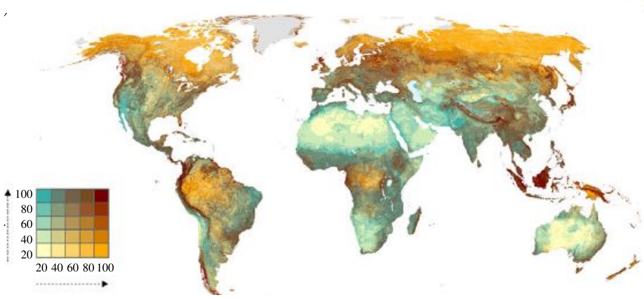
Source: Soto-Navarro et al. 2020

Carbon-Dense/High Biodiversity Areas

(Reactive Biodiversity - irreplaceable and threatened biodiversity)

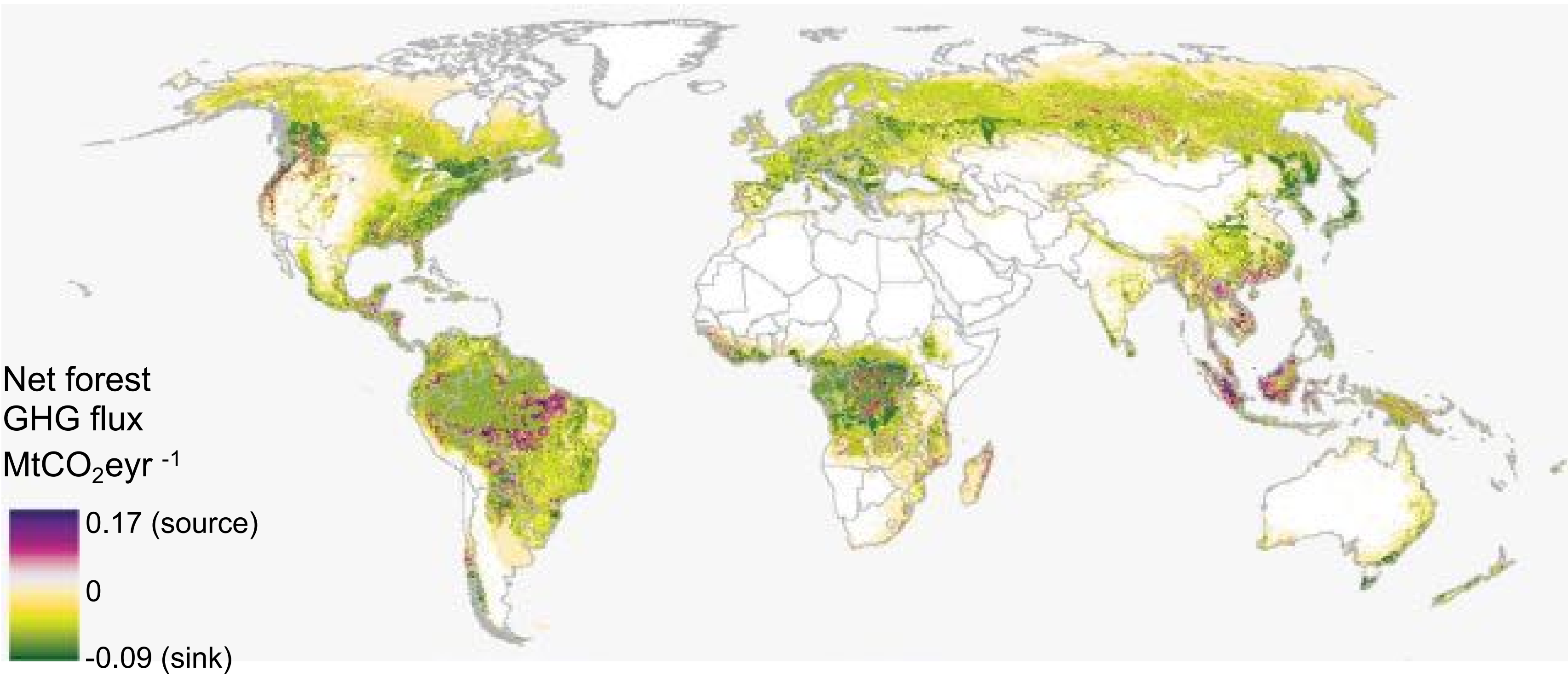


- ❑ Globally ~ 21% of the hot spots for Reactive Biodiversity and Carbon Density are formally protected



Source: Soto-Navarro et al. 2020

Net Forest GHG flux



- About 27% of the global net forest GHG sink occurred within protected areas from 2001-2019

Reprinted from Harris et al 2021

PRINCIPLE 1

- Natural Climate Solutions do not replace the imperative to reduce emissions from fossil fuels

Photos: FatCamera/istock and Bruce Raynor/shutterstock

PRINCIPLE 2

- Natural Climate Solutions must provide benefits for both biodiversity and climate change

Not a NCS - Building houses out of wood to store the carbon in a structure

Not a NCS - Wood pellets for export
Photo: Flickr

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PRINCIPLE 3

- Natural Climate Solutions should be permanent – they must store and sequester carbon over the long term.

BC Interior Rainforest/ Conservation North

Douglas fir plantation BC/ R. Smith

PRINCIPLE 4

- ❑ Addressing rights and title of Indigenous Peoples goes hand-in-hand with NCS

■ Intact ecosystems
■ Intact forest layer

● Indigenous communities

● Indigenous Guardians pilot program

Source: Artelle et al. 2019

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PRINCIPLE 5

- Natural Climate Solutions require equal attention to both ‘catch’ and ‘store’
- ‘Catch’ refers to protecting and increasing the ability of ecosystems to sequester carbon from the atmosphere. It is important to note that 100 to 1000 billion tonnes of CO_2 will have to be removed from the atmosphere by the year 2100 to limit temperature increases to 1.5 deg C.
- ’Store’ refers to protecting the carbon that is stored in ecosystems for long periods (hundreds and sometimes thousands of years). This is sometimes referred to as ‘avoided emissions’.

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RECOMMENDATION 1

TARGETED PROTECTION

Protecting threatened, intact, carbon-dense/high-biodiversity ecosystems: the most effective Natural Climate Solution to 2030

Photo: Timothy Epp/Shutterstock.com

Targeted Protection

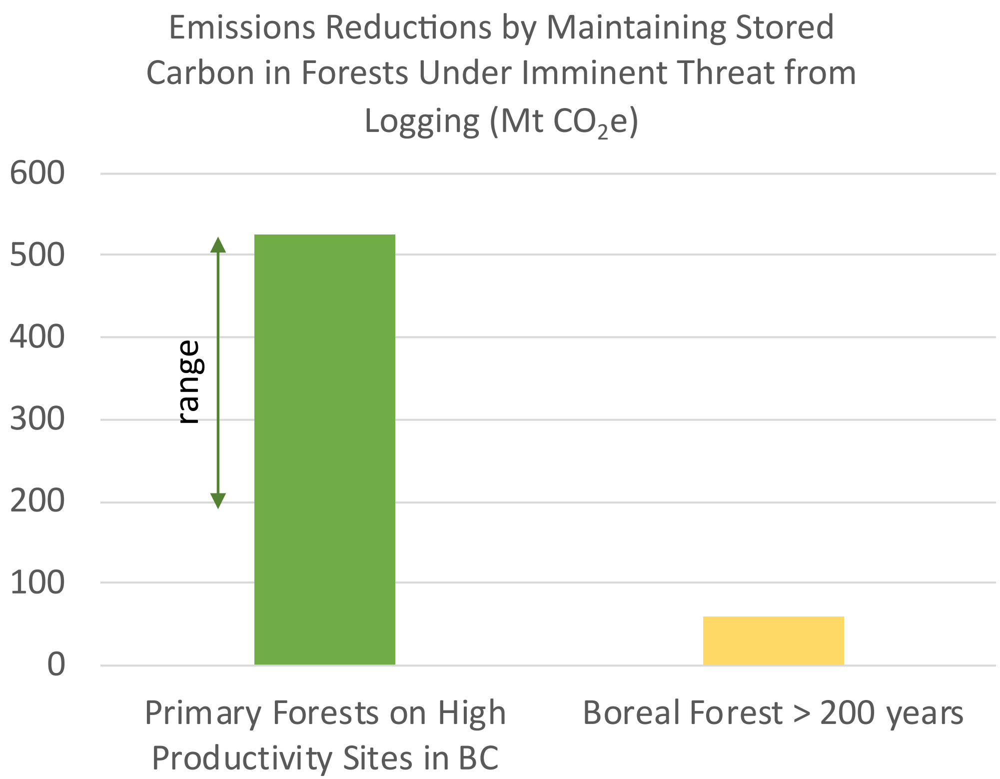
- Protecting carbon-dense ecosystems slated for some form of industrial development (i.e. old growth forests, saltmarshes, eelgrass, peatlands, grasslands)
- Would reduce annual emissions by 10 Mt CO_2 by maintaining carbon sinks, increasing to 175 Mt CO_2 per year by 2030 – increases Canada's ambition by about 40%
- Would avoid emissions of 586 Mt CO_2 e immediately and 1.8 – 11 billion tonnes (Gt) by 2030 – increases ambition by 100% immediately and 350% by 2030
- Would increase Canada's terrestrial protected areas by 1.3 million km^2 and marine protected areas by 2400 km^2

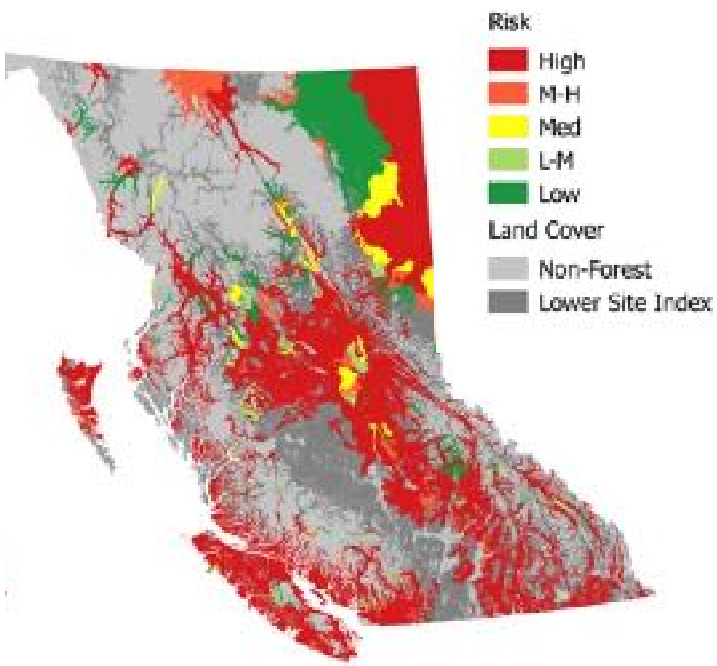
Ancient Forests and Carbon (BC example)

Inland Rainforest BC/Northern Conservation

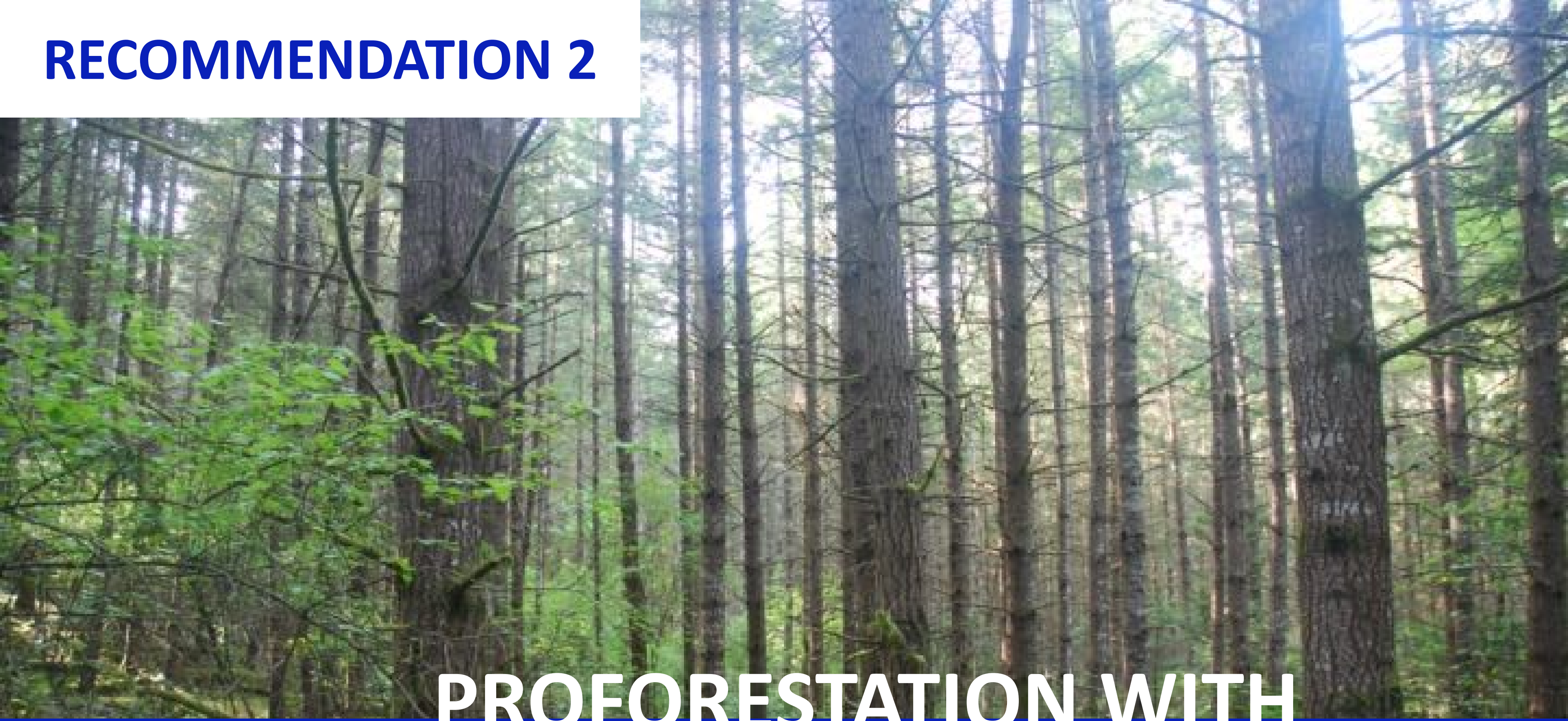
- Ancient forests are globally irreplaceable with unique qualities that make significant contributions to biodiversity conservation, climate change mitigation and adaptation.
- Ancient forests store vast amounts of carbon. In British Columbia the remaining 4,000 km^2 of unprotected, high productivity ancient forests store about 200 to 470 million tonnes of carbon.
- These ancient forests also continue to sequester a minimum of 3 million tonnes of CO_2 per year from the atmosphere for hundreds of years.
- It takes 100 years to several hundreds of years to recover the carbon stocks lost from logging because converting a natural forest to a plantation results in the loss of 42 to 70% of the stored carbon.

Targeted Protection: Ancient Forests





Risk to old-growth forests on productive sites. Source: Price, Holt, Daust 2020.



RECOMMENDATION 2

PROFORESTATION WITH PROTECTION

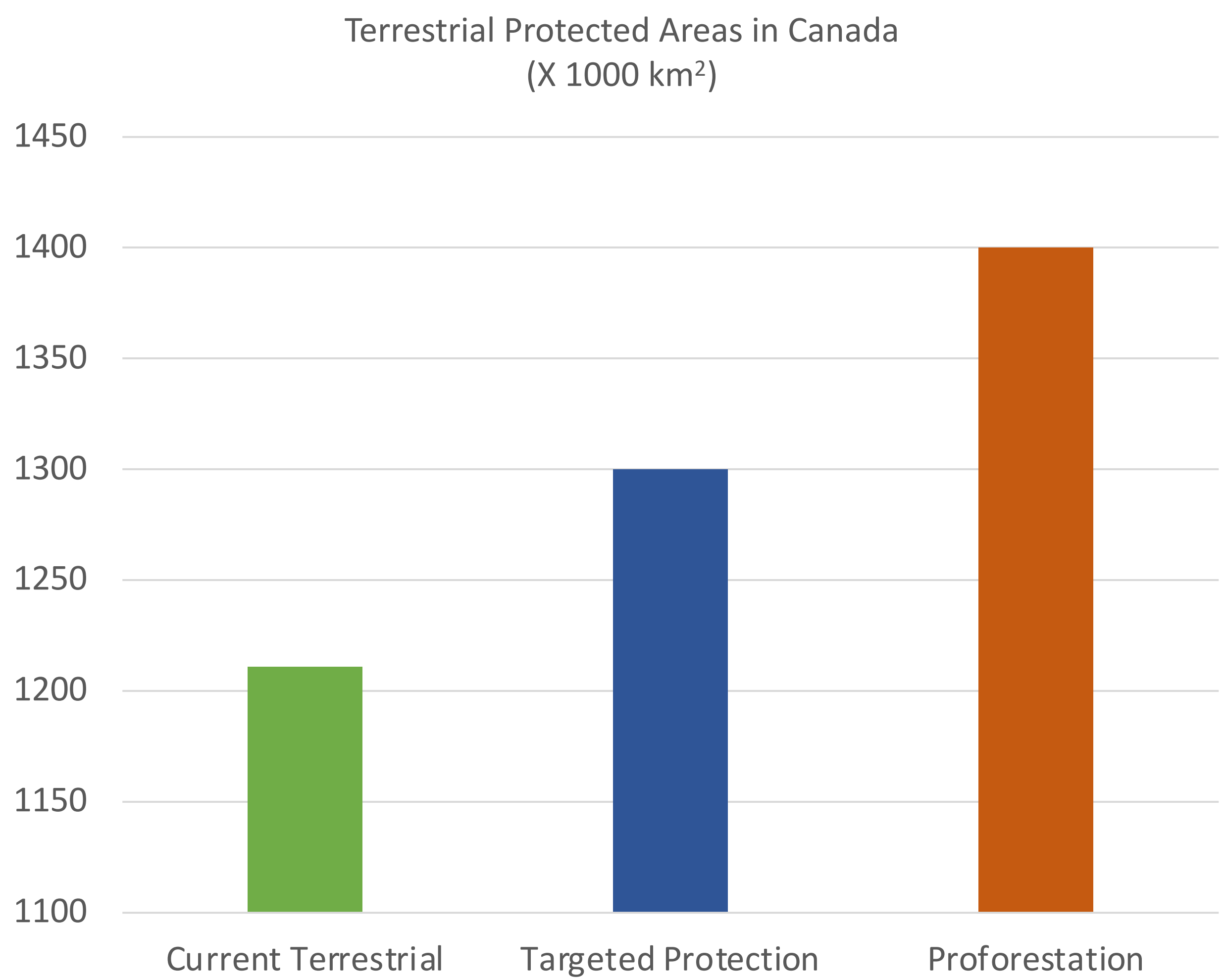
Grow 30% of Canada’s forests over 60 years old to their ecological potential, recreating a more resilient forest and replacing some of the old forests that have been lost. To make these gains permanent these forests must be protected.

Photo: Risa Smith

Proforestation with Protection

- Increases carbon sink by 1.5 Mt CO_2 per year; by 2050 this increases to 470 Mt CO_2 per year.
- Avoids emissions of 126 Mt CO_2 e per year by maintaining carbon stores; beyond 2050 this would avoid emissions of 17.7 to 99 Gt CO_2 e
- Increases protected areas by 1.4 million km^2

Protected Areas



RECOMMENDATION 3

LENGTHENED HARVEST ROTATION

Lengthen the harvest rotation in managed forests by letting forests grow until they reach their full carbon sequestration potential

Photo: River Jordan for NRDC

Lenghthened Harvest Rotation

- If implemented on 25% of the harvested land base would reduce emissions by at least 1.2 Mt CO_2/year for every year of delayed harvest
- No long term benefits as the forest would eventually be harvested

Photo: Onfokus/istock

RECOMMENDATION 4

RESTORATION EXAMPLES

Plant 2 billion trees and quantify the GHG emissions benefits of ongoing saltmarsh and eelgrass restoration: 2 of many possible long-term commitments to restore lost and degraded ecosystems.

Photo: Nick Hawkins/naturepl.com

NCS

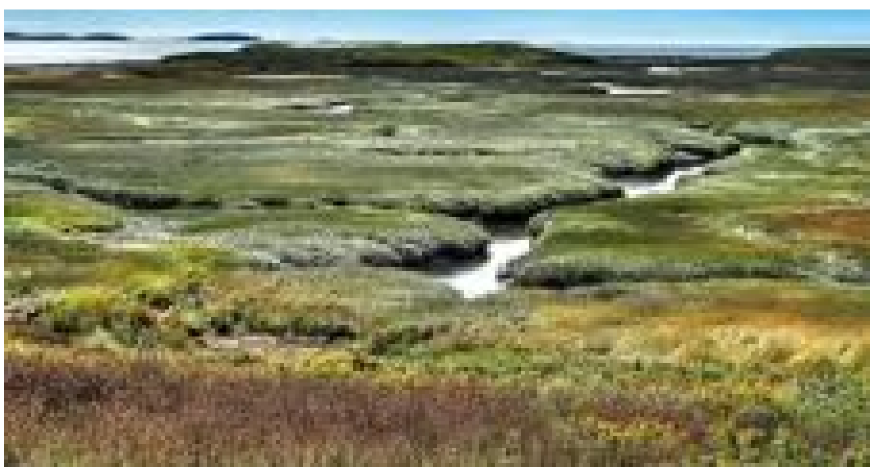
Restoration – 2 billion trees

- 2 billion additional trees would result in emissions reduction of 4-8 Mt CO_2 per year but would be delayed until post 2050
- Long term storage would be difficult to quantify

Photos: Madison Cappe

Restoration – Saltmarshes and Eelgrass

- Restoration of 20% of the saltmarshes in the Bay of Fundy, by one estimate, would sequester an additional 3.55 Mt CO_2 per year



Tantramar Marsh, Bay of Fundy. Photos: Lisa Szabo-Jones Alternatives journal.

Photo: Nick Hawkins/naturepl.com

EELGRASS BEDS IN THE SALISH SEA 1932-2016

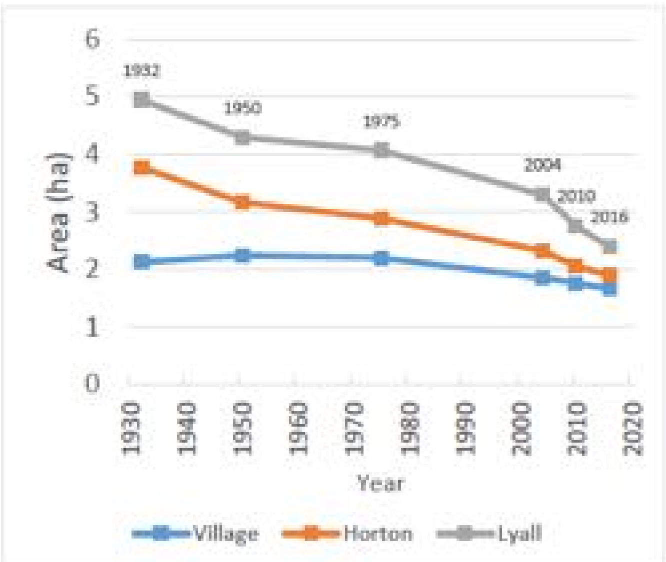


Figure 3.2 Eelgrass area (ha) over time period 1932-2016 in three sites in the Southern Gulf Islands

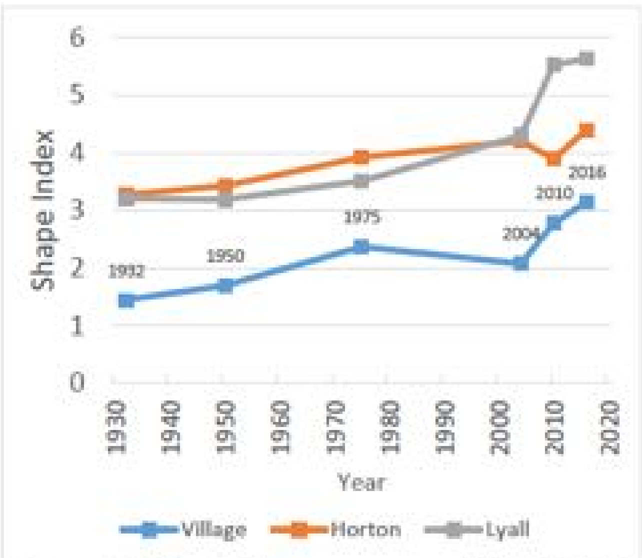
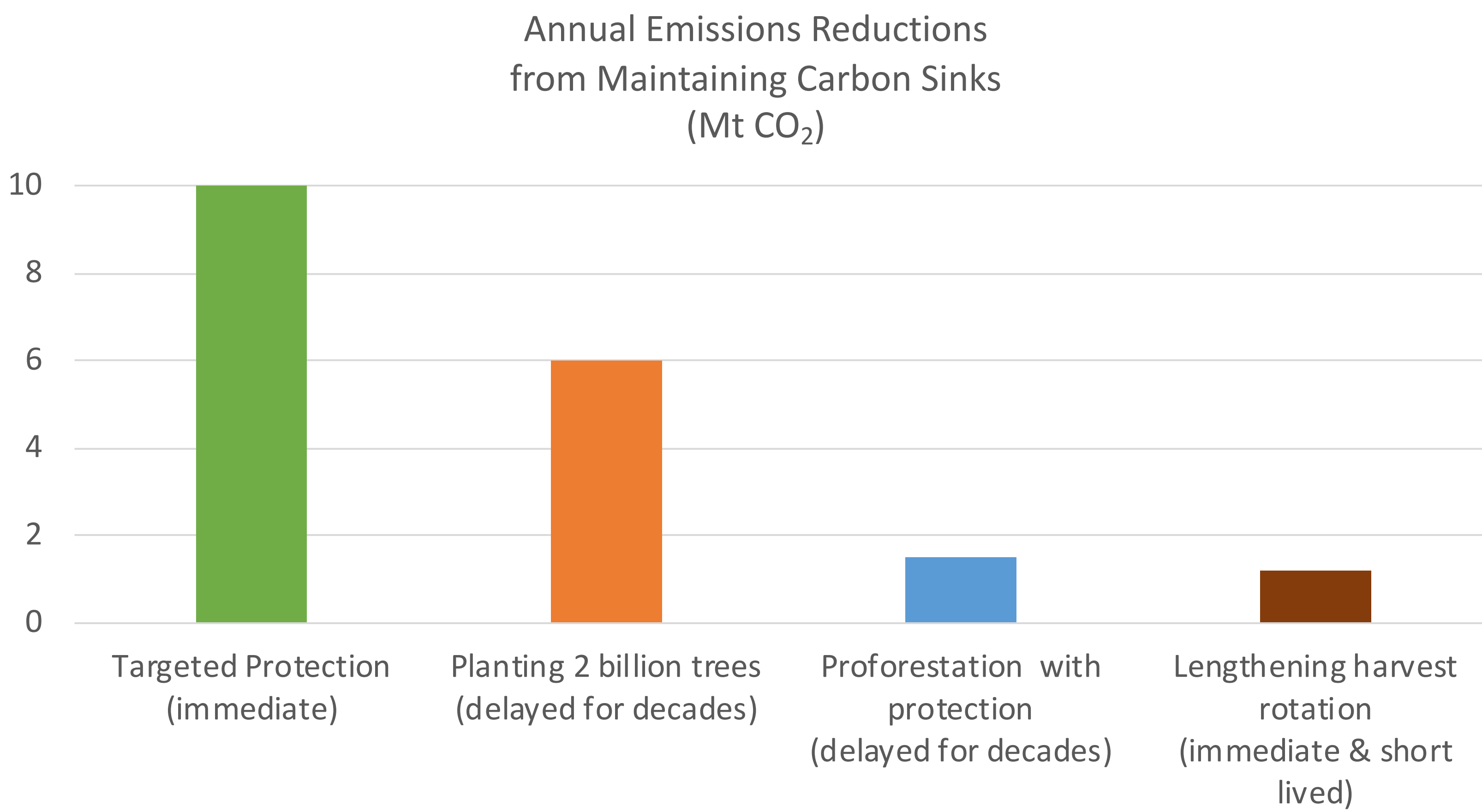


Figure 3.3 Shape Index over time period 1932-2016 of eelgrass meadows at the three study sites in the Southern Gulf Islands.

41% Area Covered

76% Fragmentation

Source: Nahirnick 2018.


Annual Emissions Reductions
from Maintaining Carbon Sinks
(Mt CO_2)
10
8
6
4
2
0
Targeted Protection
(immediate)
Planting 2 billion trees
(delayed for decades)
Proforestation with
protection
(delayed for decades)
Lengthening harvest
rotation
(immediate & short
lived)

RECOMMENDATION 5

FINANCIAL RESOURCES

Commit the necessary financial investments to ensure that NCS have a significant impact on both reducing GHG emissions and reversing biodiversity loss.

Photo: bgsmith/istock

FUND APPROPRIATELY

- Potential for GHG emissions from Protection Recommendation alone is almost 175 Mt CO_2 sequestered per year by 2030
- Canada's first investment of $3.9 billion over 10 years for NCS is an important first step, but not near enough
- By contrast Canada committed $3 billion to Carbon Capture and Storage by 2011 and much more since (although difficult to assess how much more) with an anticipated benefit 6.4 Mt CO_2 per year
- Globally in next 10—15 years NCS can provide 1/3 of emission reductions needed, but they receive less than 3% of the climate financing

Accounting for Deforestation

Canadian Forest Inventory claims 34,257 ha of deforestation in 2018.

Doesn’t include deforestation from logging scars and seismic lines.

Deforestation from logging scars in Ontario shows 21,700 ha per year, not counted.

By 2030 logging scars equivalent to 41 Mt CO_2 in foregone carbon removals – more than a year of emissions from all passenger vehicles in Canada.

Source: Logging Scars/Wildlands League. Photos: T. Hesslink

Biomass Burning – Green Energy or Greenwashing?

Wood pellets is a burgeoning industry in BC, Canada and the world.

Strange logic results in claims that burning wood pellets results in zero-emissions

Photo Credits: top: Whole trees entering pellet plant in Prince George/Conservation North; Interior Temperate Rainforest/Conservation North; right. New Road through Interior Temperate Rainforest/Taylor Roads, The Narwhal

Carbon Offsets

International (Article 6 of the Paris Agreement)
- ITMOs (Internationally Transferred Mitigation Outcomes)

National Regulatory Market
- Federal Greenhouse Gas Offset Credit System Regulations
- To encourage reductions in GHG emissions in industrial sectors that are not regulated by carbon pricing and to encourage going beyond requirements
- Priority project types: Advanced refrigeration systems, landfill methane management, improved forest management, enhanced soil organic carbon

Voluntary Offset Market
- To encourage the voluntary reduction in GHG emissions for individuals, governments, companies that either go beyond regulations or are not required to reduce emissions

Great Bear Rainforest, Canada

- Largest intact coastal temperate rainforest in the world
- Forest previously approved for commercial logging now protected
- Also one of the largest carbon offset projects in existence
- 3.7 million tonnes of carbon offsets sold since 2019
- $43 million for FN communities
- Generates 1 million tonnes of CO_2 equivalent credits per year

Photo: Risa Smith

Darkwoods Conservation Area, Canada

- At 63,000 hectares it's the single largest private land conservation project in Canada
- Purchased by a combination of private and government grants and carbon offsets
- 700,000 tonnes of carbon credits sold; guaranteed for 100 years
- Certified by the Verified Carbon Standard (VCS), and the Climate, Community & Biodiversity Standard (CCB)

Photo: NCC

Take-Home Messages

Natural Climate Solutions can be used to enhance Canada's climate change ambitions

- But must adhere to a set of principles, including benefits for biodiversity and climate change
- Most promising is protection of carbon-dense/high-biodiversity areas
- Also promising is proforestation and restoration of coastal ecosystems

Canada needs to improve its accounting practices for carbon, such as accounting for:

- All carbon in all ecosystems (grasslands, peatlands, coastal ecosystems)
- Natural disturbances, which are projected to increase with climate change
- Carbon potential of old-growth forests on productive lands, including all below-ground stores
- All types of deforestation

Offsets are controversial

- Potential to fund important conservation initiatives
- Potential to defer reductions in GHG emissions and stifle innovation

Thank You

Photo: Andre Erlich/istock

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