

# CARBON AT RISK

## B.C.'s Unprotected Old-Growth Rainforest

*Sierra Club BC, February 2013*

Jens Wieting, Forest and Climate Campaigner

Mapping Analysis by Dave Leversee

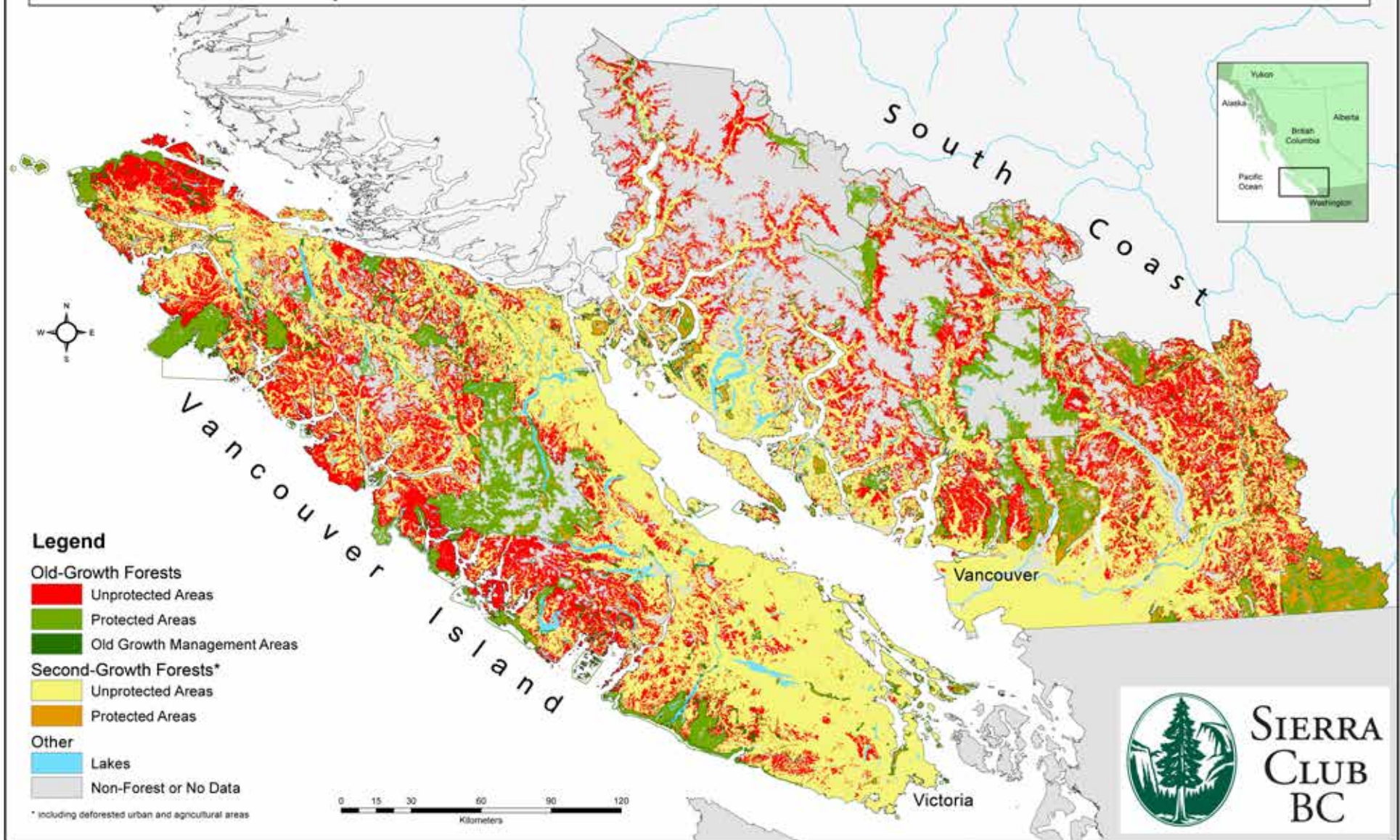


*Logging on Vancouver Island*  
*Photo: T.J. Watt*



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## Carbon at Risk: Unprotected Old-Growth Forest on Vancouver Island and South Coast



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Bald Eagle  
Photo: Travis McLachlan



Salmonberry  
Photo: Jens Wieting



Black Bear  
Photo: Jens Wieting

## Background

New reports by the World Bank and PricewaterhouseCoopers warn that the world is on a path to catastrophic global warming. International progress to fight climate change is outpaced by the speed and impacts of global warming.<sup>1</sup> The science is clear: despite the lack of international agreements each jurisdiction should seek to reduce emissions as much and as quickly as possible.

British Columbia has legislated a target to reduce its emissions by 33 per cent by 2020, compared to 2007, and managed to decrease emissions by 4.5 per cent between 2007 and 2010.

However, the province's full carbon footprint is actually much bigger because of uncounted – and increasing – emissions from fossil fuels exported from British Columbia.<sup>2</sup> In addition, emissions from B.C.'s forest lands increased by 363 per cent from 2000 to 2010; currently at 82 million tonnes of carbon dioxide annually, these

emissions now exceed the "official" emissions (62 million tonnes).<sup>3</sup>

This should be of particular concern because until a decade ago the provincial forests were a carbon sink helping to slow global warming. Our forests turned from carbon sink to carbon source primarily because of climate change impacts like the Mountain Pine Beetle and increasing number of fires. But while we have little control over some of these causes of the decline of our forests, destructive logging practices and poor forest management continue to significantly contribute to the ongoing carbon loss in our forests (52 million tonnes).

Efforts to protect and restore the ability of our forests to store and sequester carbon must particularly focus on our temperate rainforests that have shown so far to be more resilient to climate impacts than other ecosystems. Increased

conservation and improved forest management can help immediately to reduce provincial emissions. In the light of the alarming emission trends and the speed of climate change we can no longer afford to neglect our forests.

## Carbon storage and carbon loss of B.C.'s unprotected coastal old-growth rainforest

Global mapping projects show that there are few places in the world where trees grow as tall and forests store as much carbon per hectare as in the temperate rainforests along the West Coast of North America.<sup>4</sup> On the best sites a single hectare of rainforest can store over 1,000 tonnes of carbon in vegetation and soil,<sup>5</sup> much of it accumulated over thousands of years. When coastal old growth is clear-cut, up to half of the carbon is released into the atmosphere, with only a small percentage stored in the wood products over the long term.<sup>6</sup>

1. <http://www.guardian.co.uk/sustainable-business/blog/pwc-climate-change-reduction-business-investments>  
2. <http://www.sierraclub.bc.ca/our-work/global-warming/spotlights/b.c.-carbon-emissions-four-times-higher-than-reported>

3. [http://www.env.gov.bc.ca/cas/mitigation/ghg\\_inventory/pdf/pir-2010-full-report.pdf](http://www.env.gov.bc.ca/cas/mitigation/ghg_inventory/pdf/pir-2010-full-report.pdf)

82 million tonnes net carbon dioxide emissions from B.C. forest lands in 2010 were a result of 66 million tonnes due to wildfires, 44 million tonnes due to harvesting (with a small portion stored in wood products long-term), and 8 million tonnes from slash burning. Approximately 36 million tonnes of carbon dioxide got newly sequestered. Despite their significance, these emissions are only reported as 'memo items' and not included in B.C.'s 'official' emissions account.

4. <http://www.nasa.gov/topics/earth/features/forest-height-map.html>

5. Trofymow, J.A. and B.A. Blackwell. 1998. Changes in ecosystem mass and carbon distributions in coastal forest chronosequences. *Northwest Science* 72: 40 – 42.

6. Ingerson, Ann L. 2007. U.S. Forest Carbon and Climate Change. Washington, D.C.: The Wilderness Society

***Even when only counting more productive rainforest ecosystems with a higher likelihood of getting logged, unprotected old-growth forests on Vancouver Island and the South Coast cover 600,000 hectares and store over 225 million tonnes of carbon (equivalent to over 800 million tonnes of carbon dioxide or over 13 times B.C.'s annual emissions).***

While temperate rainforests have so far shown to be more resilient to climate impacts compared to other forest types of the province, modelling shows that B.C.'s ecosystems and suitable habitat for species will shift in a changing climate. According to forest ecologist Jim Pojar coastal old-growth forests should therefore be considered "effectively non-renewable resources in the present circumstances. For that reason alone, you could argue that the remaining large intact areas of old-growth temperate rainforest — globally rare to begin with — should not be logged."<sup>7</sup>

Avoided logging of old-growth rainforest is one of the most immediately effective actions to reduce emissions. Contrary to a widespread misconception most old-growth stands continue to sequester carbon over time,<sup>8</sup> on average 2 tonnes per hectare annually in a temperate climate.<sup>9</sup> It can take decades until a re-growing forest's ability to sequester carbon makes up for the ongoing annual release of carbon from each clear-cut. From a carbon perspective converting old-growth rainforest to second growth is like

giving away a safe, hefty bank account with a decent interest rate in exchange for a start-up bank account with almost zero money and the promise of spectacular growth based on unreliable forecasts.

Along the coast of British Columbia remaining large old-growth rainforests are now reduced primarily to the Great Bear Rainforest and, on a smaller scale, to Clayoquot Sound on Vancouver Island. The Great Bear Rainforest Agreements endorsed in 2006 by the provincial government, First Nations, a group of environmental organizations and logging companies included the goal to set aside 70 per cent of the natural old-growth forest under Ecosystem-Based Management. Currently 50 per cent of the region's rainforest is off-limits to logging and technical work is underway with the goal to meet the 70 per cent target in 2013.

A 2009 study commissioned by Sierra Club BC, Greenpeace and ForestEthics Solutions found

that increasing forest conservation in the Great Bear Rainforest outside of protected areas to the agreed-upon 70 per cent target will help to keep the equivalent of over 150 million tonnes of carbon dioxide in the ground.<sup>10</sup>

In Clayoquot Sound, with the largest cluster of intact old-growth rainforest valleys on Vancouver Island, approximately 74,000 hectares of intact rainforest valleys remain legally unprotected. Environmental organizations propose to seek permanent protection through conservation financing, similar to the mechanism used to create new protected areas in the Great Bear Rainforest.

Despite the huge loss of old-growth forests in the southern parts of the coast, there remain significant areas of unprotected old-growth rainforest scattered across tracts of Vancouver Island and the South Coast of British Columbia, two regions with an overall significant lack of old-growth protection resulting in a high risk for species loss.<sup>11</sup>

Our new analysis highlights the amount of carbon stored in unprotected old-growth forest on Vancouver Island and the South Coast and an estimate of the ongoing carbon loss due to the current annual logging rate of unprotected old growth in these two regions. More detailed studies and better forest data and inventories

***The current annual rate of old-growth logging on Vancouver Island and the South Coast (over 5,700 hectares in 2011) results in a carbon loss of approximately 3 million tonnes of carbon dioxide that will not be recovered over several decades, equivalent to B.C.'s emissions reduction achieved between 2007 and 2010.***

7. <http://thetyee.ca/Opinion/2012/11/23/Great-Bear-Rainforest-Agreements>

8. Old-growth forests as global carbon sinks  
<http://www.nature.com/nature/journal/v455/n7210/abs/nature07276.html>

9. Presentation by Sean C. Thomas, Faculty of Forestry, University of Toronto, June 2007

are required to inform fine-scale conservation planning and improved forest management.

## **Carbon at risk: Carbon storage of unprotected old growth on Vancouver Island and the South Coast**

**T**oday, old-growth forests on Vancouver Island and the South Coast have been reduced to less than 42 per cent of the original forest cover, primarily due to logging. The most productive types of forests have less than 10 per cent old-growth forest remaining. Only 16 per cent of the total forest area in these regions is off-limits to logging in protected areas or Old Growth Management Areas (OGMAs). Our mapping analysis shows over one and a half million (1,623,600) hectares of unprotected old-growth on Vancouver Island and South Coast. Using the estimated average of 375 tonnes of carbon storage per hectare for Pacific Maritime forests,<sup>12</sup> this area stores over 600 million tonnes of carbon.

However, for a more conservative estimate we have considered only good- and medium-productivity forest (excluding poor-productivity forest), because these forests store more carbon than average and are more likely to get logged. Unprotected old-growth forests of these types cover 602,000 hectares and store approximately 225 million tonnes of carbon. Since 1 tonne of carbon is associated with around 3.67 tonnes of carbon dioxide, this is equivalent to over 828 million tonnes of carbon dioxide or over 13 times B.C.'s annual emissions.

According to provincial data in 2011, 5,734 hectares of old growth got logged on Vancouver Island (4,533 hectares) and the South Coast (1,201 hectares). This area of forest stored approximately 2,150,200 million tonnes of carbon, equivalent to 7,891,234 tonnes of carbon dioxide. With about half of the stored carbon getting released after clear-cutting, approximately 4 million tonnes of carbon dioxide will not be recovered for several decades. Even if assuming that approximately one quarter gets stored in wood products the carbon emissions would be equivalent to the 3 million tonnes of carbon dioxide or 4.5 per cent reduction of B.C.'s official emissions achieved between 2007 and 2010.

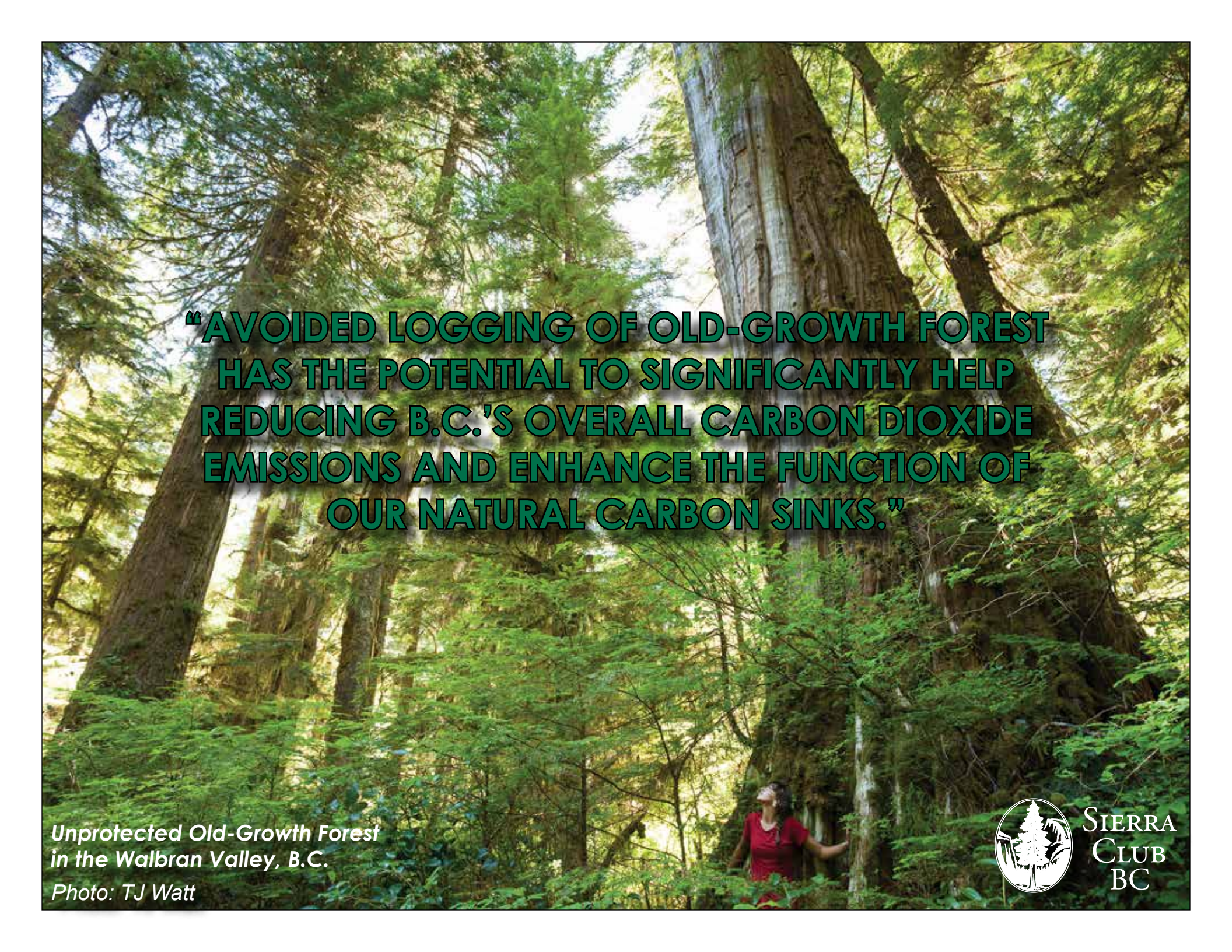
## **Outlook**

**I**ncreased conservation of the remaining old-growth temperate rainforest, phasing out logging of old-growth and transitioning logging fully to second growth is urgent from a climate adaptation and mitigation perspective. Many types of forests, particular on Vancouver Island and the South Coast, are at a high ecological risk of species loss because of lack of old growth and increasing stress due to global warming. Because of climate change, we can no longer expect natural regeneration after clear-cutting to produce the same forest ecosystems. Thus, our remaining old-growth forests have to be considered 'non-renewable'. Avoided logging of old-growth forest has the potential to significantly help reducing B.C.'s overall carbon dioxide emissions and enhance the function of our natural carbon sinks. Improved forest management, in particular longer rotation, eliminating waste and selective logging, is equally important to reduce carbon loss. Forestry can be an important sector of the low-

carbon economy of the future, but not without increased forest conservation and improved forest management.



12. [http://www.treesintrust.com/external/LTA\\_ClimateChange.pdf](http://www.treesintrust.com/external/LTA_ClimateChange.pdf)



**“AVOIDED LOGGING OF OLD-GROWTH FOREST  
HAS THE POTENTIAL TO SIGNIFICANTLY HELP  
REDUCING B.C.’S OVERALL CARBON DIOXIDE  
EMISSIONS AND ENHANCE THE FUNCTION OF  
OUR NATURAL CARBON SINKS.”**

*Unprotected Old-Growth Forest  
in the Walbran Valley, B.C.*

*Photo: TJ Watt*



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