



RESTORING THE BALANCE FOR CLIMATE AND SPECIES

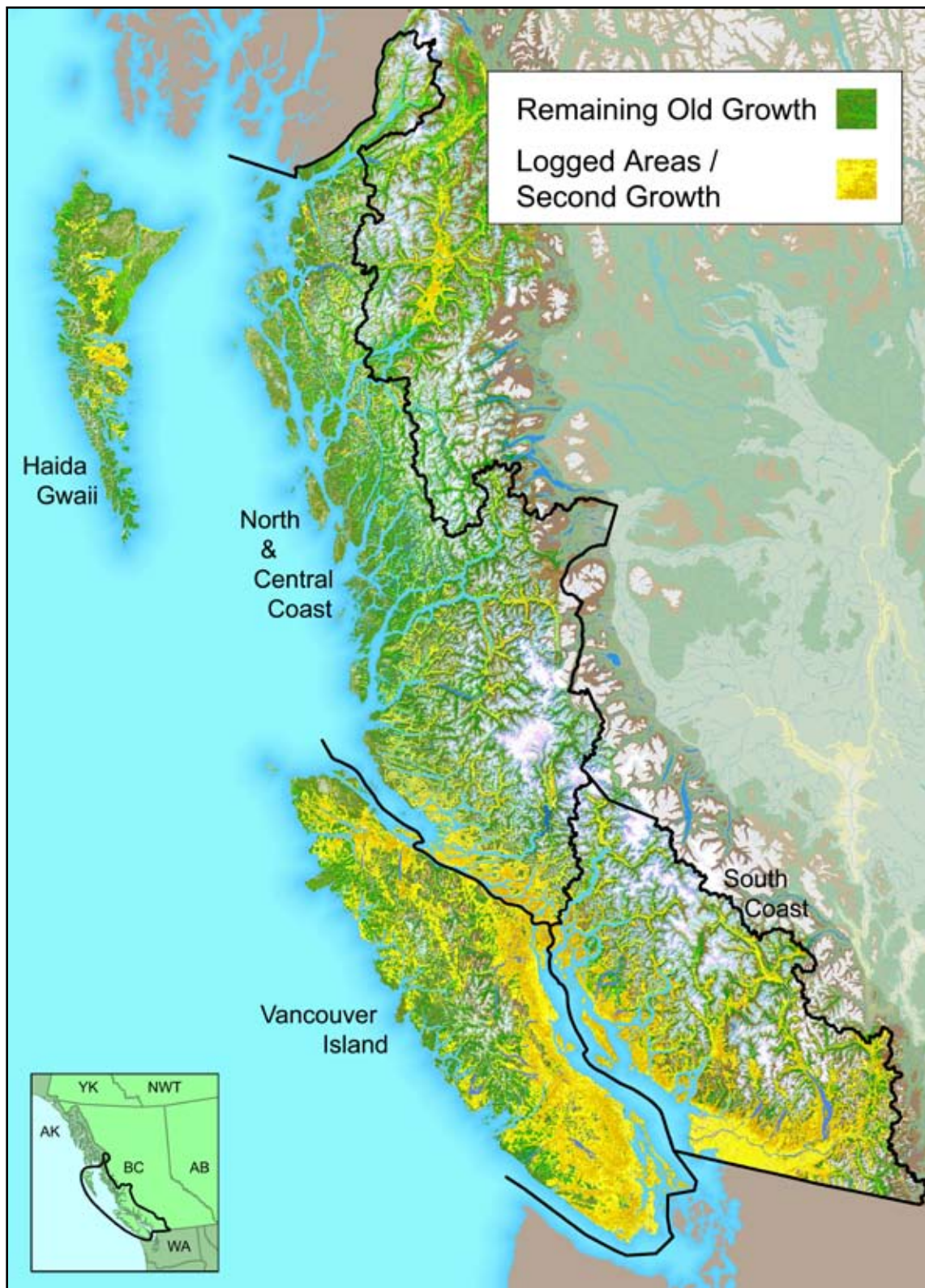
How to Fight Global Warming and
Protect Nature in B.C.'s Coastal Rainforest

Jens Wieting, with Mapping Analysis by Dave Leverage
Sierra Club BC, January 2011



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Photos: Cedar, Black Bear and Salamander: Jens Wieting, Marbled Murrelet: Mark Hobson, Clearcut: T.J. Watt



Map: Dave Leversee, Sierra Club BC

Remaining old growth rainforest and logged areas/second growth along British Columbia's Pacific Coast.

Restoring the Balance for Climate and Species: How to Fight Global Warming and Protect Nature in B.C.'s Coastal Rainforest

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Executive Summary

British Columbia's coastal rainforests store massive amounts of carbon, making them a key asset in the fight against global warming. Yet our inadequate logging practices and insufficient stewardship mean that coastal rainforests, rather than acting as global carbon sinks, are instead a significant — and uncounted — source of B.C. greenhouse gas emissions.

A detailed 2009 analysis¹ by Sierra Club BC showed that decades of industrial logging have led to a significant decline in old-growth coastal rainforest, seriously compromising carbon storage capacity and species habitat. The report also highlighted insufficient levels of protection, with significant regional differences. Building on the 2009 report, our 2010 findings show that:

- B.C.'s coastal forests continue to be a source of greenhouse gas emissions despite being among the best carbon storehouses on the planet. Net emissions from forest lands of B.C.'s Pacific Maritime Ecozone alone, mainly caused by logging, were 16 million tonnes in 2008 — nearly one-quarter of B.C.'s 'official' emissions tally, which notably did not include emissions from forest lands.² Including emissions from B.C. coastal forests in B.C.'s official greenhouse gas emissions inventory would increase the province's total 2008 emissions by a considerable 24 per cent.
- Vancouver Island continues to be the coastal subregion with the most forest ecosystems at a very high risk for species extinction (1.2 million hectares) and the lowest level of overall protection (only 13.2 per cent).
- While the 42,000 hectares of new Old Growth Management Areas³ (OGMAs) set aside by the B.C. government in 2010 on northern Vancouver Island are a step in the right direction, they only present miniscule progress for high-productivity forest ecosystems which contain very important habitat values and the highest carbon storage per

hectare. On Vancouver Island only a scant eight per cent of these forests is set aside in protected areas, and the area off-limits to logging in Old Growth Management Areas only increased from two to three per cent with the recent step. Notably, the new areas off-limits to logging were not selected on the basis of which forest ecosystems have the highest risk for species extinction. In fact, high-productivity ecosystems that should be the highest priority for protection are vastly under-represented, at less than six per cent. Forty-five per cent of the new Old Growth Management Areas cover poor or zero⁴ productivity forest ecosystems.

B.C.'S OFFICIAL 2008 GREENHOUSE GAS EMISSIONS WOULD HAVE BEEN A DRAMATIC 24 PER CENT HIGHER IF EMISSIONS FROM B.C. COASTAL FORESTS HAD BEEN INCLUDED IN THE COUNT.

Sierra Club BC recommends the following steps to make coastal rainforests a carbon sink rather than a carbon source, and to protect at-risk species and jobs:

- The immediate inclusion of carbon emissions from forest lands and wetlands in both provincial and federal greenhouse gas emissions, to assist in setting reduction targets and taking action to meet these targets.
- Establishment of a coherent B.C. forest policy to ensure that provincial forest lands become a carbon sink rather than a source. Key components of this policy will include increased conservation, improved forest management, and measures to reduce the risks of fire and pests.
- Identification of conservation priorities for coastal temperate rainforests based on the Ecosystem-Based Management approach implemented in the Great Bear Rainforest, with the immediate goal of additional protection of forest ecosystems that are at a high risk of species extinction.
- Healthy forests require healthy governance. After years of cuts and insufficient oversight, B.C. must significantly increase support for improved forest management practices, promote value-added products and phase out raw log exports. The result

1. State of British Columbia's Coastal Rainforest, Mapping the Gaps for Ecological Health and Climate Protection, Sierra Club BC, December 2009 <http://www.sierraclub.bc.ca/campaign-spotlights/coastal-rainforest-at-risk/>

2. Both B.C.'s and Canada's forests demonstrate a trend to become a source of carbon rather than a carbon sink. Notably, neither the federal nor provincial governments include emissions released from forests in greenhouse gas emissions inventories. "Gov't Buries Fact that Logging Blows our Emissions Target, September 22, 2009", The Tyee, <http://theyee.ca/Opinion/2009/09/23/LoggingCO2/>

3. Provincial data calculate the new management areas at 42,000 hectares, while the provincial government's press release claimed "39,000 hectares protected for old growth conservation" http://www2.news.gov.bc.ca/news_releases_2009-2013/2010FOR0117-000889.htm

4. Approximately 28 per cent of the new Old Growth Management Areas cover poor productivity forest and 17 per cent cover lands of such poor productivity that they do not qualify as forest in current data.

will be increased employment and preservation of carbon sinks and critical species habitat.

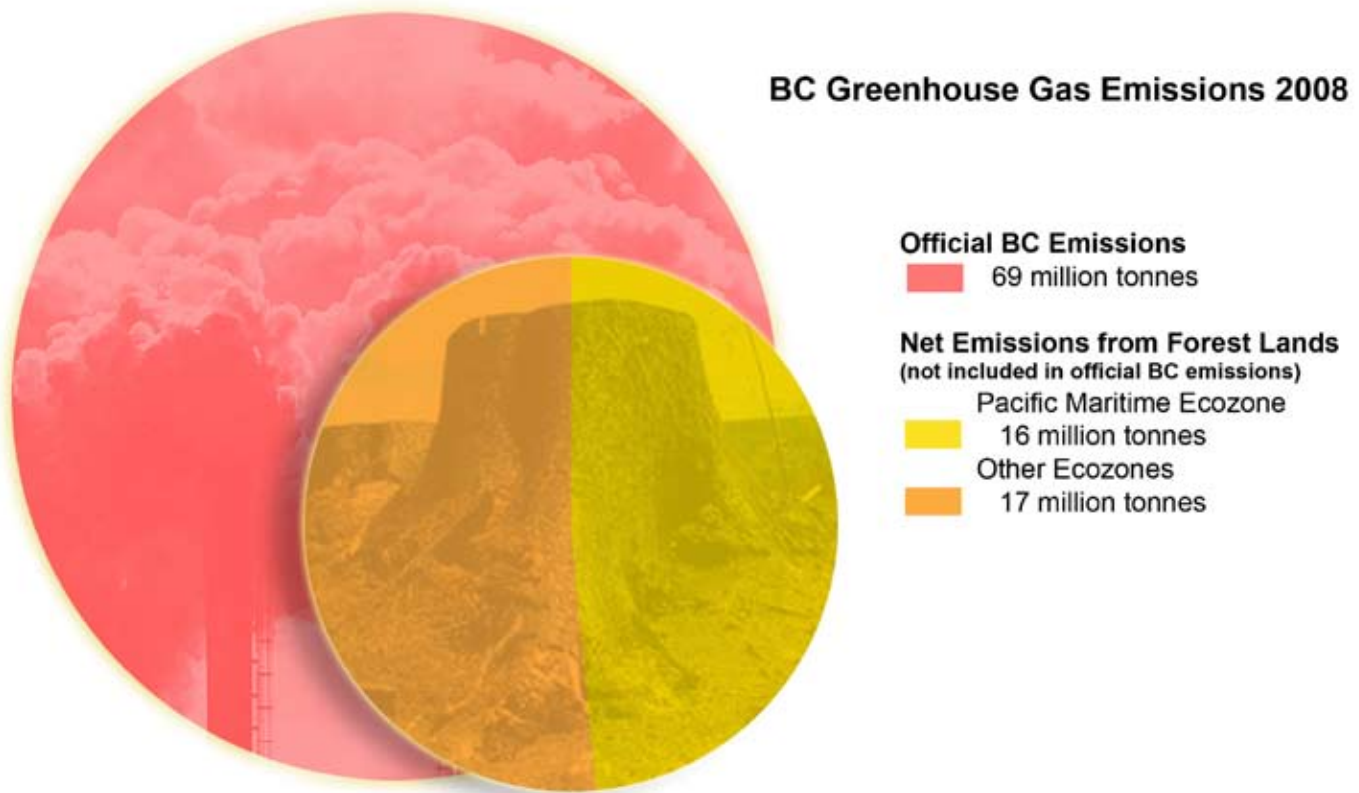
Background

At the end of 2010, the international community met in Cancun, Mexico, for the 16th United Nations climate change summit. With greenhouse gas emissions continuing to increase, there is little time left to reduce carbon dioxide levels in the atmosphere before global warming produces catastrophic consequences. If global warming passes dangerous tipping points, forest ecosystems in different parts of the world will be at uncontrollable risk of die-off, fires, pests and other forms of breakdown with further release of carbon storage. Efforts to reduce CO₂ emissions from all sources require urgent action.

One of the tangible outcomes of the Cancun summit was agreement among the participating countries that “parties should collectively aim to slow, halt and reverse

forest cover and carbon loss, according to national circumstances.”⁵ Countries that harbour large forested areas must swiftly implement land use policies that maintain and increase carbon storage capacity and protect species habitat that is under increasing pressure due to climate change. British Columbia can and must be a leader in this undertaking.

B.C.’s temperate rainforests are one of the best carbon storehouses on the planet. Healthy old-growth forests are among the ecosystems with the highest carbon storage per hectare on the planet and they continue to sequester carbon.⁶ At the same time, coastal temperate rainforests are globally rare ecosystems covering less than 0.2 per cent of the planet’s land base; they are also home to rare and at-risk species. With only a small portion of temperate rainforests intact, protecting and restoring species habitat becoming increasingly urgent in light of global warming.



5. Outcome of the work of the Ad Hoc Working Group on long-term Cooperative Action under the Convention; Countries also agreed to consider as a further commitment for developed countries “whether a cap should be applied to emissions and removals from forest management,” Land use, land-use change and forestry, <http://unfccc.int/2860.php>

6. Old-growth forests as global carbon sinks, Luyssaert, S. et al. Nature 455, 213-215, September 2008 <http://www.nature.com/nature/journal/v455/n7210/abs/nature07276.html>

Broken Balance: Carbon and BC's Coastal Rainforest

British Columbia's temperate rainforests store very high volumes of carbon and the frequency of natural disturbance is extremely low. Fires and pest infestations, which can cause huge releases of carbon dioxide in some B.C.'s forests, are rare in coastal forests, so the long-term certainty of carbon storage is relatively high.

Logging practices in temperate old-growth rainforests cause massive loss of carbon storage and the ability to recover total carbon stores is limited for hundreds of years. Harvesting one hectare of 'average' coastal rainforest can result in emissions equivalent to putting more than 100 cars on the road for a year.⁸

According to the B.C. Greenhouse Gas Inventory Report released in September 2010⁹, annual net emissions from forest lands, mainly from logging, were 33 million tonnes of CO₂¹⁰ in 2008. Despite their significance these emissions are only reported as 'memo items' and not included in B.C.'s 'official' emissions account. Counting these emissions would increase official provincial GHG emissions (69 million tonnes in 2008) by 48 per cent.¹¹

For the first time, the provincial report contains data distinguishing between emissions from forest lands in the Pacific Maritime and other ecozones in B.C. (Montane Cordillera, Boreal Cordillera, Boreal Plains and Taiga Plains). It is no surprise that forests in other ecozones are currently a carbon source and not a sink because of the aftermath of the Mountain Pine Beetle outbreak. However, Sierra Club BC is extremely concerned that mainly due to logging practices, the Pacific Maritime Ecozone continues to be a significant

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The 2009 analysis⁷ done by Sierra Club BC showed how the decline in old-growth rainforest ecosystems due to industrial logging has seriously compromised species habitat and carbon storage capacity:

- More than two million hectares of rainforest ecosystems on B.C.'s coast, mostly on Vancouver Island and in the South Coast, have less than 30 per cent old growth remaining and are considered to be at high risk of species extinction.
- The conversion of more than one million hectares of good and medium productivity old-growth rainforest ecosystems on Vancouver Island to young forest over past decades translates into a loss of at least 100 million tonnes of carbon storage (equivalent to more than five times the official annual greenhouse gas emissions of British Columbia).

The following new findings build on the detailed 2009 Sierra Club analysis and should be read in context with the report.

7. State of British Columbia's Coastal Rainforest, Mapping the Gaps for Ecological Health and Climate Protection, Sierra Club BC, December 2009 <http://www.sierraclub.bc.ca/campaign-spotlights/coastal-rainforest-at-risk/>

8. Ecosystem-Based Management in the Great Bear Rainforest, Defense for Climate and Species, February 2009 http://www.savethegreatbear.org/resources/Reports/climate_report_0309

9. British Columbia Greenhouse Gas Inventory Report 2008 http://www.env.gov.bc.ca/cas/mitigation/ghg_inventory/index.html

10. 33 million tonnes of net emissions are a result of 55 million tonnes from harvesting, 7 million tonnes from wildfires and 8 million tonnes from slash burning minus 37 million tonnes of carbon newly sequestered by provincial forests. Carbon stored in wood products is currently not included in emissions from harvesting. However, only a relatively small percentage of the carbon counted as emissions from harvesting remains stored in wood products for a longer period of time. For example, of the 1.7 billion tonnes of carbon harvested in Oregon and Washington from 1900 to 1992, only 23 per cent is contained in forest products (including landfills). Harmon et al., Modeling Carbon Stores in Oregon and Washington Forest Products 1900-1992. *Climate Change* 33:521-550 (1996). <http://www.springerlink.com/content/u51867621j8307m7/>

11. Provincial data calculate the new management areas at 42,000 hectares, while the provincial government's press release claimed "39,000 hectares protected for old growth conservation" http://www2.news.gov.bc.ca/news_releases_2009-2013/2010FOR0117-000889.htm

source of emissions with a net release in 2008 of more than 16 million tonnes of CO₂,¹² which would increase the official provincial GHG emissions by 24 per cent.

Land use policies such as increased conservation and improved forest management have the potential to drastically influence emissions from forests.¹³ Yet logging and carbon loss don't have to go hand in hand.

For example, second growth can be logged selectively while at the same time increasing the volume of standing trees and carbon storage over time.¹⁴

High Risk for Species and Insufficient Forest Protection on Vancouver Island and the South Coast

The health of a coastal rainforest ecosystem is measured in part by the amount of old growth remaining and its ability to sustain the species that are dependent on it for survival. Preserving at a minimum 30 per cent of old growth forest in an ecosystem is a critical threshold. Anything below this threshold in coastal rainforest signifies a high risk for species loss.¹⁵

THE HEALTH OF A COASTAL RAINFOREST ECOSYSTEM IS MEASURED IN PART BY THE AMOUNT OF OLD GROWTH REMAINING AND ITS ABILITY TO SUSTAIN THE SPECIES THAT ARE DEPENDENT ON IT FOR SURVIVAL. HAVING LESS THAN 30 PER CENT OF OLD GROWTH FOREST IN AN ECOSYSTEM MEANS A HIGH RISK FOR SPECIES EXTINCTION.

12. 16 million tonnes of net emissions are a result of 18.7 million tonnes from harvesting and 0.8 million tonnes from wildfires and slash burning minus 3 million tonnes of carbon newly sequestered by coastal forests.

13. Maintaining the role of Canada's forests and peatlands in climate regulation, Carlson, M. et al. July/August 2010
<http://pubservices.nrc-cnrc.ca/rp-ps/absres.jsp?jcode=ttc&ftl=ttc86434-4&lang=eng>

14. Merv Wilkinson harvested 2 million board feet of lumber from the Wildwood parcel over 70 years of selective logging, with 1.3 million board feet of standing timber at the beginning and 1.6 million board feet at the end of his work at Wildwood
<http://www.mondaymag.com/articles/entry/tall-timber-tales>

15. State of British Columbia's Coastal Rainforest, Mapping the Gaps for Ecological Health and Climate Protection, Sierra Club BC, December 2009
<http://www.sierraclub.bc.ca/campaign-spotlights/coastal-rainforest-at-risk/>

Coastal old growth forests differ considerably from one another. For the purpose of the Sierra Club BC analysis, we distinguished between Good, Medium and Poor productivity ecosystems dominated by conifer tree species. Productivity is a measure of how fast trees will grow on a particular site. Very productive sites grow large trees very fast. Medium productivity sites can also grow very large trees, but it takes longer. Poor productivity sites tend to only grow very small, stunted trees, even after thousands of years. Good productivity ecosystems are relatively rare along the coast, medium productivity ecosystems are common and poor productivity ecosystems cover the largest coastal area.

Overall, the Poor productivity category — where industrial harvesting has had a very small footprint to date — still has a very high proportion of old forests today (coastal average 76 per cent). In the Medium productivity category, the overall percentage of old forest is already lower (coastal average 55 per cent). These areas have only recently seen harvesting, since they tend to be on steeper slopes and less accessible. The Good productivity sites have a very low percentage of old growth remaining (coastal average 17 per cent).

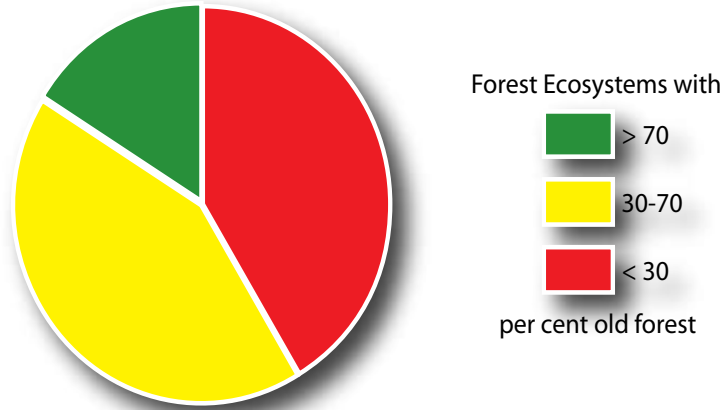
The situation is particularly alarming for Vancouver Island and the South Coast, where 50 per cent of all forest ecosystems — or close to two million hectares — have less than 30 per cent of old-growth forest remaining and are therefore at a high risk for species loss. More than half of Vancouver Island's high-risk ecosystems have less than 10 per cent old forest remaining. For example, only 1.2 per cent of the old-growth Coastal Douglas Fir ecosystem remains.

In July 2010, the Ministry of Forests¹⁶ announced that it had set aside additional Old Growth Management Areas (OGMAs) on northern and north-central Vancouver Island.

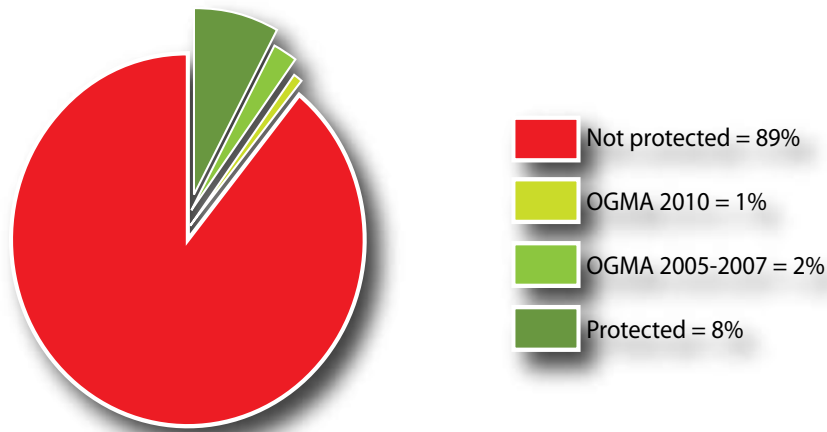
While the 42,000 hectares of newly set-aside forest are a step into the right direction, they only present miniscule progress for high productivity forest ecosystems, which contain very important habitat values and the highest carbon storage per hectare. On Vancouver Island, only eight per cent of these forests are set aside in protected areas, and the percentage off-limits to logging in Old Growth Management Areas only increased from two to three per cent with the recent additions. Notably, the selection process for new areas to set aside did not prioritize forest ecosystems with the

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Vancouver Island Percentage of Forest Land covered by Ecosystems at High Risk of Species Extinction (below 30 per cent Old Forest)



Vancouver Island Good Productivity Forest Ecosystems in Protected Areas and Old Growth Management Areas



highest risk of species extinction. In fact, 45 per cent of the new Old Growth Management Areas cover poor or zero¹⁷ productivity forest ecosystems and only six per cent of them cover high productivity forest ecosystems with the greatest need for additional protection.

Recommendations

Effectively maximizing carbon storage and protecting the tremendous biological diversity of provincial ecosystems under a changing climate will require a comprehensive strategy that addresses both mitigation (reducing emissions from deforestation and degradation) and adaptation (allowing species a better chance to adapt to a changing climate).¹⁸ This strategy requires both federal and provincial governments to fully account for emissions from forests and wetlands.

17. Approximately 28 per cent of the new Old Growth Management Areas cover poor productivity forest and 17 per cent cover lands of such poor productivity that they do not qualify as forest in current data.

18. For a detailed review of science see "A New Climate for Conservation: Nature, Carbon and Climate Change in British Columbia" http://www.sfu.ca/act/documents/NewClimate_report_FE.pdf

Counting emissions is a logical first step to policy reform that will develop action plans to reduce emissions while taking advantage of synergies and increasing species habitat protection at the same time.¹⁹

Through increased conservation and improved forest management, as well as measures to reduce the risks of fire and pests wherever possible, a coherent provincial forest global warming policy must ensure that provincial forest lands become a carbon sink and no longer contribute to B.C.'s overall emissions as a significant carbon source.

For the coastal temperate rainforest zone, conservation priorities should be identified based on the Ecosystem-Based Management approach implemented in the Great Bear Rainforest. For coastal rainforest ecosystems below the critical limit of 30 per cent of old forest, surviving old-growth forest must urgently be

19. Global congruence of carbon storage and biodiversity in terrestrial ecosystems; Strassburg, Bernardo B.N. et al.; Conservation Letters, Volume 3, Number 2, April 2010, pp. 98-105(8) http://www.unep.org/PDF/PressReleases/Strassburg_et_al_%282009%29CL.pdf

protected from logging. Older second growth stands must be set aside to restore species habitat and other ecological functions. The immediate goal must be to bring these forest ecosystems above the high-risk threshold for old forests as quickly as possible.

At the same time, it is essential that land use planning in regions that are still relatively intact, such as the Great Bear Rainforest, follow the precautionary approach²⁰ to avoid unnecessary degradation of healthy ecosystems. Conservation of smaller, relatively intact rainforest areas farther south, such as Clayoquot Sound, is crucial to allow for wildlife connectivity among remaining intact forest areas along the coast.

B.C. forestry in the era of global warming has much potential to provide jobs in a diverse low-carbon economy, provided that conservation is prioritized and management practices are improved. Logging practices must be improved through new regulations and incentives to reduce emissions and protect species habitat, including selective logging, longer rotations, reduction of wood waste and elimination of slash burning.²¹

Government support for improved forest management practices — combined with promotion of value-added products and a phase-out of raw log exports — can readily generate new jobs while reducing industrial development pressures on carbon sinks and species habitat.

Healthy forests require healthy governance. After years of budget and staff cuts and insufficient provincial oversight of on-the-ground operations and monitoring of forest health, B.C. must make it a priority to allocate appropriate resources so that B.C. coastal forest management prioritizes protection of carbon sinks, jobs and species.

Habitat loss and excessive carbon release is a significant problem around B.C. Forty-three per cent of B.C.'s species are at risk of disappearing. In addition to increasing forest conservation and improving forest management practices, B.C. must enact strong legal protection for at-risk species and ecosystems. Such a law must identify species at risk, protect their habitat, and be adequately enforced and funded.²²

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20. According to the scientific recommendations in the context of land use planning in the North and Central Coast, low risk precautionary management requires maintaining 70 per cent of the natural amount of old forest by ecosystem.

21. For a detailed discussion of improved forest management, reduction of wood waste and other recommendations, see the January 2010 report 'Managing BC's Forests for a Cooler Planet, Carbon Storage, Sustainable Jobs and Conservation' http://www.sierraclub.bc.ca/quick-links/publications/forests-wilderness-1/ccpa_bc_managingforests.pdf

22. www.protectbiodiversity.ca