Biodiversity and Old Growth in the Great Bear Rainforest

Authors: Adam Mertens, Diyang Zhang, Liang Qi, Jiadong Ye, Zoltan Mityok

Created: 2015

Introduction

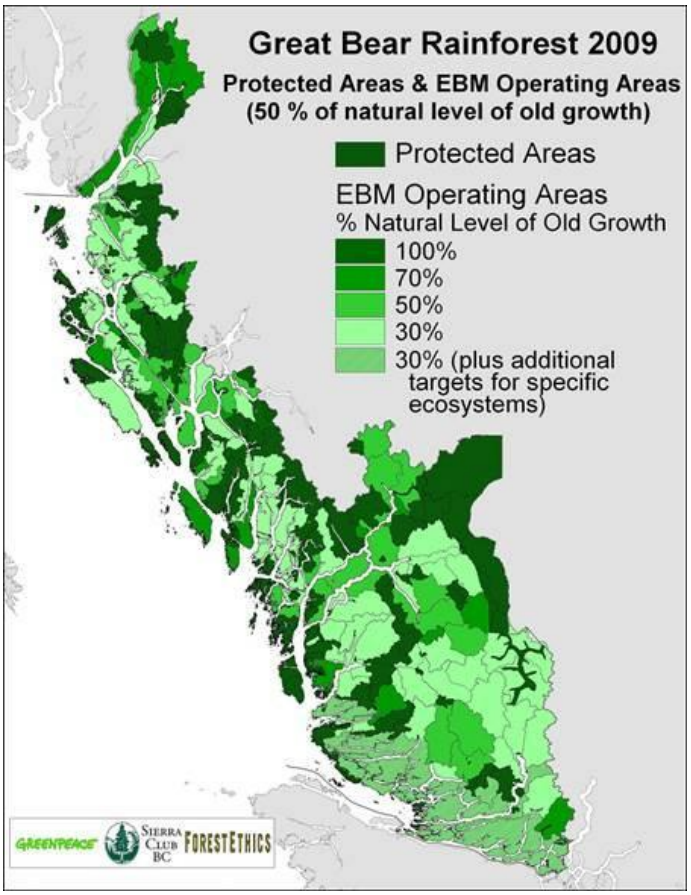

Figure 1. Great Bear Rainforest 2009 [map]. (2009, April 2). Retrieved from http://www.savethegreatbear.org/files/maps/Mar_2009-status.jpg

Located on British Columbia's central and north coast, the Great Bear Rainforest (GBR) comprises one quarter of the world's remaining ancient coastal temperate rainforest, which is of significant ecological importance both regionally and globally (36). The majority of forest types are old growth conifer stands, with species of western hemlock and red cedar (6). Old-growth forest provides an array of provisional resources that has brought great wealth to B.C., promoting economic development and employment. However, as old-growth forest remains an indeterminate definition in forestry regulation, forest companies have arguably continued

to log old-growth according to arbitrary discretion (33). Deforestation, road construction and other operations have changed the local ecological landscape, altering wildlife habitat and affecting the livelihood of local communities. As a result, First Nations, united with environmentalists and NGOs, have been aggressively advocating for forest sustainability while calling governments to determine clearer objectives and improve logging practices.

The disputes surrounding the GBR are categorized as wicked problems as there is not only scientific uncertainty but also value uncertainty surrounding the usage and protection of this region according to different stakeholders. The uneven shared interests between key stakeholders makes it difficult to reach an agreement as all participating parties represent a diversity of ecological and utilitarian-based values. Secondly, finding an appropriate management strategy requires innovation due to the distinct significance of the region (13). Third, a comprehensive governance system is necessary to monitor and enforce regulations, which remains gridlocked in the negotiation process.

Framing the Problem

The complexity of the issue of managing for biodiversity and old growth forest in the Great Bear Rainforest can be better understood by characterizing it based on the properties and outcomes of wicked environmental problems described by Balint et al (2011). We can predict the intricacy of the problem and rank its various dimensions in terms of their relative importance by looking at a number of factors offered by Walters, Aydelotte, and Miller (2000). These factors include: the degree of conflict over the issue; the number of stakeholders; the level of confidence in the information on the issue; the number of alternatives; the knowledge of the outcomes; the probability of the outcomes. These factors all contribute to the complexity of this problem, and lead to difficulties in the management and governance of these resources.

Figure 2: Mind map of the problem of biodiversity and old growth in the Great Bear Rainforest and the complex interactions involved. Full interactive mind map can be accessed at the following link: https://mm.tt/587392553?t=BVhQqGqb6N

The most important issues contributing to the conflict surrounding the GBR are the differences in cultural, economic, and environmental values between stakeholders, with little overlap in ideologies. Stakeholders include citizen actors, environmental activist groups, First Nations groups, governments, timber companies, and professionals (15). Values have been and continue to be a major source of conflict, as initiatives led by Greenpeace and other environmental NGOs have influenced global markets, while forest companies pointed to legislation to defend their practices (36). Furthermore, they lead to difficulty in defining the problem itself as each group recognizes different issues. Looking at the history of conflict between stakeholders in the area, actions of one group have the potential to either impede or contribute to successful collaboration and management practices.

The second most important contributing factor to the issue lies in governance structures and practices, influencing policies in the region which have particularly affected First Nations. The British Columbian provincial government holds formal authority over land-use decisions in the province, whose decisions are based upon political, economic and environmental legacy (15). The planning process of the North and Central Coast Land and Resource Management Plans (NCLRMP and CCLRMP) incorporated views of various stakeholders, but issues remain surrounding titles granted to First Nations groups. A wide variety of infringements can be made upon titles that First Nations groups hold over land, if the chief justice deems that other

values take precedence (32). The unequal valuing of stakeholder views and restricted access to titles represents a key issue in the management of the GBR.

A third and final contributor to the issue is a lack of scientific certainty about environmental issues coupled with ambiguity in the wording of current legislation (33). The criteria of the NCLRMP and CCLRMP designate areas for specific usage, however the formal definition of 'old-growth' forests in these plans has not provided clear guidelines for forest sector actors and governing bodies (19). Solutions to this issue are more easily overcome than value differences and governance structures, as they can be mitigated through more carefully worded legislation and continued scientific research into the value of biodiversity and old-growth forests from ecosystem and economic standpoints.

Governance Practices

The current governance framework is based on a government-to-government relationship involving multiple stakeholders including the BC provincial government, Indigenous peoples, forest companies and environmental non-governmental organizations (ENGOs). With the creation of the NCLRMP and CCLRMP, a framework has been composed of regional agreements, provincial and federal legislations, Indigenous input, and proposals from environmental organizations.

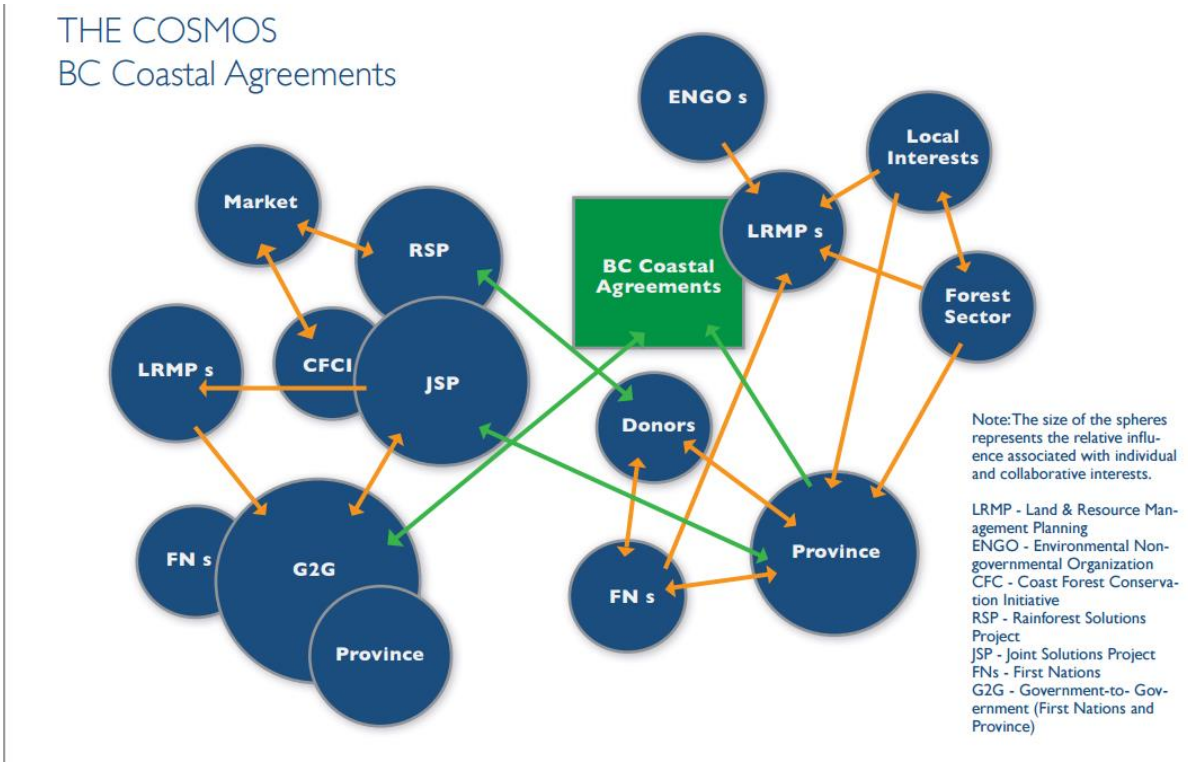

Figure 3. Governance Framework according to commissioned report by Coast Forest Conservation Initiative (42).

Regional Agreements

A series of Great Bear Rainforest Agreements have been signed between First Nations and the Province since 2001 (2). Specifically, the key factors of the decision are implementing EBM to promote human well-being and lower ecological risk, categorizing EBM operation areas, and formalizing the government-to-government structure, and engaging key stakeholders in the collaborations (40).

The agreements regulate not only the EBM plan but also the government-to-government relationship between the Province and the First Nations, legally establishing platforms to make the negotiations realistic. Many preliminary legal battles have informed the federal and provincial legislature considering First Nations title and rights (27),(38). Resource forums and the Reconciliation Protocol of 2009 were other objectives aimed at creating a framework for decision making that was to be consensus-based and cooperatively managed, to a degree of effectiveness which has been contested (3),(5),(29). Regional agreements provide principles of resource management, while specific actions are regulated and supported by laws in BC and across Canada.

Federal and Provincial legislations

Both the federal government and the provincial government set laws to protect biodiversity and support EBM. Despite financial support from the Natural Areas Conservation Program established by the federal government (20), provincial legislations such as the Forestry Act and Forest and Range Practices Act have direct power on resource operations in BC.

Over time, provincial legislation on GBR management has been moving toward a multi-participatory model. Prior to mid-1990s, forest policy was dominated by the provincial government and the forest industry. Changes in provincial governance under the Central Coast and North Coast LRMPs (11) strengthened and involved multiple stakeholders. In June, 2015, the provincial government published the Great Bear Rainforest Order to specify the definitions of key terms involved, and the objectives of managing the forests to support economic and ecological goals (24). Although it gives the total area of forest that can be extracted as commercial timber and the area of forest that should be protected, the order does not provide detailed information on location or boundary of Managed or Natural Forest, which may cause confusion and conflicts in practice.

The potential problems and complexity of old-growth management in the GBR has drawn the attention of international and environmental organizations, as the consequences of regional forest management will affect global biodiversity and other resources worldwide.

Global influences and non-statutory (informal) institutions

International agreements that have shaped the GBR issue and strengthened particular advocate positions include the Brundtland Report of 1987 (10), which pioneered the notion that economics, biodiversity and society are three aspects that must be balanced and managed for together. Forest management in Canada is also restricted by regional and international trade agreements, such as NAFTA, that consider timber market among countries.

In addition to commercial value, the GBR also has important cultural meaning for First Nations. The National Aboriginal Forestry Association (NAFA) points out the necessity for accommodating Aboriginal cultural and traditional uses of forestry resources (32). Recognizing the political and cultural state of First Nations in the GBR resource governance, LRMPs were signed by the provincial government to reach the consensus of collaborative

governance (12). This process marks a progressive transformation in the GBR as it pushes governance toward a co-management regime.

ENGOs play a key role in proposing sustainable management plans, including shifting traditional profit-focused management to biodiversity conservation (36). Governments and stakeholders involved would need more efficient measures to share their knowledge and responsibilities to accomplish the final goal of EBM which is to enhance human well-being and reduce ecological risks.

Moving forward

Confronting challenges

The multi-participatory management strategy in the Great Bear Rainforest has shown an unprecedented collaborative breakthrough. Along with success however, comes unforeseen challenges to face in the future in policy implementation and development. In combination with the nature of wicked problems in resource management, it's also difficult to reach an agreement among different stakeholders involved due to the uneven shared values, diverse expectations and interests between stakeholders which result in highly conflictual views (Table 1) towards governance arrangements. Also, structural problems and systematic uncertainty are inherently embedded in this collaborative relationship. Whether democratic accountability is brought into public in a transparent manner and if probity and equity in participation is grounded to every participated actor will largely determine the success of this partnership. Otherwise, the deficiency in participation forces and completeness of obligations and responsibilities may lead to underlying blockages in decision making. For example, some partners have expressed frustration over the slow progress in reaching a mutually acceptable solution. The disproportionate participation between actors can also lead to dissatisfaction with the membership rules and decision outcome (15). Therefore, current governance in the GBR is far from robust and sustainable without a clear sanction system to evaluate the accountability and participation of each stakeholder. What ultimately needs to take into account is the outstanding issues of the least disadvantaged stakeholder, First Nations, who are historically situated as a socio-economically marginalized group as a result of unrecognized aboriginal rights and title. Hence accommodating First Nations' demands for economic development and acknowledging their rights to access traditional territories poses a considerable challenge to BC government and other players (39). Considering the EBM initial intention as enhancing ecosystem integrity and improving community wellbeing, how to balance the conservation practices and facilitate economic activities and deliver benefits to communities will keep challenging the complex and multi-dimensional governance framework and ecosystem-based management in the Great Bear Rainforest.

Low interest, Low influence stakeholders	High interest, medium influence stakeholders
Civil society • Public awareness towards forest matters, but policy change and forest management doesn't have direct impact on them	First Nations, local community Private sector (ecotourism operators) Environmental NGOs • Initiative groups but have limited power to influence the decision making process
Medium interest, high influence stakeholders	**High interest, high influence stakeholders**
Government agencies/councils • Forest practices policy/direct decision makers	Timber companies, forest sector industry • Direct beneficiary from the tree farm license and assigned timber volume • Policy change and banning logging regulations will directly affect their profits

Table1. Levels of interest and influence of multi-stakeholders in Great Bear Rainforest.

Resolutions for the "wickedness"

Solutions and recommendations vary from relatively straight-forward amendments in legislation, to more fundamental changes in law or governance, thus requiring a degree of triangulation as multiple solutions may be used together, differing based on timeframe, feasibility and aim.

A clear example of alleviating some of the uncertainty surrounding the GBR in the immediate future would be to amend the Great Bear Rainforest Order (24) to include the preamble as part of the order's legally binding objectives. Currently, the preamble of the order is the only portion of the document explicitly stating that 70% of the range of natural variation be retained as old growth forest at a regional scale. By including the preamble, management would be required to meet this percentage target de jure, and more derivative issues related to uncertainty may be resolved (i.e., frustrations with slow negotiation process) (34), (43).

Negotiations face additional uncertainty due to research gaps (4), (14). With greater volumes of information available, more certainty regarding habitat thresholds can be utilized to create optimal management targets. A practicable solution would therefore be to conduct ongoing interdisciplinary research within the GBR region. A win-win situation appears evident when faced with a lack of baseline data and inventories, combined with an opportunity to increase local employment and human capital. International/NGO interest may be utilized philanthropically to assist in training, employing and funding local communities in projects relating to conservation field work, wildlife monitoring and/or third party accreditation.

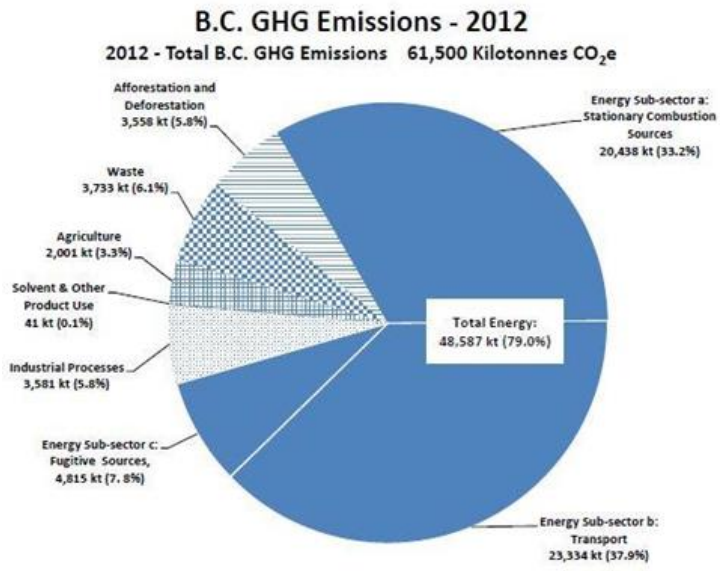

Figure 4. Proportion of greenhouse gases emitted from each major sector in British Columbia. The green arrow highlights the degree of emissions stemming from the forest sector. Figure obtained from the greenhouse gas inventory report (23).

The precautionary target of 70% old growth retention may be implemented, while embedding flexibility in legislation that allows for future revisions to be made, based on best available science. For example, an additional clause may be added to the order to that effect.

Along with research and training, diversification of resource-dependent regions have often been encouraged (7), (30), (41). The nascent carbon market is a potential component of a triangulated solution to the GBR issue by diversifying economies and linking global climate and biodiversity concerns to the GBR. The forest sector can be looked to for carbon sequestration and emission offsetting in order to meet provincial targets and gain further revenue via carbon taxation (44). Figure 4 highlights the fact that an appreciable degree of emissions stems from forestry activities; currently only deforestation and afforestation are included in provincial carbon accounting while other operations are categorized as “memo items” (23). Atmospheric benefit sharing agreements (ABSAs) is one offset strategy, where communities work with government to further the carbon neutral government policy (18), (35).

Other strategies include amending the Forest Range and Practices Act (FRPA) to include carbon as management criteria, and incorporate memo items in forest carbon accounting. Changes in valuation and law can incentivize further offset measures in forest operations such as the avoidance of slash burning. Unforeseen consequences include the unjustified accreditation and lack of transparency in additionality tests within ABSAs (31). It is also difficult to ascertain how easily forest practices may be altered to manage for carbon, as the forest industry has a long history of resisting change (7), (14).

Lastly, consent based decision-making is recommended in order to move forward. Although NAFA and other organizations (17) have encouraged nations to grant the right to consent to aboriginals, the federal government of Canada has fought to prevent the veto from being legally binding (1), (8), (9). First Nations throughout BC have outstanding claims to their ancestral lands; any and all policies contingent on First Nations eventually face conflict due to this issue, thereby interrupting and destabilizing agreements, economic productivity and business alliances (3), (29). Provincially, the Tsilhquot’in court case recognized and affirmed

the Constitution Act of 1982, section 35, which compels any and all infringing groups to consult and accommodate First Nations, but the vagueness to what is considered “fiduciary duty”, and the lack of accountability in terms of hard standards and sanctions makes the test to infringe upon aboriginal rights easily passable (27), (37). First Nations ought to have the right to say no when policy decisions impact the land they live on, so that they may acquire the best opportunities possible during interim measures. A legally binding right to consent would secure certainty in land use and other agreements, offering the most transformative economic benefit to communities, as decisions become fully reflective of First Nations goals and values. Whether such a recommendation is realistic in the immediate future remains doubtful, as most conflicts continue to be resolved on a case by case basis (24), (32), (37), (38).

References

Peer Reviewed Articles

Barsh, R. L. (1996). Indigenous peoples and the UN Commission on Human Rights: a case of the immovable object and the irresistible force. *Human Rights Quarterly, 18*(4), 782-813. doi:10.1353/hrq.1996.0038

Bird, L. M. (2011). *Making the New Relationship work: Crown-First Nation Shared Decision-Making in the Great Bear Rainforest.* (Master’s thesis). Retrieved fromhttps://circle.ubc.ca/handle/2429/39834.

This article analyzed whether the First Nations have shared authority on decision-making over land use zones, ecosystem-based management rules, and the operational plans in the Great Bear Rainforest. In addition, the thesis investigated the process of the government-to-government, and the relationship built between the Crown and the Coastal First Nations. The research used interviews as a major source to collect information of decision-making processes in practice. The interviewees provided unique and various insights. The results showed that current negotiation between the Crown and the Coastal First Nations through a forum was not as active as expected, and there was no legislated and specific mechanism for amendment. The thesis also reviewed the history of the Crown-Coastal First Nation agreements on resource management in the Great Bear Rainforest. It revealed that the government-to-government relationship on decision-making was gradually making progress with the respect to First Nations’ rights.

Booth, A. L., & Skelton, N. W. (2011). Industry and government perspectives on First Nations’ participation in the British Columbia environmental assessment process. *Environmental Impact Assessment Review, 31*(3), 216–225.http://doi.org/10.1016/j.eiar.2010.11.002

To qualitatively identify problems and record perspectives on industry’s interactions with First Nation’s regarding natural resource management, a series of semi-structured interviews were conducted with proponents, consultants, government and First Nations within the Treaty 8 Territory in Northern B.C. and Alberta. Results were discussed based on the perceived level of satisfaction that subjects felt towards joint environmental assessment (EA) and First Nation consultation processes. Several problems were uncovered including uneducated cross-cultural assumptions, limited First Nation capacity, and vague EA goals and standards. Concluding remarks singled out trust as the most fundamental cause of poor

relations between First Nations and government, which in turn greatly hinders industry's chances at healthier relations with First Nations. There is a limited degree of literature on this subject: "Therefore the absence of any studies on their [industry's] perspectives appears to be a significant research gap" (Booth & Skelton, 2011, p. 220). The degree of subjectivity is cause for some caution, and the scope of the study was limited to one – albeit large – region. "Our results are suggestive only, not conclusive" (Booth & Skelton, 2011, p. 219). To better understand industry perspectives and struggles, it is most certainly valuable to have this paper as a research piece, and hopefully greater knowledge will be gained from works such as this in the future.

Bunnell, F. L. (2008). Indicators for sustaining biological diversity in canada's most controversial forest type—Coastal temperate rainforest. *Ecological Indicators, 8*(2), 149-157. doi:10.1016/j.ecolind.2006.11.007

Cullen, D., McGee, G. J. A., Gunton, T. I., & Day, J. C. (2010). Collaborative planning in complex stakeholder environments: An evaluation of a two-tiered collaborative planning model. *Society & Natural Resources, 23*(4), 332-350. doi:10.1080/08941920903002552

This peer-review article introduces the interests each key stakeholders have toward the forestry management in BC. This paper seeks to explain the special status First Nation have on forest management and how to collaborate effectively with The different stakeholders. The author suggests that a "two table"model would give indigenous people a special speaking in the decision-making process rather than treating them as another stakeholder at the table. The suggestion is asserted by investigation and fieldwork results. This paper is from a reliable resource with a comprehensive interpretation, and its content is of high credibility.

DellaSala, D. A. (2011). *Temperate and boreal rainforests of the world: Ecology and conservation.* Washington, DC: Island Press/Center for Resource Economics. doi:10.5822/978-1-61091-008-8

Edenhoffer, K., & Hayter, R. (2013). Restructuring on a vertiginous plateau: The evolutionary trajectories of British Columbia's forest industries 1980–2010. *Geoforum*, *44*, 139-151. doi:10.1016/j.geoforum.2012.10.002

A theoretical essay arguing that "the analysis of the life cycles of resource industries' highlights lengthy periods of structural crises that involve long-term forces of change. These stimulate various kinds of policy experimentation that redefine the rules of the game, sometimes intentionally, sometimes not" (Edenhoffer & Hayter, 2013, p. 150). Sighting many sources of government and academic data, British Columbia's forest economy was used as an example of a resource industry cycle that has altered corporate organizational structures, societal imperatives and the physical landscape. Edenhoffer and Hayter (2013) describe the unique conditions and difficulties of resource industries – mainly their volatility in the market – the evolution of the forest economy from the 1980s to 2010, and how the 1980s became a fundamental turning point for the industry as a result of economic crisis. A combination of plateauing cheap, high quality resource extraction, globalization and the American recession comprised the fulcrum which created this turning point. Due to chronic economic uncertainties and the largely public ownership of the resource base, Aboriginal and other stakeholders have managed to force industry to diversify, innovate, add value, and re-regulate in recent years. The historical context of the forest sector was well summarized and discussed, with well cited sources, sound arguments and descriptive

insights; this paper greatly assists in research regarding the Great Bear Rainforest's industry stakeholders.

Engle, K. (2011). On fragile architecture: The UN declaration on the rights of indigenous peoples in the context of human rights. *European Journal of International Law, 22*(1), 141-163. doi:10.1093/ejil/chr019

Joffe, P. (2010). UN declaration on the rights of indigenous peoples: Canadian government positions incompatible with genuine reconciliation. *National Journal of Constitutional Law, 26*(2), 121.

McDermott, C. (2014). REDDuced: From sustainability to legality to units of carbon-the search for common interests in international forest governance.*Environmental Science & Policy, 35*, 12-19. doi:10.1016/j.envsci.2012.08.012

This peer reviewed article introduces the institutional history of international forest governance and focuses to reducing emission from deforestation and degradation and forest enhancement (REDD+)under the UNFCCC. The author examined the previous failures and suggest the REDD+ strategy would attract investors, government and other stakeholders to act and achieve the shared global forest efficient management. The paper is based on a large collection of data and comparison between different regions in the world. The authors are professors in University of Oxford, which makes this paper reliable; and its content is very credible; though I want to suggest that local government's interest is largely ignored in this paper.

McGee, G., Cullen, A., & Gunton, T. (2010). A new model for sustainable development: A case study of the great bear rainforest regional plan. *Environment, Development and Sustainability, 12*(5), 745-762. doi:10.1007/s10668-009-9222-3

This peer-reviewed journal article demonstrates a new model of sustainable development in great bear rainforest, which is a collaborative, multi-involved and community-based plan that aims to promote ecosystem-based management and achieve long term sustainability. This paper asserts that this planning is imperative because "this region comprises one quarter of the world's remaining ancient coastal temperate rainforest, it's of significant ecological importance" (745). The authors argue that this innovative model results in significant reduction in timber harvesting as well as other resource extraction, which also maintains the old-growth trees standing level. In general, this paper is able to provide fundamental but substantial information for public to understand the existing sustainable model for retaining and preserving ancient trees and associated ecosystem resources. It also can be an intrusive reference for management model building and regional development planning in forested areas. However this article does not provide any explicit criticism of this model as there is an absence of negative faces and deficiencies of the plan, which is contradictory with other literatures doing the similar research.

Moore, M., & Tjornbo, O. (2012). From coastal timber supply area to great bear rainforest: Exploring power in a social-ecological governance innovation. *Ecology and Society, 17*(4), 26. doi:10.5751/ES-05194-170426

Pesklevits, A., Duinker, P., & Bush, P. (2011). Old-growth forests: Anatomy of a wicked problem. *Forests, 2*(1), 343-356. doi:10.3390/f2010343

Price, K., Roburn, A., & MacKinnon, A. (2009). Ecosystem-based management in the great bear rainforest. *Forest Ecology and Management, 258*(4), 495-503. doi:10.1016/j.foreco.2008.10.010

This is a peer reviewed article that broadly examines the definition and implementation of EBM in the GBR. Price et al (2009) provide a base understanding of how EBM is being employed in the management of old growth forests and biodiversity in the area of study, and which elements are unique to the GBR. Elements that are particularly unique to the area as outlined by this paper are power shifts and coalitions between various stakeholders, which ultimately contributed to the establishment of the LRMP. No methods have been specified in this paper. Contact information is provided for authors; article peer reviewed; extensive references provided. The aforementioned factors contribute to the credibility and support of this paper. A strength of this paper in relation to our research is the description of the individual elements of EBM and how they have been addressed through the current management plan.

Saarikoski, H., Raitio, K., & Barry, J. (2013). Understanding 'successful' conflict resolution: Policy regime changes and new interactive arenas in the great bear rainforest. *Land Use Policy*, 32, 271-280. doi:10.1016/j.landusepol.2012.10.019

This is a well-organized peer-reviewed article assembled by multi-engagement work and a wide array of resources. This paper seeks to introduce the Great Bear Rainforest agreement for discussing the resolution of land use conflicts and development in the great bear rainforest. The author describe the methodological approach by providing data collection and analysis process in detail. Thus there is an evidence of extensive research and reference to other similar literatures. The argument asserted by the authors is complementary with their fieldwork results and the fieldwork is further supplemented with other documentary analysis of relevant planning and background documents, with a specific insight into the Central Coast Land and Resource Management Plan completion table report (CCLRMP, 2004). It presents a very comprehensive, exhaustive analysis and covers many facets of policy regimes by bringing up multiple opinions and interpretations. It's a quite useful and reliable source for our study topic.

Walters, L. C., Aydelotte, J., & Miller, J. (2000). Putting more public in policy analysis. *Public Administration Review, 60*(4), 349-359. doi:10.1111/0033-3352.00097

Government Documentation

Assembly, U. G. (2007). *United nations declaration on the rights of indigenous peoples.* Retrieved from http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf

British Columbia Government (2011). *Atmospheric benefit sharing agreements.* Retrieved from http://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/consulting-with-first-nations/first-nations-negotiations/atmospheric-benefit-sharing-agreements

British Columbia Ministry of Sustainable Resource Management. (2005) North Coast Land and Resource Management Plan: Final Recommendations. Retrieved from https://www.for.gov.bc.ca/tasb/slrp/lrmp/nanaimo/ncoast/docs/NCLRMP_Final_Recommendations_feb_2_2005.pdf

This is a land and resource management plan, created by the North Coast LRMP planning table that contains tables outlining the recommended land use designations (protection areas, biodiversity areas, special forest management areas, and EBM operating areas) for the plan area. These tables quantify the scope of the protected areas, and make distinctions between the different designations. Understanding the different land use designations and the scale of each designation is central to interpreting the effectiveness and appropriateness of EBM in the GBR, and for understanding how this management approach is being employed in the GBR. The land use designations in tables 4 – 7 were created by the NCLRMP planning table, which included representatives of nine public sectors, eight First Nations, local governments and the provincial government (BC Ministry of Sustainable Resource Management, 2005). Information and technical resource analysis was done in collaboration between the Government Technical Team (GTT) and the Coast Information Team (CIT). This inclusive method of data collection is very appropriate, as all stakeholders were included in the planning process. The collaborative nature of this project, the objective nature of the land use designations and boundaries, and the publishing body (BC Ministry of Sustainable Resource Management) suggest that these tables are credible and reasonable. In the introduction it is written that the land use designations are 'recommended', and therefore may not reflect the actual adopted boundaries.

Environment Canada. (2013). *Natural Areas Conservation Program*. Retrieved from http://www.ec.gc.ca/default.asp?lang=En&n=FEF1141D-1&news=FF339FA8-CB6C-421E-8686-FAA79A544125

Forest Range and Practices Act. (2004). *Forest Planning and Practices Regulation*. Retrieved from Government of B.C. website: http://www.bclaws.ca/Recon/document/ID/freeside/14_2004

Ministry of Energy and Mines. (2011). *Liquefied natural gas: a strategy for B.C.'s newest industry*. Retrieved from http://www.gov.bc.ca/ener/popt/down/liquefied_natural_gas_strategy.pdf

Ministry of Environment. (2012). *Greenhouse gas inventory report*. Retrieved from the Government of B.C. website: http://www2.gov.bc.ca/assets/gov/environment/climate-change/reports-and-data/provincial-ghg-inventory-report-bcs-pir/pir-2012-full-report.pdf

Ministry of Forests, Lands and Natural Resources Operations. (2015). *Great Bear Rainforest Order, Draft*. Retrieved from Government of B.C. website: https://www.for.gov.bc.ca/TASB/SLRP/GBR_BMTA_LUOR.html

Ministry of Sustainable Resource Management. Central Coast LRMP Completion Table. (2004). *Report of Consensus Recommendations to the Provincial Government and First Nations*. Retrieved from http://www.coastforestconservationinitiative.com/pdf4/CCLRMP_Final.pdf

Oliphant, S. (2014). *B.C. Government and First Nations leaders look to future of reconciliation*. Retrieved from https://news.gov.bc.ca/stories/bc-government-and-first-nations-leaders-look-to-future-of-reconciliation

Tsilhqot'in Nation v. British Columbia, 2 S.C.R. 257 (2014). Retrieved from https://scc-csc.lexum.com/scc-csc/scc-csc/en/item/14246/index.do

Popular Media

Balint, P. J., Stewart, R. E., Desai, A. (2011). *Wicked environmental problems: Managing uncertainty and conflict.* San Francsico; Washington: Island Press. doi:10.5822/978-1-61091-047-7

Forsyth, J., Hoberg, G., & Bird, L. (2013). In Search of Certainty: A Decade of Shifting Strategies for Accommodating First Nations in Forest Policy, 2001-11. In Tindall, D. B., Trosper, R. L., & Perreault, P. (Ed.), *Aboriginal Peoples and Forest Lands in Canada* (pp. 299-312), Vancouver: UBC Press

Hayter, R. (2000). Flexible crossroads: The restructuring of British Columbia's forest economy. Vancouver: UBC Press.

Hoekstra, G. (2013, January 18). Great Bear Rainforest enters the carbon economy: Critics say conservancy project does not meet a key carbon credibility test. *The Vancouver Sun* Retrieved from http://www.vancouversun.com/technology/Great+Bear+Rainforest+enters+carbon+economy/7840943/story.html?__lsa=7b58-34da

Howlett, M. (2001). Policy venues, policy spillovers and policy change: the courts, aboriginal rights and British Columbia forest policy. In Cashore, B., Hoberg, G., Howlett, M., Rayner, J., Wilson, J. (Eds.), *In Search of Sustainability: British Columbia Forest Policy in the 1990s.* (pp.120-140). Vancouver: UBC Press.

Hume, M. (2015, July 27). Report chides TimberWest over old trees in the Great Bear Rainforest. The Globe and Mail. Retrieved fromhttp://www.theglobeandmail.com/news/british-columbia/report-chides-timberwest-over-old-trees-in-the-great-bear-rainforest/article25716089/

McElroy, J. (2015, May 21). Groups call TimberWest to reduce logging in Great Bear Rainforest. *Global News*. Retrieved from http://globalnews.ca/news/2011236/groups-call-on-timberwest-to-suspend-logging-in-great-bear-rainforest/

Pollon, C. (2012, June 11). Great Bear Rainforest to be massive carbon offset project. *The Tyee*. Retrieved from http://thetyee.ca/News/2012/06/11/Great-Bear-Carbon-Offset/

Grey Literature

Armstrong, P. (2009). *Conflict resolution and British Columbia's Great Bear Rainforest: Lessons learned 1995-2009*. Retrieved from Coast Forest Conservation Initiative website: http://www.coastforestconservationinitiative.com/pdf7/GBR_PDF.pdf

This document is provided by Coast Forest Conservation Initiative, and explained how the multi-interest governance leads to coastal rainforest management, including government-to-government relationship between First Nations and BC government. According to the agreement signed in 2009, the decision-making on land use and resource management should agree with First Nations' knowledge, culture and values. Building this new relationship between governments aimed at involving First Nations to decision-making processes with respects, and creating a sustainable management for future generations. Armstrong conducted this document by looking through the timeline of the Great Bear Rainforest policy. The author analyzed the impacts of the agreement on each player participated in. The document also contained a glossary of key terms related to the Great Bear Rainforest agreements, which is helpful for the public to understand the concepts better.

Hoberg, G. (2015). What is the Role of First Nations in Decision-Making on Crown Government Resource Development Projects? – A Hoberg Course Brief. Retrieved from GreenPolicyProf website: http://greenpolicyprof.org/wordpress/?p=996

Hoberg, G., & Taylor, S. (2011). *Between Consent and Accommodation: What is the Government Duty to Accommodate First Nations Concerns with Resource Development Projects?* Retrieved from GreenPolicyProf website: http://greenpolicyprof.org/wordpress/?p=638

Low, M., & Shaw, K. (2011). First nations rights and environmental governance: Lessons from the great bear rainforest. *BC Studies,* (172), 9. Retrieved from:

http://ojs.library.ubc.ca/index.php/bcstudies/article/view/2247

Nanwakolas Council, Coastal First Nations, and BC Ministry of Forests, Lands and Natural Resource Operations. (2012). *Ecosystem Based Management on B.C.'s Central and North Coast (Great Bear Rainforest), Implementation Update Report*. Retrieved from https://www.for.gov.bc.ca/tasb/slrp/lrmp/nanaimo/central_north_coast/docs/ebm_implementation%20update_report_july%2031_2012.pdf

Norden, A., Tansey, J., Prosperity, S., & desLibris. (2013). *Great bear markets the interface of finance, forestry and conservation in BC's Great Bear Rainforest.* Retrieved from https://circle.ubc.ca/handle/2429/48406

Patrick, A. (2009). *Conflict resolution and British Columbia's Great Bear Rainforest: lessons learned 1995 – 2009*. Retrieved from http://www.coastforestconservationinitiative.com/pdf7/GBR_PDF.pdf

Rainforest Solutions Project. (2005). Agreements Abound, but No Change on the Ground Great Bear Rainforest Agreement Report Card, April 2005. Retrieved from https://www.for.gov.bc.ca/hfd/library/documents/bib95655.pdf

Data Sources

Lee, M. (2012). *BC's Legislated Greenhouse Gas Targets vs Natural Gas Development. Canadian Centre for Policy Alternatives, BC office.* Retrieved from https://www.policyalternatives.ca/sites/default/files/uploads/publications/BC%20Office/2012/10/CCPA-BC_GHG-Targets-vs-Natural-Gas.pdf

- Previous
- Next

Site Registration

If you want to add yourself to this blog, please log in.

The Department of Geography - Environment and Sustainability Program
Vancouver Campus
1984 West Mall
Vancouver, BC Canada V6T 1Z2
Tel 604 822 2663
Website www.geog.ubc.ca/